EC-L FILM SYSTEM FOR PORTAL IMAGING

- **Three times more contrast than traditional portal localization radiographs**
- **Improved treatment field verification**

113-232

113-234

The EC-L film system is comprised of EC film in either a EC Lightweight oncology cassette or a EC Lightweight fast cassette. Achieve a new standard in portal image quality with the EC-L film system. With a more than three times improvement in contrast over conventional systems, EC film provides exceptional definition of bony structures for more confident verification of treatment fields.

EC Lightweight cassettes combine all the features of its predecessors, the X-OMATIC and X-OMAT cassettes with a new design that makes it 45% lighter. The EC lightweight cassette is compatible with Multiloaders 700 plus and 7000, and can be used interchangeably with existing cassettes.

Tight contact, tough build, and ease of use

- A 45% reduction in weight* allows for easier handling and eases technologist fatique.
- Cassettes use curved front and back panels to roll air out from between film and screens as the cassette is closed to create excellent film/screen contact, reduce blur and improve sharpness.
- Cassettes are built tough to satisfy all your imaging needs. Impact-resistant edges, corners, and a durable hinge are some of the features that help the cassette maintain remarkable screen-film contact and light integrity.
- The single latch design in a cassette offers quick and easy one-handed usage.
- Self-sticking labels conveniently fit on cassette edge grooves to make identification of cassette type easy.

A technique chart for portal localization images taken using 4 to 18 MV energies is available. Initial images may be taken using the same techniques currently employed, making adjustments as needed. It is critical that consistent source-to-film distances be used.

Item #	Description	Size	Weight
113-232	EC Lightweight Regular Cassette	14" x 17" (35 x 43 cm)	4.6 lb (2.1 kg)
113-233	EC Lightweight Fast Cassette	14" x 17" (35 x 43 cm)	4.6 lb (2.1 kg)
113-234	EC Film, Quantity 100	14" x 17" (35 x 43 cm)	

AGFA RADIATION THERAPY CASSETTES

CRC Radiation Therapy Cassettes use all brands of film, including ready pack films. They are designed especially for radiotherapy and feature high-quality lead intensifying screens similar to those used in high-energy industrial radiography.

Note: These cassettes are not returnable.

Item #	Film Size	Front Screen	Rear Screen	Window	Energy	Weight
869406	10" x 12"	1.00 mm T	0.50 mm T	No	10 MeV - Up	5.4 lbs.
869430	10" x 12"	1.00 mm T	0.50 mm T	Yes	10 MeV - Up	5.4 lbs.
811467	14" x 17"	0.25 mm T	0.25 mm T	Yes	Cobalt 60	6.4 lbs.

HEAVY DUTY 4 SQUARE CASSETTES

The Four Square Cassette uses all brands of film. It features a closed channel stainless steel frame. The front panel consists of a phenolic plastic face and felt backing which is laminated to a magnesium alloy plate. This construction presents a flat surface that will not warp and gives excellent film/screen contact. The door is made of aluminum, lead foil (0.005" thick) and thick wool felt with two floating stainless steel hinges.

The locking bars are made of stainless steel and are designed to give excellent closure to prevent light leakage and provide the necessary pressure at all points to give complete contact. The “D” Ring provides easy opening of the cassette door.

Lead Intensifying Screens are ordered separately.

Item #	Film Size	Thickness	Weight
112-036	14" x 36" (35 x 91 cm)	0.665" (1.689 cm)	12.4 lb (5.6 kg)

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ALUMINUM FRAME X-RAY CASSETTES

Without Windows

- Solid aluminum construction and proven design of these cassettes provide ultimate quality.
- Durable push button latches and spring loaded door assure effortless opening. No more fumbling with sticking latches!
- Resilient polymer corners reduce dents and damage if dropped.

Lead Intensifying Screens must be ordered separately.

Item #	Cassette	Film Size
112-113	Aluminum	10" x 12" (25.4 x 30.5 cm)
112-118	Aluminum	14" x 17" (35.6 x 43.2 cm)

LEAD INTENSIFYING SCREENS FOR RADIOTHERAPY

Lead Intensifying Screens are primarily used to intensify the radiographic image. They are generally used in pairs by placing the x-ray film between the bare lead surfaces of the screens. Each screen surface is protected with a semitransparent coating, which must be peeled off prior to use. For maintaining long-lasting screens it is highly recommended that a cassette be used.

Screen Recommendation		
Energy	Front	Rear
Cobalt 60	0.25 mm (.010")	0.13 mm (.005")
4 MeV - 6 MeV	0.50 mm (.020")	0.25 mm (.010")
10 MeV - Up	1.00 mm (.040")	0.50 mm (.020")

Item #	Description	Screen Size	Screen Thickness	Weight
114-205	Lead Screen	10" x 12"	0.13 mm (.005")	4 oz (0.1 kg)
114-705	Lead Screen	14" x 17"	0.13 mm (.005")	7 oz (0.2 kg)
114-710	Lead Screen	14" x 17"	0.25 mm (.010")	1 lb (0.5 kg)
114-720	Lead Screen	14" x 17"	0.50 mm (.020")	2 lb (1.0 kg)
114-740	Lead Screen	14" x 17"	1.00 mm (.040")	4 lb (1.8 kg)
114-836	Lead Screen	14" x 36"	0.25 mm (.010")	2 lb (1.0 kg)
112-050	Screen Installation			
114-930	Screen Cutting			
123-110	Double-Coated Tape 3/4" x 36 yards			

SIMULATOR RADIOGRAPHIC CASSETTE

With Grid

The Radiographic Cassette with grid (14" x 17" or 35.7 x 43.3 cm) has an aluminum inter-spaced grid, 103 line, 8:1 Ratio and 48" to 72" focus range. The use of Kodak Lanex Fast Green Screens give a faster film speed than regular screens.

Note:
Order lead screens separately.

Customer must verify the thickness of a cassette that will fit into cassette holder.

Item #	Size	Thickness	Window
118-117-02	14" x 17"	0.545" (1.4 cm)	No

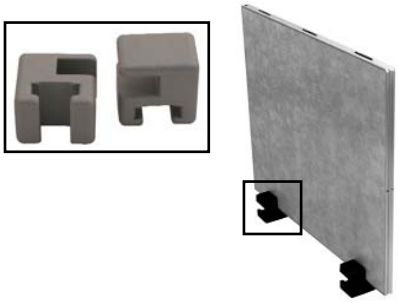
Non-Returnable Item

SIMULATOR SCREENS

Screens Only

Item #	Screen Only	Size	Window	Film = Relative Speed	Film = Relative Speed
118-040-02	Kodak Lanex Fast Green Screens	14" x 17"	No	TML or TMG = 400	TMH = 1200
118-040-03	Kodak Lanex Regular Green Screens	14" x 17"	No	TML or TMG = 600	TMH = 800

RAIL CASSETTE HOLDERS



The Rail Cassette Holders (set of two) easily slide onto the couch rails from either side. They are securely held in place and can not be jarred off.

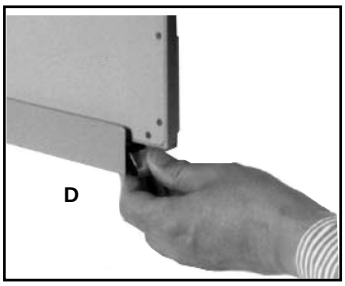
Specifications

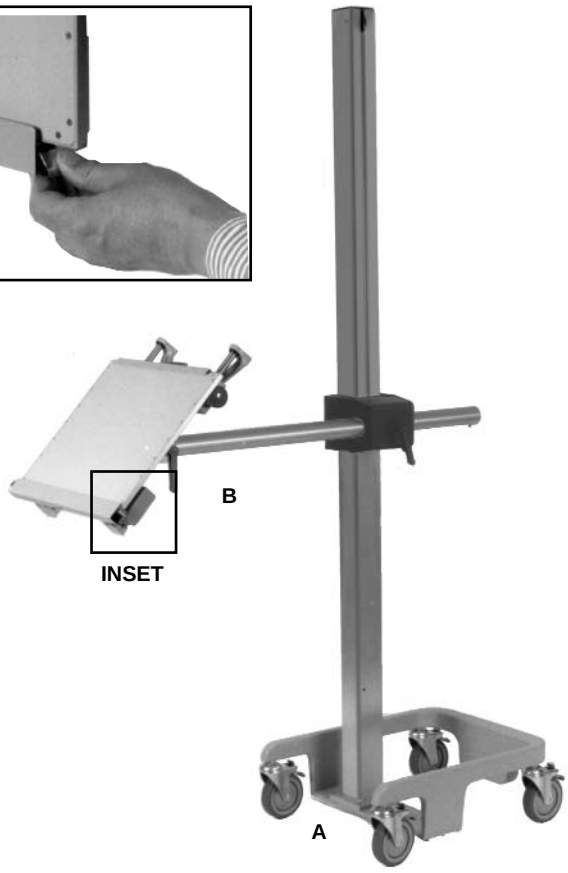
Width of Cassette: 5/8" (1.6 cm)

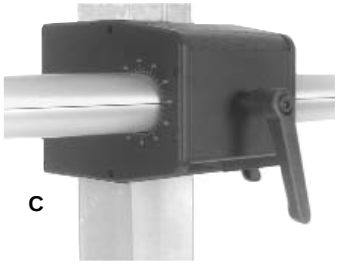
Item #	Description	Size
128-403	Varian Clinac 4 Set	3/8" x 1 1/8" (0.95 x 2.87 cm)
128-403	Varian PSA Spine Set	3/8" x 1 1/8" (0.95 x 2.87 cm)
128-404	Varian ETR Set	3/8" x 1 1/8" (0.95 x 2.87 cm)
128-403	Varian Ximatron Set	3/8" x 1 1/8" (0.95 x 2.87 cm)
128-420	Siemens Z-II, Z-IV or Z-XT Set	3/8" x 1" (0.95 x 2.55 cm)
128-420	Siemens Mevasim Set	3/8" x 1" (0.95 x 2.55 cm)
128-427	Siemens TEM Set	3/8" x 1" (0.95 x 2.55 cm)
128-430	Philips SL25 or SL75 Set	State Rail Size
128-460	Oldelft Simulator Set	State Rail Size
128-470	Mitsubishi Set	.2" x 1" (0.5 x 2.5 cm)

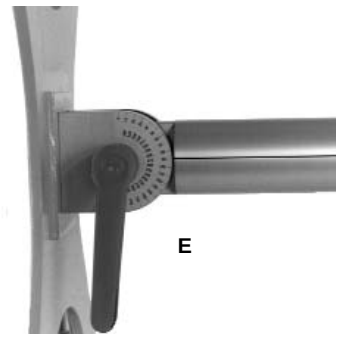
MOBILE DR, CR AND CASSETTE HOLDER

RPDinc's design allows the DR, CR and Cassette Holder to extend 6" (15.24 cm) further over the couch than other units on the market. An option is available for a custom post height for extended range couches.









- **Smooth gliding motion on roller bearings**
- **High range of motion**
- **Counter-balanced DR, CR and cassette holder**
- **Counter-balanced base**
- **DR, CR and Cassette safety latch**
- **Easy loading from either side**
- **Automatic angle indicators**
- **Holds most DR and CR plates**

The Mobile DR, CR and Cassette Holder has been engineered around the needs of the radiation therapist with unmatched ease of motion obtained through the use of precision components.

Needle roller bearings enable smooth travel both vertically and horizontally eliminating the frustrating binding action found on other cassette holders when repositioning. The DR, CR and Cassette Holder glides freely even while a heavy cassette is loaded. A counter-weight offsets the weight of the cassette, allowing for almost effortless motion. The DR, CR and Cassette Holder is able to position close to tables and objects due to the unique base counter-weight system and the offset square post (Figure A). These 2 features prevent rotation and the possibility of the unit tipping over.

The DR, CR and Cassette Holder can tilt 180° (Figure B), rotate 360° (Figure C) and is spring loaded to provide tension on the cassette to ensure that it is secured. A spring loaded latching system (Figure D) enables up to a 14" x 17" (35.5 x 43 cm) cassette to be inserted from either side and once latched, secures the cassette from sliding out during rotation. The cassette carrier will also accept 14" x 36" and 17" x 28" (35.5 x 91.5 cm and 43 x 71 cm) cassettes by bypassing the latching mechanism.

Easy to read angle indicators (Figures C & E) allow for accurate angulation of the cassette carrier. Indicator scales coincide with the degree rotation of the treatment machine gantry, eliminating the need for calculating the correct cassette carrier angle. Simply rotate the cassette carrier so the degree indicator reading is the same as the machine gantry reading, and the correct corresponding angle is automatically established.

Motion locking systems are equipped with large comfortable ratchet type handles which enable the operator to easily secure positions with minimal effort. Easy mobility is accomplished with four high quality ball bearing wheels. The wheels have a toe tap positive locking mechanism which doesn't allow swivel or movement of the wheel, providing excellent safety and stability.

The Mobile Cassette Holder will hold any DR or CR plate that has the same dimensions as an analog film cassette.

Specifications

Maximum DR, CR and Cassette Height: 70" (177 cm)
Minimum DR, CR and Cassette Height: 15" (38 cm)
Maximum DR, CR and Cassette Extension: 26" (66 cm) from front edge of base to center of cassette
Arm Length: 36" (91.5 cm)
Base: 19" x 24" (48.3 x 61 cm)
Height: 82.75" (210 cm)
Finish: Textured tan polyurethane , clear and black anodizing
Weight: 145 lb (66 kg)
Shipped UPS (3 cartons)

Item #	Description
130-001	Mobile DR, CR and Cassette Holder

HUESTIS FLEXI-HOLDER®

Huestis Flex-Holder® significantly reduces retakes caused by improper cassette positioning. It permits smoother scheduling and superior radiographs saving film, time and labor for cost effective radiographic procedures.

The free-standing model features an extra wide base for maximum stability. It allows accurate radiographs to be taken from virtually any angle from floor level to 71" + (180 cm) high. It rolls into position on large, locking casters and tilts the cassette 180° facing straight up, down, or anywhere in between. This free-standing model accepts virtually all cassettes.

Eliminates Retakes
- Helps eliminate retakes caused by improper cassette positioning.
- Replaces inefficient sandbags and other “make-shift”holders.

Versatile Savings
- Saves time and labor for smoother scheduling and superior radiographs.
- Saves film and reduces radiation exposure due to minimal retakes.
- Minimizes patient assistance and discomfort in positioning.

Flexible Arm Movement
- Radiographs can be taken from any angle from floor level to 71" (180 cm).
- Tilts cassette 180° facing straight up, straight down or anywhere in between
- Rotates cassette 360° clockwise or counterclockwise
- Arm rotates 360° on vertical column
- Arm assembly is counter-weighted for easy raising or lowering
- 36" (91 cm) arm

Convenient Ratchet Handles
Ratchet handles can be repositioned easily to help eliminate interference problems when positioning cassettes.

One Hand Operation
A lip on the cassette holder enables the cassette to be inserted with one hand, if necessary.

Accurate Calibration Scales
Column and arm calibration scales provide exact, repeatable angulation.

Easy Operation
Drop cassette against stop and tighten grips. Adjust visually or by calibration scales. Roll into place and lock casters.

Diagnostic Applications
- Three-way studies of acute abdomens
- Myelograms
- Fractures where patient is immobilized
- Lateral decubitus fluid level studies of abdomen and chest
- Operating room radiography

Therapeutic Applications
- Radiation therapy verification films (portal films)
- Localization for tangential breast, isocentric or oblique fields
- Simulation without fluoroscopy
- Implant source localization by orthogonal films

Specifications

Base: 19" x 22" (48.4 x 56.1 cm)
Overall Height: 75" (191.2 cm)
Weight: 110 lb (50 kg)
Ships by truck

Item #	Description	Horizontal Arm
130-303-1	Mobile Flexi-Holder	36" (91.8 cm)

21 STEP WEDGE SENSITIVITY GUIDE

The 21 Step Wedge Sensitivity Guide is a transparent step wedge with 21 steps that get progressively denser by increments of 0.15. Each step is numbered and has accurate and uniform increments.

The 21 Step Wedge Sensitivity Guide meets the needs for critical densitometry with traceability. Densities compare with those of a NIST Standard Reference Material No, 1008 Step Tablet by means of a densitometer that conforms to conditions specified in American National Standards Diffuse Transmission Density A.N.S.I. PH2.19-1986.
NIST traceable.

Specifications

Size: 1.25" W x 9.75" L (3.2 x 24.9 cm)

Item	Description
370-005	21 Step Wedge

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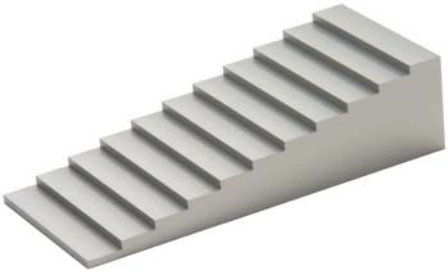
ALUMINUM STEPWEDGE



The Aluminum Stepwedge is the standard tool for evaluating the dynamic range (latitude) of a digital or film-screen imaging system. This wedge provides 11 steps in 3.2 mm increments. The number of distinguishable steps represents the dynamic range of the system. Images may be evaluated visually or by using a densitometer. The Aluminum Stepwedge provides a useful means of comparing the characteristic curve of various film/screen combinations, mAs reciprocity, and if done very carefully, sensitometry.

Note: To increase accuracy when evaluating filmscreen systems, a sensitometric pattern should be placed on the film immediately before processing.

Specifications

Construction: 6061 Aluminum Alloy
Steps: 11 Steps, 3.2 mm high and 12.7 mm deep
Dimensions: 5.5" x 2.4" (14 x 6.1 cm)
Weight: 15.87 oz (450 g)

Item #	Description
370-006	Aluminum Stepwedge

396 DUAL COLOR SENSITOMETER

The 396 Dual Color Process Control Sensitometer offers the latest technology with greatly improved green and blue film performance. It also features an exposure time control to adapt performance to various film types.

Imagine the convenience of a sensitometer this small that exposes a 21-step wedge on green or blue sensitive x-ray film. It is simple to use, just set the instrument to the proper exposure for the film being used. Place the film inside, then close and firmly press down on the cover. When you hear the beep, the exposure is complete.

Specifications

Unit-to-Unit Repeatability: ± 0.02 Log Exposure
Exposure Stability: ± 0.02 Log Exposure per year
Temperature Sensitivity: ± 0.02 Log Exposure from 59° - 86° F (15° - 30°C)
Power: 9 Volt alkaline battery (included) Apporox. 10,000 exposures/battery
Light Modulation: 21 Step Wedge, 0.15D per step
Blue Color Peak Wavelength: 455nm ± 10nm
Green Color Peak Wavelength: 512nm ± 10nm
Exposure Time: 0.1 second typical regulated by light accumulataion system
Recycle Time: 2 seconds
Dimensions: 3.75" W x 7" L x 2.3" H (9.5 x 17.8 x 5.9 cm)
Weight: 0.9 lb (0.4 kg)
Designed and manufactured to comply with the calibration requirements described in DIN V 6868-55

Item	Description	Exposure
370-052	396 Dual Color Sensitometer	Single Sided

Specifications and Design Subject to Change Without Notice

X-RITE 331C TRANSMISSION DENSITOMETER

- **Measuring range: 0-3.5D (1mm) 0-4.0D (2mm)**
- **Battery operated**
- **Scale factor (slope) stability: ±1% per 6 months**
- **Measuring area: 1 & 2 mm**
- **Measuring length: 5.5" (13.97 cm)**
- **Certified step wedge**

Designed for black and white film measurement applications where portability is required. Self-contained light table accommodates film up to 11" (28 cm) wide. The new 331C provides the same performance and reliability as the older model 331, and now includes enhanced power management features:

- NiMH battery that delivers greater than 2,000 measurements per battery charge
- Takes only 1 hour to fully charge from a discharged state
- Uses standard 12VDC battery charger and is considerably more power efficient. The charger is only active when the battery requires charging
- LED light indicates instrument charging status
- "Sleep" mode powers down the instrument when not in use to conserve battery power
- Easy to read touch pad
- EnergyStar compliant

PERFORMANCE

Though the 331C Densitometer is portable and compact, it has the same accuracy and repeatability as larger countertop units, measuring densities up to 4.0 D.

EASY TO USE

The built-in light table eliminates the need for an external light source and easily accommodates film up to eleven inches wide. The 331C has push-button zeroing, a sleep mode to reduce battery drainage, a certified step wedge, a LED charge status indicator, and instrument carrying case.

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Specifications

Measuring Range: 0-3.5D (1mm), 0.4.0D (2mm)
Accuracy: ±.02D
Repeatability: ±.01D
Operating Temperature Range: 50°-104°F (10°-40°C)
Power Requirements: 100-240V - 50/60Hz
Warm-Up Time: None
Scale Factor (slope) Stability: ±1% per 6 months
Measuring Area: 1 & 2 mm
Measuring Length: 5.5" (13.97cm)
Power Supply: Four rechargeable AA NiMH batteries and charger
Physical Dimensions: 2.9" W x 7" L x 2" H (7.46 x 17.78 x 5.08 cm)
Weight: 1.5 lb (0.68 kg)

Item	Description
370-031	Densitometer, X-Rite 331C, Black & White

TBX1000™ TRANSMISSION DENSITOMETER

- **Soft key menu operation**
- **Advance optical system to meet various industries' specifications**
- **7.5 inch throat to measure large samples**
- **Readings are very repeatable with a high degree of accuracy**
- **Optional band pass filter**
- **USB port standard**
- **Software Calibration**
- **Switchable LED table lamps**
- **Excellent for measuring optical densities of metallized films**

The TBX1000™ Transmission Densitometer measures ISO Visual diffuse Optical Density (OD) to 6.00D. This wide measuring range allows evaluation of many types of film, laminates, and substrates. The data can be uploaded to spreadsheets via the USB port. To meet special requirements an optional filter carrier may be supplied allowing supplementary filters to be used to isolate a portion of the spectrum that may be of interest. The TBX™ can show deviations from a stored reference value for all functions.

Specifications

Optical Design: ANSIPH2.19
Display: Graphical LCD (128x64 pixel)
Apertures: 1, 2, 3mm
Throat Length (Arm): 7.5" (191mm)
Output Port: USB
Power: 12V via universal 110/220 Adapter
Measuring Range: 0 to 6.00D
Accuracy: ±0.02D
Precision: ±0.01D
Warm-up Time: None

Item	Description
370-002	TBX1000™ Transmission Densitometer
370-000-3	0.3mm Aperture for 370-002 Densitometer

RADIOGRAPHY / FLUOROSCOPY QC KIT

This kit includes all of the test devices necessary to perform QC in radiographic and fluoroscopic suites

- Victoreen® RAD-CHECK® PLUS
- Wide-Range Digital kVp Meter
- Digital X-Ray Pulse-Counter / Timer
- Radiographic Ionization Chamber, 30 cm^3
- Carrying Case

Specifications

Rad-Check™ Plus
Ranges: 0.001 to 2 R, 0.01 to 20 R/min
Internal Chamber: 30 cc volume, energy response ± 5% from 15 to 65 keV (30-150 kVp filtered), 20.5 cm^2 (5.1 cm diameter) effective measurement area. Center of chamber 1.03 cm below top of chamber
Standard Calibration: At 75 kVp with 4 mm Al filtration at 22°C and one atmosphere.
Reproducibility: Within 2% short- term over 100 mR to 2 R range (1 to 20 mGy).
Electrometer Drift: 0.5 to 1 mR/min typical; 6mR/min maximum (5 to 10 µGy; 60µGy/min maximum).
Maximum Exposure Rate: Minimum 90% collection efficiency at 20 R/sec
Automatic Reset: Resets display to zero; can also be reset manually.
Operating Temperature: 10-40°C,
Relative Humidity: 0 to 90%, non-condensing
Display: 3.5" x 0.5" (8.9 x 1.3 cm) LCD, low battery indicator
Controls: Auto or manual reset selector. Display zero reset button. Dose or dose rate output selector. Integral or remote ion chamber selector. On/off switch.
Power: 9 V alkaline battery, >100 hours operation (50 hours in manual reset mode)
Size: 6" W x 6.25" D x 2.75" H (15.29 x 15.93 x 7 cm)
Weight: 1.125 lb (0.5 kg)
CE Tested. Meets applicable standards.

Wide Range Digital kVP Meter
Ranges: Low: 50 to 90 kVp, 0.1 kVp resolution
High: 80 to 150 kVp, 0.1 kVp resolution
Accuracy: ± 3% or 3 kVp (whichever is greater)
mAs requirements: (45.7 cm SDD) 18 mAs at 120 kVP; 50 mAs at 60 kVp, single phase. Minimum exposure time: 1/20 (0.05) sec
Controls: On/off, single/three-phase and range selection switch
Operating temperature: 50° to 104°F (10° to 40°C)
Relative Humidity: 0 to 90%, non-condensing
Power Requirements: 9 V alkaline battery, 150 hours operation
Display: 3.5" x 0.5" (8.9 x 1.3 cm) LCD. Automatic indication of (a) low battery condition, (b) need to adjust exposure factors
Output Signal: BNC connector for waveform analysis
Dimensions: 8" W x 6" D x 2.5" H (20.4 x 15.3 x 6.4 cm)
Weight: 2 lb (0.9 kg)
CE Tested. Meets applicable standards.

Digital x-Ray Pulse / Counter / Timer
Accuracy
AC input: ± 1 count
DC Input: 2%, ± 1 count
X-Ray Detection: ±1 count
Sensitivity
AC Input: 90 VAC minimum
X-Ray Input: 50 kVp, 5 mA at 5 cm from top surface of case, pointed to target on case
Range: 9999 pulses; 9999 milliseconds
Display: 0.3" (0.8 cm) liquid crystal
Power Requirements: 9 V battery, alkaline or equivalent, 48 hours minimum; typically 6 months of normal use
AC Input Jacks: 130 VAC maximium, 90 VAC minimum; input circuit not affected by reversed polarity
Output Signal: BNC connector for waveform analysis
Connections: None required for direct exposure measurement
Controls / Indicators
Three-position switch: Pulse, Off, Milliseconds
Four-digit LCD: 0.4" (1.2 cm) character
Low battery indicator
"Low Batt": Appears in display when battery voltage reaches 5.3 V ± 0.3 V
Power-on: LED (green); oscilloscope output
Dimensions: 3.15" W x 5.8" D x 1.6" H (8 x 14.7 x 4.0 cm)
Weight: 0.5 lb (0.21 kg)

Radiographic Ionization Chamber
Volume: 30 cm^3
Energy Response: Within 7% from 30 to 150 kVp (15-65 keV)
Cable: 15' (4.6 m)
Chamber Dimensions: 4" x 4" x 0.5" T (10.2 x 10.2 x 1.4 cm)
CE Tested. Meets applicable standards.

Item	Description
370-526	Radiography / Fluoroscopy QC Kit

CASSETTE AND FILM CART

- **Non-marring plastic surface on all shelves**
- **Back-sloped shelves prevent cassettes or envelopes from falling off of the cart**
- **Full perimeter bumper to protect walls and other equipment from damage**
- **Contoured padded handles on both sides to make pushing and pulling easier**
- **Locking swivel casters for easy movement**

Specifications

Size: 25" W x 18.5" D x 42.5" H (63.7 x 47.2 x 108.3 cm)
Material: Cold roll steel construction
Finish: Light grey baked enamel finish
Casters: 5" polyurethane locking swivel

Item	Description
122-001	Cassette and Film Cart

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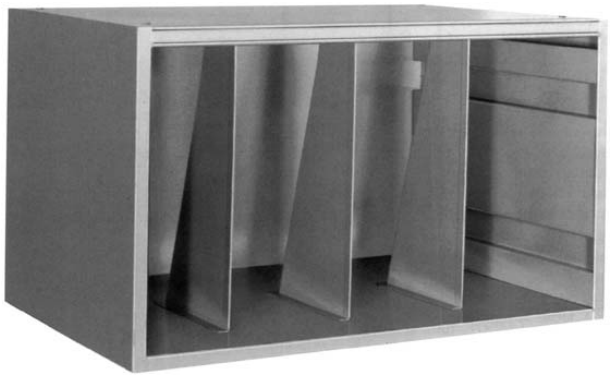
STACKABLE VERTIFILE



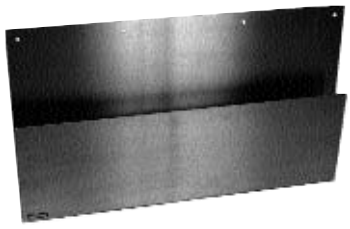
The open shelf Vertifile can be stacked one upon the other, side by side, and back to back. Each section is shipped complete and set up. No assembly is required. When stacking, the cabinets are secured together with 4 screws through matching holes in top and bottom of each cabinet. Partitions are fixed and not adjustable.

Specifications

Inside Dimensions of Each Shelf: 19.5" D and 16.1" H (49.7 x 41 cm)
Exterior Dimensions: 29" W x 19.75" D x 17.25" H (73.9 x 50.3 x 43.9 cm)
Approximate Distance Between Partitions: 7.25" (18.5 cm)
Finish: Light gray baked enamel (on cold rolled steel).
Weight: 48 lb (22 kg)

Item	Description
122-841	Stackable Vertifile

WALL MOUNTED CASSETTE HOLDERS



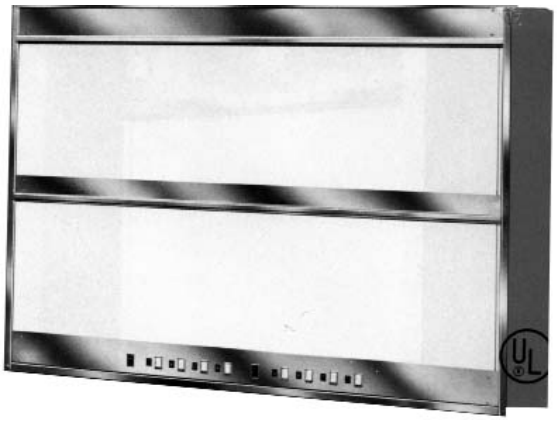
These stainless steel Cassette Holders mount to the wall for storing cassettes before using.

Specifications

Size: 31" W x 19" H x 2" D (79.02 x 48.43 x 5.1 cm)

Item	Description
129-831	Wall Mounted Cassette Holder

4X HI-LOW ILLUMINATORS



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- **Dual Brightness System**
- **Four 15W Fluorescent Tubes Per Viewing Section**
- **Superior Light Distribution**
- **Surface and Recessed Models**
- **Positive Gravity Grip Film Holder**

The 4X Hi-Low Illuminators have a unique four tube dual brightness system which provides two levels of light intensity. Each 14" x 17" (35.68 x 43.33 cm) viewing area has four F15T8/D fluorescent tubes, two low leakage thermally protected ballasts and specially designed reflectors. On the low setting light distribution is far superior to conventional two tube viewers. When additional illumination is required a touch of a switch increases the light output of the four lamps to their maximum brightness. Each viewing section is controlled by an on/off rocker switch and a Hi-Low brightness selector switch. A master on/off switch is also supplied for each tier of three or more banks. All switches are grouped together and mounted in the center of the front panel on the bottom tier.

Low leakage instant on ballasts, internal dividers (to prevent light "spill over"), centered cluster switches, one piece plexiglass fronts and continuous stainless steel gravity film grips are supplied as standard. A master on/off switch is also supplied for each tier of three or more banks. Each tier of the illuminator is of one piece heavy duty steel construction.

Recessed models come complete with recessing flanges (in white baked enamel) permanently welded to the case. Holes are provided in the flange for ease of mounting.

Finish
White Baked Enamel, Stainless Steel Trim (recessing flanges are white baked enamel.

Electrical
Viewers operated on 120 volt, 60 Hz, 1.6 Amps AC per viewing area. Surface mounting models are supplied with a 6' three conductor line cord. Recessed models come with BX connectors.

Options
1 to 6 banks wide
1 or 2 tiers
Automatic or standard switches
Hospital grade plug

Dimensional Information

Viewing Areas	Two	Three	Four
Case Width	28.75" (73.3 cm)	42.75" (109 cm)	56.75" (144.7 cm)
Wall Opening	29" (73.9 cm)	43" (109.6 cm)	57" (145.3 cm)
Case Depth	3.75" (9.6 cm)	3.75" (9.6 cm)	3.75" (9.6 cm)

Height Dimensions

Tiers	Single	Double
Case Height	21.5" (54.8 cm)	43" (109.6 cm)
Wall Opening	21.75" (55.4 cm)	43.25" (110.2 cm)

Automatic Switches Item #	Standard Switches Item #	4X Hi-Low Illuminators	Viewing Areas
1020-502	1020-542	Desk/ Surface Mount	2
1020-503	1020-543	Desk/ Surface Mount	3
1020-504	1020-544	Desk/ Surface Mount	4
1020-512	1020-552	Desk/ Surface Mount	2 Over 2
1020-513	1020-553	Desk/ Surface Mount	3 Over 3
1020-522	1020-562	Recessed Wall Mount	2
1020-523	1020-563	Recessed Wall Mount	3
1020-532	1020-572	Recessed Wall Mount	2 Over 2
1020-533	1020-573	Recessed Wall Mount	3 Over 3

TRIMLINE PLUS HI-LO™ ILLUMINATORS

- **Variable light intensities per viewing area**
- **Film activated auto switches**
- **Cluster switches and a master switch on 2 over 2 units and up**
- **Gravity roller grip film retainer**
- **"E-Z"™ Bar for easy surface wall mounting**
- **Power: 120VAC, 60Hz, 1.10 Amp**

The Trimline Plus Hi-Lo™ provides two light intensities per each 14" x 17" (35.7 x 43.3 cm) viewing area. Uniquely at the lower light intensity, all 4 bulbs remain lit to maintain the even light distribution. The Trimline Plus Hi-Lo™ is available in 12 sizes.

It features a sleek 3.25" (8.3 cm) deep cabinet with a baked on white finish, a roller grip film retainer, an 8' (2.4 m) power cord with hospital grade plug, film activated auto switches. Cluster switches on 2 over 2 units and up. Recessed wall mounting is available and includes a frame.

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UL 60601-1
CAN/CSA C22.2 No. 601.1

Item	Trimline Plus Hi-Lo™ Illuminators	Wall Mounting Size	Weight
1020-602	2 Bank Unit with 28" x 17" (71.4 x 43.3 cm) view	28" W x 3.25" D x 22" H (71.4 x 8.3 x 56.1 cm)	45 lb (21 kg)
1020-603	3 Bank Unit with 42" x 17" (107.1 x x 43.3 cm) view	42" W x 3.25" D x 22" H (107.1 x 8.3 x 56.1 cm)	68 lb (31 kg
1020-604	4 Bank Unit with 56" x 17" (142.7 x 43.3 cm) view	56" W x 3.25" D x 22" H (142.7 x 8.3 x 56.1 cm)	93 lb (43 kg)
1020-622	2 Over 2 with 28" x 34" (71.4 x 86.7 cm) view	28" W x 3.25" D x 44" H (71.4 x 8.3 x 112.2 cm)	94 lb (43 kg)
1020-633	3 Over 3 with 42" x 34" (107.1 x 86.7 cm) view	42" W x 3.25" D x 44" H (107.1 x 8.3 x 112.2 cm)	131 lb (60 kg)

Other Sizes Available

DESK TOP VIEW BOXES

- **Shatter-resistant acrylic top gives maximum light diffusion and minimum glare**
- **Rubber feet prevent sliding**
- **Screw-on acrylic top is easily replaced and all interior components are easily serviced**
- **No starters to burn out**
- **6' (2 m), 3-wire electric cord with grounding plug**
- **Rust-resistant stainless steel frame**
- **Listed by Underwriters' Laboratories**

Specifications

Item 1020-24 View Box, Small
Lamps: Four 20 watt fluorescent bulbs
Switches: Two (each switch controls two bulbs)
Power: 115 VAC, 60Hz
Size: 18" W x 24.5" L x 3" H (45.9 x 62.5 x 7.7 cm)
Weight: 16 lb (7.3 kg)

Item 1020-36 View Box, Large
Lights: Six 20 watt fluorescent bulbs
Switches: Three (each switch controls two bulbs)
Power: 115 VAC, 60 Hz
Size: 24.5" W x 36" L x 3" H (62.5 x 91.8 x 7.7 cm)
Weight: 29 lb (13.2 kg)

Item	Description
1020-24	View Box, Small
1020-36	View Box, Large

INTENSI-SPOT

The Intensi-Spot provides a concentrated light source for viewing sections of an overexposed film. Utilizing a 75-watt lamp, shielded by an octagon mask for light concentration, the Intensi-Spot can be tilted to any angle.

The Intensi-Spot includes a handy foot switch that can vary the light's intensity . The unit comes in a baked-on white polyester powder finish, with holes in the base for wall mounting, and a 6' (1.8 m) power cord with 3 prong plug.

Specifications

Power: 120VAC, 60Hz
Size: 9" H x 6" D (23 x 15.3 cm)
Weight: 5 lb (2.3 kg)

Item	Description
1021-295	Intensi-Spot

COOL-LITE

The Cool-Lite is a unique viewing device that provides concentrated light for viewing sections of over-exposed film. By using an energy-efficient 15 watt fluorescent bulb (equiv . to 60 watt incandescent), the Cool-lite can be left on all day and does not generate heat.

The Cool-Lite tilts to any angle, has a white baked-on polyester powder finish, and includes holes in the base for easy wall mounting. The Cool-lite comes with a 6' (1.8 m) power cord with a 3 prong lug.

Specifications

Power: 120VAC, 60Hz
Size: 9" H x 6" D (23 x 15.3 cm)
Weight: 5 lb (2.3 kg)
UL 60601-1CAN/CSA C22-2 No. 601.1

Item	Description
1021-695	Cool-Lite

BRIGHT-SPOT ILLUMINATOR

- **Wall or Desk Mount**
- **Swivel Base**
- **Variable Intensity Foot Switch Control**

A unique low cost bright spot illuminator for viewing dense films. The lamp housing swivels for easy viewing, base has key holes for wall mounting and plastic non-marring feet to stand on a desk. A rheostat foot switch is supplied to vary the brightness of the special high intensity bulb which is surrounded by a polished aluminum reflector.

Bright-Spot comes with a 6' (2 m) line cord with 3 prong plug.

Specifications

Finish: Light gray baked enamel
Power: Viewer operates on 120 VAC, 60Hz, 0.7 Amps AC
Size: 6" W x 7" D x 8" H (15.3 x 17.8 x 20.4 cm)

Item	Description
1021-188	Bright Spot Illuminator

FILM DUPLICATOR

Constructed of stainless steel finished in durable baked enamel, this duplicator can be used with any available duplicating film.

To operate the duplicator, simply place the film to be duplicated on the plexiglass screen with a sheet of duplicating film on top, close the cover and set the exposure time. The red light will signal you when exposure is complete. Develop your duplicating film.

Specifications

Screen Size: 14" x 17" (35.68 x 43.33 cm)
Unit Size: 16" W x 23.25" L x 9" H (40.8 x 59.3 x 22.9 cm)
Weight: 41 lb (18.7 kg)

Item	Description
370-250	Film Duplicator

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MOBILE WORKSTATIONS

750-019

750-021

750-022

750-024

- **Double-Jointed Extendable Arms**
- **Track-Slide Height Adjustment**
- **Extension Monitor Arms**

Components can be easily relocated along support post. The Mobile Workstations have an all-steel mobile base. An extension arm keyboard tray and 75 mm/100 mm VESA swivel mount are standard on all workstations. Workstations with a CPU Holder also have an additional 31 1/2" track (for 63" total) and CPU holder that is adaptable for standard or thin CPU casements.

Includes
1 - Integrated Workstation
1- Steel Post (Total Height 67" (170.75 cm)
1 - Stabilizer H-Base
1 - Cable Channel
4 - Locking Casters
1 - Optional Filler Panel

Item	Description
750-019	Single View Workstation
750-021	Dual View Workstation
750-022	Single View Workstation with CPU Holder
750-024	Dual View Workstation with CPU Holder

Components not compatible with other series.
Electronic equipment shown is not included.

ACCELERATOR LOCALIZING CROSS TRAY

With Divergent Tungsten Pins - Wedge Slot

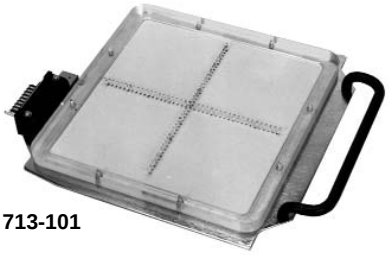
The Accelerator Localizing Cross Trays have divergent tungsten pins 1/16" and 3/32" in diameter x 1/2" long (0.16 and 0.24 x 1.27 cm). They are spaced 1 cm apart in four quadrants at isocenter. Every fifth pin is 3/32" (0.24 cm) diameter, which makes for easy counting. The small dots prevent any obscuring of the film viewing, yet allow easy measurements. The acrylic graticule fits into the metal tray so the graticule will not shift off center even if bumped. **Note: Localizing Cross Trays can be manufactured for any accelerator.**

Information Needed To Order

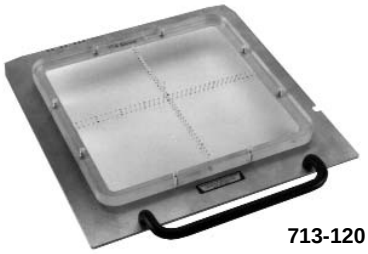
- Machine Manufacturer and Model
- Type of Coding
- Target to bottom of wedge tray slot in centimeters
- Contact Information

Specifications

Acrylic Tray Density: 1.185 g/cm^3



713-101



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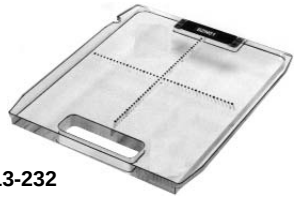


713-232

VARIAN GRATICULES

Item	Description	Field Size	Distance
713-101	Varian Type II Graticule Wedge Slot, Coding Plug (15 or 09) on Metal Tray		42.1, 49.2, 53.0 or 53.8 cm
713-103	Varian Type II Graticule Wedge Slot, Coding By-Pass on Metal Tray		
713-120	Varian Type III Graticule Wedge Slot, Optical Coded on Metal Tray		49.2 or 53.0 cm
713-121	Varian Type III with MLC Graticule Wedge Slot, Optical Coded MLC on Metal Tray	30 x 30 cm	57.6 cm
713-123	Varian Type III with MLC Graticule Wedge Slot, Optical Coded MLC on Metal Tray	40 x 40 cm	57.6 cm

Graticules for Other Varian Machines Are Available
Please Provide Contact Information When Placing Order

SIEMENS GRATICULES

Item	Description
713-221	Siemens Mevatron Graticule Wedge Slot with Screw Coding
713-232	Siemens Primus with MLC or Mevatron Graticule Wedge Slot with Digital Coding Plug (S2N01 or S2N18)
713-235	Siemens Mev 12 Graticule Wedge Slot
713-236	Siemens Mev 6 Graticule Wedge Slot

OTHER MANUFACTURERS GRATICULES

713-403

713-710

Item	Description
713-300	AECL Therac 6 Graticule
713-400	Elekta/Philips SL15, 18, 20, 25 Graticule Tray Slot
713-401	Elekta/Philips SL75-5 Graticule Tray Slot
713-403	Elekta/Philips SL-20, 75, L5 Graticule Mounted to Gantry Head
713-500	Mitsubishi Graticule
713-600	ATC/EMI Graticule
713-708	GE or CGR Saturne 20 Graticule
713-710	GE Saturne 40, 41, 42, 43 Graticule Metal Tray with Coding Studs
713-711	GE Saturne MLC Graticule
713-712	GE Saturne 3 Graticule

SIEMENS REPLACEMENT GRATICULE

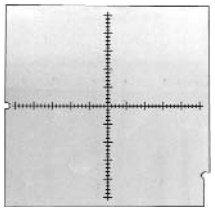
This replacement Siemens photon light field graticule can be mounted to a removable tray.

793-000 and 793-001

793-002

Item	Siemens Replacement Graticule
793-000	Screw Coding, Siemens P/N 19-41-959 Rev. D Revision D: The central axis starts at 4.283" (109mm)
793-001	Screw Coding, Siemens P/N 19-45-463 Rev. A Revision A: The central axis starts at 4.187" (106mm)
793-002	Digital Coding, Siemens P/N 8497752

SIEMENS SIMULATOR GRATICULES



790-100

Item	Description	Distance
790-080	Siemens Simulator Graticule	80 cm
790-100	Siemens Simulator Graticule	100 cm
790-120	Siemens Simulator Graticule	120 cm
790-140	Siemens Simulator Graticule	140 cm

Please Provide Contact Information When Placing Order

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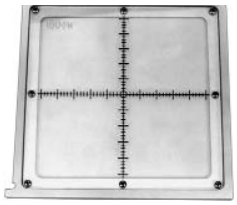
SIEMENS MEVASIM S SIMULATOR GRATICULES
With Aluminum Frame

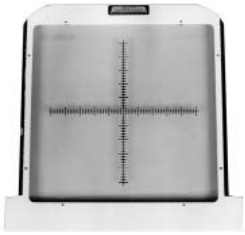


790-210

Item	Description	Distance
790-208	Siemens Mevasim S Simulator Graticule with Frame	80 cm
790-210	Siemens Mevasim S Simulator Graticule with Frame	100 cm
790-220	Siemens Mevasim S Simulator Graticule with Frame	120 cm
790-240	Siemens Mevasim S Simulator Graticule with Frame	140 cm

Please Provide Contact Information When Placing Order

VARIAN XIMATRON SIMULATOR GRATICULES
With Aluminum Frame



791-108

Item	Description	Distance
791-108	Varian II Ximatron Simulator Graticule with Frame	80 cm
791-100	Varian II Ximatron Simulator Graticule with Frame	100 cm
791-120	Varian II Ximatron Simulator Graticule with Frame	120 cm
791-130	Varian II Ximatron Simulator Graticule with Frame	130 cm
791-140	Varian II Ximatron Simulator Graticule with Frame	140 cm
791-101	Graticule Frame ONLY	

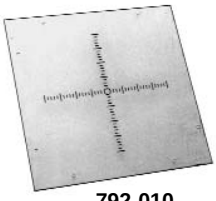
Please Provide Contact Information When Placing Order

791-168

Item	Description	Distance
791-160	Varian III Ximatron Simulator Graticule with Frame	80 cm
791-162	Varian III Ximatron Simulator Graticule with Frame	90 cm
791-164	Varian III Ximatron Simulator Graticule with Frame	100 cm
791-166	Varian III Ximatron Simulator Graticule with Frame	110 cm
791-168	Varian III Ximatron Simulator Graticule with Frame	120 cm
791-170	Varian III Ximatron Simulator Graticule with Frame	130 cm
791-172	Varian III Ximatron Simulator Graticule with Frame	140 cm
791-160-4	Graticule Handle ONLY	
791-160-11	Graticule Frame ONLY, Optical Coded	

Please Provide Contact Information When Placing Order

SIMULATOR GRATICULES
(80 cm, 100 cm, 120 cm or 140 cm)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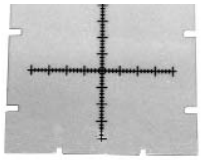
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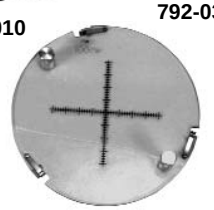
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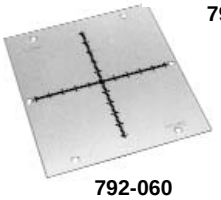
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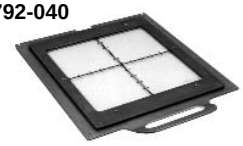
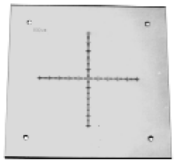

792-060
Mounted in Frame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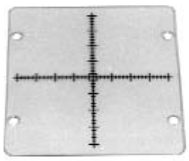

792-120

The Graticule is custom made for any simulator and can be furnished with a holder for mounting to the simulator. Line spacing at isocenter is 1 cm with every 5th cm line longer, as pictured. The high density line is 0.020" (0.050 cm) wide. Please specify distance needed for graticule and contact information.

Item	Description	Distance
792-010	AECL Simulator Line Graticule	All
792-011	AECL Therasim Line Graticule	All
792-020	TEM Simulator Line Graticule	All
792-030	Philips Simulator Line Graticule	All
792-031	Philips 1976 Simulator Line Graticule	All
792-032	Philips Super M80 Simulator Line Graticule	All
792-033	Philips SLS-9 Simulator Line Graticule	All
792-040	Oldelft Simulator Line Graticule	All
792-041	Replacement Oldelft Simulator Graticule	All
792-050	CGR Simulator Line Graticule	All
792-060	Kermath Simulator Line Graticule	All
792-070	Mitsubishi Simulator Line Graticule	All
792-080	Picker Simulator Line Graticule	All
792-090	Toshiba LX-8 Simulator Line Graticule	All
792-092-1	Toshiba LX-30A Simulator Line Graticule,Tray ONLY	
792-092-2	Toshiba LX-30A Simulator Line Graticule	80 cm
792-092-3	Toshiba LX-30A Simulator Line Graticule	100 cm
792-100	TEM (Sold by Siemens) Simulator Line Graticule	All
792-102	Replacement Varian Simulator Line Graticule	80 cm
792-120	Haynes Simulator Line Line Graticule	All

SIMULATOR GRATICULE HOLDERS

The holder will allow different graticules (80 cm, 100 cm, 120 cm or 140 cm) to be used.

Item	Description
792-601	AECL Simulator Holder for Multiple Graticules
792-630	Philips Simulator Holder for Multiple Graticules

Other Manufacturers Available

CT / PET TABLE INSERT

For Radiation Therapy Treatment Planning

The ideal CT Image for radiation therapy treatment planning should have the patient on a flat table, magnification indicators, and density markers.

The RPDinc CT/PET Table Insert is made of 3/8" (0.97 cm) clear polycarbonate. The insert measures 84" (213.5 cm) long and the width is custom made to fit the CT or PET Table. A center support runs the length of the insert to prevent any sag.

The CT/PET Table Insert is made with foam rubber edges and will sit on top of the edges of the curved CT bed.

Optional Magnification and Density Rods

The bottom of the CT/PET Table Insert has two 1/8" (3.31 mm) diameter aluminum rods, spaced 30 cm apart that run the length of the insert and are used for magnification measurements.

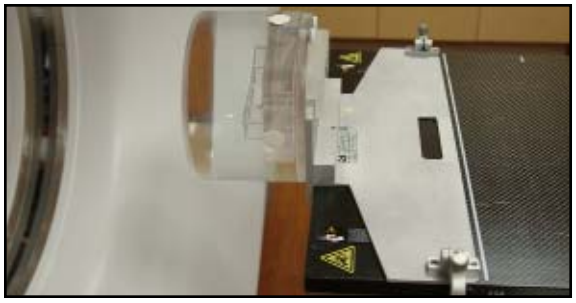
A 1" (2.54 cm) diameter polystyrene rod and a 1" (2.54 cm) diameter acrylic rod are placed on either side of the center support. Both these rods run 72" (183 cm) along the bottom of the insert. These rods provide a reference for density checks.

Specifications

Table Density: Polycarbonate - 1.2 g/cm³
Rod Density: Acrylic - 1.185 g/cm³ and Polystyrene - 1.05 g/cm³
Size: 84" L x 3/8" T (213.4 x 0.97 cm)
Weight: 55 lb (25 kg)

Item #	Table Manufacturer	Magnification and Density Rods
683-310	GE	Included
683-320	Siemens	Included
683-330	Philips	Included
683-410	GE	Not Included
683-420	Siemens	Not Included
683-430	Philips	Not Included

GE LIGHTSPEED PHANTOM HOLDER FOR FLAT TABLE TOP 50 CM WIDE



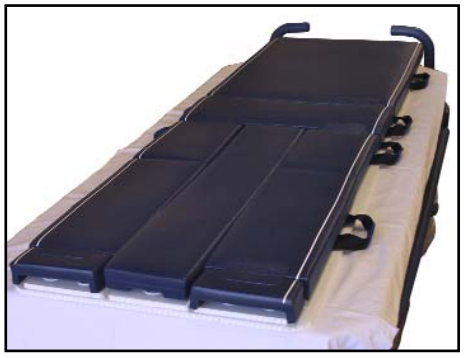
The GE LightSpeed Phantom Holder attaches to a 50 cm wide flat top CT table. The GE LightSpeed Phantom Holder is an easy on, easy off unit for a flat top CT table. The bottom of the front mounting plate references the holder to the front edge of the CT table and the top is where the GE LightSpeed Phantom hooks on to the holder. A small thumb screw allows for leveling of the phantom. The two lock bars are spring loaded upward to be out of the way while securing to the CT table. The large adjustment range allows for different thicknesses of CT table tops. The phantom holder has a built-in handle for easy carrying.

Specifications

Material: Black Anodized Aluminum
Overall Size: 20.8" W x 4.5" L x 6.5" H (52.8 x 11.4 x 16.5 cm)
Mounting Plate Size: 8.45" W x 4.67" H x 0.335" T
(21.5 x 11.8 x 0.8 cm)

Item	Description
018-250	GE LightSpeed Phantom Holder f/FlatTable Top 50cm W

SLESSINGER BOARD FOR HDR BRACHYTHERAPY



- **CT and/or MR Compatible**
- **Easy to Clean**

The Slessinger Board is a padded sliding board that is CT and MR compatible. It is designed to facilitate HDR brachytherapy, specifically for pelvic treatments. The patient can be transferred onto the board from the operating room couch and remain on the board in recovery, during imaging for planning and until the HDR treatment is given. The intent is to minimize patient movement to ensure that the imaging for planning is not compromised by patient leg movement prior to treatment and thus delivering the treatment plan faithfully. The legs are slightly elevated, affording ready access to the perineum and preventing applicators from resting against anything. Leg elevation is maintained with the use of two (2) tightening knobs at the end of the elevation panels. Transfers on and off CT/MR/simulator couches are relatively easy due to the smooth plastic bottom surface and side handles. The board is also very useful when a patient is transferred via ambulance from the surgical facility to the treatment facility.

The CT/MR Slessinger Board V2.0 for HDR Brachytherapy has the additional benefit of having a hinged flexi-split to allow raising the head when on a stretcher. This version also includes heel cushions for additional patient comfort.

Image guided HDR brachytherapy is gaining in prominence. Prostate and gynecological applications are reliant on patient stability and comfort between the acquisition of imaging for planning and treatment. Although the Slessinger Board was devised to facilitate precise prostate HDR brachytherapy its application for image guided GYN HDR is also very significant with increasing reliance on DVH analyses. The concept of limiting rotation of a multichannel APBI balloon is yet another possible application, by avoiding the patient walking between imaging and treatment prior to each treatment fraction. The rationale and description of the Slessinger Board has also been described in the Brachytherapy Journal article by Slessinger, entitled "Practical considerations for prostate HDR brachytherapy", published early in 2010.

The Slessinger Board can be easily cleaned with non-caustic germicidal cloths or sprays. Patients may not be carried on the Slessinger Board, but rather are transferred directly from one support to another.

Specifications

Base Dimensions: 21" W x 72" L x 0.75" T (53.3 x 183 x 1.9 cm)
Base Material: Corrugated polypropylene
Pad Dimensions: 20.5" W x 69" L x 1.5" T (52.3 x 175 x 3.8 cm)
Pad Material: Vinyl coated closed cell foam
Weight Limit: 350 lb (159 kg)

Item	Description
946-004	CT/MR Slessinger Board V2.0 for HDR Brachytherapy

VISIONMARK™ CT

The VisionMark™ CT markers offer the perfect combination of tack surfaces and easy-peel corners, keeping the markers correctly positioned with minimal discomfort to the patient on removal. These **NON-METALLIC** markers reduce read time on CT scans with virtually no scatter. These sizes and ball densities are perfect for all CT skin marking applications. Available in 3 mm, 4 mm, and 5 mm ball sizes. No lead means they are safer for yourself, your patient and the environment.

Item	Visionmark™ CT	Quantity
680-305	2.0 mm Ball	50
680-310	2.5 mm Ball	50
680-312	3.0 mm Ball	50
680-314	4.0 mm Ball	50
680-316	5.0 mm Ball	50

CT Mark
Wire and Dots

The CT Mark wire and dots are a new blue formation designed specifically for CT. These markers are lead free, will not cause artifact (scatter) on CT scans and the labels are latex-free.

Item	Description	Quantity
680-349	CT Mark Wire, 1.0 mm	330 cm
680-350	CT Mark Wire, 2.0 mm	300 cm
680-352	CT Mark, 2.3 mm	110
680-354	CT Mark, 4.0 mm	50

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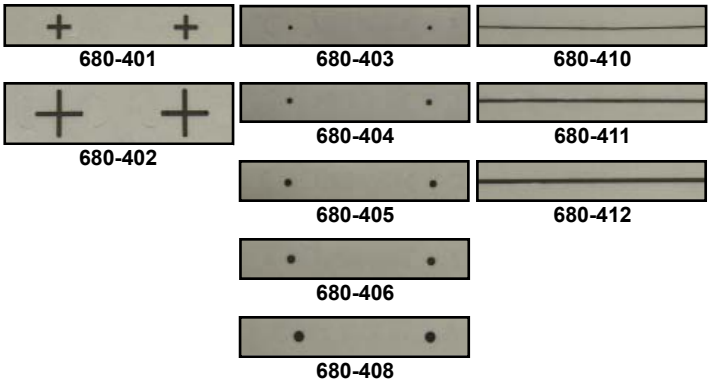
CT MARKER-INDICATOR RADIOPAQUE

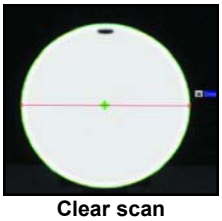


- **Use in CT, RT Simulation, Treatment Planning, Diagnostic Radiology, Angiofraphy, Mammography and Fluoroscopy**
- **Use to identify masses, scar tissue, moles, birth marks or any point of interest**
- **Provides a clear and accurate reference point with no spray artifacts**
- **Flat marker - will not indent tissue**
- **Disposable**
- **Clear adhesive backing**
- **Multiple sizes available**
- **Lead Free**
- **Crosses - 0.38" L (9.5 mm)**
- **Dots - 0.125" diameter (3 mm)**
- **Lines - cut to desired length**
- **NOT for use in MRI**

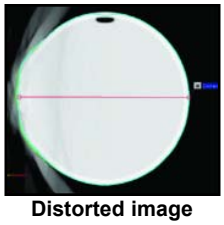
Item #	CT Marker-Indicator Radiopaque	Quantity
680-401	Crosses, 10 mm	130
680-402	Crosses, 20 mm	130
680-403	Dots, 1.5 mm	115
680-404	Dots, 2.0 mm	115
680-405	Dots, 2.5 mm	115

Item #	CT Marker-Indicator Radiopaque	Quantity
680-406	Dots, 3.0 mm	115
680-408	Dots, 4.0 mm	115
680-410	Line, 0.5 mm	69" (175 cm)
680-411	Line, 1.0 mm	66" (167 cm)
680-412	Line, 1.50 mm	62.5" (159 cm)

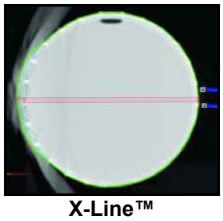
X-LINE™
PRECISION RADIOTHERAPY TAPE FOR CT SIMULATION



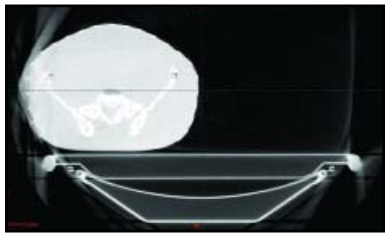
Clear scan within sFOV

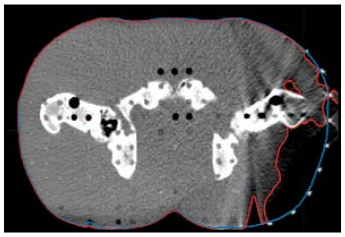


Distorted image in 65cm eFOV



X-Line™ connect-the-dots body contour





Siemens HDFOV PRO Phantom

A Solution to CT Simulation Image Distortion in Obese Patients

- **More Accurate**
- **Fast and Simple**
- **Low-Cost**
- **Optimal Dosage**
- **Latex Free**

X-Line™ allows accurate contouring within distorted regions of the CT image, improving radiotherapy outcomes.

Obese patients must be imaged with the extended field of view (eFOV), often resulting in distorted body contours. X-Line™ provides a series of reliable dots within the distorted sections of the eFOV, allowing for easy identification of the true body contour. The radiopaque lines on X-Line™ show up as hyperdense in CT simulation. Connect underneath the dots to get an accurate body contour - it's that easy!

Body contour distortion from large patients in the eFOV

- GE Discovery CT590 RT, Optima CT580 RT and LightSpeed RT have a scan FOV (sFOV) of 50cm and a 65cm extended FOV (eFOV) option
- Siemens Somotom models have a 50cm sFOV and eFOV up to 80cm
- Body regions within the eFOV is distorted and contains artifact, resulting in an inaccurate body contour
- Body contour inaccuracies can lead to incorrect SSD and dosage calculations

X-Line™ General Instructions

- Apply X-Line™ to all body regions that might fall outside of the scan field of view
- Tear a strip length that fully encompasses the region of interest
- Expect to use 3-5 strips per patient, depending on their size

Step 1 - Peel

- Peel away the protective backing
- X-Line™ is kiss cut to make for easier removal

Step 2 - Apply

- Apply X-Line™ to the region of interest
- Orient the radiopaque lines perpendicular to the direction of the CT cross section
- Space the X-line™ strips approximately 1 inch apart
- Only apply each X-Line™ strip once

Step 3 - Scan

- Then, perform the CT scan as usual
- Remove and discard the X-Line™ strips after the scan

Step 4 - Connect

- Finally, connect just underneath the bright, hyperdense dots in the resulting CT images
- Connecting underneath the dots avoids including these hyperdense regions in the radiation dose planning

Specifications

Size: 2" wide (5.08 cm) with three equally spaced radiopaque lines 1" apart (2.54 cm)
Quantity: Rolls are 50' long (15.24 m) with perforations spaced every 2" (5.08 cm).

Item	Description
680-470	X-Line Tape, Full Adhesive
680-475	X-Line Tape, Partial Adhesive

MULTI-MODALITY MARKERS

462-029 462-030

Item 462-029 Multi-Modality Markers for Radiology/Radiation Therapy
- Appears as bright object on CT, MRI and Diagnostic Imaging scans
- Inner center hole affords passage of needle through central hole
- 15 mm outer diameter and 3.5 mm thick
- 5 mm axial hole with 2 mm central hole
- Composed from hydrogel with medical grade adhesive

Item 462-030 Multi-Modality Markers for Nuc Med/PET
- Visible on Nuclear Medicine, CT and MRI scans
- Liquid-containing well suitable for injection of short-life radionuclide using a conventional hypodermic needle
- 15 mm outer diameter and 3.5 mm thick
- 5 mm axial hole
- Composed from hydrogel with medical grade adhesive

Item #	Description	Quantity
462-029	Multi-Modality Markers for Radiology/Radiation Therapy	50
462-030	Multi-Modality Markers for Nuc Med/PET	50

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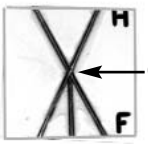
CT MARKER



Material: Aluminum Wire
Size: 1" (2.54 cm) Square

Item #	Description
680-125	CT Marker

MULTIMODAL SPOT MARKERS

Written Verification of Radioactive Materials License is Required to Place an Order

The Multimodal Spot Markers are used for patient orientation and image registration in camera studies. The Co-57 is used for CT-SPECT and Ge-68 and Na-22 for CT-PET fusion imaging.

Specifications

Model MMS02
Capsule: 1" dia. x 1/4" (2.54 x 0.64 cm) thick clear cast acrylic
Active Dimensions: 1.5 x 1.5 mm cylinder
CT Target: 1/4" (0.64 cm) OD bone-equivalent ring (surrounds active element)
Suggested Usage: Multimodal fiducial marker for image coregistration

Model MMS03
Capsule: 1" dia. x 1/4" (2.54 x 0.64 cm) thick clear cast acrylic with etched "crosshairs" centered on active element for laser alignment
Active Dimensions: 1 mm diameter sphere
CT Target: 2 mm OD bone-equivalent ring (surrounds active element)
Suggested Usage: Multimodal fiducial marker for image coregistration

Model	Nuclide	10 µCi .37 MBq	25 µCi .925 MBq	50 µCi 1.85 MBq	100 µCi 3.7 MBq
MMS02	Co-57	680-200	680-201	680-202	680-203
MMS02	Ge-68	680-210	680-211	680-212	680-213
MMS02	Na-22	680-220	680-221	680-222	680-223
MMS03	Co-57	680-230	680-231	680-232	680-233
MMS03	Ge-68	680-240	680-241	680-242	680-243
MMS03	Na-22	680-250	680-251	680-252	680-253

SIMULATOR LEAD FOIL TAPE

Simulator Lead Foil Tape is used on the patient to outline the treatment field. It sticks to patients and is easily removable.

Item	Description	Quantity
428-250	Simulator Lead Foil Tape 0.25" (0.635 cm) Wide	36 Yds (33 m)

CT MARKING WIRE

682-090 682-100 682-102 682-104

Item	China Markers	Length
682-080	Aluminum Wire 0.080" (2.03 mm) Diameter	42' (12.8 m)
682-090	Aluminum Wire 0.040" (1.02 mm) Diameter	165' (50.3 m)
682-100	Aluminum Wire 0.064" (1.63 mm) Diameter	67' (20.4 m)
682-102	Copper Insulated Wire, Black 0.055" (1.40 mm) Diameter	100' (30.5 m)
682-104	Copper Insulated Wire, Red 0.080" (2.03 mm) Diameter	100' (30.5 m)

CT RECTAL MARKER

Rectal - Vaginal - External

The **NON-METALLIC** CT Rectal Marker is a flexible tube packed with teflon balls spaced at 1 cm intervals from center to center.

The Rectal Marker is used to accurately obtain both the rectum position and magnification by counting the balls. This determines the rectum location relative to the radiation field.

An adjustable anus marker can be utilized during CT simulation.

The Rectal Marker can be used as a vaginal marker or an external marker.

Specifications

Sterilization: Gas
Tubing: 5/16" (8 mm) Dia. x 30 cm Flexible
Balls: 3/16" (5 mm) Dia. Spaced Every cm
Anus Locator: Adjustable Delrin
Latex Cover: 2.0 cm Dia. x 30 cm L

Item #	Description
460-010	CT Rectal Marker with Anus Marker
460-006	Latex Cover for Rectal Marker, 1/pkg
460-006-12	Latex Covers for Rectal Marker, 12/pkg

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SHADOWFORM MARKERS

460-501 460-502 460-503

- **T-Bar handle which can be removed for insertion of barium**
- **Disposable**
- **Rectal markers are available in two lengths and are marked at 1 cm intervals**
- **No cross contamination**
- **Outlines the soft tissue of the pelvic region**
- **Latex-free**
- **Markers are made from a soft, smooth, flexible plastic**
- **Used for Simulation and CT Planning**
- **Provides excellent localization of pelvic structures**

CE

Item	Shadowform Markers	Quantity
460-501	18 cm Vaginal Marker	10
460-502	38 cm Rectal Marker	10
460-503	10 cm Rectal Marker	10

CT VAGINAL DEPTH SCALE

The **NON-METALLIC** CT Vaginal Depth Scale is 1.6 cm in diameter and 26 cm long and has teflon balls which are spaced 1 cm apart and are 5 mm diameter. A delrin introitus marker is included with the 1.6 cm diameter vaginal scale (Item 707-145). A thumb screw holds the introitus marker in position.

The Vaginal Depth Scale Holder (Item 707-020) can be used in CT if the area to be scanned does not include the holder.

Specifications

Material: Acrylic
Density: 1.1859 g/cm³

Material: Teflon
Density: 2.16 g/cm³

Item #	Description
707-145	CT Vaginal Depth Scale with Introitus Marker
707-020	Vaginal Depth Scale Holder
460-006	Latex Cover for Vaginal Depth Scale, 1/pkg
460-006-12	Latex Covers for Vaginal Depth Scale, 12/pkg

3.2 cc CT ION CHAMBER

Specifications

Detector Type: Vented air ion chamber (5 x 30 cm)
Volume: 3.2 cc
Sensitive Length: 10.0 cm
Chamber Material: Polystyrene
Chamber Inside Diameter: 6.4 mm
Chamber Wall Thickness: 54 mg/cm^2
Electrode Material: Aluminum
Sensitivity: 10 R•cm/nC (nominal)
Standard Calibration: 100 kVCP, 5.5 mm Al HVL (NIST Tech. M100)
Response Uniformity Along Axis: ± 3% over central 90% of active length
Beam Orientation: Normal to chamber axis
Phantom Adapter OD: 1.27 ± 0.04 cm (0.50 ± 0.015 in)
Leakage Current (300 V collection potential): < 10^{-13} A at 10 min polarization time,<10^{-14} A at 2 hr polarization time
Intensity Limits: Continuous beam: 4.86 kR/min (1% recombination loss)
Pulsed Beam: 51.5 mR/pulse (1% recombination loss)
Maximum Pulse Repetition Rate: 3.3 kHz
Cable Length: 3' (0.9 m)
Operating Voltage: -300V

Item #	Description
300-505	CT Ion Chamber, 3.2 cc, with triax BNC: used with the 35040 (ATD), TRIAD™ and TRIAD™ TnT
300-515	CT Ion Chamber, 3.2 cc, with coax BNC for signal and banana plug for bias: used with the 4000, 8000 and RAD-CHECK® PLUS Dosimeter

10 cc CT ION CHAMBER

Specifications

Detector Type: Vented air ion chamber
Volume: 10.1 cc
Sensitive Length: 10.0 cm
Chamber Material: Acrylic (PMMA)
Chamber Outside Diameter: 0.5 in ± 0.015 in (12.7 mm ± 0.4 mm)
Chamber Inside Diameter: 0.45 in (11.44 mm)
Chamber Wall Thickness: 77 mg/cm^2
Electrode Material: Aluminum, 1100
Sensitivity: 3.2 R•cm/nC (nominal) or 0.3/nC
Standard Calibration: 100 kVCP, 5.5 mm Al HVL (NIST Tech. M100)
Response Uniformity Along Axis: ± 3% over central 90% of active length
Beam Orientation: Normal to chamber axis
Leakage Current: (300 V collection potential) Less than 10^{-14}A at 10 min polarization time
Intensity Limits: Continuous beam: 31.6 R/Sec, (1% recombination loss)
Pulsed Beam: 15.8 mR/pulse (1% recombination loss)
Collection Time: 0.478 mSec
Cable Length: 3' (0.9 m)
Operating Voltage: -300 V

Item #	Description
300-510	CT Ion Chamber High Sensitivity, 10 cc for multislice CT, with triax BNC: used with the 35040 ATD and other electrometer/dosimeters, including TRIAD™ and TRIAD™ TnT

EXRADIN A17 SLICE THERAPY CT CHAMBER

Exradin A17 Schematic

- **Fiducial markers identify center and both ends of the collecting volume providing easy setup in relation to the beam**
- **Proven guard design yields stable, precise measurements and minimizes settling time by creating uniform field lines**
- **Shell and guard are made of durable, long lasting Shonka conductive plastic**
- **Use of homogeneous material throughout the chamber minimizes perturbation of the beam due to the presence of the chamber and optimizes measurements**
- **Axially symmetric design of the chamber provides an uniform, isotropic response**
- **Inherent waterproof construction eliminates need for additional protective coverings**
- **The Model A17 Exradin Slice Therapy Chamber has an inherent ^{60}Co buildup cap built into its wall thickness for air calibrations and measurements**
- **Ionization collection efficiency is 99.9% or better**
- **Collecting volume is 1.91 cc**

CT ion chambers combine robust design with uniform energy response for high energy MV applications.

For performing measurements necessary for calculating CTDI (CT dose index)
The Model A17 Exradin Slice Therapy Chamber is designed for tomotherapy applications. This chamber is useful for weekly QA checks or patient dose verification with phantoms or water tank setups. It has excellent response uniformity over the central 8 cm of the chamber length, with variation less than plus or minus 1.5%.

Fast, Precise Measurements
Its waterproof construction makes it ideal for checking the consistency of beams at various jaw widths. The chamber vents through a flexible tube that surrounds the triaxial cable, ensuring the collecting volume is in pressure equilibrium with the surroundings. The design assures there are no stem or voltage soakage effects, providing precise and reliable measurements.

Durable Construction, Built to Last
The Model A17 Exradin Slice Therapy Chamber is constructed of rugged C552 Shonka air-equivalent plastic, providing excellent conductivity and years of reliable use.

Specifications

Collecting Volume: 1.91 cm^3
Collecting Volume Length: 8.0 cm
Collector Diameter: 2.4 mm
Body Tube Outside Diameter: 12.7 mm
Wall Thickness: 3.3 mm
Chamber Length: 17.0 cm
Body Tube and Guard Material: Shonka air-equivalent plastic C552
Response Uniformity Over the Central 8.0cm of Chamber Length: ±1.5%
Collector Material: Carbon fiber
Electrical Power Requirements: Operates at ±300 VDC
Nominal Collection Efficiency: 100%
Maximum Polarizing Potential: 1000 V
Nominal Inherent Leakage Currents: 10^{-15} A
Low-Noise Triaxial Cable: 50 ohms, 29 pF/ft, 1.5 m long
Signal Connector: Triaxial BNC plug (2-Lug, male pin); others available upon request
Waterproof: Yes
Product Standards: CE_{0413}, Designed to meet IEC 60601-1, IEC 61674
CE

Item	Description
300-540	CT Chamber, Exradin A17 Slice Therapy

EXRADIN A101 CT CHAMBER

Exradin A101 Schematic

- **Fiducial markers identify center and both ends of the collecting volume providing easy setup in relation to the beam**
- **Proven guard design yields stable, precise measurements and minimizes settling time by creating uniform field lines**
- **Shell and guard are made of durable, long lasting Shonka conductive plastic**
- **Use of homogeneous material throughout the chamber minimizes perturbation of the beam due to the presence of the chamber and optimizes measurements**
- **Axially symmetric design of the chamber provides an uniform, isotropic response**
- **Ionization collection efficiency is 99.9% or better**
- **Collecting volume is 4.54 cc**

Uncompromising Quality
CT ion chambers combine robust design with uniform energy response for low energy kVCT applications.

For Performaing Measurements Necessary For Calculating CTDI (CT Dose Index)
The Exradin Model A101 CT Ion Chamber is designed to perform the measurements necessary for calculating the CTDI (computed tomography dose index) as described in the AAPM TG 74, Quality Control in Diagnostic Radiology. The chamber is 10 mm in diameter and comes with an acrylic sheath for use with phantoms that have the typical 13.1 mm cavity. It has excellent response uniformity over the central 10 cm of the chamber length, with variation less than plus or minus 3%.

Fast, Precise Measurements
Model A101 is ideal for checking the consistency of beams at various jaw widths. The chamber is vented to the ambient, ensuring the collecting volume is in pressure equilibrium with the surroundings. The design assures there are no stem or voltage soakage effects, providing precise and reliable measurements.

Durable Construction, Built to Last
The Model A101 CT Chamber is constructed of rugged C552 Shonka air-equivalent plastic, providing excellent conductivity and years of reliable use.

Specifications

Collecting Volume: 4.54 cm^3
Collecting Volume Length: 10.0 cm
Collector Diameter: 2.4 mm
Body Tube Outside Diameter: 10.0 mm
Wall Thickness: 1.0 mm
Chamber Length: 164.3 mm
Body Tube and Guard Material: Shonka air-equivalent plastic C552
Response Uniformity Over the Central 10 cm of Chamber Length: ±3%
Energy Response: 80 kVp to 150 kVp ±4%
Collector Material: Carbon fiber
Electrical Power Requirements: Operates at ±300 VDC
Nominal Collection Efficiency: 100%
Maximum Polarizing Potential: 1000 V
Nominal Inherent Leakage Currents: 10^{-15} A
Low-Noise Triaxial Cable: 50 ohms, 29 pF/ft, 1.5 m long
Included Adapter Sleeve: Wall thickness of 1.3 mm; constructed of PMMA
Signal Connector: Triaxial BNC plug (2-Lug, male pin); others available upon request
Waterproof: No
Product Standards: CE_{0413}, Designed to meet IEC 60601-1, IEC 61674
CE

Item #	Description
300-550	Exradin A101 CT Chamber

PTW CT CHAMBERS

PTW 30009 CT CHAMBER

Vented cylindrical pencil chamber for dose length product measurements in computed tomography

- Pencil type chamber for measurements within a CT head or body phantom or free in air
- Provides a sensitive measuring length of 10 cm
- Shows a homogeneous response over the whole chamber length

The CT chamber is a vented cylinder chamber designed for dose length product and dose length product rate measurements in computed tomography. The chamber allows the determination of the $CTDI_{100}$[1], $CTDI_W$[2] and $CTDI_{Vol}$[3] according to IEC 61223-2-6 and IEC 61223-3-5.

[1]$CTDI_{100}$ = Computed Tomography Dose Index 100
[2]$CTDI_W$ = Weighted $CTDI_{100}$
[3]$CTDI_{Vol}$ = Volume $CTDI_W$

Item	Description
300-560	PTW 30009 CT Chamber, 3.14 cc

PTW 30017 CT CHAMBER

Vented cylindrical pencil chamber for dose length product measurements in computed tomography

- Pencil type chamber for measurements free in air
- Provides a sensitive measuring length of 30 cm
- Shows a homogeneous response over the whole chamber length

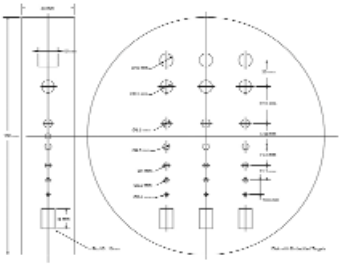
The CT chamber is a vented cylinder chamber designed for dose length product and dose length product rate measurements in computed tomography according to the amendment to IEC 60601-2-44.

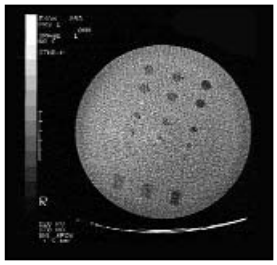
Item	Description
300-565	PTW 30017 CT Chamber, 9.3 cc

Specifications	Item 300-560	Item 300-565
PTW Model	30009	30017
Type of Product	Vented pencil type chamber	
Application	Dosimetry in computed tomography	
Measuring Quantity	Air kerma length product, exposure length product	
Reference Radiation Quality	120 kV, HVL 8.4 mm Al (RQT9)	
Nominal Sensitive Volume	3.14 cm^3	9.3 cm^3
Design	Not waterproof, vented,pencil type	
Reference Point	Chamber center	
Direction of Incidence	Radial	
Nominal Response	14 nC/(Gy·cm)	13 nC/(Gy·cm)
Chamber Voltage	-100 V nominal ± 500 V maximal high voltage to be connected only with active current-limiting device (I_{max}< 0.5 mA)	
Energy Response	≤ ±5% for 70 - 150 kV	≤ ±5% for 50 - 150 kV
Leakage Current	≤ ±10 fA	
Cable Leakage	≤ 1pC/(Gy·cm)	
Materials and Measures		
Wall Material	1 mm PMMA, graphite coated	
Wall Area Density	119 mg/cm^2	
Dimension of Sensitive Volume	Radius 3.5 mm Length 100 mm	Radius 3.5 mm Length 300 mm
Wall Area Density	119 mg/cm^2	
Electrode	Al tube, graphited outer diameter 3 mm	
Ion Collection Efficiency at Nominal Voltage		
Ion Collection Time	274 µs	
Max. Dose Rate for ≥95.0% saturation	12.4 Gy/s	
Max. Dose Per Pulse for ≥95.0% saturation	2.26 mGy	
Useful Ranges		
Chamber Voltage	± 100 - 400 V	
Radiation Quality	50 - 150 kV electrons	
Temperature	10° to 40° C, 50° to 104° F	
Humidity	10 to 80%, max 20 g/m^3	
Air Pressure	700 - 1060 hPa	

SPIRAL/HELICAL CT PHANTOM

Optimize Collimation and Table Speed (Pitch) to Ensure Detection of Small Lesions in the Abdominal Cavity





- **Usable on all standard and helical scanners**
- **Target Contrast = 5, 10, 20 HU above background**
- **Valid contrast at all energy settings**
- **Compact**
- **Indestructible**

The Spiral/Helical CT Phantom is designed to test scanning protocols to verify that small low contrast lesions will be detected. The phantom permits complete testing of low contrast lesion detectability when scan parameters are varied. These parameters include collimation, pitch, reconstructed field of view, reconstruction algorithms, z-axis interpolators, kVp, mA and rotation time. Testing can be applied to protocols designed for head and abdomen. The Spiral/Helical CT Phantom contains clinically-relevant spherical targets that are 5, 10 and 20 HU above the background matrix (Plastic Water® LR).

Item 680-061 Spiral/Helical CT Phantom Includes

(1) CT Disk (Plastic Water® LR)
(1) Water Equivalent Base (Plastic Water® DT)
(1) Water Equivalent Top (Plastic Water® DT)
(1) Soft-sided Carrying Case

Specifications

Size: 8" x 7" x7" (20.3 x 17.8 x 17.8 cm)
Material: Tissue Equivalent epoxy materials
Weight: 12 lb (5.4 kg)

Item #	Description
680-061	Spiral/Helical CT Phantom

CT DOSE PHANTOM

Acrylic

Photo Unavailable

- **Usable on all CT scanners**
- **Head and abdominal configurations included**
- **Made from acrylic with a density of 1.19 gm/cc**
- **Includes 10 PMMA plugs**
- **1.31 cm inside hole dia. sized for standard CT Dose probes**
- **Rugged foam lined carrying case included**

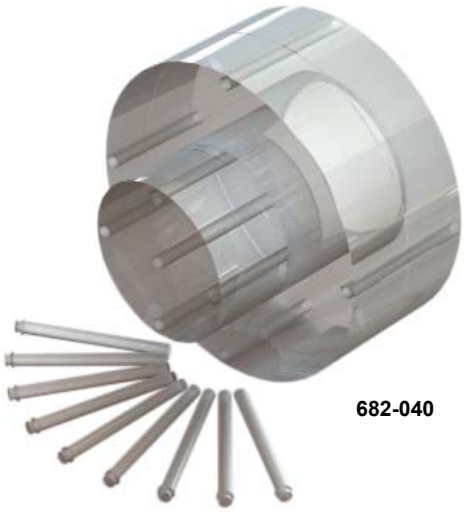
The CT Dose Phantom consists of two 15 cm thick Solid PMMA disks measuring 16 cm (head) and 32 cm (body) in diameter.

The disks have five through-holes with an inside diameter of 1.31 cm to accommodate standard CT dose probes and five acrylic rods to plug the holes not in use. One hole is at center and four are around the perimeter, 90° apart and 1 cm from hole center to the outside edge of the phantom.

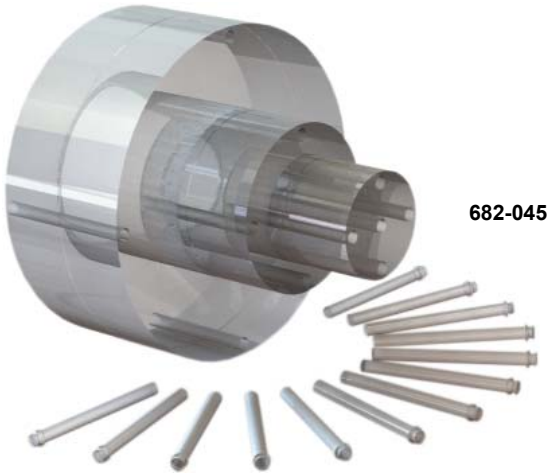
The head and body phantoms along with the ten acrylic rod plugs are packaged in an extremely rugged foam lined carrying case.

Item	Description
682-005	CT Dose Phantom, Acrylic

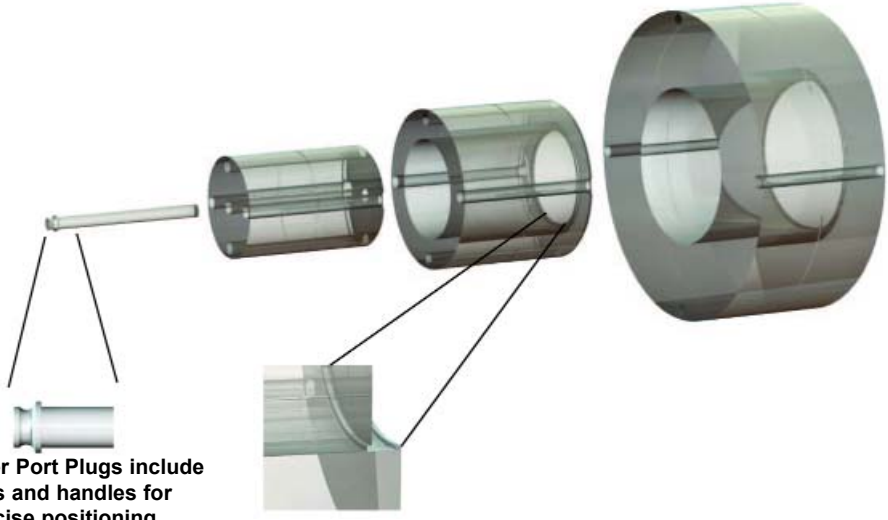
CT DOSE INDEX PHANTOM



682-040



682-045



Chamber Port Plugs include stops and handles for precise positioning

Tongue and groove design provides fast setup times and ensures precise module alignment

- **Economical and easy to use**
- **Customized case with built-in wedges for use as a phantom holder**
- **Chamber Port Plugs include stops and handles for precise positioning**
- **Tongue and groove design provides fast setup times and ensures precise module alignment**

Computed Tomography Dose Index (CTDI) Phantoms are a key part of your CT Quality Control Program. Measure Absorbed Dose and monitor scanner output with this new and easy to use design.

The Gammex 468 CDTI Phantom was designed to meet specifications outlined by the Food and Drug Administration (FDA 21CFR 1020.33) and the International Electrotechnical Commission (IEC 60601-2-44). The phantom is offered as a 2-piece (Item 682-040) or as a 3-piece (Item 862-045) telescopic configuration. Each configuration consists of nested modules, allowing the user to adapt the phantom to the desired size required by the protocol in use. Each module allows the user to collect dose measurements on the central axis of the phantom or at periphery positions located every 90 degrees at 1.0-cm depth from the surface.

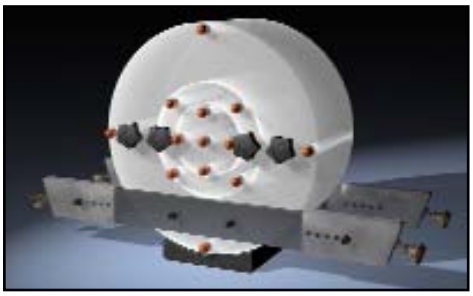
Specifications

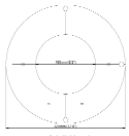
Material: Polymethyl-Methacrylate (PMMA/Acrylic)
Density: 1.19 g/cm^2
Alignment Markings: Etched lines centered at the transverse, coronal and sagittal planes

Dimensions
Adult Body: 32 cm x 14.5 cm
Adult Head/Pediatric Body: 16 cm x 14.5 cm
Pediatric Head (Item 682-045 only): 10 cm x 14.5 cm

Item #	Description
682-040	CT Dose Index Phantom
682-045	CT Dose Index Phantom -Adult & Pediatric

CT DOSE PHANTOM





682-007-14, 682-007-15 and 682-007-16

- **Abdominal and Adult Head configurations**
- **PMMA disks and plugs with density of 1.10 g/cc**
- **1.31 cm diameter holes sized for standard CT Dose probes**
- **Nesting PMMA disks minimize storage space**
- **Compatible with all CT scanners**

For all computed tomography systems, the Food and Drug Administration recommends measuring the CT Dose Index. Each section of the CIRS CT Dose Phantom can provide separate dose information. The user can also measure maximum, minimum and mid-range values of the nominal tomographic section thickness when performing dose profile measurements.

The CT Dose Phantom consists of a set of a nesting 15 cm thick solid PMMA disks measuring 16 cm (head) and 32 cm (body) in diameter. The adult head disk is also suitable for pediatric body measurements. Handles on the body and head are provided for ease in handling and maneuverability.

Through holes measuring 1.31 cm in diameter will accommodate standard CT probes. Acrylic rods are provided to plug the holes when not in use. The acrylic rods are machined to receive 1 mm diameter TLD rods.

The CT Dose Phantom is manufactured to comply with the FDA's performance standard, 21 CFR 1020.33 that details the measurement requirements.

An optional Support Bracket can be used to suspend the CT Dose Phantom above the imaging couch and align it along the axis of X-ray tube rotation. This enables the phantom to be used to assess CT dose in helical mode or any mode that requires the extended travel of the imaging couch or a wide beam. This set-up might be used to address the dosimetry approach described in TG111. An additional application of the support bracket is to provide a body to simulate continous scatter radiation from the patient during helical CT for dose safety measurements inside and outside the exam room.

Replacement acrylic rods are available in 14, 15 or 16 cm long.

Item 682-007 CT Dose Phantom Includes

(1) Abdominal Cylinder
(1) Adult Head Cylinder
(9) Acrylic Rods
(1) Foam Lined Carry Case
(1) User Guide
(1) 48 Month Warranty

Specifications

Overall Dimensions: 12.5" x 12.5" x 5.5" (31.8 x 31.8 x 15 cm)
Weight: 29 lb (13 kg)
Materials: PMMA

Item #	Description
682-007	CT Dose Phantom
682-009	CT Dose Phantom Support Bracket, Optional
682-007-14	Acrylic Rod CT Probe, 1.31cm Dia. x 14cm Long
682-007-15	Acrylic Rod CT Probe, 1.31cm Dia. x 15cm Long
682-007-16	Acrylic Rod CT Probe, 1.31cm Dia. x 16cm Long

HEAD/BODY CT PHANTOM

- **Head Module of a uniform disc of Solid Water® Material**
- **Ring of Bone mimicking material that mounts around the head module is included**
- **Body scanning module, body annulus is mounted on the head module.**
- **The head has 5 tapered cavities which accept tapered inserts and the body annulus ring has 4 cavities, providing a total of 9 test positions.**

The Head/Body CT Phantom provides a set of tools for evaluating CT image quality. The main modules are constructed of Solid Water®. This permits testing without the difficulties of filling phantoms with water. The set of standard inserts is sufficient for many users. The Head/Body CT Phantom comes complete with a custom carrying case.

Specifications

Phantom Construction: Solid Water® Material
Inserts Included:
(9) Uniform Solid Water® inserts for measurement of Noise, CT Number, and Uniformity
(1) Edge/Contrast Scale Response
(1) Spatial Resolution (1.50 to 0.4 mm at 100% contrast)
(1) Low Contrast Detectability (0.6%)
(1) Alignment Artifact (Aluminum Pin)
(4) Alignment, Slice Thickness, Phantom Position
(2) Slice Thickness and Sensitivity Profile 2:1 Slope (26.6° Slope)
(2) Beam Hardening Artifact (Simulated Bone)
(6) Linearity
Case Size: 24" x 16" x 8" (70 x 41 x 22 cm)
Weight: 35.7 lb (16.2 kg)

Item #	Description
682-461	Head/Body CT Phantom

TISSUE CHARACTERIZATION PHANTOM

- **Easy method for electron density measurement of different tissue materials**
- **14 different tissue and insert materials to measure**
- **Distance measurement holes to assist in measuring CT distance measurement accuracy**
- **Includes a handy carrying case for storage and transportation**
- **Proven Solid Water core design**
- **Interchangeable rods permits positioning customization**
- **Interchangeable inserts of materials permits easy measurement of a wide range of tissues**
- **Compact design makes storage and transportation simple and easy**
- **Wide range of materials permits full range of measurements**
- **Optional Titanium and Stainless Steel inserts available**
- **Economical**
- **Also permits checking the CT scanner's distance measurement accuracy**
- **Data measured can be transferred to the TPS for more additional corrections for tissue inhomogeneities**

Accurate corrections for tissue inhomogeneities are a critical part of isodose treatment planning. Although most computerized treatment planning systems currently use CT image data, these systems frequently use empirical formulae in computing correction factors for tissue inhomogeneities.

The Tissue Characterization Phantom can be used to establish the relationship between the electron density of various tissues and their corresponding CT number in Hounsfield Units. This data can then be transferred to the computerized treatment planning system for more accurate corrections for tissue inhomogeneities.

Scanning the phantom on a periodic basis provides data useful for the QA program of both the CT scanner and treatment planning system.

The Phantom consists of a Solid Water disk approximately the size of an average pelvis. A matrix of 16 holes in the disk hold interchangeable rods made of various tissue and water simulating materials. The physical density (gm/cm^3) and electron density relative to water of the rod materials are provided on a specification sheet with each phantom. The phantom also has a pattern of small air holes with known spacings for checking the CT scanners's distance measurement accuracy. A handy carrying case is also included.

Specifications

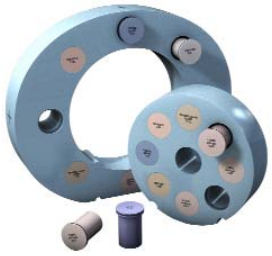
Disk Material: Solid Water® (Gammex 451)
Size: 12.9" Dia x 2" H (32.8 x 5.08 cm)
Weight of Disk and Rods: 10 lb (4.6 kg)
Phantom with case: 14.5 lb (6.6 kg)
Warranty: One year

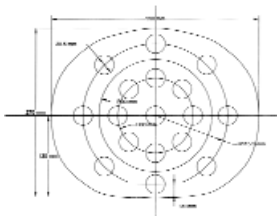
Rod Material	Electron Density Relative to Water	Physical Density g/cm^3
Lung (LN-300)	0.29	0.30
Lung (LN-450)	0.40	0.45
Adipose (AP6)	0.90	0.92
Breast	0.96	0.99
CT Solid Water	0.99	1.02
Brain	1.05	1.05
Liver (LV1)	1.07	1.08
Inner Bone	1.09	1.12
Bone (B200)	1.11	1.15
Bone (CB2-30% Mineral)	1.28	1.34
Bone (CB2-50% Mineral)	1.47	1.56
Cortical Bone (SB3)	1.69	1.82
True Water	1.00	1.00
Optional Titanium Insert	3.79	4.59
Optional Stainless Steel Insert	6.58	8.00

Item #	Description
682-467	Tissue Characterization Phantom
682-468	Titanium Insert, Optional
682-469	Stainless Steel Insert, Optional

ELECTRON DENSITY PHANTOM

Correlate CT Number and Tissue Electron Density





- **Evaluate CT scan data**
- **Correct for inhomogeneities**
- **Document relationship between CT number and tissue electron density**
- **Simulate indicated tissue within the diagnostic and theraputic energy range**
- **Quick assessment of distance registration (optional)**

B

The Electron Density Phantom is used to account for tissue heterogeneity in radiotherapy treatment planning. The phantom is used with a CT scanner to provide precise correlation between electron density of tissues and their CT number in Houndsfield units (HU).

The Electron Density Phantom consists of two nested disks made from Plastic Water®-LR. They can represent both head and abdomen configurations. Nine different tissue equivalent electron density plugs can be positioned at 17 different locations within the scan field. Included is a water vial plug that can be filled with any fluid. Optional distance marker plugs enable quick assessment of the CT scanner's distance measurement accuracy

Specifications

Overall Dimensions
Electron Density Head Insert: 7" Dia x 1.97" D (180 x 50 mm)
Electron Density Body without Head Insert:
12" W x 10.7" H x 1.97" D (330 x 270 x 50 mm)

Weights
Electron Density Head Insert: approx 2 lb (0.950 kg)
Electron Density Body without Head Insert: approx 4.7 lb (2.1 kg)

Materials: Water and Tissue Equivalent Epoxy Materials

Item #	Description
682-062	Electron Density Phantom

ELCTRON DENSITY PHANTOM ITEM 682-062 INCLUDES

Qty	Description	*Physical Density, (g/cc)	Electron Density x 10^{23} Electrons/cc	RED (Relative to H_2O)
1	Electron Density Head Insert	1.029	3.333	0.998
1	Electron Density Body without Head Insert	1.029	3.333	0.998
2	Lung (Inhale) Equivalent Insert Electron Density Plug	0.20	0.634	0.190
2	Lung (Exhale) Equivalent Insert Electron Density Plug	0.50	1.632	0.489
2	Breast (50% Gland / 50% Adipose) Equivalent Electron Density Plug	0.99	3.261	0.976
2	Solid Trabecular Bone (200 mg/cc HA) Equivalent Electron Density Plug	1.16	3.730	1.117
2	Liver Equivalent Electron Density Plug	1.07	3.516	1.052
2	Muscle Equivalent Electron Density Plug	1.06	3.483	1.043
2	Adipose Equivalent Electron Density Plug	0.96	3.171	0.949
2	Solid Dense Bone (800mg/cc HA) Equivalent Electron Density Plug	1.53	4.862	1.456
1	Solid Dense Bone (1250mg/cc HA) Equivalent Electron Density Plug	1.82	5.663	1.695
1	Water Equivalent Material Surrounding Removable 1" diameter Vial for Real Water Electron Density Plug	1.00	3.340	1.000
1	Set of 2 Feet for 682-062			
1	Soft Carry Case			
1	User Guide			
1	48 Month Warranty			

ELCTRON DENSITY PHANTOM OPTIONAL ACCESSORIES

Item	Description	*Physical Density, (g/cc)	Electron Density x 10^{23} Electrons/cc	RED (Relative to H_2O)
682-207	**800 mg/cc HA in Water Equivalent - Core Insert	1.53	4.862	1.456
682-212	**Titanium Rod Core Insert	4.51	12.475	3.735
682-213	Distance Marker Insert	1.029	3.333	0.998
682-216	Water Equivalent Insert	1.029	3.333	0.998
682-217	**1000 mg/cc HA in Water Equivalent - Core Insert	1.66	5.243	1.570
682-218	**1250 mg/cc HA in Water Equivalent - Core Insert	1.82	5.663	1.695
682-219	**ICRU Cortical Bone Equivalent Core Insert***	1.93	5.956	1.780
682-220	**1500 mg/cc HA in Water Equivalent - Core Insert	1.99	6.134	1.837
682-221	**1750 mg/cc HA in Water Equivalent - Core Insert	2.15	6.600	1.976
682-226	Solid Dense Bone (1000 mg/cc HA) Equivalent Electron Density Plug	1.66	5.243	1.570
682-228	Solid Dense Bone (1500 mg/cc HA) Equivalent Electron Density Plug	1.99	6.134	1.837
682-229	Solid Dense Bone (1750 mg/cc HA) Equivalent Electron Density Plug	2.15	6.600	1.976

* Physical Density - The actual physical density of the insert can vary within ±1% of the manufacturing target density.
Note: CIRS strongly recommends that the user inputs the electron density whenever prompted for material data by the TPS.

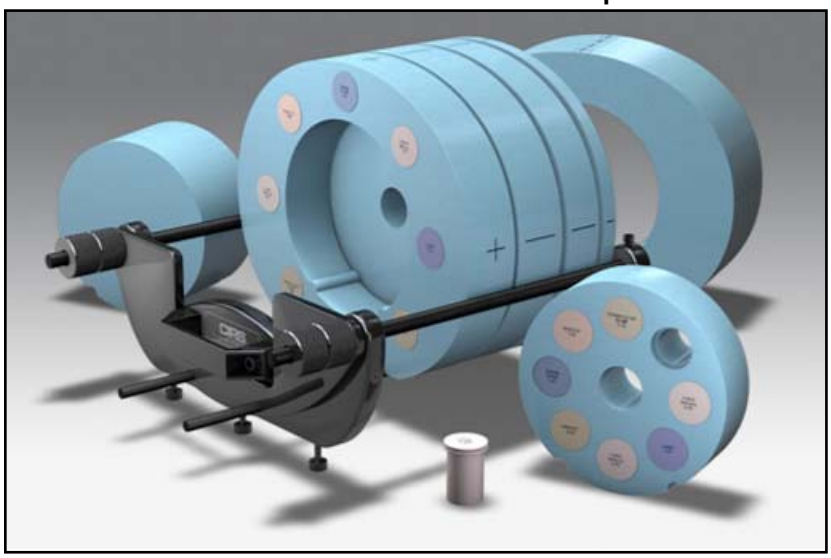
** These inserts have a a standard 30 mm diameter and contain a 10 mm diameter core of the indicated reference surrounded by H_2O-equivalent background. Hydroxyapatite (unit mg/cc) in H2O background Plugs to accommodate chambers, TLD's and film available upon special request. The titanium reference has a unique diameter of 6.35 mm.

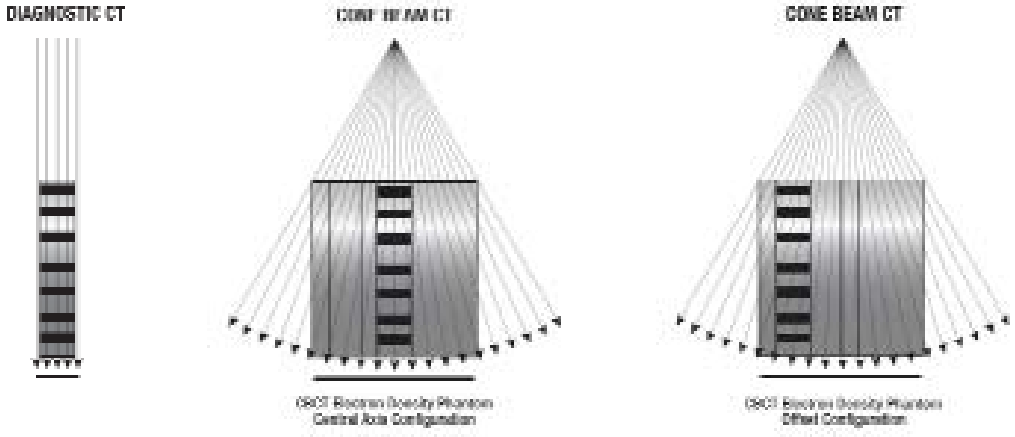
*** CIRS Cortical bone reference is based on ICRU Report No.44, and represents approximately 12.2% H_2O, 24.6% protein, 58% mineral (assumed to be Calcium Hydroxyapatite (HA)), and 5.2% monosaccharides. CIRS further offers a series of mineral density references that mimic various HA concentrations in a pure water-equivalent epoxy background matrix.

† Refer to Appendix A for the CIRS cavity and plug code list of available chamber cavities

CBCT ELCTRON DENSITY PHANTOM

Increase HU Value Confidence for Adaptive RT





A large number of HU readings can be obtained by placing the electron density plugs in different positions both in central axis and offset configurations. Using the equation of curve fitting for collected values, a CBCT to electron density calibration curve can be calculated.

- **Evaluate CT scan data**
- **Correct for inhomogeneities**
- **Document relationship between CT number abd tissue electron density**
- **Simulate indicated tissue within the diagnostic and therapeutic energy range**
- **Quick assessment of distance registration (optional)**

The Cone Beam (CBCT) Electron Density Phantom is an extended version of Item 682-062 Electron Density Phantom and specifically designed for Cone Beam CT Imaging systems. Preliminary data shows that there may be differences between the HU readings for Diagnostic CT and Cone Beam CT. The geometry of the Cone Beam CT requires additional material and suggests that off central axis measurements should be taken.

The phantom was designed in collaboration with Dr. Peter H. Cossmann, PhD to provide a reliable tool for CT number to electron density calibration in volumetric imaging. Reliable CT calibration curves help enable treatment plan adaptation directly from Cone Beam CT data. Additionally, the phantom can accommodate any ion chamber for dose measurements and validation of heterogeneity correction based on the corrected CT calibration curve.

The CBCT Electron Density Phantom's size covers geometries for imagers with dimensions of up to 40 cm x 40 cm. It is made of Plastic Water®-LR and contains the same set of tissue equivalent electron density inserts as the standard Item 682-062. Additional interchangeable slabs allow for repositioning of the electron density section off axis.

Specifications

Overall Dimensions: 13" W x 10.6" H x 9.8" D (33 x 27 x25 cm)
Weight: 40 lb (18 kg)
Materials: Water and Tissue Equivalent Epoxy Resin

Item #	Description
682-200	CBCT Electron Density Phantom

CBCT ELECTRON DENSITY PHANTOM ITEM 682-200 INCLUDES

Qty	Description	Physical Density (g/cc)	Electron Density Per cc x 10^{23}	RED (Relative to H_2O)
1	Electron Density Head Insert	1.029	3.333	0.998
1	Electron Density Body without Head Insert	1.029	3.333	0.998
2	Lung (Inhale) Equivalent Insert Electron Density Plug	0.20	0.634	0.190
2	Lung (Exhale) Equivalent Insert Electron Density Plug	0.50	1.632	0.489
2	Breast (50% Gland / 50% Adipose) Equivalent Electron Density Plug	0.99	3.261	0.976
2	Solid Trabecular Bone (200 mg/cc HA) Equivalent Electron Density Plug	1.16	3.730	1.117
2	Liver Equivalent Electron Density Plug	1.07	3.516	1.052
2	Muscle Equivalent Electron Density Plug	1.06	3.483	1.043
2	Adipose Equivalent Electron Density Plug	0.96	3.171	0.949
2	Solid Dense Bone (800 mg/cc HA) Equivalent Electron Density Plug	1.53	4.862	1.456
1	Solid Dense Bone (1250 mg/cc HA) Equivalent Electron Density Plug	1.82	5.663	1.695
1	Water Equivalent Material Surrounding Removable, 1" dia Vial for Real Water Electron Density Plug	1.00	3.34	1.00
1	50 mm Thick Bolus Slab	1.029	3.333	0.998
2	100 mm L x 30 mm dia Background Equivalent Plug	1.029	3.333	0.998
1	12.5 mm Thick Bolus Slab	1.029	3.333	0.998
1	37.5 mm Thick Bolus Slab	1.029	3.333	0.998
1	CBCT Electron Density Phantom -Annulus (100 mm Thick)	1.029	3.333	0.998
1	CBCT Electron Density Phantom-Annulus Solid Insert (100 mm Thick)	1.029	3.333	0.998
1	Holder/Support set for 682-200 & Model 062MQA			
1	Soft Carry Case for 682-200			
1	User Guide			
1	48 Month Warranty			

CUSTOMERS ARE ENCOURAGED TO COMPLETE THEIR ORDER WITH THE PURCHASE OF THE INSERT OPTION LISTED BELOW

Item	Description	*Physical Density, (g/cc)	Electron Density x 10^{23} Electrons/cc	RED (Relative to H_2O)
682-214	†Water Equivalent Chamber Rod with Cavity for Ion Chamber	1.029	3.333	0.998

†Refer to Appendix A for the CIRS cavity and plug code list of available chamber cavities.
If the ion chamber cavity is not specified by customer, phantom is supplied with cavity that accommodates a Farmer type ion chamber.

CBCT ELECTRON DENSITY PHANTOM OPTIONAL ACCESSORIES

Item	Description	*Physical Density, (g/cc)	Electron Density x 10^{23} Electrons/cc	RED (Relative to H_2O)
682-207	**800 mg/cc HA in Water Equivalent - Core Insert	1.53	4.862	1.456
682-212	**Titanium Rod Core Insert	4.51	12.475	3.735
682-213	Distance Marker Insert	1.029	3.333	0.998
682-216	Water Equivalent Insert	1.029	3.333	0.998
682-217	**1000 mg/cc HA in Water Equivalent - Core Insert	1.66	5.243	1.570
682-218	**1250 mg/cc HA in Water Equivalent - Core Insert	1.82	5.663	1.695
682-219	**ICRU Cortical Bone Equivalent Core Insert***	1.93	5.956	1.780
682-220	**1500 mg/cc HA in Water Equivalent - Core Insert	1.99	6.134	1.837
682-221	**1750 mg/cc HA in Water Equivalent - Core Insert	2.15	6.600	1.976
682-226	Solid Dense Bone (1000 mg/cc HA) Equivalent Electron Density Plug	1.66	5.243	1.570
682-228	Solid Dense Bone (1500 mg/cc HA) Equivalent Electron Density Plug	1.99	6.134	1.837
682-229	Solid Dense Bone (1750 mg/cc HA) Equivalent Electron Density Plug	2.15	6.600	1.976

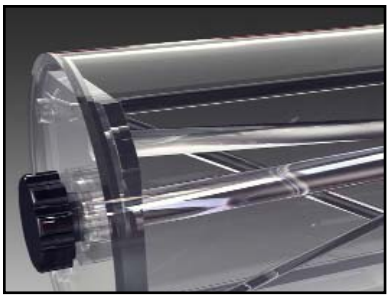
* Physical Density - The actual physical density of the insert can vary within ±1% of the manufacturing target density.
Note: CIRS strongly recommends that the user inputs the electron density whenever prompted for material data by the TPS.

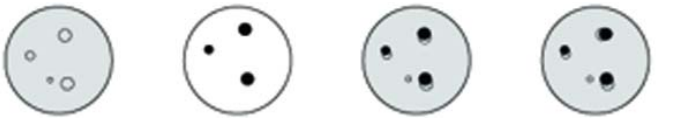
** These inserts have a a standard 30 mm diameter and contain a 10 mm diameter core of the indicated reference surrounded by H_2O-equivalent background. Hydroxyapatite (unit mg/cc) in H_2O background Plugs to accommodate chambers, TLD's and film available upon special request. The titanium reference has a unique diameter of 6.35 mm.

*** CIRS Cortical bone reference is based on ICRU Report No.44, and represents approximately 12.2% H_2O, 24.6% protein, 58% mineral (assumed to be Calcium Hydroxyapatite (HA)), and 5.2% monosaccharides. CIRS further offers a series of mineral density references that mimic various HA concentrations in a pure water-equivalent epoxy background matrix.

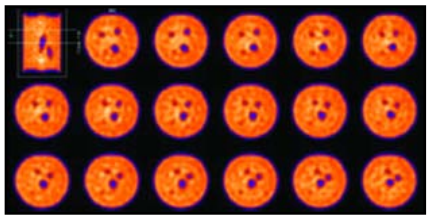
GILLIAN QA PHANTOM

Evaluate Image Distortion and Alignment in SPECT/CT, PET/CT and MRI

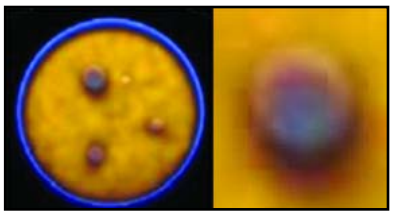




CT Image | SPECT Image | Combined Image showing verticle misalignment | Combined Image showing more serious alignment problem



Transverse SPECT of Phantom



Misalignment detail

- **Compatible with SPECT/CT, PET/CT and MRI**
- **Check alignment and distortion across the entire imaging field**
- **Easy to fill and drain**
- **Allows for independent assessment of equipment function**
- **Simple geometry allows for quick visual interpretation**

Hybrid scanning systems such as SPECT/CT and PET/CT are increasingly being used to improve tumor identification, treatment delivery and monitor treatment effectiveness. By combining images from two different imaging modalities, hybrid scanning systems take advantage of the strengths of individual imaging modalities while minimizing their respective weaknesses. Proper alignment of the fused images is an ongoing concern.

The Gillian QA Phantom provides a simple and cost effective solution to verify image alignment and distortion. The phantom consists of a water tight acrylic cylinder that can be filled with a variety of fluids. Four non-parallel rods of varying diameter run the entire length of the cylinder. Images produced with the phantom can quickly and clearly show if there is any mismatch in the fused images.

Gillian QA Phantom Includes

(1) Gillian QA Phantom
(1) Fill Plug
(1) Drain Adapter
(1) Vent Port
(1) Carry Handle with Strap
(1) User Guide
48 Month Warranty

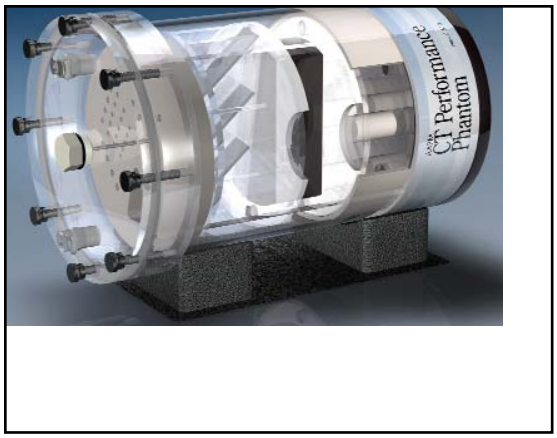
Specifications

Overall Dimensions: 10" x 10.75" x 16" (25.4 x 27.3 x 40.7 cm)
Weight: 14 lb (6.4 kg)
Materials: Acrylic
Rod Diameters: 0.5", 0.75", 0.87" and 1.26" (12.75, 19, 22 and 32 mm)

Item #	Description
682-850	Gillian QA Phantom

AAPM CT PERFORMANCE PHANTOM

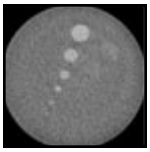
Meets guidelines in AAPM Report #1 "Performance Evaluation and Quality Assurance of CT Scanners"



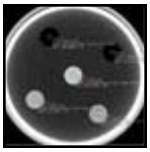
Measurement Capability

- **Noise**
- **Sensitivity / Detectability**
- **Mechanical Alignment**
- **Beam Hardening**
- **Slice Thickness**
- **Size Independence**
- **Radiation Dose**
- **Spatial Uniformity**
- **HU Linearity**
- **Spatial Resolution & line spread function**

Item 682-010 Includes

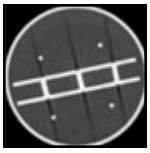


Contrast Test Object
(This option is only available with purchase of the phantom body)
8.5" OD x 2.5" L (21.6 x 6.35 cm) solid acrylic equivalent disk block with 12 fillable cavities 2.25" deep (5.72 cm). Two of each cavity with diameters: 1, 0.75", 0.50", 0.375", 0.25", and 0.125" (2.54, 1.9, 1.27, 0.95, 0.64, 0.32 cm), spaced twice their diameter apart from a center line. Cavities can be easily filled from the ouside with dextrose or sodium chloride solutions of various concentration.

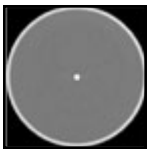


CT Number Linearity Insert
7.5" OD x 2.5" L (19.05 x 6.35 cm) includes 1" diameter (2.54 cm) rods of polyethylene, PMMA (acrylic), polycarbonate, polystyrene, and nylon. Density values (g/cc): polyethylene - 0.95, polystyrene - 1.05, nylon - 1.1, acrylic - 1.19, polycarbonate - 1.20.

Resolution Insert
7.5" OD x 2.5" L (19.05 x 6.35 cm) with acrylic equivalent test object with 8 sets of air thru holes (five holes per set): Diameter of holes is 1.75, 1.5, 1.25, 1.00, 0.75, 0.61, 0.50, and 0.40 mm. Distance between each hole equal to hole diameter. Each row is 5 mm apart. Insert also contains a 0.009" (0.023 cm) stainless steel wire positioned longitudinally for calculation of line-spread function.



Slice Thickness Insert
7.5" OD x 3.5" L (19.05 x 8.89 cm) Contains three 0.02 x 1" (0.064 x 2.54 cm) aluminum strips angled at 45°, positioned on center and aligned vertically.



Alignment Pin
0.25" diameter x 3" L (0.64 x 7.62 cm) aluminum pin with threaded attachment to housing cover plate.

Image Unavailable

Bone Ring
7.65" ID x 0.2" wall thickness x 2.8" L (19.43 x 0.5 x 7.1 cm) cortical bone ring. Fits over linearity, resolution and slice thickness insert to harden the beam.

User Guide
48 month warranty

The AAPM CT Performance Phantom offers the user a single test object that measures ten distinct CT performance parameters. The phantom design is based on the guidelines presented in Report #1 of the American Association of Physicists in Medicine Task Force on CT Scanner Phantoms. The goals of report #1 were to "(1) define 'performance' of a CT scanner and (2) describe methods of performance testing through utilization of particular phantoms."

A CT number linearity insert, high contrast resolution insert and slice width insert are housed in an 8.5" diameter (21.6 cm) PMMA water tank with quick disconnect valves for ease of filling and draining between use. Also included is a 0.25" (0.64 cm) bone equivalent ring that can be fit over the inserts to evaluate the effects of beam hardening.

A contrast test object is adhered to the bottom of the tank that includes two rows of cavities from 1 to 0.125" diameter (2.54 to 0.32 cm). The cavities can be filled with various solutions for contrast evaluation. An aluminum alignment insert is incorporated in the lid of the tank and can be interchanged with a polystyrene TLD insert for dose measurements.

A user's manual, holding cradle, filling tubes and other accessories are included. Optional items: Low Contrast Insert, Whole Body Resolution and Noise Ring, TLD Insert, Low Contrast Insert - Spherical Targets or Carrying Case.

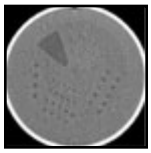
Specifications

Overall Dimensions: 8.5" OD x 15.5" L (21.6 x 39.4 cm)
Empty Weight: 17.25 lb (7.9 kg)
Phantom Housing: PMMA cast tubing 8.5" OD, 8" ID x 12.75" L (21.6 OD, 20.3 ID x 32.4 cm) with removable lid

Optional Accessories

Image Unavailable

Item 682-014 TLD Insert
0.5" dia. x 3.5" L (1.3 x 8.9 cm) PMMA rod drilled 3" deep (7.6 cm) to accept TLD's. Can be swapped with Alignment pin in housing cover without removing the cover.



Item 682-012 Low Contrast Insert
8" OD x 1.18" L (20.3 x 3 cm) propietary epoxy with CT density 6-10 HU above water. The test object contains a series of water-filled holes from 2.5 to 7.5 mm in diameter, in 0.5 mm steps. For each target size the center-to-center distance between holes is twice the hole diameter.

Image Unavailable

Item 682-013 Whole Body Resolution and Noise Ring
12" OD x 8.5" ID x 2" L (30.5 x 21.6 x 5.1 cm) fits over phantom housing and contains the same test object as the Resolution Insert, at two locations 90° apart.

Item 682-015 Low Contrast Insert- Spherical Targets
8" OD x 1.18" L (20.3 x 3 cm) Plastic Water® LR equivalent background. The test object contains spheres 5, 10 & 20 CTU above background and 3 reference plugs for each material used as spheres.

Item #	Description
682-010	AAPM CT Performance Phantom
682-014	TLD Insert
682-012	Low Contrast Insert
682-013	Whole Body Resolution & Noise Ring
682-015	Low Contrast Insert - Spherical Targets
682-020	Carrying Case, Foam-Lined

NUALINE LASERS FOR CT AND LINAC ROOMS

710-993

710-994

710-995

710-998

710-997

B

- **Individual laser line has micro Angular and Transverse adjustments.**
- **It is extremely easy for installation and routine calibration. Customers may be able to install the lasers without professional help.**
- **The laser's compact size makes it fit any existing laser systems.**
- **No tools required.**

Item 710-993 GSG1 Green Sagittal Laser
The laser head could pivot in a range of 135° for flexible location (on the ceiling direct above the couch or on a vertical wall).

The laser line has two adjusting knobs. One for tilting laser line and one for moving laser line transversely. The adjustment is tool-less.

Item 710-994 GCR1 Green Crosshair Laser
The laser head could be adjusted over the mounting base for laser center alignment.

Each laser line has two adjusting knobs. One for tilting laser line and one for moving laser line transversely. The adjustment is tool-less.

Item 710-995 SG1 Red Sagittal/Backpointer Laser
The laser head could pivot in a range of 135° for flexible location (on the ceiling direct above the couch or on a vertical wall).

The laser head could be adjusted over the mounting base for laser center alignment.

The laser line has two adjusting knobs. One for tilting laser line and one for moving laser line transversely. The adjustment is tool-less. This feature brings easiness for both installation and routing calibration.

This laser (without a line generator lens) could also be used as a back-pointer.

Item 710-997 CR2 Red Crosshair Laser
Model CR2 is designed for small treatment rooms with diagonal layout. The laser head has a pivoting range of 135°. No additional mounting bracket is needed.

Two internal screws for adjusting cross hair line (as a whole) horizontally and vertically. The line titling is done by rotate the laser head over the mounting base.

Item 710-998 CR3 Red Crosshair Laser
The laser head could be adjusted over the mounting base for laser center alignment.

Each laser line has two adjusting knobs. One for tilting laser line and one for moving laser line transversely.

The adjustment is tool-less. This feature brings easiness for both installation and routing calibration.

Specifications

Electrical power consumption
Red laser: <0.2A / 7VDC.
Green laser: <1A / 3VDC

FDA Compliance
Nualine laser meets FDA requirement of class I medical device. Nualine laser devices are listed with FDA and the company is registered with FDA. A warning label on the device meets FDA code 1040.10.

Item #	710-993	710-994	710-995	710-997	710-998
Model	GSG1	GCR1	SG1	CR2	CR3
Description	Green Sagittal	Green Crosshair	Red Sagittal/Backpointer	Red Crosshair	Red Crosshair
Wave Length	532nm DPSS	532nm DPSS	635nm	635nm	635nm
Line Width	< 1 mm	< 1 mm	< 1 mm	< 1 mm	< 1 mm
Range	4 -15' (1.2 - 4.5 m)	4 -15' (1.2 - 4.5 m)	6 -12' (1.8 - 3.7 m)	6 -12' (1.8 - 3.7 m)	6 -12' (1.8 - 3.7 m)
Focus	Adjustable	Adjustable	Fixed	Fixed	Fixed
Size	3" x 5.9" x 2" (7.6 x 15 x 5 cm)	4" x 5.9" x 1.8" (10.2 x 15 x 4.5 cm)	3.2" x 2.75" x 2.3" (8.1 x 7 x 5.8 cm)	3.5" x 3" x 2.3" (8.9 x 7.6 x 5.8 cm)	4.5" x 4" x 2" (11.4 x 10.2 x 5 cm)
Weight	15 oz (425 gm)	28.3 oz (800 gm)	10.6 oz (300 gm)	12.9 oz (365 gm)	19.5 oz (550 gm)

CENTRALITE® RED DIODE FIXED LASERS

- **Unique three-filter design reduces transient power issues and extends diode life**
- **Precise line quality with width of less than 1mm at isocenter and line depth of field of 1.5m – 4m ensures accurate position reproducibility**
- **Fingertip controls provide independent adjustments for angle of rotation of cross-lines**

Red diode lasers have long been the standard in radiation therapy. Three configurations are offered for the Centralite® Red Diode Lasers. The lasers may also be purchased individually.

Specifications

Red Diode Laser
Laser Beam Output: Less than 1 mW per beam (Class II laser)
Line Width: 0.9-1.2 mm at isocenter when mounted 3 m from isocenter.
Fan Beam Angle: Greater than 50 degrees.
Wavelength: 650 nm
Adjustment Sensitivity: Less than 0.1 mm (manual or motor drive).
Drift: No measurable drift
Power: 115/220 Vac 50/60 Hz AC/DC converter.
Dimensions: Mounting plate and case 5.5" W x 3.9" D x 13" H
Certification: Complies with CDRH regulations for Class II lasers.
CE

Item	Centralite® Lasers
710-910	Red Diode Cross Laser
710-920	Red Diode Sagittal Laser

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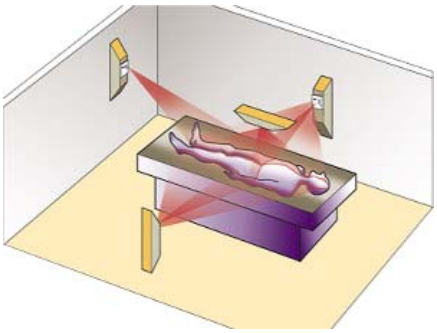
LS-1 LASER SYSTEM

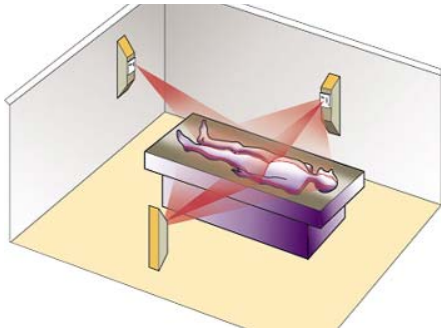


Depending on the configuration of the room, the two lateral and overhead cross lasers may be mounted either vertically or horizontally. The sagittal laser mounts vertically on the back wall, allowing the beam to project downward at a 20° angle.

System Includes
3 Red Diode Cross Lasers
1 Red Diode Sagittal Laser
Mounting Plates and AC/DC Converter

Item	Centralite® Laser Systems
710-941	LS-1 Red Diode

LS-2 LASER SYSTEM

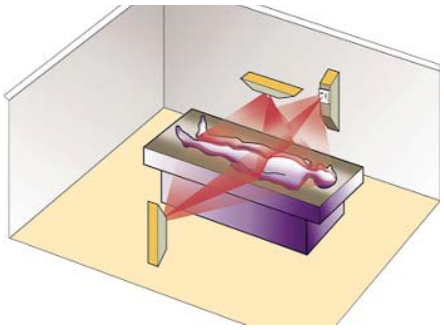


The two lateral cross lasers may be mounted vertically or horizontally. The sagittal laser is mounted vertically on the back wall, allowing the beam to project downward at a 20° angle.

System Includes
2 Red Diode Cross Lasers
1 Red Diode Sagittal Laser
Mounting Plates and AC/DC Converter

Item	Centralite® Laser Systems
710-942	LS-2 Red Diode

LS-3 LASER SYSTEM



In this configuration, two cross lasers may be mounted vertically or horizontally on opposing walls. The third laser is mounted on the ceiling, allowing the two beams to project downward through the isocenter.

System Includes
3 Red Diode Cross Lasers
Mounting Plates and AC/DC Converter

Item	Centralite® Laser Systems
710-943	LS-3 Red Diode

LAP ASTOR LASERS

Laser Systems for Patient Alignment

Integrated Tiltable Bracket

ASTOR room lasers are high precision tools for patient setup and improved treatment quality.

Precise, accurate and reproducible patient positioning is paramount to the success of radiation therapy treatments. Combined with on board imaging systems the patient positioning lasers provide an interface between the patient and the treatment delivery system. Room lasers are necessary tools for aligning the patient, daily reference isocenter adjustments, and assuring optimized isocenter accuracy for your linear accelerator.

LAP room lasers are equipped with extremely stable highly polished and extra flattened plane glass windows. They have a very low and constant dispersion to assure a fine and sharply edged laser line. The glass is anti-reflective to avoid interference from the beam.

LAP UltraLine® is the result of the advanced mechanical systems and the unique optoelectronics used to generate and align laser lines for medical applications.

Adjustments ASTOR red room lasers

- Rotate vertical and horizontal line
- Parallel line translation right/left and up/down
- Plane tilt horizontal and vertical (without cover removement)
- Focus vertical and horizontal line

ASTOR Green forms a cross by using one singular element: a prism, manufactured to split one beam into two perpendicular lines. This configuration allows LAP ASTOR GREEN room lasers to use one window only. As the beam forming takes place before the prism and its surface antireflection coating is selcted for the laser's wavelength, focussing of the crosshair has virtually no influence on rectangularity or brightness distribution – a real superprism. Due to the singular prism, focussing of both lines of the laser cross is handled by a single adjustment screw.

Adjustments ASTOR green roomlasers

- Rotation clockwise and counterclockwise
- Parallel line translation right/left and up/down
- Plane tilt horizontal and vertical(without cover removement)
- Focus crosshair

ASTOR lasers come standard with adjustable tilting brackets allowing for rotation up to 45°. Due to its very small size LAP lasers are ideal for mounting in small and hard to reach places.

Specifications

ASTOR Red
Line Width Up to 4 m Distance: <1mm
Line Length at 3 m / 10 ft Distance: 13.1 ft (4 m)
Laser Type: Diode
Wavelength: 635 nm
Output Power: <1mW
Supply Voltage: 100 - 240 VAC
Internal Voltage: 5 V DC
Power Consumption: 1 W
Operating Temperature: 0-40°C
Dimensions: 7.4" H x 3.4" W x 3.6" D (188 x 86 x 93 mm)
Weight: 3.3 lb (1.5 kg)
Isocenter Adjustment Accuracy at Isocenter: ± 0.5 mm

ASTOR Green
Line Width Up to 4 m Distance: <1mm
Line Length at 3 m / 10 ft Distance: 10 ft (3 m)
Laser Type: Diode Pumped Solid State
Wavelength: 532 nm
Output Power: <1mW
Supply Voltage: 100 - 240 VAC
Internal Voltage: 5 V DC
Power Consumption: 10 W
Operating Temperature: 15-30°C
Dimensions: 8.7" H x 4.3" W x 4.0" D (221 x 110 x 101 mm)
Weight: 5 lb (2.4 kg)
Isocenter Adjustment Accuracy at Isocenter: ± 0.5 mm

CE

The solid state diode Backpointer laser comes in either red or green. The small housing of the red diode Backpointer has been specially designed to replace the fiber optic head of the older generation.

Item	LAP Lasers
711-001	ASTOR Red - Crosshair
711-002	ASTOR Red - Line
711-010	ASTOR Green - Crosshair
711-012	ASTOR Green - Line
711-025	Backpointer Laser - Red
711-026	Backpointer Laser - Green

LAP APOLLO LASERS

Laser Systems for Patient Alignment

ASTOR room lasers are high precision tools for patient setup and improved treatment quality.

Precise, accurate and reproducible patient positioning is paramount to the success of radiation therapy treatments. Combined with on board imaging systems the patient positioning lasers provide an interface between the patient and the treatment delivery system. Room lasers are necessary tools for aligning the patient, daily reference isocenter adjustments, and assuring optimized isocenter accuracy for your linear accelerator. The LAP APOLLO lasers deliver the highest precision, accuracy and reproducibility: with their long lines and 6 degrees of remote controlled freedom they are ideally suited for today's advanced treatments.

Key points of APOLLO roomlasers

- Longer laser lines for improved patient positioning
- Clockwork precision motors and gears
- Full 6 degrees of freedom adjustment via wireless IR RC
- Compact design combined with the finest optoelectronics
- Superior aluminium construction, extruded and CAM machined

LAP roomlasers are equipped with extremely stable highly polished and extra flattened plane glass windows. They have a very low and constant dispersion to assure a fine and sharply edged laser line. The glass is anti-reflective to avoid interference from the beam.

LAP APOLLO avoids the pitfalls of two separate lines forming a cross by using one singular element: a prism, manufactured to split one beam into two perpendicular lines. This configuration allows LAP APOLLO room lasers to use one window only, making them the most compact systems. As the beam forming takes place before the prism, and its surface antirefl ection coating is selected for the laser's wavelength, focussing of the crosshair has virtually no influence on rectangularity or brightness distribution – a real superprism. Due to the singular prism, focussing of both lines of the laser cross is handled by a single adjustment drive.

During the installation of the treatment machine the APOLLO lasers are adjusted so that their respective laser lines precisely intersect the isocenter. If over time further adjustments are required to achieve accuracy and performance related to the true isocenter of the treatment machine, the APOLLO lasers offer an advanced remote controlled system that provides fast and simple adjustments from a convenient handheld remote control.

FULL FUNCTION REMOTE CONTROL

- Line rotation clockwise and counterclockwise
- Parallel line translation right/left and up/down
- Plane tilt horizontally and vertically
- Focus control

APOLLO lasers come standard with adjustable tilting brackets allowing for rotation up to 45°. Due to its very small size LAP lasers are ideal for mounting in small and hard to reach places.

Specifications

APOLLO Red
Line Width Up to 4 m Distance: <1mm
Line Length at 3 m / 10 ft Distance: 12 ft (4 m)
Laser Type: Laser Diode
Wavelength: 635 nm
Output Power: <1mW
Supply Voltage: 100 - 240 VAC
Internal Voltage: 5 V DC
Power Consumption: 1 W
Operating Temperature: 0-40°C
Dimensions: 8.7" H x 4.3" W x 4.1" D (221 x 110 x 104 mm)
Weight: 5.7 lb (2.6 kg)

ASTOR Green
Line Width Up to 4 m Distance: <1mm
Line Length at 3 m / 10 ft Distance: 10 ft (3 m)
Laser Type: Diode Pumped Solid State
Wavelength: 532 nm
Output Power: <1mW
Supply Voltage: 100 - 240 VAC
Internal Voltage: 5 V DC
Power Consumption: 10 W
Operating Temperature: 15-30°C
Dimensions: 8.7" H x 4.3" W x 4.1" D (221 x 110 x 104 mm)
Weight: 5.7 lb (2.6 kg)

CE

The solid state diode Backpointer laser comes in either red or green. The small housing of the red diode Backpointer has been specially designed to replace the fiber optic head of the older generation.

Item	LAP Lasers
711-015	APOLLO Red - Crosshair
711-017	APOLLO Red - Line
711-020	APOLLO Green - Crosshair
711-022	APOLLO Green - Line
711-025	Backpointer Laser - Red
711-026	Backpointer Laser - Green

LAP LASER APOLLOBLUE

Advanced Laser System for Patien Alignment

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APOLLOBLUE ROOM LASERS – HIGH PRECISION TOOLS FOR PATIENT SETUP AND IMPROVED TREATMENT QUALITY

Precise, accurate and reproducible patient positioning is paramount to the success of radiation therapy treatments. Combined with on board imaging systems the patient positioning lasers provide an interface between the patient and the treatment delivery system. Room lasers are necessary tools for aligning the patient, daily reference isocenter adjustments, and assuring optimized isocenter accuracy for your linear accelerator. The LAP APOLLOblue lasers deliver the highest precision, accuracy and reproducibility: with their long lines and 6 degrees of remote controlled freedom they are ideally suited for today's advanced treatments.

Key points blue vision laser:

- **Clearest lines**
- **Finest lines**
- **Human skin reflects blue light better**

WHY BLUE LASERS?

The human retina contains approximatively 120 millions rods and only 6 millions cone receptors, which, when stimulated by light, send signals to the brain. These signals are subsequently interpreted as vision. Rods and cones are not equally sensitive to visible wavelengths of light. Unlike the cones, rods are more sensitive to blue light and are not sensitive to wavelengths greater than 640 nm, the red fraction of the visible spectrum. If the human eye is exposed to less light than normal, the reception changes from photopic to scotopic sight. This increases the sensitivity of the human eye to blue light by a factor of 10 or more, whereas sensitivity for green increases only by a factor of 2 or less and for red it is reduced to less of even more.

The best working environment for blue lasers is a dimmed room. This is the case in a CT or linac room.

Because of the shorter wavelength, blue laser light penetrates organic materials and skin less than red or green laser light. Scattering and diffuse reflections such as interactions with oxygenated blood are reduced. The longer wavelength of red and green lasers, leads correspondingly, to an increase in the penetration depth.

LINE QUALITY MAKING THE DIFFERENCE

When using a treatment or imaging system the isocenter must be precisely verified. The LAP APOLLOblue positioning lasers project ultra-fine laser lines denoting the isocenter of these systems so that the patient can be quickly and accurately placed on the treatment couch in a reproducible position. LAP APOLLOblue lasers set the highest standard when it comes to line quality, stability, reliability and ease of use.

EASE OF ADJUSTMENT

During the installation of the treatment machine the APOLLOblue lasers are adjusted so that their respective laser lines precisely intersect the isocenter. If over time further adjustments are required to achieve accuracy and performance related to the true isocenter of the treatment machine, the APOLLOblue lasers offer an advanced remote controlled system that provides fast and simple adjustments from a convenient handheld remote control.

Specifications

Line width (up to 4 m distance): < 0.5 mm (FWHM)
Line length (at 3 m distance): 3 m
Laser type: Diode
Wavelength: 450 nm
Output power: < 1 mW
Laser class: 2
Supply voltage: 100 - 240 VAC
Internal Voltage: 24 VDC
Power consumption: 1 W
Operating Temperatur: 15-30°C
Dimensions: 8.7" H x 4.3" W x 3.9" D **(**221x110x100 mm)
Weight: 6 lb (2.6 kg)

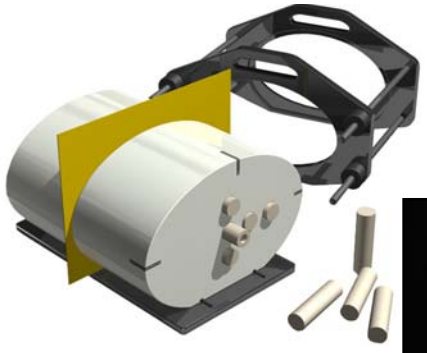
Item	Description
711-027	LAP Laser APOLLOBLUE - Crosshair
711-028	LAP Laser APOLLOBLUE - Line

CIRS IMRT PHANTOMS

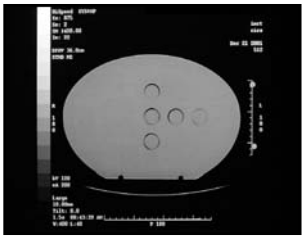
The CIRS IMRT Phantoms for Film and Ion Chamber Dosimetry are designed to address the complex issues surrounding commissioning and comparison of treatment planning systems while providing a simple yet reliable method for verification of individual patient plans and delivery.

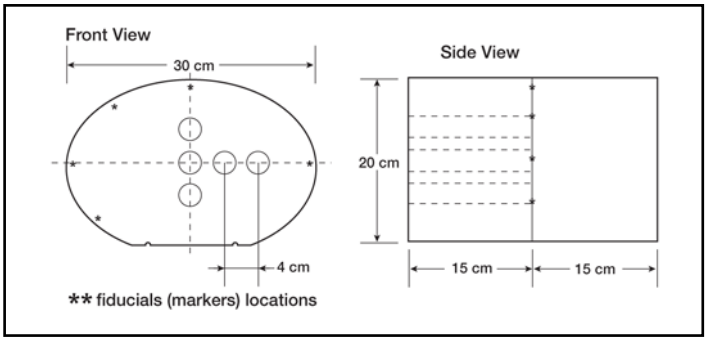
CIRS IMRT phantoms are manufactured from tissue equivalent materials that mimic within 1% from 50 keV to 15 MeV for accurate simulation from CT planning to treatment delivery. The interchangeable rod design allows the phantom to accommodate a multitude of dose measurement devices such as ion chambers, TLD, diodes and MOSFET's in the same location within the phantom.* Phantom cross sections accommodate GafChromic® or standard ready-pack films.

CIRS IMRT HOMOGENEOUS PHANTOM



Shown with Lung Equivalent Rod and Ion Cavity





- **Check 2D dose distributions (3D distributions optional)**
- **Point dose measurements in multiple planes**
- **Calibrate film with ion chamber**

The IMRT Homogenous Phantom is homogeneous and elliptical in shape. It properly represents human anatomy in size and proportion. It measures 30cm long x 30cm wide x 20cm thick (PA).

Water equivalent interchangeable rod inserts accommodate ionization chambers allowing for point dose measurements in multiple planes within the phantom.* The phantom also supports radiographic or GafChromic® film at mid-plane in the phantom for analysis of dose distributions[1]. Additional inserts are available to support a variety of other detectors including TLD's, MOSFET, and diodes.

Handling, assembly and proper orientation of the phantom is made easy with the use of a unique alignment base and holding device. The surfaces of the phantom are etched for ease of laser alignment, and CT markers ensure accurate film to plan registration.**

[1]The CIRS line of IMRT phantoms is compatible with the RIT 113 software for film to plan analysis. GafChromic® is a registered trademark of International Specialty Products, Wayne, NJ.

Item 682-500 Includes the following

(2) Tissue equivalent sections, one drilled to accommodate solid rod inserts
(1) Set of CT to film fiducial markers
(5) Water equivalent solid rod inserts
(1) Alignment base
(1) Holding Device

Insert Options

*Customers are encouraged to complete their order with the purchase of the 682-533 Water Equivalent Rod Insert with Ion Chamber Cavity. Customer must specify ion chamber and cavity code. Refer to the separate ion chamber and cavity codes chart (see Appendix A).

Specifications

Overall Size: 17" W x 15" L x 10" T (43.2 x 38.1 x 25.4 cm)
Weight: 46 lb (17.2 kg)
Phantom Body Material: Tissue Equivalent Epoxy Materials
Insert Material: CIRS Tissue Equivalent Materials (epoxy resin based)

References

Gershkevitsh, Eduard, et al., Dosimetric Verification of Radiotherapy Treatment Planning Systems: Results of IAEA Pilot Study. 2008 Elsevier Ireland Ltd., Radiotherapy and Oncology 89 (2009) 338-346, pgs. 338-346, March 2009.

Zhao, Y. et al., Monte Carlo evaluation of a treatment planning system for helical tomotherapy in an anthropomorphic hetergeneous phantom and for clinical treatment plans. Med. Phys., vol. 35 (12), pgs. 5366-5374, December 2008.

Luo, W., et al., Analysis of image quality for real-time target tracking using simultaneous kV-MV imaging. Med. Phys., vol. 35 (12), pgs. 5501-5509, December 2008.

Brunckhorst E., et al., Commissioning of Radiotherapy Treatment Planning Systems:Testing for Typical External Beam Treatment Techniques. IAEA, International Atomic Energy Agency, IAEA-TECDOC-1583, pgs. 1-67, January 2008.

Altman, M., et al., A Novel Phantom for use in 3-dimensional In Vitro Cell Experiments. Med. Phys., vol. 33 (6), pgs. 2058-2059, Poster # SU-FF-T-40, June 2006.

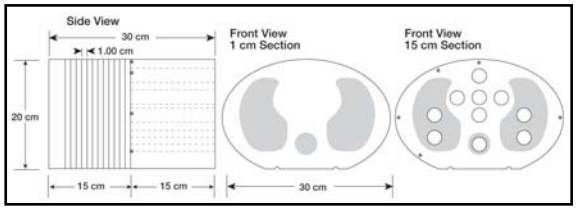
Item #	Description
682-500	IMRT Homogeneous Phantom
682-533	Water Equiv Rod Insert with Chamber Cavity Specify Chamber and Cavity Code

Ion chamber and cavity codes can be found in Appendix A

Item #	Optional Accessories
682-525	Water Tissue Equivalent Rods for TLD's, Set of 5
682-526	Single Breast Attachment
682-527	Film Stack for Small Volume 3D Image Reconstruction
682-528	Gel Dosimetry Cassette
682-529	Thorax Region Section Accommodates 682-527 or 682-528
682-530	Homogeneous Section Accommodates 682-527 or 682-528
682-532	Set of CT to Film Fiducial Markers
682-534	Bone Equivalent Rod Insert with Ion Chamber Cavity Specify Chamber and Cavity Code
682-535	Lung Equivalent Rod Insert with Ion Chamber Cavity Specify Chamber and Cavity Code
682-537	Electron Density Ref Plugs Set of 4: lung, bone, muscle, adipose
682-539	Water Equivalent Spacer Slab (1 cm)
682-545	Case for IMRT Phantoms and Cavity Slab
682-546	Case for IMRT Phantoms

Ion chamber and cavity codes can be found in Appendix A

CIRS IMRT THORAX PHANTOM



- **Verify heterogeneity corrections**
- **Correlate CTU to electron density**
- **Check dose distributions in sensitive areas**
- **Check depth doses and absolute dose**
- **2D and 3D isodoses**
- **Calibrate film with an ion chamber and other detectors***
- **Verify individual patient treatment plans**

The IMRT Thorax Phantom is elliptical in shape and properly represents an average human torso in proportion, density, and two-dimensional structure. It measures 30 cm Long x 30 cm Wide x 20 cm Thick.

Tissue equivalent interchangeable rod inserts accommodate ionization chambers allowing for point dose measurements in multiple planes within the phantom. Hole placement allows verification in the most critical areas of the chest. One half of the phantom is divided into 12 sections, each 1 cm thick, to support radiographic or GafChromic® Film[1]. Additional inserts are available to support a variety of other dedectors including TLD's, MOSFET and diodes

Handling, assembly and proper orientation of the phantom is made easy with the use of a unique alignment base and holding device. The surfaces of the phantom are marked for ease of laser alignment. CT markers are included to ensure accurate film to plan registration on the center film.

682-510 IMRT Thorax Phantom Includes

(1) Thorax section drilled to accommodate rod inserts
(12) 1cm thorax sections
(1) 3cm end section
(5) Water equivalent solid rod inserts
(1) Bone equivalent solid rod insert
(4) Lung equivalent solid rod inserts
(1) Set of CT to film fiducial markers
(1) Alignment base
(1) Holding Device

Insert Options

*Customers are encouraged to complete their order with the purchase of at least one (1) of each insert option listed below. Customer must specify ion chamber and cavity code. Refer to the separate ion chamber and cavity codes chart (see Appendix A).

682-533 Water Equivalent Rod Insert with Ion Chamber Cavity
682-534 Bone Equivalent Rod Insert with Ion Chamber Cavity
682-535 Lung Equivalent Rod Insert with Ion Chamber Cavity

Specifications

Overall Dim: 17" x 15" x 9" (43.2 x 38.1 x 22.9 cm)
Weight: 30 lb (11.2 kg)
Phantom Body Material: Tissue Equivalent Epoxy Materials
Insert Material: CIRS Tissue Equivalent Materials (epoxy resin based)

References

Vatnitsky S. Commissioning of Radiotherapy Treatment Planning Systems: Testing for Typical External Beam Treatment Techniques. 1583rd ed. (Brunckhorst E, Gershkevitsh E, Ibbott G, et al., eds.). IAEA. 2008.

Gershkevitsh, Eduard, et al., Dosimetric Verification of Radiotherapy Treatment Planning Systems: Results of IAEA Pilot Study. 2008 Elsevier Ireland Ltd., Radiotherapy and Oncology 89 (2009) 338-346, pgs. 338-346, March 2009.

Zhao, Y. et al., Monte Carlo evaluation of a treatment planning system for helical tomotherapy in an anthropomorphic hetergeneous phantom and for clinical treatment plans. Med. Phys., vol. 35 (12), pgs. 5366-5374, December 2008.

Luo, W., et al., Analysis of image quality for real-time target tracking using simultaneous kV-MV imaging. Med. Phys., vol. 35 (12), pgs. 5501-5509, December 2008.

Brunckhorst E., et al., Commissioning of Radiotherapy Treatment Planning Systems: Testing for Typical External Beam Treatment Techniques. IAEA, International Atomic Energy Agency, IAEA-TECDOC-1583, pgs. 1-67, January 2008

.

Altman, M., et al., A Novel Phantom for use in 3-dimensional In Vitro Cell Experiments. Med. Phys., vol. 33 (6), pgs. 2058-2059, Poster # SU-FF-T-40, June 2006.

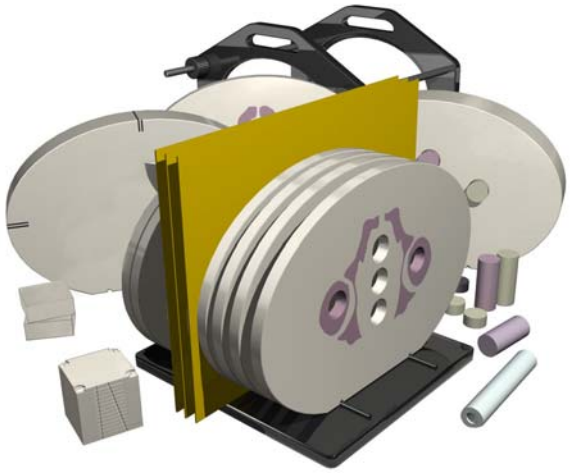
Item #	Description
682-510	IMRT Thorax Phantom
682-533	Water Equiv Rod Insert with Chamber Cavity Specify Chamber and Cavity Code
682-534	Bone Equivalent Insert with Ion Chamber Cavity Specify Chamber and Cavity Code
682-535	Lung Equivalent Insert with Ion Chamber Cavity Specify Chamber and Cavity Code

Ion chamber and cavity codes can be found in Appendix A

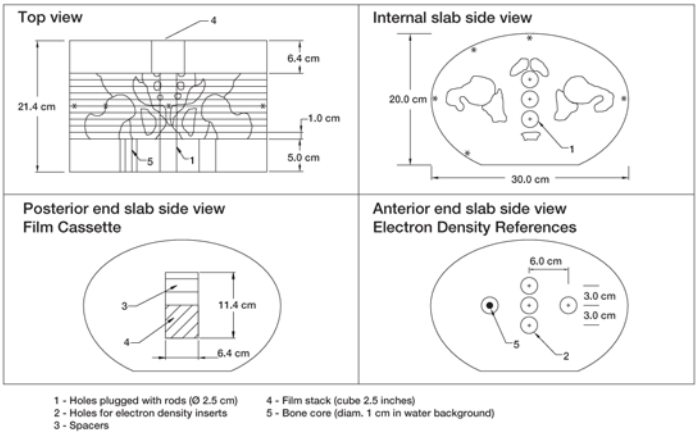
Item #	Optional Accessories
682-525	Water Equivalent Rods for TLD's, Set of 5
682-526	Single Breast Attachment
682-527	Film Stack for Small Volume 3D Image Reconstruction
682-528	Gel Dosimetry Cassette
682-529	Thorax Region Section Accommodates 682-527 or 682-528
682-530	Homogeneous Section Accommodates 682-527 or 682-528
682-532	Set of CT to Film Fiducial Markers
682-537	Electron Density Ref Plugs Set of 4: lung, bone, muscle, adipose
682-540	Thorax Region Spacer Slab (1 cm)
682-545	Case for IMRT Phantoms and Cavity Slab
682-546	Case for IMRT Phantoms

Ion chamber and cavity codes can be found in Appendix A

CIRS IMRT PELVIC 3D PHANTOM



Shown with Optional Accessories



1 - Holes plugged with rods (Ø 2.5 cm)
2 - Holes for electron density inserts
3 - Spacers
4 - Film stack (cube 2.5 inches)
5 - Bone core (diam. 1 cm in water background)

- **Verify heterogeneity corrections**
- **Correlate CTU to electron density**
- **Check dose distributions insensitive areas**
- **Check depth doses and absolute dose**
- **2D and 3D isodoses**
- **Calibrate film with an ion chamber**
- **Verify individual patient treatment plans**

The IMRT Pelvic 3D phantom properly represents human pelvic anatomy in shape, proportion and structure as well as density. This enables thorough analysis of both the imaging and dosimetry system.

The phantom is elliptical in shape, approximates the size of an average patient, and has a tissue equivalent, three dimensional skeleton. Tissue equivalent interchangeable rod inserts for ionization chambers allow for point dose measurements in multiple planes in the phantom and film calibration.* The phantom also supports film dosimetry with not only standard radiographic films but also GafChromic® media[1]. Additional inserts are available to support a variety of other detectors including TLD's, MOSFET, and diodes.

The IMRT Pelvic 3D Phantom includes four different Electron Density reference plugs which can be interchanged in five separate locations within the phantom. The surface of the phantom is etched with grooves to ensure proper orientation of the CT slices and accurate film to plan registration.

[1] The CIRS line of IMRT phantoms is compatible with the RIT 113 software for film to plan analysis. GafChromic® is a registered trademark of International Specialty Products, Wayne, NJ

Item 682-515 IMRT Pelvic 3D Phantom includes

(1) 5 cm tissue equivalent reference section for interchangeable electron density inserts
(10) 1 cm thick contiguous 3D pelvic sections each drilled to accommodate rod inserts
(1) Homogeneous section that accommodates 682-527 and 682-528 cassettes
(1) Film Stack for 3D reconstruction
(5) Water equivalent rod inserts (2.5 cm dia x 5 cm long)
(20) Bone equivalent solid disks (2.5 cm dia x 1 cm thick)
(30) Water equivalent solid disks (2.5 cm dia x 1 cm thick)
(1) Electron density reference plugs, (set of 4: lung, bone, muscle, adipose)
(1) Set of CT to film fiducial markers
(1) Alignment base
(1) Holding device

Insert Options

Customers are encouraged to complete their order with the purchase of at least one (1) of each insert option listed below. Customer must specify ion chamber and cavity code. Refer to the separate ion chamber and cavity codes chart (see Appendix A).

682-533 Water Equivalent Rod Insert with Ion Chamber Cavity
682-534 Bone Equivalent Rod Insert with Ion Chamber Cavity

Specifications

Overall Dim: 14" x 15" x 9" (35.6 x 38.1 x 22.9 cm)
Weight: 28 lb (10.5 kg)
Phantom Body Material: Tissue Equivalent Epoxy Materials
Insert Material: CIRS Tissue Equivalent Materials (epoxy resin based)

References

Gershkevitsh, Eduard, et al., Dosimetric Verification of Radiotherapy Treatment Planning Systems: Results of IAEA Pilot Study. 2008 Elsevier Ireland Ltd., Radiotherapy and Oncology 89 (2009) 338-346, pgs. 338-346, March 2009.

Zhao, Y. et al., Monte Carlo evaluation of a treatment planning system for helical tomotherapy in an anthropomorphic hetergeneous phantom and for clinical treatment plans. Med. Phys., vol. 35 (12), pgs. 5366-5374, December 2008.

Luo, W., et al., Analysis of image quality for real-time target tracking using simultaneous kV-MV imaging. Med. Phys., vol. 35 (12), pgs. 5501-5509, December 2008.

Bruncкhorst E., et al., Commissioning of Radiotherapy Treatment Planning Systems: Testing for Typical External Beam Treatment Techniques. IAEA, International Atomic Energy Agency, IAEA-TECDOC-1583, pgs. 1-67, January 2008.

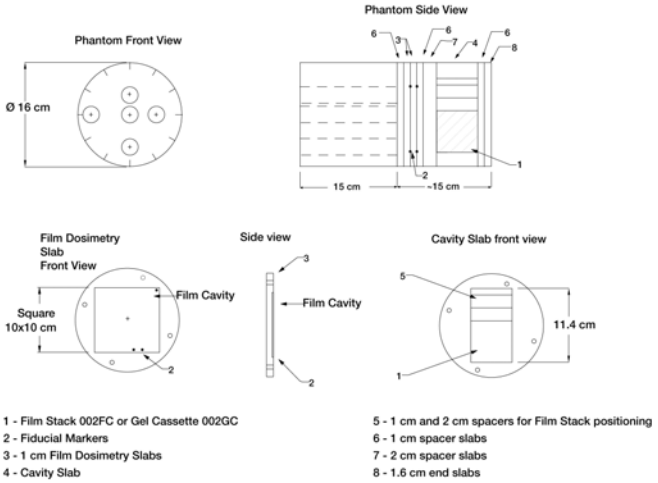
Altman, M., et al., A Novel Phantom for use in 3-dimensional In Vitro Cell Experiments. Med. Phys., vol. 33 (6), pgs. 2058-2059, Poster # SU-FF-T-40, June 2006.

Item #	Description
682-515	IMRT Pelvic 3D Phantom
682-533	Water Equiv Rod Insert with Chamber Cavity Specify Chamber and Cavity Code
682-534	Bone Equivalent Insert with Ion Chamber Cavity Specify Chamber and Cavity Code
682-531	Pelvic Region Slab Accommodates 682-527 or 682-528
682-545	Case for IMRT Phantoms and Cavity Slab
682-546	Case for IMRT Phantoms

Ion chamber and cavity codes can be found in Appendix A

CIRS IMRT HEAD AND NECK PHANTOM

Shown with Water Equivalent Rod Insert with Ion Chamber Cavity (Item 682-533)



- **Verify heterogeneity corrections**
- **Correlate CTU to electron density**
- **Check dose distributions in sensitive areas**
- **Check depth doses and absolute dose**
- **2D and 3D isodoses**
- **Calibrate film with an ion chamber**
- **Verify individual patient treatment plans**

The IMRT Head and Neck Phantom is circular in shape and approximates the size of an average patient. Tissue equivalent interchangeable rod inserts for ionization chambers allow for point dose measurements in multiple planes in the phantom, film calibration and isodose normalization.* The phantom also supports film dosimetry with not only standard radiographic films but also GafChromic® media[1]. Additional inserts are available to support a variety of other detectors including TLD's, MOSFET and diodes.

The IMRT Head and Neck Phantom accommodates one Ready Pack™ 10" x 12" film in transverse orientation, two radiochromic or radiographic 10 x 10 cm films in transverse orientation and a stack of thirteen radiochromic films precut to 63.5 x 63.5 mm in three different orientations.

The IMRT Head and Neck Phantom has an optional four Electron Density reference plugs which can be interchanged in five separate locations within the phantom. The surface of the phantom is etched with grooves to ensure proper orientation of the CT slices and accurate film to plan registration. An optional cranial bone ring is also available.

Item 682-520 IMRT Phantom Head and Neck Includes

(1) Water equivalent homogeneous section drilled to accommodate rod inserts (15 cm)
(2) Film slabs, 1 cm, film cavity 10 x 10 cm with a set of CT to Film Fiducial Markers
(1) CT to film fiducial markers in film slabs
(1) Cavity slab, 6.34 cm, to accommodate Film Stack or Gel Cassette
(1) Film Stack for small volume 3D image reconstruction
(2) Spacer slabs, 1 cm
(2) Spacer slabs, 2 cm
(2) End slabs - 1 cm and ~1.6 cm
(5) Water equivalent solid rod inserts
(1) Bone equivalent solid rod insert
(1) Alignment base
(1) Holding device

Insert Options

Customers are encouraged to complete their order with the purchase of at least one (1) of each insert option listed below. Customer must specify ion chamber and cavity code. Refer to the separate ion chamber and cavity codes chart (see Appendix A).

682-533 Water Equivalent Rod Insert with Ion Chamber Cavity
682-534 Bone Equivalent Rod Insert with Ion Chamber Cavity

Specifications

Overall Dim: 17" x 13" x 8" (43.2 x 33 x 20.3 cm)
Weight: 28 lb (10.5 kg)
Phantom Body Material: Tissue Equivalent Epoxy Materials
Insert Material: CIRS Tissue Equivalent Materials (epoxy resin based)

References

Gershkevitsh, Eduard, et al., Dosimetric Verification of Radiotherapy Treatment Planning Systems: Results of IAEA Pilot Study. 2008 Elsevier Ireland Ltd., Radiotherapy and Oncology 89 (2009) 338-346, pgs. 338-346, March 2009.

Zhao, Y. et al., Monte Carlo evaluation of a treatment planning system for helical tomotherapy in an anthropomorphic hetergeneous phantom and for clinical treatment plans. Med. Phys., vol. 35 (12), pgs. 5366-5374, December 2008.

Luo, W., et al., Analysis of image quality for real-time target tracking using simultaneous kV-MV imaging. Med. Phys., vol. 35 (12), pgs. 5501-5509, December 2008.

Bruncкhorst E., et al., Commissioning of Radiotherapy Treatment Planning Systems: Testing for Typical External Beam Treatment Techniques. IAEA, International Atomic Energy Agency, IAEA-TECDOC-1583, pgs. 1-67, January 2008.

Altman, M., et al., A Novel Phantom for use in 3-dimensional In Vitro Cell Experiments. Med. Phys., vol. 33 (6), pgs. 2058-2059, Poster # SU-FF-T-40, June 2006.

Item #	Description
682-520	IMRT Phantom Head and Neck
682-533	Water Equiv Rod Insert with Chamber Cavity Specify Chamber and Cavity Code
682-534	Bone Equivalent Insert with Ion Chamber Cavity Specify Chamber and Cavity Code

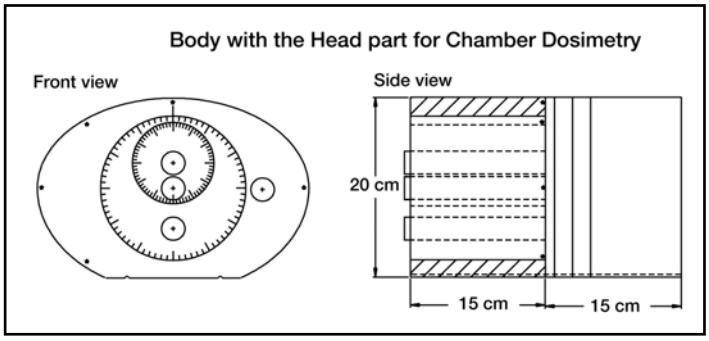
Ion chamber and cavity codes can be found in Appendix A

Item #	Optional Accessories
682-525	Water Equivalent Rods for TLD's, Set of 5
682-528	Gel Dosimetry Cassette
682-532	Set of CT to Film Fiducial Markers
682-537	Electron Density Ref Plugs Set of 4: lung, bone, muscle, adipose
682-547	Case for IMRT Head and Neck Phantom

Ion chamber and cavity codes can be found in Appendix A

CIRS IMRT HEAD AND TORSO FREEPOINT PHANTOM

Shown with Water Equivalent Rod Insert with Ion Chamber Cavity (Item 682-533)



- **Ionization chambers, TLD, MOSFET and Diodes easily positioned using interchangeable rods**
- **Choose any point dose location by rotating the cylinders**
- **Use radiographic film dosimetry Ready Pack® and/or Gafchromic® film**
- **Close placement of detectors to film improves film calibration**
- **CT - film markers ensure accurate film to plan registration**
- **Surfaces are etched with indices for precise alignment**
- **Configure with or without heterogeneities.**

The IMRT Head and Torso Freepoint Phantom was designed in collaboration with David D. Loshek PhD. With the Freepoint Phantom choose any point dose location within a circular area with diameter of 11.2 cm by simply adjusting the two rotating cylinders. Lung and bone equivalent rods can be positioned at any location within the circular area for assessment of heterogeneity correction. Remove the center cylinder from the phantom body to simulate head and neck set-ups.

Item 682-522 IMRT Head and Torso Freepoint Phantom Includes
(1) Water equivalent homogeneous torso section with cylindrical inserts (15 cm)
(2) Spacer slabs, 2 cm
(1) Spacer slab , 1 cm
(1) Spacer slab, 10 cm
(4) Water equivalent solid rod inserts
(1) Bone equivalent solid rod insert
(1) Set of CT film fiducial markers
(1) Alignment base
(1) Holding device

Insert Options
Customers are encouraged to complete their order with the purchase of at least one (1) of each insert option listed below. Customer must specify ion chamber and cavity code. Refer to the separate ion chamber and cavity codes chart (see Appendix A).

682-533 Water Equivalent Rod Insert with Ion Chamber Cavity
682-534 Bone Equivalent Rod Insert with Ion Chamber Cavity

Specifications

Overall Dim: 17" x 15.5" x 10" (43.2 x 39.4 x 25.4 cm)
Weight: 47 lb (17.5 kg)
Phantom Body Material: Tissue Equivalent Epoxy Materials
Insert Material: CIRS Tissue Equivalent Materials (epoxy resin based)

References
Gershkevitsh, Eduard, et al., Dosimetric Verification of Radiotherapy Treatment Planning Systems: Results of IAEA Pilot Study. 2008 Elsevier Ireland Ltd., Radiotherapy and Oncology 89 (2009) 338-346, pgs. 338-346, March 2009.

Zhao, Y. et al., Monte Carlo evaluation of a treatment planning system for helical tomotherapy in an anthropomorphic hetergeneous phantom and for clinical treatment plans. Med. Phys., vol. 35 (12), pgs. 5366-5374, December 2008.

Luo, W., et al., Analysis of image quality for real-time target tracking using simultaneous kV-MV imaging. Med. Phys., vol. 35 (12), pgs. 5501-5509, December 2008.

Brunckhorst E., et al., Commissioning of Radiotherapy Treatment Planning Systems: Testing for Typical External Beam Treatment Techniques. IAEA, International Atomic Energy Agency, IAEA-TECDOC-1583, pgs. 1-67, January 2008.

Altman, M., et al., A Novel Phantom for use in 3-dimensional In Vitro Cell Experiments. Med. Phys., vol. 33 (6), pgs. 2058-2059, Poster # SU-FF-T-40, June 2006.

Item #	Description
682-522	IMRT Head and Torso Freepoint Phantom
682-533	Water Equiv Rod Insert with Chamber Cavity Specify Chamber and Cavity Code
682-534	Bone Equivalent Insert with Ion Chamber Cavity Specify Chamber and Cavity Code

Ion chamber and cavity codes can be found in Appendix A

Item #	Optional Accessories
682-525	Water Equivalent Rods for TLD's, Set of 5
682-526	Single Breast Attachment
682-527	Film Stack for Small Volume 3D Image Reconstruction
682-528	Gel Dosimetry Cassette
682-529	Thorax Region Section Accommodates 682-527 or 682-528
682-530	Homogeneous Section Accommodates 682-527 or 682-528
682-532	Set of CT to Film Fiducial Markers
682-535	Lung Equivalent Rod Insert with Ion Chamber Cavity Specify Chamber and Cavity Code
682-537	Electron Density Ref Plugs Set of 4: lung, bone, muscle, adipose
682-538	Lung Equivalent Solid Rod Insert
682-545	Case for IMRT Phantoms and Cavity Slab
682-546	Case for IMRT Phantoms

Ion chamber and cavity codes can be found in Appendix A

CIRS IMRT PHANTOM ACCESSORIES

For Homogenous, Thorax, Pelvis and Head and Neck

Item 682-525 Short tissue equivalent rods for TLD (set of five).Each rod is 50 mm long by 25.4 mm (1") Outside Diameter and allows the placement of TLDs in the same position as an ion chamber in a multitude of locations along the z-axis. Inside hole Ø 5 mm with water-equivalent plugs 25 mm long. Rods are also available in other tissues and length.

Item 682-526 Single breast attachment 350 cc, 50/50 glandular/adipose ratio with TLD holes Ø5 mm, 20 x 20 mm grid spacing with tissue equivalent plugs.

C

Item 682-527 Film stack 2.5" x 2.5" x 2.5" (63.5 x 63.5 x 63.5 mm) for 3D image reconstruction using 13 layers of X-Ray or Gafchromic® film with 4 mm thick tissue equivalent spacers in between each film.

Item 682-528 Gel dosimetry cassette has the same outside cubic dimensions as the 682-527 film cassette. It receives a disposable Barrex™ cylinder (max Ø 50 mm, height 63.5 mm) that can be filled with BANG™ or other dosimetry gel.

Item 682-529 Thorax Region Section - Accommodates 682-527 or 682-528 cassettes. Thickness of sections 2.5" (63.5 mm). Cavity and three water-equivalent spacers are included to allow use of cassette in six different positions inside the phantom. Spacer's thickness is 20, 20 and 10 mm. Extra solid blocks to replace the cassette are included.

Item 682-530 Homogeneous Section - Accommodates 682-527 or 682-528 cassettes. Thickness of sections 2.5" (63.5 mm). Cavity and three water-equivalent spacers are included to allow use of cassette in six different positions inside the phantom. Spacer's thickness is 20, 20 and 10 mm. Extra solid blocks to replace the cassette are included.

Item 682-531 Pelvic Region Slab - Accomodates 682-527 and 528 cassettes.

Item 682-532 Set of CT to film fiducial markers from stainless steel are visible during the CT simulation. They also imprint small but clearly visible indentations on the film. Five fiducials at each phantom to film interface allow for very precise film to plan registration.

Item 682-533 Water equivalent insert with ion chamber cavity **(Specify ion chamber and cavity code, see Apppendix A)**.

Item 682-534 Bone equivalent rod with ion chamber cavity **(Specify ion chamber and cavity code, see Apppendix A)**.

Item 682-535 Lung equivalent insert with ion chamber cavity **(Specify ion chamber and cavity code, see Apppendix A)**.

Item 682-537 Electron density reference plugs (set of 4: lung, bone, muscle and adipose)

ELECTRON DENSITY REFERENCE INSERT			
	Density	**Electron Density per cc x 10^23**	**Electron Density Relative to H_2O**
Lung	0.21	0.69	0.207
Bone	1.60	5.03	1.506
Muscle	1.06	3.48	1.042
Adipose	0.96	3.17	0.949

Item 682-538 Lung equivalent solid rod insert

Item 682-539 Water Equivalent Spacer Slab for 682-500

Item 682-540 Thorax Region Spacer Slab for 682-515

Item 682-545 Case for IMRT Phantoms when ordered with corresponding Cavity Slab: 682-500, 682-510, 682-515 and 682-522 .

Item 682-546 Case for IMRT Phantoms 682-500, 682-510, 682-515 and 682-522.

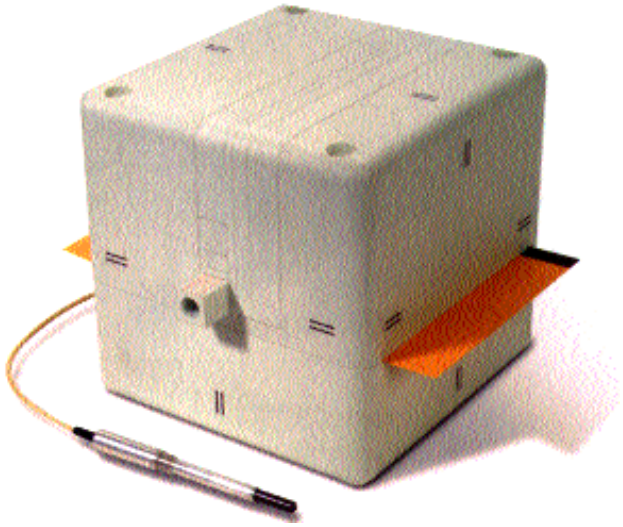
Item 682-547 Case for IMRT Head and Neck Phantom, Item 682-520.

Item #	Optional Accessories
682-525	Water Equivalent Rods for TLD's, Set of 5
682-526	Single Breast Attachment
682-527	Film Stack for Small Volume 3D Image Reconstruction
682-528	Gel Dosimetry Cassette
682-529	Thorax Region Section Accommodates 682-527 or 682-528
682-530	Homogeneous Section Accommodates 682-527 or 682-528
682-531	Pelvic Region Slab Accommodates 682-527 or 682-528
682-532	Set of CT to Film Fiducial Markers
682-533	Water Equiv Rod Insert with Chamber Cavity Specify Chamber and Cavity Code
682-534	Bone Equivalent Rod Insert with Ion Chamber Cavity Specify Chamber and Cavity Code
682-535	Lung Equivalent Rod Insert with Ion Chamber Cavity Specify Chamber and Cavity Code
682-537	Electron Density Ref Plugs Set of 4: lung, bone, muscle, adipose
682-538	Lung Equivalent Solid Rod Insert
682-539	Water Equivalent Spacer Slab (1 cm)
682-540	Thorax Region Spacer Slab (1 cm)
682-545	Case for IMRT Phantoms and Cavity Slab
682-546	Case for IMRT Phantoms
682-547	Case for IMRT Head and Neck Phantom

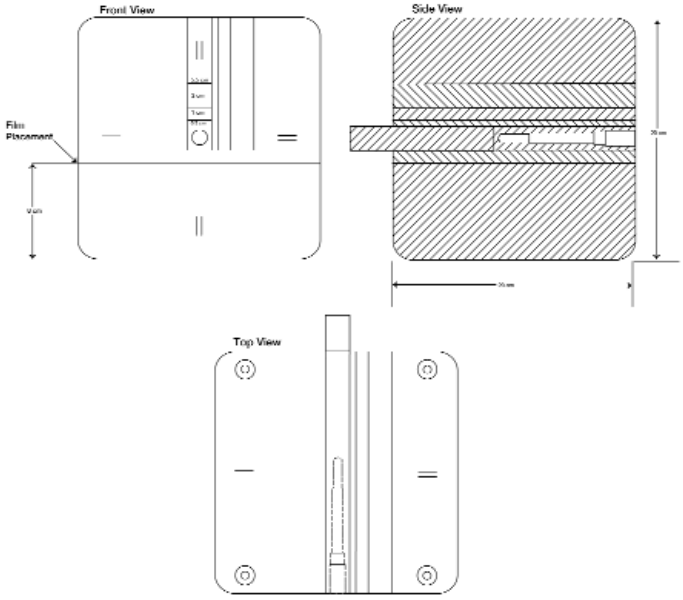
Ion chamber and cavity codes can be found in Appendix A

CUBE 20 PHANTOM

The most convenient device for routine QA and IMRT applications



682-400 Shown with Optional Water Equivalent Cavity Block



- **Routine patient QA**
- **Beam constancy checks**
- **MLC QA**
- **User friendly set-up and positioning**
- **Suitable for head/neck and torso treatments**
- **Mimics water within 1%**

The Cube 20 Phantom was designed for routine QA in RT and IMRT applications where ease of use and quick set-up are important. The Cube 20 phantom is manufactured from Plastic Water® DT which faithfully mimics the linear attenuations of water within 1% from 50 keV to 25 MeV. This enables complete QA from CT image acquisitions to therapy dose verifications. The 20 cm cubic dimension was chosen as a suitable approximation for both head/neck and torso treatments. All the edges are rounded to avoid CT artifacts.

Chamber, diode or MOSFET detectors are easily positioned at isocenter of the cube and laser alignment marks on all sides facilitate precise positioning of the phantom. Detector position can be adjusted in 1 mm increments longitudinally and 5 mm increments for lateral and elevational adjustments.

Ready-Pac film can be inserted in the cube. By rotating the cube, the film is easily set in sagittal, coronal or transverse orientations. Stainless steel fiducials are clearly resolvable on CT images and leave small indentations on the film for precise film to plan registration.

Item 682-400 Cube 20 Phantom Includes

1 - Cube 20 Phantom
3 - Lateral Spacers - 0.5 cm, 1.0 cm and 2.0 cm
3 - Elevational Spacers - 0.5 cm, 1.0 cm and 2.0 cm

Insert Option

Customers are encouraged to complete their order with the purchase of the insert option listed below. Refer to the separate ion chamber and cavity codes chart (see Appendix A).

682-402 Water Equivalent Ion Chamber Cavity Block

Specifications

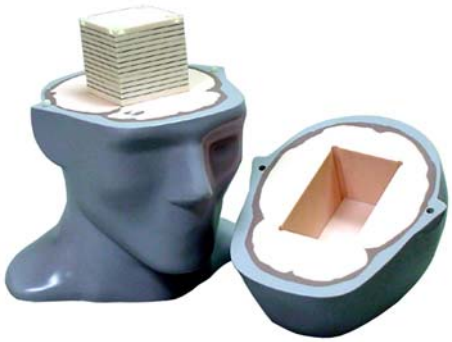
Size: 8" x 8" x 8" (20.3 x 20.3 x 20.3 cm)

Item	Description
682-400	Cube 20 Phantom
682-402	Cube 20, Water Equivalent Ion Chamber Cavity Block Specify Chamber and Cavity Code

Ion chamber and cavity codes can be found in Appendix A

RADIOSURGERY HEAD PHANTOM

For Evaluation of Treatment Accuracy



- **Verification of intracranial dose distribution**
- **3D isodose verification**
- **Commissioning and comparison of Treatment Planning Systems**
- **Verification of individual patient treatment plan**
- **Teaching tool for Gamma Knife and Radiosurgery**

The Radiosurgery Head Phantom was designed to improve the accuracy of treatment plan verification in radiosurgery. It allows for 3D dose verification in a large cranial volume.

The Phantom contains average brain, bone spinal cord, vertebral disks and soft tissues. Linear attenuations of the tissues are within 1% of actual attenuations from 50 keV - 25 MeV.

The 2.5" x 2.5" x 2.5" (6.4 x 6.4 x 6.4 cm) Film Cassette contains 13 levels of X-Ray or Gafchromic® Film to increase accuracy of 3D dose distribution. It can be interchanged with an equivalent Gel Dosimetry Cassette or TLD holder. Two brain-equivalent spacers allow the user to locate the cassette in one of four different positions without breaking the consistency of the intracranial anatomy.

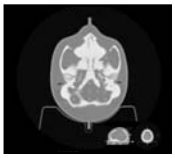
Item	Description
682-800	Radiosurgery Head Phantom

MRI DISTORTION PHANTOM FOR SRS

For Assessment of Image Distortion in Treatment Planning Systems

CT

MRI



CT Showing Ear Canals

- **Provides a realistic anthropomorphic scenario for CT and MR imaging**
- **Unique inter-cranial 3D grid design allows assessment of spatial distortion**
- **Special pads enable use with all fixation frames**
- **CT/MR markers facilitate positioning and image regisration**

CIRS Model 603A was designed for assessment of MR image distortion in Stereotactic Radiosurgery Planning. It is also a useful tool for verifying image fusion and deformable image registration algorithms used in various treatment planning systems. The tissue equivalent, anthropomorphic design provides the closest conditions to a clinical imaging scenario. The phantom can be imaged using X-ray, Computed Tomography and Magnetic Resonance Imaging. It images well with all MRI sequences tested to date, including T1 weighted, T2 weighted, 3D Time of Flight, MPRAGE and CISS sequences.

The skull is manufactured from a plastic-based tissue substitute, and the interstitial and surrounding soft tissues are made from a proprietary signal generating water-based polymer. The entire phantom is encased in a clear plastic shell to protect gel from desiccation. The phantom is supplied with specially designed pads that allow fixation with any stereotactic frame or mounting for end-to-end testing. The phantom is also suitable for frameless SRS QA.

The entire inter-cranial portion of the skull volume is filled with an orthogonal 3D grid of 3 mm diameter rods spaced 15 mm apart. Five extended axis-rods intersect at the reference origin of the grid. The end of each extended axis is fitted with CT/MR markers allowing for accurate positioning with lasers and co-registration of CT and MR image sets.

The phantom includes right and left air voids, 3 mm in diameter by 17 mm long to simulate each ear canal for evaluation of potential distortions commonly found in clinical settings.

682-825 Includes

(1) 3D Anthropomorphic Skull Phantom
(1) ABS Cradle
(5) Stereotactic Frame Pads
(1) Custom Carry Case
(1) User Guide
(1) 48-Month Warranty

Specifications

Overall Dimensions: 32 cm x 24 cm x 18 cm
Weight: 12 lbs (5.5 kg)
Materials
Skull: Plastic-based bone substitute
Interstitial/Soft Tissues: Water-base polymer
Grid: Reinforced nylon

Item	Description
682-825	MRI Distortion Phantom for SRS

COUCH TABLE PADS

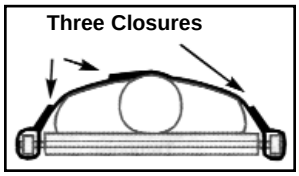
Polyfoam: High density foam that is supportive and comfortable for use in short duration procedures.
Density: 0.0288 gm/cm^3

Color: Blue
Covering: Non-slip, long wearing nylon - water resistant seams.

Item #	Treatment Table Pad	Size
192-219	Polyfoam	19" x 72" x 1"
192-224	Polyfoam	24" x 72" x 1"

Custom Sizes are Available

UNIVERSAL STRAPS



The two piece side rail Universal Straps are strong, durable and flexible. The end of each strap loops around the side rails and fastens to itself with a powerful new Velcro® hook. The two free ends are then overlapped onto one another to complete the strap. The Universal Straps will fit tables 18 - 30" wide.

Item #	Description	Width	Length
253-202	Universal Straps	2"	40"
253-204	Universal Straps	4"	40"

D

SMOOTH MOVER™ PATIENT MOVER

268-030

268-000

The Smooth-Mover™ Patient Mover is an economical ultra smooth patented board which is capable of safely moving even extremely large patients with minimal staffing requirements. It is radio-translucent and can be left in place during x-ray procedures. It is lightweight, yet durable. Perfect for daily patient moving needs.

Specifications

Dimensions: 3/16" x 22" x 72" (0.5 x 56 x 183 cm)
Weight: 9 lb (4.1 kg)
Color: Royal Blue

Item #	Description
268-000	Smooth Mover™ Patient Mover
268-030	Wall Hanger for Smooth-Mover™ Patient Mover

I.V. POLE

Attaches To The Treatment Couch Rails

The I.V. Pole has an adjustable locking ring to prevent the post from dropping if the rail holder loosens. Rail block must be ordered separately.

Specifications

Material: Stainless Steel
Length: 48"
Hooks: 2 ram horn type hooks
Mount: Rail accessory or RPD accessory rail blocks

Item #	Description
255-302	I.V. Pole, Varian, Post Size: 3/4" Dia. x 48" L
255-303	I.V. Pole, Siemens, Post Size: 5/8" Dia. x 48" L
255-290	Rail Block, Varian, Rail Size: 0.375" x 1 1/8"
255-291	Rail Block, Siemens, Rail Size: 0.375" x 1"
255-292	Rail Block, Philips, State Rail Size
255-293	Rail Block, Oldelft, State Rail Size
255-294	Rail Block, Theratron-Equinox 0.250" x 1"

Other Manufacturers Available

ADJUSTABLE KNEE CRUTCHES

Attach To The Treatment Couch Rails

255-201

255-290

The heavy duty steel post provides sturdiness and has an adjustable locking ring to prevent the post from dropping if the rail holder loosens. Rail block must be ordered separately.

The aluminum Adjustable Knee Crutches are covered with 3/16" beige, vinyl material. The Knee Crutch rotates to ensure patient comfort and a locking handle then secures the crutch in place.

Item #	Description
255-201	Knee Crutches, Varian, Post Size: 3/4" Dia.
255-220	Knee Crutches, Siemens, Post Size: 5/8" Dia.
255-290	Rail Block, Varian, Rail Size: 0.375" x 1 1/8"
255-291	Rail Block, Siemens, Rail Size: 0.375" x 1"
255-292	Rail Block, Philips, State Rail Size
255-293	Rail Block, Oldelft, State Rail Size
255-294	Rail Block, Theratron-Equinox 0.250" x 1"

Other Manufacturers Available - Sold in Pairs

D

ARM BOARD / COUCH WIDTH EXTENDER

For Attaching to Treatment Couch Rail

This clear lexan Arm Board (1/2" x 5" x 19") attaches to the treatment or simulator couch side rail and is used to support the arm or shoulder.

Item #	Description
255-002	Varian Spine Style Arm Board
255-003	Varian ETR Style Arm Board
255-008	Varian Ximatron Arm Board
255-020	Siemens Z-II Arm Board
255-022	Siemens Z-IV or Z-XT Arm Board
255-024	Siemens Mevasim "S" Arm Board
255-027	Siemens TEM Simulator Arm Board
255-030	Philips SL75 or SL25 Arm Board
255-060	Oldelft Simulator Arm Board

Other Manufacturers Available

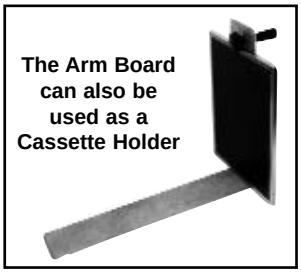
HAND GRIPS

Attach To Treatment Couch Rails

Item #	Description
255-101	Varian Hand Grips
255-120	Siemens Hand Grips
255-122	Siemens Mevasim "S" Hand Grips
255-130	Philips Hand Grips
255-160	Oldelft Hand Grips

Other Manufacturers Available

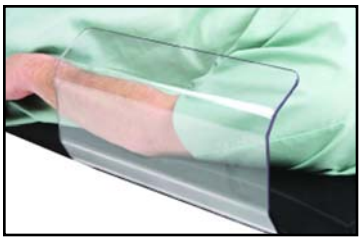
ALUMINUM ARM BOARD



The Aluminum Arm Board is constructed of 3/16" (0.48 cm) thick aluminum. The arm rest is 5 3/4" (14.66) wide. The horizontal portion is approximately 28" (71.37 cm) long and the vertical portion is approximately 19" (48.43 cm) high. The handle can be adjusted over a range of 9 1/4" (23.58 cm).

Item	Description
250-000	Aluminum Arm Board
252-020	Replacement Knob for Arm Board
252-030	Replacement Handle for Arm Board

TOBOGGAN ARM/LEG GUARDS



255-500

255-504

- **Keep arms/legs on the table**
- **Help prevent accidental dislodgment of IV and arterial lines**
- **Help shield ulnar nerve against excess pressure**

Toboggan Arm/Leg Guards are easy-to-clean radiolucent shields made of Vivak®, a crystal clear, extremely strong, and radiolucent material. Slide the toboggan under the pad and the patient's weight holds it in place. Top is curved on Items 255-500 through 255-503. Item 255-504 does not curve.

Small: Great for upper body procedures; use when a shorter height or length is required. Also offers a better fit for pediatric, adolescent, and small patients. Smaller size reduces interference with overhead cameras and other surgical equipment.
Medium (Standard): Fits most average size patients' extremities. Available individually or in pairs.
Large: Accomodates larger arms and legs
Extra Large: Is 24" (60.96 cm) long to provide extra support and protection

Item	Toboggan Arm/Leg Guards	Size
255-500	Small, Pair	10" L x 6" H x 10.25" D (25.4 x 15.24 x 26.03 cm)
255-501	Medium, Single	15.75" L x 8" H x 10.25" D (40 x 20.32 x 26.03 cm)
255-502	Medium, Pair	15.75" L x 8" H x 10.25" D (40 x 20.32 x 26.03 cm)
255-503	Large, Pair	15.75" L x 10.5" H x 10.25" D (40 x 26.7 x 26.03 cm)
255-504	Extra Large, Pair	24" L x 9.5" H x 10.25" D (60.96 x 24.13 x 26.03 cm)

D

NON-MAGNETIC SANDBAGS

Item	Description	Quantity
259-025	Sandbag, 7"x12" (17.8 x 30.5 cm)	5 lb (2.3 kg)
259-030	Sandbag, 7"x20" (17.8 x 50.8 cm)	10 lb (4.5 kg)
259-035	Sandbag, 11"x15" (27.9 x 38.1 cm)	15 lb (6.8 kg)
259-040	Sandbag, 8.5"x22" (21.6 x 55.9 cm)	20 lb (9.1 kg)

GRIP RINGS™

253-115 253-116 253-117 253-118

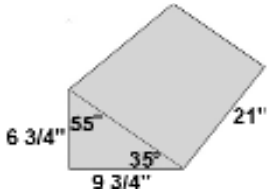
The circular design of Grip Rings™ allows pressure to be evenly distributed, preventing harsh marks on the skin. The attractive and smooth outer skin becomes an integral part of the cushion through a high strength bond to the foam core. Only high tech, non-absorbing, closed cell cushing mediums are encapsulated to ensure the highest measure of quality. The outer skin of tough vinyl is smooth and easy to wipe clean with most anti-bacterial solutions, and free of surface textures that trap and hold bacteria from soil and body fluids. If the outer skin is cut or torn the inner cushion will not “sponge-up” liquids/fluids as some products that utilize conventional upholstery materials.

Grip Rings™ are blue in color, have a wall thickness is 1" (2.54 cm) and are virtually tear resistant.

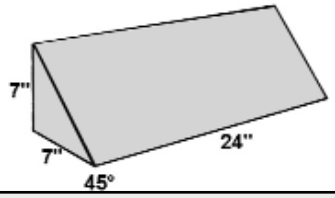
Item	Description
253-115	Grip Ring, 3" I.D.
253-116	Grip Ring, 4.25" I.D.
253-117	Grip Ring, 6" I.D.
253-118	Grip Ring, 10" I.D.
253-119	Grip Ring Set of 3, Includes 3", 4.25" and 6" I.D.
253-120	Grip Ring Set of 4, Includes 3", 4.25", 6" and 10" I.D.

FOAM POSITIONERS

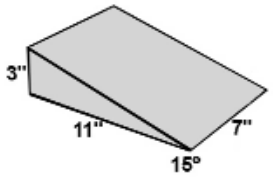
These foam positioners are made of a high density polyurethane foam covered in a durable, blue Sure-Check Microvent material. The fabric is whisper soft and comfortably quiet. It provides silent protection for both patient and pillow. It also contains thousands of microscopic air vents providing the ultimate in patient comfort. The fabric is fluid resistant and contains a unique antimicrobial system to protect the pillow fabric



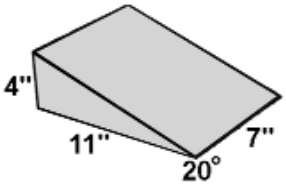
Item #	Description
258-100	Wedge 35/55° Angle



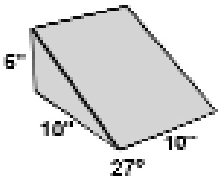
Item #	Description
258-102	Wedge 45° Angle



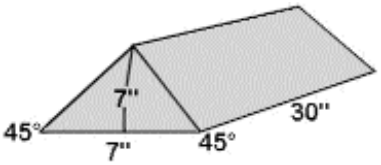
Item #	Description
258-104	Wedge 15° Angle



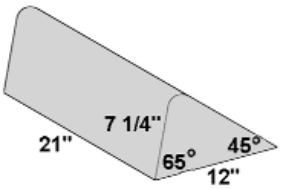
Item #	Description
258-106	Wedge 20° Angle



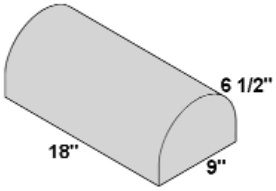
Item #	Description
258-108	Wedge 27° Angle



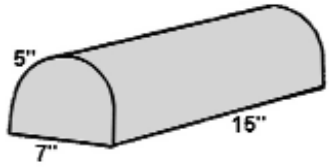
Item #	Description
258-110	Wedge 45° Angle



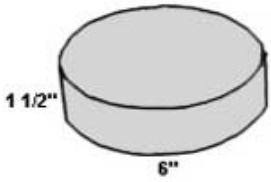
Item #	Description
258-112	Bolster 45/65° Angle



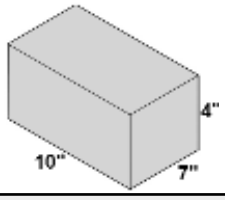
Item #	Description
258-114	Bolster



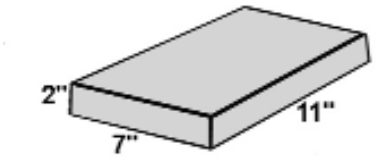
Item #	Description
258-116	Knee Bolster



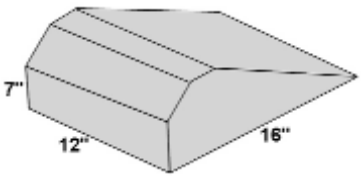
Item #	Description
258-118	Circle



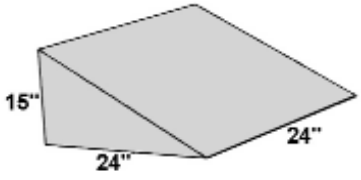
Item #	Description
258-122	Rectangle 10” x 7” x 2”
258-124	Rectangle 10” x 7” x 3”
258-126	Rectangle 10” x 7” x 4”



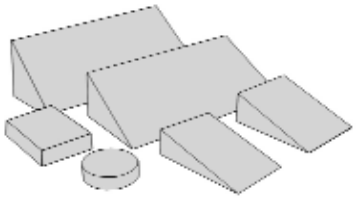
Item #	Description
258-120	Rectangle



Item #	Description
258-128	Torso Block



Item #	Description
258-130	Chest/Leg Elevator

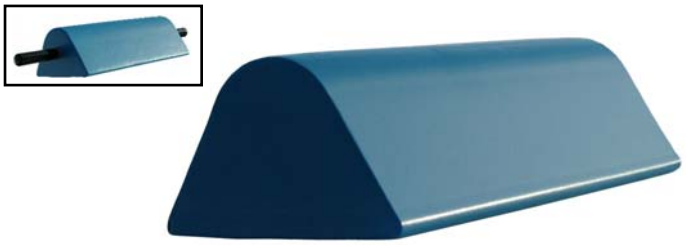


Item #	Description
258-135	Standard 6 Piece Set

Item 258-135- 6 piece set includes:

258-104 (15° Angle)	258-100 (35°/55° Angle)
258-106 (20° Angle)	285-102 (45° Angle)
258-118 (Circle)	258-120 (Rectangle)

COVERED FOAM WEDGE



Cover: Blue, anti-skid coating
Size: 7 5/8" W x 17 3/4" L x 4 7/8" H (19.4 x 45.1 x 12.4 cm)

Item	Description
258-950	Blue Coated Foam Triangular Wedge
258-951	Blue Coated Foam Triangular Wedge w/Handle

LEG REST WITH KNEE CUT-OUTS

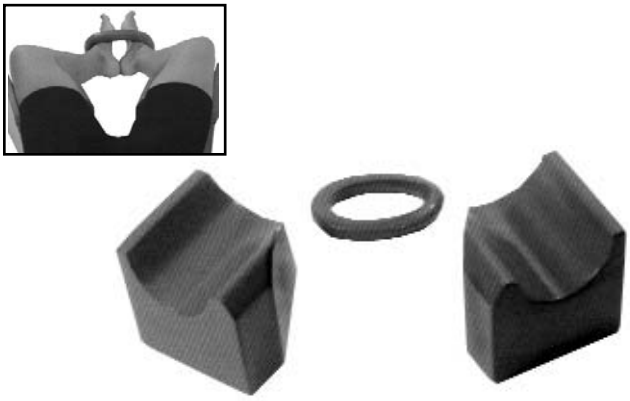
- Provides leg/knee support while maintaining hip flexion
- Relieves lower back stress and pain
- Stain-resistant coating is easily cleaned
- Knee cut-outs are 6" W x 2" D (15.24 x 5.08 cm) on all sides

Specifications

Color: White

Item #	Leg Rest with Knee Cut-Outs
258-050	Small, 18" W x 15" L x 5" H (45.7 x 38.1 x 12.7 cm)
258-051	Medium, 13" W x 17.5" L x 7" H (33.0 x 44.5 x 17.8 cm)
258-052	Large, 18" W x 24" L x 10" H (45.7 x 61.0 x 25.4 cm)

ABDUCE KNEE POSITIONER SET



The purpose of this product is to arrange patients in an abduction pelvic position with maximum comfort.

This blue, vinyl-coated, semi-firm sponge can be very useful for treatment of the pelvis, hip and vulva/scrotum areas.

Place the sponge(s) under the femur/knee area with the lower side of the sponge, a ten-degree slant, toward the patient's trunk. The knee(s) are seated into the sponge's concave area.

The patient's feet can be held together with the grip ring. The set includes two positioners and one 6" (15.24 cm) grip ring.

Item	Description
258-300	Abduce Knee Positioner Set

LEG IMMOBILIZER

Excellent to add comfort for patients treated in the prone position. Constructed of foam, covered with black vinyl.

Specifications

Size: 16" L x 14" W x 6" to 11" H (40.6 x 35.5 x 15.2 to 27.9 cm)

Item #	Description
258-345	Elevated Leg Immobilizer

UNIVERSAL CAST POSITIONER

The universal cast provides comfort and support to the patient when treatment requires the patient position to be supine with the arms above the head. Firm polyfoam integrated with Plexiglass® base provides firmness and stability for reproducible setups. Save time and valuable storage space by eliminating the need to make and store individual patient casts.

One size fits all patients except young children. Waterproof coating is washable with standard hospital disinfectant.

Developed for a group of prominent Boston radiation oncology centers.

Item	Description
258-310	Arms Up Universal Cast Positioner, Covered Foam

ATTENUATE ARMS POSITIONER™

Includes One set of ComforCleers™ and Grip Ring

258-320

258-325

258-320 and 258-325

- **CT Compatible**
- **Washable Blue Vinyl Covering**

The Attenuate Arms Positioner is constructed of high density foam, soft, yet firm. A polyethylene base helps maintain rigidity and the handle on the base makes for ease in handling or hanging on wall. For head support use a Silverman head and neck Support.

Patients may be positioned with proper head support, arms extended above their head and placed onto the foam positioner. A slightly elevated angle allows the arms to rest, with an additional angle for the wrist area. Patients can hold onto the soft “Grip Ring” or just relax.

The Attenuate Arms Positioner includes the Positioner, one set of Head Supports and a 4 1/4" (10.8 cm) Grip Ring.

The Accessory Set is two blue vinyl coated foam positioners for under the upper arms. These provide additional support to the arms.

The Positioner and Accessory Set can also be used for supporting the lower legs when additional support is needed

Specifications

Size: 20" W x 9.5" H (50.8 x 24.13 cm)

Item #	Description
258-320	Attenuate Arms Positioner
258-325	Attenuate Arms Positioner Accessory Set

PRON PILLO®

The slight contour to the front of the Pron Pillo® gives comfort to the forehead. The open space for the eyes and nose puts less pressure near the eye area. The elevated base allows the patient to breath freely while being in a comfortable position. The slight taper allows for the natural contour of most face sizes. The Pron Pillo® supports the head and shoulders. The shoulder support design provides comfortable space for the patient's chest area.

The Pron Pillo® is radiolucent but not artifact free, therefore, it is not recommended for inclusion in films. It is totally waterproof, has an easy to clean smooth finish, and is now made of a softer foam.

Specifications

Size: 21" L x 18" W x 6" H (53.3 x 45.7 x 15.2 cm)
Weight: Less than 1 lb (0.45 kg)

CE

Item	Description
256-000	Pron Pillo®

D

LUNG COMPRESSOR

Air Compression Belt with Gauge

The Lung Compressor, Air Compression Belt with Gauge is designed to put pressure just below the lungs to limit lung movement with respirations. The air bladder with a cotton cover is attached to a 60" (152.4 cm) long velcro belt which is wrapped snugly around the patient just below the sternal notch. Once the belt and air bladder are in position on the patient, the air bladder is manually inflated with a hand pump. The included pressure gauge is used to record the amount of pressure used to achieve the desired limits of lung movement. This allows for reproducibility of the same amount of pressure for each treatment fraction.

This item can be cleaned by hand using a cloth dampened with a mild detergent dissolved in water. DO NOT SOAK MATERIAL. For stubborn spots or stains, use a soft brush and the solution. Allow material to air dry fully before reuse.

Note: Over inflation of the air bladder can cause seaming of the cotton cover to rip.

Specifications

Material: Velcro Hook and Loop, Cotton, Rubber
Size: 60" L x 4" W (152.4 x 10.16 cm)

Item	Description
260-301	Lung Compressor, Air Compression Belt with Gauge

BREATH HOLD ES™

Proactively Manage Respiratory Motion

Base Unit with Remote Displays
The Base Unit connects to the bellows belt to measure air pressure and enable LED light display. The base unit also serves as a charger for the three Remote Displays.

The Wireless LED Display visulaizes the air pressure as a series of lights to guide the patient through pre-selected breath-holds or reproducible shallow breathing.

Measurement Tool
The Measurement Tool quantifies expansion of the bellows belt to enalble reproduction of settings from SIM to treatment and between treatmen days

Bellows Belt
The bellows belt contracts and expands on the abdomen with patient breathing.

Clamp/Gooseneck
The Gooseneck holds the remote display, providing a flexible positioning for easy patient viewing. Various mounting options accomodate all table designs.

Wireless Repeater Kit

Effective and Convenient Respiratory Motion Control for Radiation Therapy Procedures

Make Respiratory Motion Control a Reality for Your Radiation Therapy Program Today
- Supports consistent breathing for imaging for therapy planning.
- Supports consistent breath-holds for RT delivery.
- Accelerates treatment time compared to gating.
- Greater comfort than compression devices.
- Easy patient set-up.

Medspira Breath Hold ES™ has been successfully used in radiation therapy (RT) programs nationwide for procedures involving the chest and upper abdomen. Breath Hold ES™ helps patients achieve the reproducible breath-hold points and the consistent shallow breathing that can potentially enable greater precision in targeting treatment areas as well as enhanced imaging for therapy planning.

Integrate Respiratory Control into Your Program Today
If your facility relies on free breathing for challenging RT procedures, Medspira Breath Hold ES™ provides an important new option, making it easier than ever before to integrate respiratory control into your RT program. The device is simple to use and affordable - many patients report feeling empowered through their active involvement in breathing control and the therapy process. Lightweight and portable, Breath Hold ES™ can be shared among therapy suites. Technologists learn to use the device in a matter of minutes.

Benefits Over Gating and Compression
If your facility currently uses gating technologies to compensate for breathing motion, Breath Hold ES™ may significantly accelerate procedure time - benefitting both workflow and patient care - while supporting a highly consistent and predictable breathing pattern for most patients. Additionally, compared to respiratory compression devices, Breath Hold ES™ provides a high degree of patient comfort and reliability.

Enhanced Precision for Left Side Breast Cancer Therapy
Numerous studies have shown that during radiation therapy for left side breast cancer, reproducible breath-hold techniques support consistent positioning of the tumor to minimize radiation dose to the heart. With Breath Hold ES™ , every radiation therapy site can help provide these patients with the carefully targeted treatment they need.

Innovative Biofeedback-Based Control
For radiation therapy involving the chest and upper abdomen, including the lungs and left breast.
- Restricts tumor mobility and potentially minimizes treatment margins through consistent breath-holds or controlled shallow breathing.
- Relies on biofeedback for proactive patient breathing control
- Greater patient comfort than other motion control technologies
- Portable, standalone system, with easy patient set-up
- Compatible with any LINAC and CT system
- Simple and intuitive operation
- Developed by physicians at the Mayo Clinic
- Affordable pricing

Highly effective, easy and convenient, Breath Hold ES™ delivers new precision for radiation therapy procedures involving the lungs and upper abdomen, where respiratory motion is an ongoing problem. Breath Hold ES™ combines an expandable bellows system, pressure-sensitive transducer tube that wraps around the patient's chest, and an LED display. During both radiation planning and treatment, the device visualizes the respiratory cycle as a pattern of lights. This feedback effectively guides the patient towards a consistent pre-selected breath-hold position or a reproducible, shallow respiratory pattern.

Keeping Technicians Informed in Real Time
A remote Breath Hold ES™ display that operates through protective bunkers enables technicians in the control room to follow the patient's breathing motion in real time.

The system includes
1 - Base Unit / Docking Station
3 - Remote Displays
1 - Power Supply
1 - Measurement Tool
2 - Bellows Belt with Measuring Tape and Bellows Pads
1 - Clamp/Gooseneck
1 - Wireless Extender Kit
1 - Radiation Therapy Quick Reference Guide
1 - General Demonstration Video

Warnings
- This product contains natural rubber latex in the bellows belt which may cause an allergic reaction.
- This system is not suitable for use in the presence of flammable anesthetics in combination with air, oxygen, or nitrous oxide.
- This equipment is not protected against ingress of water.

Specifications

Power Requirements
Remote Unit: Battery 2 cell 7.4V, 2.4A
Base Unit: Battery 6 cell 12.0V, 5A
Charger Input: 100-240V, 2A, 50/60Hz
Charger Output: 12V, 5A

Operating Temperature Range
0 to 3,000 ft (914 m):
50° - 95°F(10° - 35°C): 101kPa to 91 kPa
3,000 to 7,000 ft (2,134 m):
50° - 89.6°F (10° - 32°C): 91kPa to 78 kPa
Operating and Non-Operating Humidity Range:
10% to 80% RH, non-condensing
Shipping/Storage/Non-Operating Temperature Range:
32° - 122°F (0° - 50°C)
Shipping/Storage Humidity Range:
10% to 90% RH, non-condensing

Item	Description
261-000	Breath Hold ES™ System
261-003	Disposable Belt Strap

IMPROVED DUNCAN HEAD HOLDER

The Improved Duncan Head Holder offers head support for maintaining a patient's head in a proper, relaxed, comfortable alignment in the prone position. The Improved Duncan Head Holder provides double thickness in the plastic cradle for increased strength while adding a rubber channel to the rocker legs to avoid slippage.

Sanitary
Disposable, absorbent pre-cut tissue is available to place over the face mask, providing an barrier between the head holder and patient's face.

Economical
Plastic head holder can be reused with different patients. Simply purchase replacement polyfoam pads which affix to head holder using supplied double face tape.

Specifications

Size: 8" W x 7.75" L x 5" H (20.3 x 19.7 x 12.7 cm)
Weight: 1.75 lb (0.8 kg)

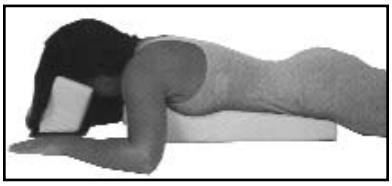
Item	Description
248-200	Improved Duncan Head Holder, Prone
248-201	Disposable Paper Covers, 100/Pkg
248-202	Replacement Foam Pads, 6/Pkg

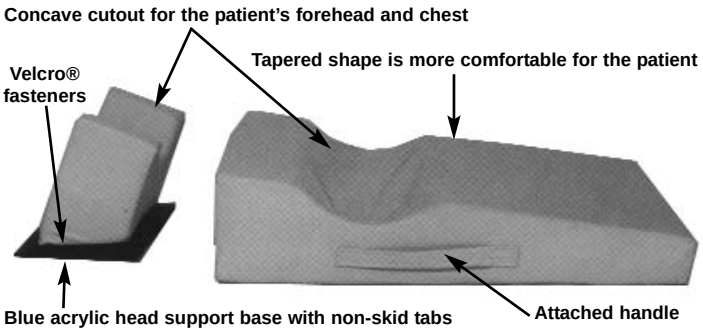
CHILD CHIN SUPPORT
with Angle Indicator

- **Can be used in CT scans**
- **Useful for head stability when treating in a prone position**
- **Does not interfere with lateral brain and spinal fields**
- **Adjustable with angle indicator**
- **Comfortable for the patient**
- **Made of rigid plastic and aluminum**
- **Easily cleaned**

Item	Description
257-201	Child Chin Support

PRONE COMFORT PILLOW SET™





The Prone Comfort Pillow Set is made of a royal blue vinyl coated semi-firm microcell foam that is extremely comfortable, easy to clean and safe to use. Non-skid tabs on the head support create firm stability.

The Prone Comfort Pillow can be used with most prone head positioners, vacuum bags or molding systems. The Prone Comfort Pillow can be utilized in CT or MRI.

Head Support
- 7.5" x 4" x 6.5" (19.1 x 10.2 x 16.5 cm)
- Concave cutout and angled to adapt to patients forehead
- Velcro® fasteners for easy attachment and removal
- Blue acrylic base, 3/16" x 6" x 9.5" (0.5 x 15.2 x 24.1 cm) with drilled hole for wall hook

Comfort Pillow
- 14" x 21" x 2.5" (35.6 x 53.3 x 6.4 cm)
- Concave for body contour
- Tapering improves patient's body comfort
- Handle for movable ease

Item	Description
258-351	Comfort Pillow
258-352	Comfort Head Support
258-355	Prone Comfort Pillow Set™, Vinyl Coated

TIMO FOAM HEAD-NECK SUPPORTS

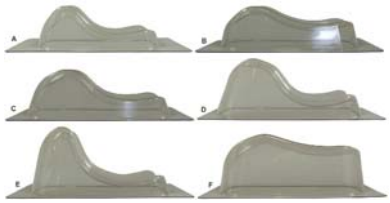
Specifications

Material: Coated urethane foam

Item	Timo Head/Neck Support	Size in mm
248-000	Set, A thru F	
248-001	A, Red	125 W x 200 L
248-002	B, Green	120 W x 225 L
248-003	C, Blue	120 W x 235 L
248-004	D, Brown	125 W x 235 L
248-005	E, Yellow	125 W x 225 L
248-006	F, Gray	125 W x 235 L

SILVERMAN HEAD-NECK SUPPORTS

Standard Trim - No Peg Holes



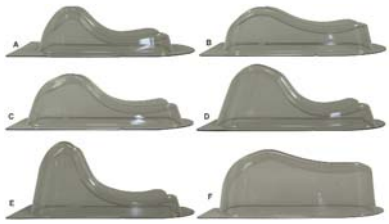
Specifications

Material: PETG
Size: 7" x 11.2" L (180 x 285 mm)

Item #	Silverman Head/Neck Supports
249-030	Set, A thru F
249-031	A
249-032	B
249-033	C
249-034	D
249-035	E
249-036	F

SILVERMAN HEAD-NECK SUPPORTS

With Rounded End and Peg Holes



Specifications

Peg Hole: 0.2" diameter (5 mm)
Peg Holes from Center to Center: 6.2" (15.8 cm)
Material: PETG

Item #	Silverman Head/Neck Supports with Peg Holes
249-050	Set, A thru F
249-051	A
249-052	B
249-053	C
249-054	D
249-055	E
249-056	F

SILVERMAN HEAD-NECK SUPPORTS

With Peg Holes for Bionix Devices

Specifications

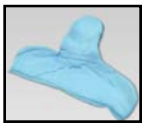
Material: PETG

Item #	Silverman Head/Neck Supports (Bionix)
249-020	Set, A thru F
249-021	A
249-022	B
249-023	C
249-024	D
249-025	E
249-026	F

MOLDCARE® CUSHIONS

262-174

262-175


262-176

262-177

262-178

262-179

The MOLDCARE® cushions are customized head supports composed of a soft fabric bag containing expanded polystyrene beads coated in a moisture-cured resin. When activated with water, the pillow becomes rigid, conforming to the contours of the patient's head and neck. It can be used alone or on a Silverman Head Support to create the most comfortable and repeatable head support available.

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Since MOLDCARE® has a low specific gravity (0.01) with a CT value less than -800, the device can be used in treatment with a CT simulator.

MOLDCARE® cushions are also MR compatible.

Easy to use

1. Remove MOLDCARE® Cushion from package.
2. Fill spray bottle with room temperature or lukewarm water (up to 40°C/105°F).
3. Push spray bottle nozzle slightly against the cushion and spray a shot of water into the cushion. Repeat about12 times approximately every 10 cm to ensure uniform dampening.
4. Place MOLDCARE® Head Cushion over head support.
5. Place patient's head on cushion, ensuring frame clears cushion, and form as desired.
6. Wait 5 to 10 minutes until pillow sets (once patient exits cushion, cushion continues the hardening process for another 10 minutes.

Item	MOLDCARE®	Size
262-174	Small Head Cushion	15 x 20 cm
262-175	Head Cushion	20 x 25 cm
262-176	Trapezoid Head & Shoulder Cushion	58 x 65 cm
262-177	Medium Cushion	20 x 45 cm

Item	MOLDCARE®	Size
262-178	Large Cushion	40 x 60 cm
262-179	X-Large Cushion	60 x 60 cm
262-180	Spray Bottle for Moldcare Cushions	

ACCUCUSHION™ MOLDABLE HEAD AND NECK SUPPORTS

- **Simply heat in waterbath or oven at 165°F (74°C)**
- **Comfortable and extremely secure**
- **Once heated, cushion forms easily and quickly**
- **Can be reheated and reshaped**
- **No odor**

A superior method for head immobilization with unique warm and form technology.

The Moldable AccuCushions™ provide a secure custom head support for each patient. Simply heat the cushion in your waterbath or a Klarity Oven. Gently form it under your patient's head and neck. It will be a warm, calming pillow that cools to provide secure yet comfortable positioning for highly accurate treatment and reproducibility. Moldable AccuCushions™ are designed for use with Silverman head supports or alone as a support pillow, with or without a thermoplastic mask. Moldable AccuCushions™ can be reheated and reformed as often as needed.

For single patient use.

*Patent Pending

Item	AccuCushion™	Size
262-550	Small Cushion	15x20 cm
262-552	Medium Cushion	20x25 cm
262-554	Large Cushions	20x45 cm

DISPOSABLE PLASTIC HEAD HOLDERS

Item #	Description	Diameter	Quantity
246-000	Plastic Head Holders	7.25" (18.4 cm)	50
244-000	Plastic Head Holders	6" (15.2 cm)	50

TENSION BOARD

Arm to Foot Adjustable

A 'D' style handle is connected to a spring and then to an adjustable leather strap. For easy adjustment, the leather strap has holes every inch and is numbered every fifth hole. The leather strap simply slips over a pin on each side of the foot board.

Item#	Description
253-100	Arm to Foot Tension Board

BITE BLOCK SYSTEM

The Bite Block System is a stand alone patient head immobilizer system that needs no fixing to a treatment table and can be moved from room to room. The aluminum base plate has protruding pins which fit into the holes of the attached plastic bottom of six different size head-neck supports, thus, locating it in a fixed position every time it is used. In some treatment set-ups it may be necessary to angle the head to the right or left. For these treatments, place the horizontal adjustable base plate on the base plate and lock in position with two thumb screws. The head-neck supports also fit onto protruding pins located on the horizontal adjustable base plate or the pediatric adjustable base plate.

A three lock system allows for easy adjustment and reproducibility. Vertical and horizontal adjustment is accomplished using 15 cm scales and two locking knobs. The bite block tray angle is adjustable using a 180° scale and is locked with a knob.

An easy to remove individualized bite tray uses dental impression material. The impression procedure takes ten minutes using Caulk Reprosil® Impression Material (Item 266-100), which must be ordered separately.

A fast set-up can be accomplished by using the Nasal or Bridge Trays. Rest the patient's head in the correct head-neck support, adjust the head, lower the nasal or bridge tray and lock to the desired position.

Specifications

Size: 17" vertical post welded to a 10" x 13" base plate
Aluminum Base Plate has an Anti-Skid Rubber Base
Three Lock System: Vertical, horizontal and tray angle
Scales: 15cm Vertical, 15cm horizontal and 180° tray angle

Bite Block System Includes

(1) Adjustable Base Plate
(6) Head-Neck Supports with plastic bottoms
(5) Adult Bite Tray
(1) Child Bite Tray
(1) Nasal Tray
(1) Bridge Tray
(1) Tongue Tray
(1) Chin Tray
(1) 20 cm white plastic rule
(1) Cork Screw Tray w/four sample corks (one of each size)

Item	Description
260-000	Bite Block System

Item	Accessories
260-008	Pediatric Adj Base Plate for Bite Block
260-010	Adult Bite Tray
260-011	Child Bite Tray
260-012	Nasal Tray
260-014	Bridge Tray
260-018	Tongue Tray
260-020	Chin Tray
260-022	Cork Screw Tray

CAULK REPROSIL® IMPRESSION MATERIAL

For Use with Bite Trays

Caulk Reprosil® Impression Material provides excellent dimensional accuracy and stability. This material is applied to the bite tray and a dental impression is made. One package will make 20 - 25 impressions. Note: Does not include mixing pad or caulk tray adhesive. Tray adhesive not recommended for bite trays that will be reused.

Item #	Description
266-100	Caulk Reprosil® Impression Material

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CORKS

Sold 10 per package.

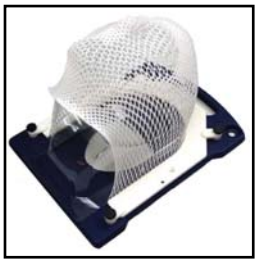
Item #	Top Diameter	Bottom Diameter	Length
274-812	2.8 cm	2.25 cm	3.0 cm
274-813	3.0 cm	2.40 cm	3.0 cm
274-816	3.5 cm	2.75 cm	3.7 cm

BITE WEDGE

- Hygienic wrapping tears off easily for immediate access
- Sanitary, high-density polyethylene pad provides a firm protective cushion
- Pad is bonded to a tough but flexible double strength hardwood, assuring durability
- Wedges can be notched for the teeth (see picture above)

Item	Description	Quantity
274-100	Bite Wedge	12
274-100-1	Bite Wedge	144

T-FORM™ HEAD AND NECK IMMOBILIZER



Shown with Thermoplastic Mask

- **MRI Compatible Radiolucent Material**
- **Cost Effective Alternative to Carbon Fiber**
- **Lighter Weight than Carbon Fiber**
- **Net Weight 1 lb (0.5 kg)**
- **Carbon Fiber-like attenuation**
- **Capable of supine, prone or lateral treatment positions**
- **Fits Both Disposable and Reusable U-Frame Thermoplastic Masks**
- **Locks Down to Most Treatment Couches**

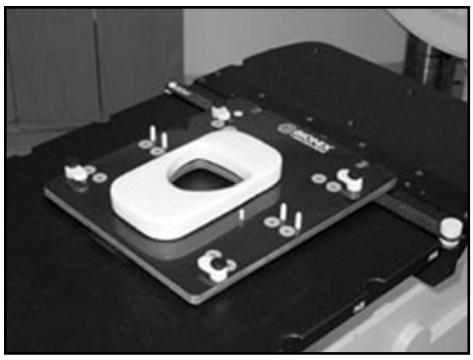
The T-Form Head and Neck Immobilizer is made out of a composite material that is radiolucent, light-weight and durable. The T-Form Head & Neck Immobilizer fits most U-Frame thermoplastic masks and interfaces with various attachments to provide positioning options.

Compatible with these Bionix Devices

- Carbon Fiber 45° Tilt Attachment
- Prone Attachment
- Lateral Attachment
- Timo, Silverman and Moldcare® Head Cushions

Item#	Description
262-145	T-Form Head and Neck Immobilizer

SUPRONE PLUS™ IMMOBILIZER



- **Fits most disposable or reusable U-Frame Thermosplastic Masks**
- **Locks down to most couches**
- **May be used for flat positioning**
- **Includes comfort cushion for patient in prone position**
- **Multiple Attachments allow interface with VersaBoard**

SuProne Plus™ Immobilizer provides rigid patient positioning to maximize reproducibility. This immobilizer can be used independently or it can be attached to accessories in order to offer prone, supine, lateral and flat positioning with maximum patient comfort.

CE

Item#	Description
262-130	SuProne Plus™ Immobilizer, Acrylic

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LATERAL ATTACHMENT

- **Attaches to VersaBoard™, SuProne Plus™ or T-Form Head and Neck Immbolizer**
- **Three standard positioning heights included (2 cm, 5cm and 7cm)**
- **Can be used prone**
- **Locks down to most couches**

CE

Item#	Description
262-131	Lateral Attachment, Acrylic

PRONE ATTACHMENT

- **Attaches to VersaBoard™, SuProne Plus™ or T-Form Head and Neck Immbolizer**
- **May be positioned ± 20°**
- **Includes comfort cushion for patient**
- **Easy to locate and read degree location**
- **Stable base for maximum reproducibility**
- **Locks down to most couches**

CE

Item#	Description
262-132	Prone Attachment, Acrylic
262-136	Prone Attachment, Carbon Fiber

45° TILT ATTACHMENT

- **Attaches to VersaBoard™, SuProne Plus™ or T-Form Head and Neck Immbolizer**
- **May be positioned 5° to 45°**
- **Easy to locate and read degree location**
- **Stable base for maximum reproducibility**
- **Locks down to most couches**

CE

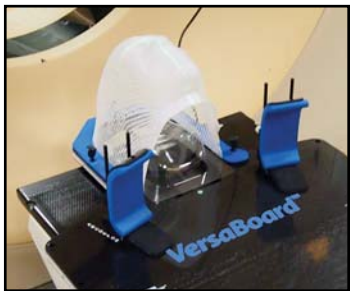
Item#	Description
262-135	45° Tilt Attachment, Carbon Fiber

ACCESSORY ATTACHMENT ADAPTOR

- **Allows attachment of the 45° Tilt and Prone Attachments to the SuProne Plus™ Immbolizer or VersaBoard™**

Item#	Description
269-521	Accessory Attachment Adaptor

VERSABOARD™ AND ACCESSORIES



269-500 Shown with 269-519

- **Made of Carbon Fiber**
- **Allows for 360° treatment angles**
- **24" (61 cm) at the widest point**
- **Includes patient transition pad and prone face cushion for patient comfort**
- **Easily accomodates Head Only and Head and Shoulder Thermoplastic Masks**
- **Ruled edges for maximum reproducibility and alignment**
- **Accomodates Silverman headsupports, MOLDCARE® head cushions and SecureVac™ VersaCushion**
- **Locks down to most couches using SecureFit™ Lockdown Bars (Items 262-190 to 262-199)**

The VersaBoard™ was designed specifically to better stabilize head, neck and brain patients during IMRT treatments. Made out of carbon fiber, the VersaBoard™ offers a variety of thermoplastic and accessory options. The VersaBoard™ also provides the option to cantilever off the end of the couch to allow for a 360° treatment angle.

Item 269-519 The Premium Shoulder Suppression System is made of carbon fiber and can be adjusted in 3 directions (side to side, top to bottom and up or down) for optimum positioning.

Item 269-521 Accessory Attachment Adaptor is required when adding accessories to the VersaBoard

Item#	Description
269-500	VersaBoard™
269-519	VersaBoard™ Premium Shoulder Suppression System

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ACCESSORY ATTACHMENT ADAPTOR

- **Allows attachment of the 45° Tilt and Prone Attachments to the SuProne Plus™ Immbolizer or VersaBoard™**
- **Accessory Attachment is required when adding accessories to the VersaBoard**

Item#	Description
269-521	Accessory Attachment Adaptor

LATERAL ATTACHMENT

- **Attaches to VersaBoard™, SuProne Plus™ or T-Form Head and Neck Immbolizer**
- **Three standard positioning heights included (2 cm, 5cm and 7cm)**
- **Can be used prone**
- **Locks down to most couches**

CE

Item#	Description
262-131	Lateral Attachment, Acrylic

45° TILT ATTACHMENT

- **Attaches to VersaBoard™, SuProne Plus™ or T-Form Head and Neck Immbolizer**
- **May be positioned 5° to 45°**
- **Easy to locate and read degree location**
- **Stable base for maximum reproducibility**
- **Locks down to most couches**

CE

Item#	Description
262-135	45° Tilt Attachment, Carbon Fiber

PRONE ATTACHMENT

- **Attaches to VersaBoard™, SuProne Plus™ or T-Form Head and Neck Immbolizer**
- **May be positioned ± 20°**
- **Includes comfort cushion for patient**
- **Easy to locate and read degree location**
- **Stable base for maximum reproducibility**
- **Locks down to most couches**

CE

Item#	Description
262-132	Prone Attachment, Acrylic
262-136	Prone Attachment, Carbon Fiber

VERSABOARD™ ACCESSORIES

262-175

262-176

244-402

The Head and Shoulder SecureVac Cushion is a reusable customizable device ideal for indexing the shoulders during IMRT head & neck treatments.

244-426

The VersaCushion is a brick shaped customizable reusable head support. Made from a durable vinyl material, it is designed to withstand the rigorous 8 week treatment cycle while keeping the shape of the patient's head and neck.

269-522

The SecureVac/MoldCare Adapter securely indexes customized head supports to eliminate shifting during treatment. This adapter will work on any product with Silverman pegs.

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Item #	MOLDCARE®
262-175	Head Cushion
262-176	Head and Shoulder Cushion

Item #	SecureVac™
244-402	Head and Shoulder, 65x67cm, 10L Fill
244-426	VersaCushion, 32x15x9 cm, 2 L Fill
269-522	SecureVac/MoldCare Locator Device

SECUREFIT BARS

262-190
262-191
262-193
262-195
262-196

Item #	SecureFit™ Lockdown Bar	Material
262-190	Varian EXACT Couch	Aluminum
262-191	Slider Attachment	Aluminum
262-192	Siemens Couch	Aluminum
262-193	Varian EXACT, Sliding Bar II	Aluminum
262-195	Varian EXACT	Carbon Fiber
262-196	Elekta Couch	Aluminum
262-197	Phillips Couch	Aluminum
262-198	GE Couch	Aluminum
262-199	Nucletron Couch	Aluminum

THERMOPLASTIC MASKS FOR VERSABOARD™

EMRT-8350

EMRT-8335

EMRT-8345

EMRT-8330

Item #	Embrace™ Disposable Versaboard™ Masks	Thickness
EMRT-8350	Head and Shoulder VersaFrame	2.4 mm
EMRT-8335	Head Only VersaFrame	2.4 mm
EMRT-8355	Head and Shoulder VersaFrame	3.2 mm
EMRT-8340	Head Only VersaFrame	3.2 mm
EMRT-8345	Head and Shoulder VersaFrame SecureFrame	3.2 mm
EMRT-8330	Head Only VersaFrame SecureFrame	3.2 mm

Used with Bionix VersaBoard for Head and Neck IMRT

BIONIX® BUTTERFLY BOARDS

269-437

269-438

269-439

269-441

269-442

The Bionix® Butterfly Boards are lightweight and durable devices that comfortably support a patient's arms during treatment procedures of the breast, lung and thorax. Designed to fit into a CT scanner, the Butterfly Boards can also be used for diagnostic purposes.

Item 269-439 Narrow Extended Butterfly Armboard measures 19.5" (49.5 cm) from wing to wing making this board more compatible with small bore CT scanners.

The Standard Butterfly Boards have two Delrin handgrips. The Extended and Narrow Extended Butterfly Boards feature an adjustable T-Bar handgrip. The T-bar offers both vertical and horizontal adjustments for precise patient positioning and maximum comfort.

The Bionix® Butterfly Boards may be used with any vacuum cushion or SecureFoam™. They easily attach to any Bionix® Breast Board and accommodate Silverman and MOLDCARE© head cushions. The Butterfly Boards can be used independently and lock down to most couch tops.

The polycarbonate Butterfly boards are MR compatible.

Specifications

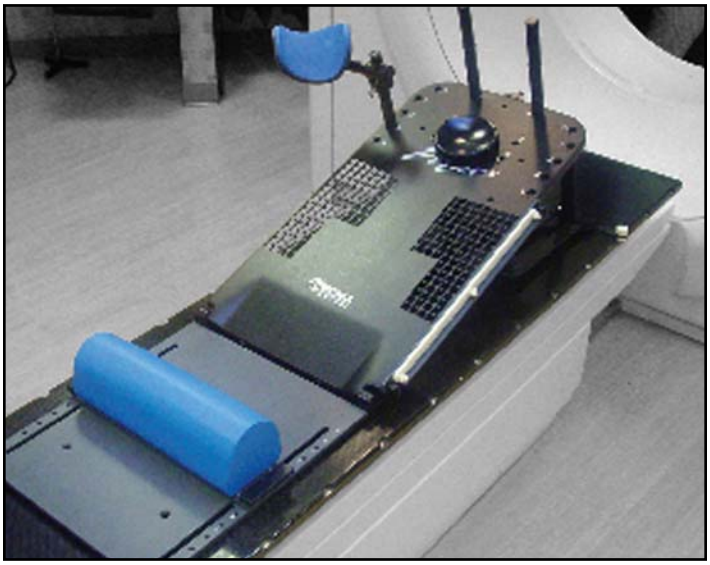
Item 269-437 and 269-441 Standard Butterfly Board
Height: 6.25" (15.9 cm) Wings, 9.25" (23.5 cm) Arm Post
Overall Width: 23.875" (60.6 cm)
Length: 14.5" (36.8 cm)
Weight: 4.25 lb (2 kg)

Item 269-438 and 269-442 Extended Butterfly Board
Height: 6.25" (15.9 cm) Wings
Width Inside Wing: 14" (35.6 cm)
Overall Width: 24" (61 cm)
Length: 24.5" (62.2 cm)
Weight: 12 lb (5.5 kg)

Item 269-439 Narrow Extended Butterfly Armboard
Height: 6.25" (15.9 cm) Wings
Width Inside Wing: 14" (35.6 cm)
Overall Width: 19.5" (49.5 cm)
Length: 23.5" (59.7 cm)
Weight: 9 lb (4.1 kg)

Item #	Butterfly Board
269-437	Standard with 2 Hand Posts, Polycarbonate
269-438	Extended with T-Bar Handle, Polycarbonate
269-439	Narrow Extended with T-Bar Handle, Polycarbonate
269-441	Standard with 2 Hand Posts, Carbon Fiber
269-442	Extended with T-Bar Handle, Carbon Fiber

MAX3™ PLUS BREAST BOARD AND ACCESSORIES



- **Four integrated elevation carbon fiber wedges at 7°, 12°, 17°, and 23°**
- **Indexing Backstop Cushion to prevent patients from involuntarily sliding downward**
- **Able to accommodate patients up to 350 lb (158.8 kg)**
- **Compatible with Embrace Head Only VersaFrames**
- **Compatible with Silverman head supports**
- **Locks down onto most treatment couches**
- **Accommodates Butterfly Board, Arm Supports and SecureVac™ Bags**
- **Accomodates Thermoplastic sheets**
- **Large grid panels for increased treatment angles**

The Max3 Plus Breast Board is made out of carbon fiber and is specifically designed to treat breast and lung patients. The system features large grid panels and an integrated carbon fiber wedge system. The system also accommodates a large variety of accessories to secure patients during treatment.

Item 269-426 Max3™ Plus Breast Board includes

- (1) Max3™ Plus Breast Board
- (1) Head Cup
- (2) Hand Posts
- (1) Indexing Backstop Cushion

Item	Description
269-426	Max3™ Plus Breast Board

Clocking Plate Arm Support

- **Low profile design is ideal for smaller bore CT's**
- **Provides 3 axes of adjustment with multiple indexing points**
- **A simple design makes adjustment quick and easy**

The Clocking Plate Arm Support rotates the arm right and left and also moves up and down. This system will allow you to easily move the arm into the desired position.

Item #	Description
269-427-1	Clocking Plate Arm Support, Right
269-427-2	Clocking Plate Arm Support, Left

SecureFit Arm Support

- **Offers 5 indexing points on the vertical post, 4 on the horizontal, and 4 to rotate the arm support**
- **Provides a secure support for the patient's arms during treatment**
- **Thick arm pad provides extra patient comfort during immobilization**

The calibrated arm supports are great additions to any of the Bionix breast boards. The arm supports provide flexibility, support and comfort improving patient positioning and reproducibility.

Item #	Description
269-428-1	SecureFit Arm Support, Right or Left

MAX3™ PLUS BREAST BOARD ACCESSORIES

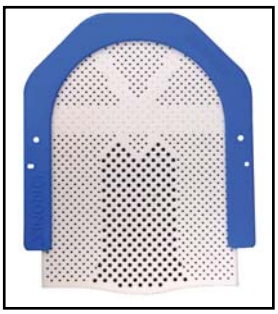
269-441

269-442

Item #	Butterfly Board
269-437	Standard with 2 Hand Posts, Polycarbonate
269-438	Extended with T-Bar Handle, Polycarbonate
269-439	Narrow Extended with T-Bar Handle, Polycarbonate
269-441	Standard with 2 Hand Posts, Carbon Fiber
269-442	Extended with T-Bar Handle, Carbon Fiber

All Butterfly Boards include adapter posts to allow for breast board compatibility.

D



EMRT-8335

Item #	Embrace™ Thermoplastic Masks	Thickness
EMRT-8335	Head Only VersaFrame	2.4 mm
EMRT-8340	Head Only VersaFrame	3.2 mm

Item #	Embrace™ Thermoplastic Sheets	Size	Thickness
EMRT-8400	Perforated, Punched on 18" Side	18" x 24"	2.4 mm
EMRT-8405	Solid, Punched on 18" Side	18" x 24"	2.4 mm
EMRT-8410	Perforated, Punched on 18" Side	18" x 24"	3.2 mm
EMRT-8415	Solid, Punched on 18" Side	18" x 24"	3.2 mm

Item #	SecureVac™	Size	Liter Fill
244-408	Cushion	100 x 70 cm	30
244-410	Cushion	100 x 70 cm	35

Other Sizes Available

262-190

262-191

262-193

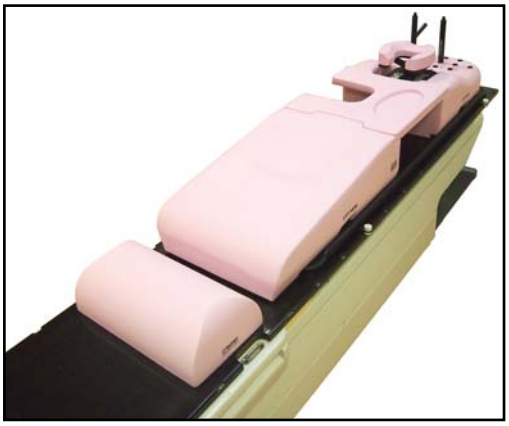
262-195

262-196

SecureFit Bars are also available in order to securely attach the Max3™ Plus Breast Board to your treatment table.

Item #	SecureFit™ Lockdown Bar	Material
262-190	Varian EXACT Couch	Aluminum
262-191	Slider Attachment	Aluminum
262-192	Siemens Couch	Aluminum
262-193	Varian EXACT, Sliding Bar II	Aluminum
262-195	Varian EXACT	Carbon Fiber
262-196	Elekta Couch	Aluminum
262-197	Phillips Couch	Aluminum
262-198	GE Couch	Aluminum
262-199	Nucletron Couch	Aluminum

PRONE BREAST SYSTEM



269-620

Created with a focus on ensuring patient comfort, re-positional accuracy and simplicity in use, the Bionix Prone Breast System reduces irradiation to the chest wall, healthy cardiac tissue and lungs. As the new generation of patient positioning, the system allows for even weight distribution and the accommodation of a diverse variety of patient sizes onto the system.

Simplicity In Use
- **Lightweight radiolucent T-form multi-treatment base, compatible with the Pelvis Belly Plus System, makes owning both more economically feasible**
- **As an easily stored and lightweight therapist-friendly device, the system also locks down onto most treatment couches**

Dose Delivery
- **Proprietary multi-layered variable density foam pad set makes setup accurate and reproducible, while keeping patients comfortable**

Comfort
- **Includes a supportive ankle bolster, to help keep the patient level and comfortable**
- **Dual foam, massage-style face cushion aides in patient comfort**
- **15 degree contralateral wedge, to assist with patient tilt**
- **System includes one large or small opening breast bridge based on facility needs**

Built-in Antimicrobial Protection - Antimicrobial exhibits long lasting efficacy against a broad spectrum of microorganisms which is effective against cross-contamination during storage and after patient interaction.

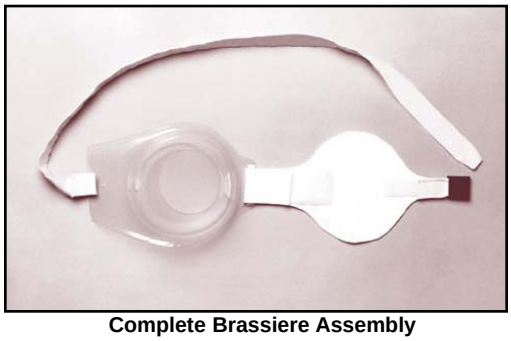
Neither of the Prone Breast Systems will accomodate the use of thermoplastics.

System includes:
Multi-treatment Base
Prone Breast Pad Set
Face cushion
15 Degree Contralateral Wedge
Handles
Large or Small Opening Breast Bridge- Customer must specify the Breast Bridge size when ordering. The Large opening is the standard if not specified.

Item #	Description
269-600	Prone Breast System, 23 cm
269-605	Low Profile Prone Breast System, 15 cm
269-461	Disposable Face Covers, 50/pkg
269-620	Prone Breast Pad Set
269-625	Low Profile Prone Breast Pad Set
269-630	Pelvis Belly Pad Set
269-608	Prone Breast Bridge - Standard Opening
269-610	Prone Breast Bridge - Small Opening

ALDERSON BREAST DOSIMETRY SYSTEM

A Treatment Brassiere to Improve Breast Radiation Therapy



Complete Brassiere Assembly

- **Reshapes the ipsilateral breast more favorably for radiation treatments.**
- **Eliminates inframammary folds**
- **Reduces dose to the lungs, heart and ribs**
- **Both shape and position are accurately repeatable, treatment after treatment**
- **More uniform dose**
- **Reshapes the contralateral breast to move it away from the beams**
- **Simplifies application of IMRT to breast treatments**

The Alderson Breast Dosimetry System (ABDS™) are breast cups formed of a transparent, semi-rigid plastic material.

Data on increased skin dose due to ipsilateral cup were submitted to the FDA. The skin dose due to the cup material was found to be substantially less than for other positioning devices. The FDA has issued a 510 (k) marketing clearance for the Treatment Brassiere.

Cup selection begins by measuring a patient's chest breadth when supine and wearing her clothing brassiere. This measurement indicates the size group (S, M, L, XL) containing the correct cup. Left and right cups are not interchangeable.

The ipsilateral cup is positioned repeatedly on the patient by markings made on the patient's skin through small holes at the medial, lateral and superior aspects of the cup flange.

Each cup is labeled to identify size group (S, M, L, XL), body Side (R or L), and breast volume.

Item 674-100 Complete Brassiere Library Includes: 20 Left and 20 Right Complete Brassiere Assemblies
Item 674-TBC Portable 2 Tier, 8 post Storage Caddie with dust cover.
Item 674-100-TBC Includes 40 Cup Library and Caddie

Specifications

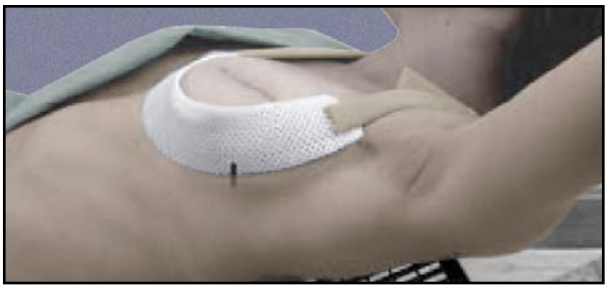
Material: Clear PETG Plastic
Density: 1.27 g/cm³
Thickness Range: .50 mm for smaller cups to .63 mm for extra large cups.

Item #	Description
674-100	40 Cup Brassiere Library
674-TBC	Brassiere Caddy - ONLY
674-100-TBC	40 Cup Brassiere Library w/Caddy

Item # - Patient Left	Item # - Patient Right	Volume	Brassiere Size	* Approx. Cup Size
674-100SL-200	674-100SR-200	200 ml	Small - Chest Breadth 27 - 32 cm	A / B
674-100SL-300	674-100SR-300	300 ml	Small - Chest Breadth 27 - 32 cm	B / C
674-100SL-400	674-100SR-400	400 ml	Small - Chest Breadth 27 - 32 cm	B / C
674-100SL-500	674-100SR-500	500 ml	Small - Chest Breadth 27 - 32 cm	C
674-100SL-600	674-100SR-600	600 ml	Small - Chest Breadth 27 - 32 cm	C / D
674-100ML-250	674-100MR-250	250 ml	Medium - Chest Breadth 32 - 36 cm	B
674-100ML-500	674-100MR-500	500 ml	Medium - Chest Breadth 32 - 36 cm	C
674-100ML-750	674-100MR-750	750 ml	Medium - Chest Breadth 32 - 36 cm	C/ D
674-100ML-1000	674-100MR-1000	1000 ml	Medium - Chest Breadth 32 - 36 cm	D / DD
674-100ML-1250	674-100MR-1250	1250 ml	Medium - Chest Breadth 32 - 36 cm	DD
674-100LL-500	674-100LR-500	500 ml	Large - Chest Breadth 36 - 42 cm	C
674-100LL-750	674-100LR-750	750 ml	Large - Chest Breadth 36 - 42 cm	C / D
674-100LL-1000	674-100LR-1000	1000 ml	Large - Chest Breadth 36 - 42 cm	D / DD
674-100LL-1250	674-100LR-1250	1250 ml	Large - Chest Breadth 36 - 42 cm	DD
674-100LL-1500	674-100LR-1500	1500 ml	Large - Chest Breadth 36 - 42 cm	DD / DDD
674-100XLL-1000	674-100XLR-1000	1000 ml	X-Large - Chest Breadth 42 cm - Over	D / DD
674-100XLL-1500	674-100XLR-1500	1500 ml	X-Large - Chest Breadth 42 cm - Over	DD
674-100XLL-2000	674-100XLR-2000	2000 ml	X-Large - Chest Breadth 42 cm - Over	DD / DDD
674-100XLL-2500	674-100XLR-2500	2500 ml	X-Large - Chest Breadth 42 cm - Over	DDD
674-100XLL-3000	674-100XLR-3000	3000 ml	X-Large - Chest Breadth 42 cm - Over	DDD

*** Breast Sizes (volumes) correlate poorly with clothing brassiere cup sizes.**

COSMAS CUP



- **Minimizes breakdown under the breast**
- **Daily setup for reproducibility is quick and precise**
- **Comfortable for patient**
- **Small and non-constricting**
- **Longer strap goes around patient's neck and attaches to shorter strap using hook and loop closure**

The Cosmas Cup is a customized device that provides lift to the patient's breast and helps eliminate unwanted folds during radiation therapy treatment.

Specifications

Material: Thermoplastic
Thickness: 2.4 mm

CE

Item #	Cosmas Cup	Size
674-200	Size B	5 cm x 22 cm
674-203	Size C	8 cm x 25 cm
674-204	Size D	10 cm x 28 cm
674-205	Size E	15 cm x 30 cm

D

MT SPANDAGE™ ELASTIC NET

Latex Free Elastic Retainer Net

Tubular elastic stretch net can accommodate a wide variety of medical needs involving virtually every part of the body. Size should be determined by patient's shirt size.

Item #	Size	Length Stretched
674-308	Medium Chest	10 yards
674-311	XX-Large Chest	10 yards
674-312	3X-Large Chest	10 yards

Others Sizes Available

SUPER-ADHESIVE NYLON HOOK AND LOOP

An extra-strong, pressure-sensitive adhesive backing sticks where others fail. Adheres to most metals, plastics and painted surfaces.

Specifications

Temperature Range: 0° to 120°F
Color: White

Item #	Super-Adhesive	Size
253-210	Hook	15' L x 1" W (38 x 2.54 cm)
253-211	Loop	15' L x 1" W (38 x 2.54 cm)
253-215	Hook	15' L x 2" W (38 x 5.08 cm)
253-216	Loop	15' L x 2" W (38 x 5.08 cm)

TREATMENT CHAIR

This versatile Treatment Chair provides upright positioning for specialty treatment cases of head, neck, thorax, breast, and lung or for patients who have difficulty lying supine for treatments. The seated patient has improved comfort, increased lung volume and reduced respiratory motion.

The Treatment Chair has an open grid back that allows for posterior treatment of the breast, lung and thorax. Patient safety features for the treatment chair include a seat belt and a Velcro® chest belt with three vertical position locations. Patient comfort is enhanced with a vinyl covered foam seat cushion which is tapered lower at the back to prevent the patient from sliding forward and giving more support under the thigh. Velcro® tabs attached to bottom of the seat cushion make it non-slip and easily removable from the chair when installing on the treatment table.

The Treatment Chair Base attaches to the front or side of the couch. The carbon fiber couch uses four plastic blocks using t-bolts and wing nuts, or to couch rails using four plastic rail blocks specific to the couch with t-bolts and wing nuts. The chair front is designed to be referenced to the table edge or to the table rail for reproducibility. The chair back is then secured to the chair base with a knob. Once the chair back is secured to the base the chair back can recline to five positive-locking positions between -5°, 0° and 20° (85° to 110°). The chair back has a carbon fiber grid treatment window with 0.007" thick polyester covering to prevent skin protrusion through the grid. Under the carbon fiber and polyester the dose rate is less than 1 mm of water equivalent build-up.

The Treatment Chair includes a Baseplate with a Round Head Cup and Straps. The straps can be mounted in three different positions over the head (Forehead, Nose or Chin). The Baseplate is typically mounted on the Treatment Chair Back in positions A to M. Positions N to Z are used when the Baseplate is rotated 180 degrees for taller patients. A notch in the Baseplate references the Baseplate location on the Treatment Chair. The Baseplate has two location pins and is secured to the Chair Back with a knob when the location is determined.

The Treatment Chair includes the Arms Down Assembly that consists of two stainless steel L-Bars and Arm Cradles. The L-Bar has vertical markings of 1-15 cm and slides into a locking clamp with rotation indexing of 1-12 locations. The horizontal leg of the L-Bar has 4 hole locations, A-D, for placement of the Arm Cradle. The Arm Cradle is lined with a foam pad.

Optional Items

Item 254-050 The Baseplate for a U-Frame Head Mask accommodates a Silverman Head and Neck Support and a Standard U-Frame Thermoplastic Head Mask. A Spacer is also included if needed. This Baseplate is also notched for position location and has two location pins and is secured to the Chair Back with a knob. The Baseplate is typically mounted to the chair back in positions A to M. Positions N to Z are used when the Baseplate is rotated 180 degrees for taller patients. The Baseplate also has two positions, A and B, for the U-Frame Clamps. 'A' is used when the Baseplate is in the A-M position and 'B' is used when the Baseplate is used in the N to Z positions. Use standard procedure for forming head mask.

Item 254-070 The Arms Up Assembly includes two vertical black posts, adjustable elbow support and handles. Each post is marked R or L indicating chair or patient right or left. Each post has a keyhole slot at the bottom which fits over a pivot pins located at the bottom center on each side of the chair. The post is then secured with a knob into an adjustable sliding lock The Arm posts can be positioned in any of 6 anterior positions, indicated by the markings of 1-6 on the side of the chair and locked with a knob. The elbow support and handles can be moved vertically to fit the patient. The elbow support can be indexed from 0-33 cm and the handles can be indexed from 1-35 cm.

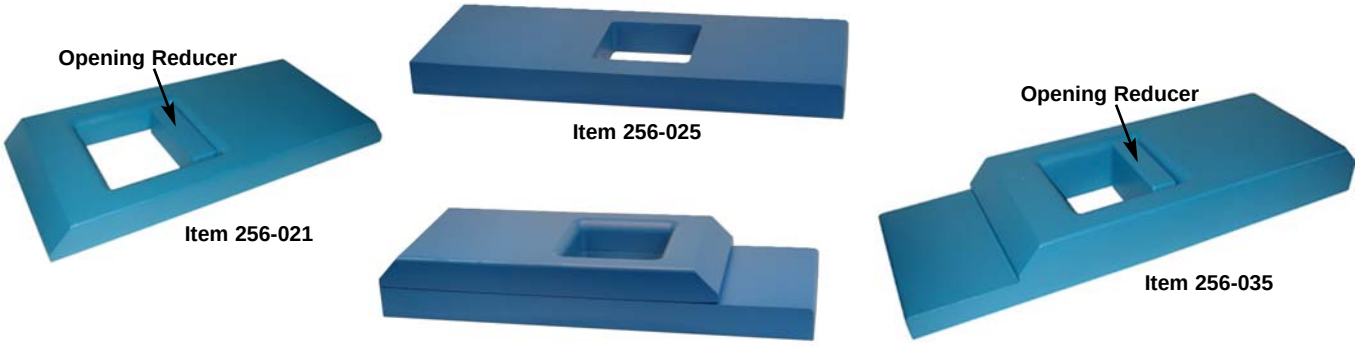
Specifications

Back Opening: 20" Wide x 24.5" High (508 x 622 mm)
Polyester covering Thickness: 0.007" (0.1778 mm)
Surface Exposure at 6 MV: No reading was obtained under the polyester only. Under the carbon fiber and polyester the dose rate is less than 1mm of water equivalent build-up.
Seat Size: 25" Wide x 17.5" Deep (635 x 444 mm)
Chair Base Weight: 28 lb (12.7 kg)
Weight with Chair Back and Arm-Down Supports: 47 lb (21.3 kg)
Total Weight with All Parts: 57 lb (25.9 kg)

Item #	Description
254-000	Treatment Chair

Item #	Optional Accessories
254-050	Baseplate for U-Frame Head Mask
254-070	Arms Up Assembly

BELLY BOARDS



Item 256-021
Shown with Item 256-025

A Belly Board is used to allow the intestinal tract to drop out of the treatment field. Treatment through the foam material has a low absorption of the beam. This unit is made of lightweight, non-breakable high density foam and is coated with a durable blue finish for easy cleaning. The light weight allows for easy handling of the Belly Board. The soft flexible surface provides patient comfort and helps retain excellent body positioning. The bottom surface is anti-skid on treatment and simulator couches. The Belly Board includes one opening reducer that when placed in the opening makes the size of the opening smaller.

A new option is Item 256-025, the Belly Board Thickness Increaser. This Belly Board Thickness Increaser can be placed under the Small Belly Board, Item 256-021; to increase the thickness of the combined Belly Boards to 8" (20.3 cm) The Belly Board Thickness Increaser has the same size opening as the Small and Large Belly Boards and has the same width and length as the Large Belly Board.

When the EXACT Enhance Bar (Item 244-250) is attached to the Belly Board with the Glue Dots (Item 244-255), the belly board can then be indexed using a Lock-Bar or a similar bar. This will allow positioning the belly board in the same position daily.

Cleaning Instructions: Soap and Water, 50/50 Bleach / Water or an ammonia solution can be used.

Efficacy of a Belly Board device with CT-Simulation in Reducing Small Bowel Volume Within Pelvic Irradiation Fields. By Indra J. Das, Ph.D., Int. J. Radiation Oncology Biol. Phys.., Vol. 39, No. 1, pp 67-76, 1977

Specifications

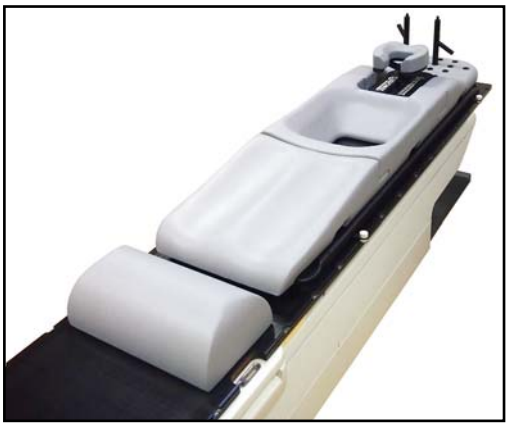
Item 256-021 Belly Board, Small
Material: Foam
Density: 0.03g/cm^3
Opening: 12 1/4" W x 13 3/8" L (31 x 34 cm)
Blue Reducer: 11.8" W x 3.23" L x 4" T (30 x 8.2 x 10 cm)
Overall Size: 20" W x 46" L x 4" T (50.8 x 117 x 10 cm)
Weight: 6 lb (2.7 kg)

Item 256-025 Belly Board, Thickness Increaser
Material: Foam
Density: 0.03g/cm^3
Opening: 12 1/4" W x 13 3/8" L (31 x 34 cm)
Overall Size: 20" W x 58" L x 4" T (50.8 x 147 x 10 cm)
Weight: 8 lb (3.6 kg)

Item 256-035 Belly Board, Large
Material: Foam
Density: 0.03g/cm^3
Opening: 12 1/4" W x 13 3/8" L (31 x 34 cm)
Blue Reducer: 11.8" W x 3.23" L x 7" T (30 x 8.2 x 17.8 cm)
Overall Size: 20" W x 58" L x 7" T (50.8 x 147 x 17.8 cm)
Weight: 14 lb (6.4 kg)

Item #	Description
256-021	Belly Board, Small
256-025	Belly Board, Thickness Increaser for 256-021
256-035	Belly Board, Large
244-250	EXACT Enhance Bar
244-255	Glue Dots, 1000/Pkg

PELVIS BELLY PLUS SYSTEM



269-655

269-630

269-620

The new generation of the Pelvis Belly Plus System comfortably positions patients, while achieving greater bowel displacement. The system is also easily transportable and provides every patient with the highest level of comfort.

Simplicity In Use

- **Lightweight radiolucent T-form multi-treatment base, compatible with the Prone Breast System, makes owning both more economically feasible**
- **Single lower extremity pad, with sculpted leg and thigh cushioning, provides greater support and comfort**
- **Easily transportable and lightweight therapist-friendly device, which makes it easy to transport from the simulation room to the treatment room**

Dose Delivery

- **Proprietary multi-layered variable density foam pad set makes setup accurate and reproducible, while keeping patients comfortable**

Comfort

- **Dual foam, massage-style face cushion aides in patient comfort**
- **Small and medium abdominal inserts accommodate a wide range of patient sizes, with an optional large abdominal insert package**

The Prone Belly Plus System will not accommodate thermoplastics.

System includes:
Multi-treatment Base
Pelvis Belly Pad Set
Prone Face Cushion
Handles
Small Abdominal Insert
Mediuim Abdominal Insert

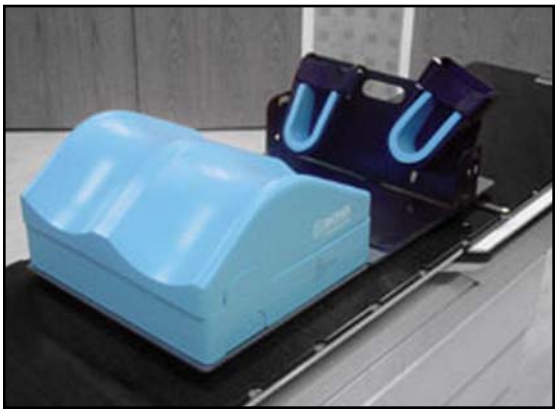
The Pelvis Belly Plus Pad set can be used without the Multi-treatment base.

MR Compatible

Made in the U.S.A.

Item #	Description
269-650	Pelvis Belly Plus System
269-461	Disposable Face Covers, 50/pkg
269-630	Pelvis Belly Pad Set
269-620	Prone Breast Pad Set
269-625	Low Profile Prone Breast Pad Set
269-655	Large Abdominal Insert

COMFORT HOLD™ THIGH AND FOOT POSITIONER



- **Foam construction for leg comfort**
- **Carbon fiber foot board construction for strength**
- **Natural positioning of feet reducing leg fatigue**
- **Removable foot cup pads to accomodate shoes-on and shoes-off treatment preferences**
- **Attaches to most couch tops using SecureFit™ Lockdown Bars (Items 262-190 to 262-199)**

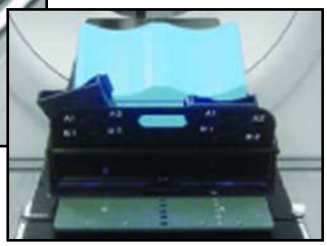
The Comfort Hold™ Thigh and Foot Positioner offers multiple indexing options, providing one of the most easily customized devices on the market. The Comfort Hold™ Thigh and Foot Positioner can be purchased as a system or individual units.

Item #	Description
256-260	ComfortHold™ Thigh and Foot Positioner

COMFORT HOLD™ FOOT POSITIONER

- **Foam-lined foot cups provide addtional comfort**
- **Multiple indexing locations allowing the foot plate to move superior or inferior to the patient in the supine position**
- **The vertical foot plate has the option of postioning 5° slightly forward or at an outward angle of 22.5° for comfortable foot flexion**
- **Two options for height adjustments and a straight or a splayed angle of 20° for the feet**
- **Removable foot cup pads to accommodate shoes-on and shoes-off treatment preferences**
- **Attaches to most couch tops using SecureFit™ Lockdown Bars (Items 262-190 to 262-199)**

Item #	Description
256-262	ComfortHold™ Foot Positioner



Back of ComfortHold™ Foot Positioner featuring indexing options

COMFORT HOLD™ THIGH POSITIONER

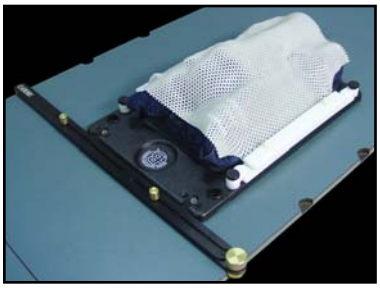
Shown without Riser

Shown with 3" (7.62 cm) Riser

- **Constructed from a comfortable foam for increased patient comfort**
- **Consists of a dual channel riser to support the legs at a 115° bend at the knee**
- **3" (7.62 cm) removable riser for multile height options**
- **Attaches to most couch tops using SecureFit™ Lockdown Bars (Items 262-190 to 262-199)**

Item #	Description
256-264	ComfortHold™ Thigh Positioner

T-FORM™ EXTREMITIES IMMOBILIZER SYSTEM



The T-Form Extremity Positioning System provides stability, comfort, high precision and the ability to conform to different anatomical tumor locations that vary in size and shape. The T-Form Extremity Immobilizer System significantly reduces patient setup time, improves systematic setup uncertainty, and allows for a reduction of the planning target volume for the treatment of extremity soft tissue sarcomas.

Item 255-600 T-Form Extremities Immobilizer System Includes

- T-Form Extremities Base
- Set of Thermoplastic Handles
- Lockdown Bar Slider Attachment (attaches to existing Lockdown bars)
- Two Extremities SecureVac Cushions
- Four Extremities Thermoplastic Sheets

D

- **Durable, Light-Weight, Radiolucent T-Form Base Plate**
- **System Specific thermoplastic and reusable thermoplastic handles**
- **Specific Thermoplastic Sheets with Reusable Handles**
- **Specific SecureVac™ Cushions**
- **SecureFit™ Bar with Sliding Attachment Enables Device to be Positioned and Indexed Anywhere on the Treatment Couch Top**
- **Locks Down to Most Couch Tops Using SecureFit™ Lockdown Bars (Items 262-190 to 262-199)**

MR Compatible

Item#	Description
255-600	T-Form Extremities Immobilizer System

Item	Accessories
EMRT-8430	Embrace™ Extremity Thermoplastic Sheet
255-604	Additional Thermoplastic Handles
255-606	SecureVac™ T-Form Extremities Cushion

BIONIX SECUREFIT™ BARS

The SecureFit™ Bar and the SecureFit™ Sliding Bar lock down to the Varian Exact Couch. Lock down bars for most other couches are also available. This positioning aid will help with exact and precise positioning throughout the entire treatment. A variety of SecureFit™ Bars index Bionix positioning devices to the couchtop.

Specifications

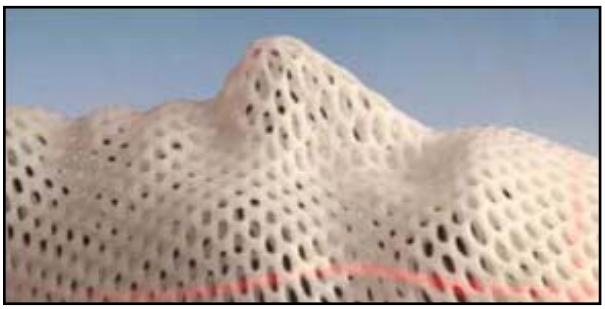
Item 262-190 Varian EXACT Couch
Thickness: 0.25" (0.6 cm)

Item 262-193 Varian EXACT, Sliding Bar II
Thickness: 0.125" (0.3 cm)

CE

Item #	SecureFit™ Lockdown Bar	Material
262-190	Varian EXACT Couch	Aluminum
262-191	Slider Attachment	Aluminum
262-192	Siemens Couch	Aluminum
262-193	Varian EXACT, Sliding Bar II	Aluminum
262-195	Varian EXACT	Carbon Fiber
262-196	Elekta Couch	Aluminum
262-197	Phillips Couch	Aluminum
262-198	GE Couch	Aluminum
262-199	Nucletron Couch	Aluminum

AQUAPLAST RT®

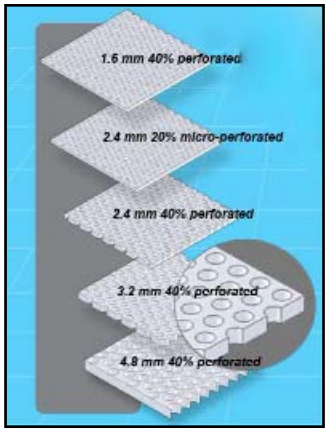


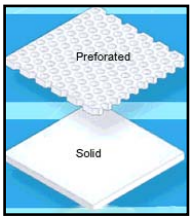
Aquaplast is available in two thicknesses (2.4 mm and 3.2 mm), and a variety of perforation patterns. The standard perforation pattern has a 40% open area. Also available is a 20% open (micro-perforated) pattern for certain applications. These percentages are appoximate and vary based on sheet thickness.

The consistent perforation pattern without solid areas results in a uniform shrinkage, forming a snug but comfortable mask without the bolus effect often associated with solid thermoplastics.

Specifications

Color: Ivory



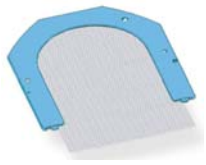


Item	Perforated Aquaplast Sheets	Size	Thickness
RT-1684P	Prepunched for U Frame	9" x 12" (23 x 30.5 cm)	1.6 mm
RT-1781P	Prepunched on 9" (23 cm)	9" x 10" (23 x 25.5 cm)	2.4 mm
RT-1782	Unpunched	18" x 24" (46 x 61 cm)	2.4 mm
RT-1782P18	Prepunched on 18" (46 cm)	18" x 24" (46 x 61 cm)	2.4 mm
RT-1783P3	Prepunched on 12" (30.5 cm)	12" x 18" (30.5 x 46 cm)	2.4 mm
RT-1784	Unpunched	24" x 36" (61 x 91.75 cm)	2.4 mm
RT-1788	Unpunched	9" x 12" (23 x 30.5 cm)	2.4 mm
RT-1788P	Prepunched on 9" (23 cm)	9" x 12" (23 x 30.5 cm)	2.4 mm
RT-1891P	Prepunched on 9" (23 cm)	9" x 10" (23 x 25.5 cm)	3.2 mm
RT-1892	Unpunched	18" x 24" (46 x 61 cm)	3.2 mm
RT-1896	Unpunched, Less stretch	24" x 36" (61 x 91.75 cm)	3.2 mm
RT-1898P	Prepunched on 9" (23 cm)	9" x 12" (23 x 30.5 cm)	3.2 mm

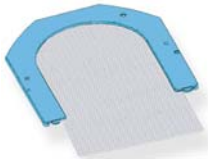
Item	Solid Aquaplast Sheets	Size	Thickness
RT-1722	Unpunched	18" x 24" (46 x 61 cm)	2.4 mm
RT-1724	Unpunched	24" x 36" (61 x 91.75 cm)	2.4 mm
RT-1822	Unpunched	18" x 24" (46 x 61 cm)	3.2 mm
RT-1824	Unpunched	24" x 36" (61 x 91.75 cm)	3.2 mm

AQUAPLAST TRADITIONAL U-FRAMES

Traditional Standard Mask



Traditional Extended Mask



Traditional Long Mask

Item	Traditional U-Frames	Thickness	Quantity
RT-1679	Standard Mask	1.6 mm	5
RT-1779	Standard Mask	2.4 mm	5
RT-1889	Standard Mask	3.2 mm	5
RT-1989	Standard Mask	4.8 mm	4

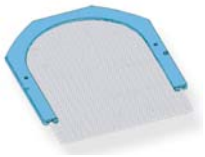
Item	Traditional U-Frames	Thickness	Quantity
RT-1679X	Extended Mask	1.6 mm	5
RT-1779X	Extended Mask	2.4 mm	5
RT-1889X	Extended Mask	3.2 mm	5
RT-1989X	Extended Mask	4.8 mm	4

Item	Traditional U-Frames	Thickness	Quantity
RT-1679L	Long Mask	1.6 mm	5
RT-1779L	Long Mask	2.4 mm	5
RT-1889L	Long Mask	3.2 mm	5

AQUAPLAST SLIMLINE U-FRAMES

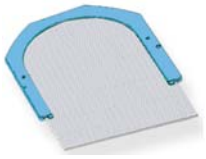
Slimline Standard Mask

Item	Slimline U-Frames	Thickness	Quantity
RT-1679S	Standard Mask	1.6 mm	5
RT-1779S	Standard Mask	2.4 mm	5
RT-1889S	Standard Mask	3.2 mm	5
RT-1989S	Standard Mask	4.8 mm	4



Slimline Extended Mask

Item	Slimline U-Frames	Thickness	Quantity
RT-1679SX	Extended Mask	1.6 mm	5
RT-1779SX	Extended Mask	2.4 mm	5
RT-1889SX	Extended Mask	3.2 mm	5



Slimline Long Mask

Item	Slimline U-Frames	Thickness	Quantity
RT-1679SL	Long Mask	1.6 mm	5
RT-1779SL	Long Mask	2.4 mm	5
RT-1889SL	Long Mask	3.2 mm	5
RT-1989SL	Long Mask	4.8 mm	4

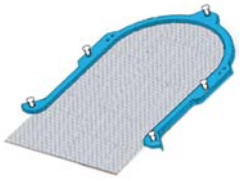
AQUAPLAST HEAD ONLY S-FRAMES

Head Only Standard Mask

Item	Head Only S-Frames	Thickness	Quantity
RT-1679SD	Standard Mask	1.6 mm	10
RT-1779SD	Standard Mask	2.4 mm	10
RT-1889SD	Standard Mask	3.2 mm	10
RT-1989SD	Standard Mask	4.8 mm	4

Head OnlyExtended Mask

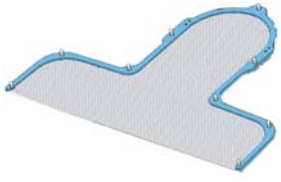
Item	Head Only S-Frames	Thickness	Quantity
RT-1679SDX	Extended Mask	1.6 mm	10
RT-1779SDX	Extended Mask	2.4 mm	10
RT-1889SDX	Extended Mask	3.2 mm	10



Head Only Long Mask

Item	Head Only S-Frames	Thickness	Quantity
RT-1679SDL	Long Mask	1.6 mm	10
RT-1779SDL	Long Mask	2.4 mm	10
RT-1889SDL	Long Mask	3.2 mm	10
RT-1989SDL	Long Mask	4.8 mm	4

AQUAPLAST HEAD AND SHOULDERS S-FRAMES



Head and Shoulder Standard Mask

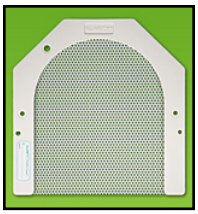
Item	Head and Shoulders S-Frames	Thickness	Quantity
RT-1682SD	Standard Mask	1.6 mm	10
RT-1782SD	Standard Mask	2.4 mm	10
RT-1882SD	Standard Mask - Less Stretch	3.2 mm	10
RT-1892SD	Standard Mask	4.8 mm	10

KLARITY® U-FRAME MASKS

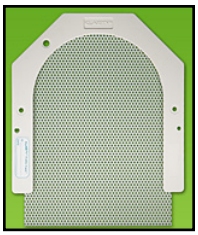
- **Low Melt Temperature: Reduces set-up time and shrinkage for maximum patient comfort**
- **Extended Molding Time: Allows for longer manipulation time**
- **Smooth Edge Comfort Design: Reduces discomfort around the neck line**
- **Low Profile Frame: More beam angles can be utilized**
- **ID Label**
- **Fit most head and neck boards in the industry**

Item KLRT-450U Klarity® ContourFrame™ (9" x 10", 2.4 mm)
- Reinforced nose for added rigidity
- Contoured, perforated patch pattern for easier breathing and increased comfort for the eyes and mouth

Item KLRT-430UC Klarity® EzeFrame™ (9" x 10", 3.2 mm)
- Thicker for a more rigid mold
- Smooth edge comfort design exclusively



Item KLRT-430W Klarity® ProfileFrame™ (10" x 10", 3.2 mm, 42% Perforation)
- Narrow frame and more thermoplastic



Item KLRT-431W Klarity® ProfileFrame™ (10" x 12", 3.2 mm, 42% Perforation)
- Narrow frame and more thermoplastic
- Extended length

D

Item #	Klarity® Disposable Masks	Thickness	Size	Perforation	Quantity
KLRT-420W	Profile Frame™	2.4mm	10" x 10"	36%	12
KLRT-421W	Profile Frame™ Extended Length	2.4mm	10" x 12"	36%	12
KLRT-450U	Contour Frame™	2.4mm	9" x 10"		12
KLRT-430UC	EzeFrame™	3.2mm	9" x 10"		12
KLRT-430W	Profile Frame™	3.2mm	10" x 10"	42%	12
KLRT-431W	Profile Frame™ Extended Length	3.2mm	10" x 12"	42%	12

Used with All Bionix Standard Headboards and Most Other Headboards

KLARITY® S-FRAME MASKS

Item KLRT-461S
S-Frame, Head/Shoulder

- **Transmission factor is less than carbon fiber**
- **Easy-to-use push/pull expansion knob system**
- **Thermoplastic has minimal shrinkage**
- **Will not stick to the board or patients' clothes**
- **Low melt temperature**
- **Long melting period**

The S-Frame thermoplastic line was designed to offer dependable immobilization for the S-Frame system. Includes Push Pins.

Item #	Klarity® S-Frame Disposable Masks	Thickness	Perforation	Quantity
KLRT-461S	Head/Shoulder	3.2 mm	42%	6
KLRT-461SH	Head Only	3.2 mm	42%	6
KLRT-464S	Reinforced Head/Shoulder	3.2 mm		6
KLRT-464SH	Reinforced Head Only	3.2 mm		6

Used with the S-Type Boards for Head and Neck IMRT

KLARITY GREEN® THERMOPLASTIC MASKS

- **Least shrinkage of all leading thermoplastic masks**
- **50% longer working time for detailed, better-fitting masks**
- **100% non-stick surface when heated**
- **Low working temperature 160°-165° F**
- **Stronger than traditional RT thermoplastics**
- **Ultra-secure reinforcing perforation pattern**
- **Use with standard U-Frame systems from CIVCO, Klarity, WFR/Qfix, Bionix and others**

The Karity Green® themoplastic masks fit on most major manufacturer's headboards and S-frame systems. Klarity Green® thermopastic material does not stick to itself and has a longer working time than other thermoplastic material.

KLARITY® U-Frame Masks with KLARITY GREEN™ Thermoplast

KLRG-420W

- Superior U-Frame Head Mask for Standard Headboards
- Lowest shrinkage of all leading thermoplastic masks
- Wider Clearance for all head sizes
- 100% non-stick surface when heated
- Fits All Standard U-Frame BasePlates
- Stronger than traditional RT white thermoplastics

Item #	Klarity Green® ProfileFrame™ U-Frame	Thickness	Size	Perforation	Quantity
KLRG-420W	ProfileFrame™	2.4 mm	10" x 10"	36%	12
KLRG-421W	ProfileFrame™, Extended Length	2.4 mm	10" x 12"	36%	12
KLRG-430W	ProfileFrame™	3.2 mm	10" x 10"	42%	12
KLRG-431W	ProfileFrame™, Extended Length	3.2 mm	10" x 12"	42%	12

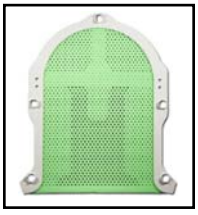
Used with All Standard Headboards

KLARITY GREEN™ IMRT Masks

KLRG-430-1W

KLRG-464-1W

Item #	Klarity Green® IMRT U-Frames	Thickness	Quantity
KLRG-430-1W	Reinforced Head Only Mask	3.2 mm	12
KLRG-464-1W	Reinforced Head Only Mask, Extended Neck	3.2 mm	12

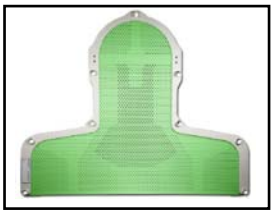


KLRG-461-4SHT

KLRG-461-5SHT

- **T-Lok™ pin design for easy on/off and less breakage**
- **Use with standard S-Frame systems from CIVCO, Klarity, WFR/Qfix and others**
- **Includes Push Pins**

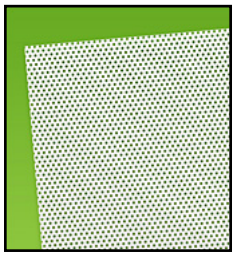
Item #	Klarity Green® IMRT S-Frames	Thickness	Quantity
KLRG-461-4SHT	Reinforced Head Mask	3.2 mm	6
KLRG-461-4ST	Reinforced Head/Shoulder Mask	3.2 mm	6
KLRG-461-5SHT	Reinforced Head Mask, Extended	3.2 mm	4



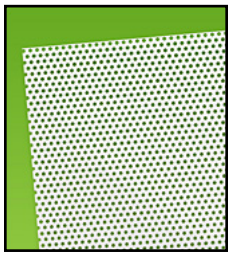
KLRG-461-4ST

KLARITY-R™ THERMOPLASTIC SHEETS

KLRT-224C



KLRT-224D



KLRT-324D

Klarity-R™ Low-Temperature Thermoplastic Sheets are designed for Radiation Oncology Patient Stabilization and Mask applications. Klarity-R™ is specially formulated for ease of molding directly on the patient. After molding Klarity-R™ has minimal shrinkage and excellent rigidity...designed for maximum patient comfort and positioning accuracy.

Klarity-R™ is available in sheets and various pre-cut patterns. Perforations and sizes conform to standard frames and positioning systems from Bionix, Civco, Orfit, Q-fix and others.
If size needed is not listed below please contact Radiation Products Design.

Item #	Klarity-R™ Thermoplastic Sheets	Thickness	Size	Perforation	Quantity
KLRT-224C	Solid, Punched on 18"	2.4 mm	18" x 24"		1
KLRT-224D	Perforated, Punched on 18"	2.4 mm	18" x 24"	36%	1
KLRT-324C	Solid, Punched on 18"	3.2 mm	18" x 24"		1
KLRT-324D	Perforated, Punched on 18"	3.2 mm	18" x 24"	42%	1

Used with the Pelvis Belly Board Plus, Prone Breast Board, and Max3 BreastBoard

UNLIMITED SCISSORS

The Unlimited Scissors cuts through softened or unsoftened thermoplastics with powerful leverage. The flexible, non-slip handles provide a comfortable grip for right or left hands.

Item #	Description
RT-4932	Unlimited Scissors

SOFTSTRIPS™ COVERS

- **Split backing for quick and easy applicaion**
- **0.5" (1.27 cm) separated lateral slits for curved edges**
- **Cushioned for patient comfort and safety**
- **Rugged for use during entire duration of treatment**

SoftStrips™ Covers are cushined 1" wide (2.54 cm) adhesive tape designed to bring comfort to the patient from the sharp jagged edges created from holes cut out of thermoplastic masks. SoftStrips™ Covers have a convenient split backing enabling therapists to easily apply this cushy tape to the thermoplastic mask.

SoftStrips™ Covers have lateral slits every 0.5" (1.27 cm) to allow for easy adhesion around bends and curves. The SoftStrips™ adhesive is designed to remain on the thermoplastic mask for the duration of treatment, up to 8 weeks. They are perfect for covering the area around the holes for eyes, nose, and mouth

Item #	Description	Size
253-300	SoftStrips™ Covers	144" L x 1" W (366 x 2.54 cm)

DIGITAL THERMOPLASTIC WATER BATH

Lift Up Drain Tray

- **Lift Up Drain Tray for Easy Removal of Thermoplastic**
- **Water Temperature Stability ± 2°**
- **Microprocessor Proportional-Integral-Derivative (PID) Temperature Control**
- **"J" Thermocouple**
- **Open Thermocouple Sensor Will Shut Unit Down**
- **Temperature Displayed in Fahrenheit or Celsius**
- **Easy View Side Panel Controls**
- **Control Panel is Customer Removable**
- **Timer with Three Second Bell Ring**
- **Cover is Cool to the Touch**
- **Hinged or Removable Cover**
- **Exterior Stays Cool Even After Hours of Operation**
- **Heating Elements will not Burn Out if Thermoplastic Water Bath Accidentally Runs Dry**
- **Over Temperature Bi-Metal Disc Thermostat**
- **Large Drain and Hose**
- **Easy to Clean**
- **Stainless Steel Corrosion-Resistant Interior and Exterior**

The Digital Thermoplastic Water Bath has a spacious interior to accommodate radiation therapy thermoplastic masks, hip molds and splinting sheets up to 21" x 25" (53 cm x 63 cm). The insulated stainless steel lid is functionally designed to open completely with just one hand, leaving the other hand free. Or, the rod hinge can be removed so the cover can be completely removed and placed on a shelf under the unit. This will allow the unit to sit on a counter with over the counter cabinets. The rugged design makes it universally ideal for clinical use. It features polished stainless steel housing, an insulated stainless steel cover and a side mounted, easy to view control panel.

The EZ-Zone® Digital PID Temperature Controller has two digital readouts, temperature and set point. It can maintain water at controlled temperatures between 100°F to 190°F (38°C to 88°C). The heating element provides even water temperatures throughout the entire unit.

An 8' (2.4 m) AC Cord with grounded hospital grade plug is standard. The units are constructed with a bottom drain for easy water removal and cleaning. Included is a 5' (1.5 m) vinyl drain hose that attaches to the side drain hose barb fitting and ball valve.

All units need special plugs and receptacles depending on the country. The temperature displayed is set to Fahrenheit at the factory; however, this can be changed to Celsius by the end user. All units are single phase, 50/60 Hz.

Item 278-120 and 278-240 also includes

- Perforated Stainless Steel Lift Tray
- Tray Lift Cable
- Netting, Plastic Liner for Perforated Stainless Steel Tray Mesh Liner Nylon
- Push-in Pins, Ribbed Push-in Pin

Specifications

Water Temperature Range: 100 to 190°F (37° to 88°C)
Temperature Accuracy: ± 2°
High Limit Temperature: 190°F or 88°C
Temperature Controller Type: PID
Thermocouple: J
Mechanical Timer: Up to15 Minutes with a 3 Second Bell Ring
Power Source: 120 VAC 12 Amps 1480 Watts and 200/240 VAC 6.25/7.5 Amps, 1250/1800 Watts
Line Frequency: 50-60 HZ
Electronic Switching: Triac with Zero Crossover Switching
On/Off Switch: 20 Amp, Waterproof
Fused: Two Fuses for AC Lines
Power Cord: 8' (2.4 m) 3 Wire, 300 Volt, SJT, with Hospital Grade Plug
Over Temperature: 212°F Bi-Metal Disc Thermostats
Drain: Ball Valve with Hose Barb
Drain Hose: 3/8" ID x 5' (1 cm x 1.5 m)
Thermoplastic Water Bath
Insulated Cover: Lift Up or Removable, Stainless Steel
Cover Clearance: 35" W x 32" D x 32" H (89 x 81 x 81 cm)
Interior Dimension: 25" L x 21" W x 5" D (63 x 53 x 12 cm)
Interior Material: Stainless Steel
Depth Markings Inside: 2", 3" and 4" (5, 7.6, and 10 cm) Indentations
Exterior Dimensions: 35" L x 25" W x 8.5" D (89 x 64 x 22 cm)
Exterior Material: Stainless Steel
Water: Use Distilled or Filtered to Prevent Mineral Deposits from Forming In Thermoplastic Water Bath

Item	Digital Thermoplastic Water Bath
278-120	120 VAC, 1480 W, 12 Amps
278-240	200/240 VAC, 1250/1800 W, 6.25/7.5 Amps

All Units's are single phase, 50/60 Hz.

Item #	Optional
640-040	BKF Cleanser and Polish for Stainless Steel
640-044	Liquid Cleaning Polish Conditioner for Stainless Steel
640-048	LIME-A-WAY, Lime, Calcium and Rust Remover
878-160	Scotch-Brite Cleaning Pads, 10/Pkg

DIGITAL THERMOPLASTIC WATER BATH

Shown with Netting (Item 278-129)

The Digital Thermoplastic Water Bath is capable of handling the largest head and shoulder splints in the industry. The water bath features a hinged lid opening in four positions. This design is ideal when the unit is placed on a counter and under overhead cabinets. The Digital Thermoplastic Water Bath delivers precise temperatures within ±1 degree. This unit is configured for 220 V electrical requirements.

An optional item for the water bath is the Netting Frame Assembly (Item 278-129). This assembly allows for lifting the frame out of the water without reaching into the water or using tongs.

Specifications

Overall Dimesnions: 33" W x 26" L x 8" H (83.8 x 66 x 20.3 cm)
Inside Dimensions: 26" W x 22" L x 5" H (66 x 55.9 x 13 cm)
Temperature Range: 155°F to 175°F(68°C to 79°C)
Electrical: 220 VAC, 1480 Watts, 7 Amps
Plug: Hospital Grade Power Cordset
UL and CE Marked

Item	Description
278-248	Digital Thermoplastic Water Bath, 220 VAC, UL & CE
278-129	Netting Frame Assembly

Single Phase, 50/60 Hz

D

THERMOPLASTIC WARMING PAN

- **Unique "serpentine shaped" heating element that evenly distributes heat throughout the unit.**
- **Provided with insulation to protect interior parts and countertops from heat build-up**
- **Unit is designed to be used with water, but will not be damaged if runs dry**
- **Steel "element support" stabalizes heating elements and reflects heat to pan**
- **All stainless steel well pan and housing**
- **Heavy-duty wiring extends element life**
- **Infinite temperature control**
- **Constructed with heavy duty stainless steel for excellent durability**
- **Interior liner formed out of tough stainless steel**
- **Certified by the following agencies: CE, UL & UL (Sanitation Classified, CSA)**

Each unit is equipped with a 60" (152.4 cm), three wire grounded power cord which terminates with a standard three pronged male plug. The 120V unit uses a NEMA 5-15P plug.

Specifications

Inside Dimensions: 19 5/16" L x 11 5/16" W x 6 1/4" H (49 x 28.7 x 15.8 cm)
Overall Dimensions: 22 1/2" L x 14 1/2" W x 9" H (57 x 36.8 x 22.8 cm)
Electrical: 120 V, 1200 watts, 10 amps.
Temperature Range: 90° to 190°F (32° to 88°C)
Weight: 30 lb (13.7 kg)

CE

Item #	Description
278-001	Warming Pan
278-002	Hinged Flat Cover for Warming Pan

THERMOPLASTIC ELECTRIC HEATING PAN

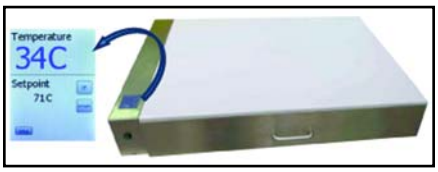
- **Tempered glass cover**
- **Cast aluminum base**
- **Nonstick surface, inside & out**
- **Fully immersible and dishwasher safe with heat control removed**
- **One year limited warranty**

Specifications

Overall Dimensions: 23" W x 13" D x 9" H (58.4 x 33 x 22.9 cm)
Inside Dimensions: 16" W x 12" D x 2" H (40.6 x 30.5 x 5 cm)
Power: 120 VAC, 1500 Watts
UL Listed

Item #	Description
278-051	Thermoplastic Electric Heating Pan

DRY HEAT CONVECTION OVEN



Unlike water baths that require tending, filling and run the risk of spillage, the oven softens thermoplastic materials used for fixation in radiation therapy to its optimal elasticity with safe, dry heat. It eliminates liquid hazards and ensures maximum comfort during application to the patient.

The dry-heat system meets today's need for universal precautions to reduce cross-contamination during patient care.

The digital temperature control makes it easy to select the setting to warm thermoplastic material to its proper consistency and keep it viable until you are ready to use it. Thermoplastic will be ready to use in 8-15 minutes (depending on the size of the material and whether it is framed or unframed).

The insulated case and space-saving compact design is perfect even for the most crowded department. The easy-sliding drawer opens fully to provide maximum access to the material.

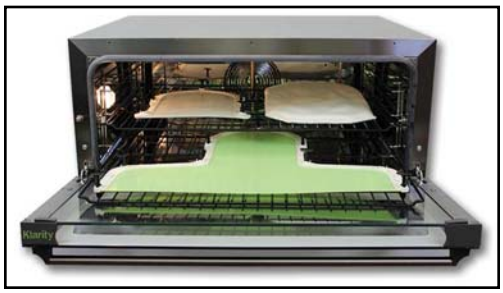
- **Space-saving compact design**
- **Non-stick surface**
- **Insulated case**
- **Dry heating eliminates the inconveniences of using water**
- **Digital temperature setting in Celsius or Fahrenheit**
- **Auto shut-down after 2 hours – Turns off after 6 hours.**
- **3" Touch Display for temperature adjustment**
- **Heat circulation, convection principal**

Specifications

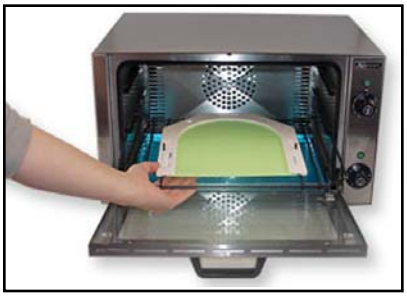
Outside Size: 31" W x 23" D x 5.5" H (79 x 58 x 13 cm)
Voltage: 120 Volt
Finish: Beige baked enamel (on cold rolled steel), stainless steel trim
Weight: 47 lb (21 Kg)

Item #	Description
278-007	Dry Heat Convection Oven

DIGITAL THERMOPLASTIC WATER BATH



278-510



278-520

- **Simple and easy to use**
- **Water-free**
- **Signifi cantly reduced risk of bacterial infection**
- **Oven warms up quickly**
- **Non-stick surface**
- **Easy to clean**

Klarity ovens are a simple and easy to use heating method for all thermoplastic masks, cushions and other devices. Klarity oven dry-heat systems meet today's need for extra precautions to reduce cross-contamination during patient care. By using convection heat to prepare thermoplastics, we have removed the need for water baths, mitigating the risk of bacterial infection. The result is a safer, more effective heating method.

Klarity ovens heat up in minutes, and can be used with all standard thermoplastics. Non-stick Teflon racks allows masks to be placed directly on the rack for easy preparation. Temperatures can be adjusted to Fahrenheit or Celsius, and all ovens have built-in timers. Thermoplastics come out of the oven completely dry and ready to be formed.

Item 278-510
The Klarity AirFlow™ Oven is our most advanced and efficient dry heating option. The oven heats masks quickly, comparable to traditional preparation times. The oven features two shelves allowing multiple thermoplastic devices to be prepared simultaneously.

Item 278-520
The Klarity Mini Oven is an economical and easily transportable dry heat option. For Head Mask preparation and Small and Medium AccuCushion preparation only.

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Item 278-510
Inner Dimensions: 25" x 19" x 10" (64 x 78 x 25 cm)
Outer Dimensions: 31.5" x 17" x 30. 5" (80 x 43 x 77 cm)
Finish: stainless steel
Weight: 88 lb (40 Kg)
Voltage: 110V

Item 278-520
Inner Dimensions: 15" x 12" x 10" (38 x 30.5 x 25 cm)
Outer Dimensions: 21" x 19" x 13" (53 x 48 x 33 cm)
Finish: stainless steel
Weight: 34 lb (15.5 Kg)
Voltage: 110V

Item #	Description
278-510	Klarity AirFlow™ Oven, 110V
278-520	Klarity Oven-Mini, 110V

SECUREFOAM™

- **Maintains shape longer than the other two-part foams.**
- **Reimbursable as a complex treatment device.**
- **Simple & cost effective method of customized repositioning.**
- **Patient comfort liners are also available.**
- **Available in 3 volumetric sizes to meet your patient positioning needs.**

SecureFoam™ is a two-part foaming agent developed to immobilize patients during radiation therapy treatment. SecureFoam™ offers the ability to quickly create an inexpensive, customized positioning device.

SecureFoam™ is available is three sizes to meet all of your needs: small, for pediatrics and small anatomical areas; medium, "ideal size" for breast and lung set-ups; and large, for large anatomical areas.

Each package contains:
(1) 2 part foaming agent (A & B)
(1) Large containment bag

Shelf Life: 6 Months

Item	SecureFoam™	Quantity
244-500	Small	10/Pkg
244-502	Medium	10/Pkg
244-504	Large	10/Pkg

SECUREVAC™ CUSHIONS

- **Constructed from thick nylon for a durable, rigid mold**
- **Maintains form for an entire 6 to 8 week treatment cycle**
- **Includes dual check valve and hose clamp to reduce leakage**
- **Adapts to industry standard pumps**
- **Able to lock down to most couch tops**

Bionix SecureVac™ vacuum cushions are durable, accurate and cost-effective. They are reusable and airtight, filled with small polystyrene spheres to immobilize the patient. SecureVac™ cushions feature a stonger nylon material to prevent punctures and leaks.

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Item #	SecureVac™	Size	Liter Fill
244-400	Cushion	50 x 20 cm	2.25
244-402	Head and Shoulder	65 x 67 cm	10
244-404	Cushion	70 x 50 cm	15
244-406	Cushion	70 x 70 cm	20
244-408	Cushion	100 x 70 cm	30
244-410	Cushion	100 x 70 cm	35

Item #	SecureVac™	Size	Liter Fill
244-412	Cushion	100 x 100 cm	50
244-414	Body Cushion	150 x 70 cm	55
244-416	Cushion	150 x 100 cm	80
244-418	w/25cm² Pelvic Portal	100 x 70 cm	35
244-426	VersaCushion	32 x 15 x 9 cm	2
244-442	Repair Kit		

MULTI-CHAMBER SECUREVAC™ CUSHIONS

- **Built in anti-microbial protection to prevent cross contamination during storage and post patient interation**
- **Long lasting efficacy vs. broad spectrum or micro-organisms**
- **Manufactured using durable materials in our proven standard blue cushions**
- **Exhibits excellent resistance to damage in handling**

The Multi-Chamber SecureVac Cushions are produced using an innovative, patented design that provides therapists with the ability to easily create large full body molds.

Each sequential chamber is formed independently from the other to ensure a custom mold is formed around each patient's anatomical contours. The multi-chamber design also makes it easy to recreate a section without losing the entire mold. The cushions work well with the Bionix Omni V SBRT Patient Positioning System, Butterfy Boards or as an independent patient positioning device.

Item 244-420
SecureVac™ Tri-Vac, 3 Chambered Cushion
The Tri-Vac Cushion is designed for full body immobilization. The cushion has three separate chambers:
- Upper Chamber 60 L x110 W cm, 35L Fill
- Middle Chamber 65 L x 70 W cm, 12L Fill
- Lower Chamber 90 L x 70 W cm, 35L Fill

Item 244-422
SecureVac™ T-Vac, 2-Chambered Cushion
The T-Vac cushion has two separate chambers and is shaped like the letter "T". The shape allows the SecureVac™ Cushion to be a popular choice for immobilizing upper extremities. It works extremely well when utilized with a Butterfly Board.
- Upper Chamber 60 L x 100 W cm, 28L Fill
- Lower Chamber 100 L x 70 W cm, 24L Fill

Item 244-424
SecureVac™ Tri-Vac, 3-Chambered Cushion with Integrated Knee Bolster
The Tri-Vac Cushion with Thigh Bolster is the perfect solution for patients that need extra support under their knees. The built-in wedge can easily be positioned anywhere within the cushions lower chamber.
- Upper Chamber 65 L x110 W cm, 35L Fill
- Middle Chamber 65 L x 70 W cm, 12L Fill
- Lower Chamber 90 L x 70 W cm, 35L Fill
- Built-in wedge 6" L x 18" W (15 x 46 cm)

Item #	SecureVac™
244-420	Tri-Vac, 3 Chambered Cushion
244-422	T-Vac, 2-Chambered Cushion
244-424	Tri-Vac, 3-Chambered Cushion w/Knee Bolster

SECUREVAC™ ACCESSORIES

244-460 and 244-459

The dual action pump with foot controls easily inflates and deflates SecureVac Cushions for easy molding. A hose adapter must be ordered separately to connect the pump to a cushion.

Item #	Description
244-459	SecureVac Dual Action Pump with Foot Pedal, 110V
244-460	SecureVac Dual Action Pump, 110V

Item #	Pump to Cushion Hose Adapter	Length
244-440	Bionix/CIVCO Pump to Bionix Cushion	8' (2.4 m)
244-444	Bionix Pump to VacFix Cushion	8' (2.4 m)
244-446	Bionix Pump to CIVCO Cushion	8' (2.4 m)
244-448	CIVCO Pump to Bionix Cushion	6" (15 cm)
244-450	Central Vac Pump to Bionix Cushions	8' (2.4 m)

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The dual-pronged high-density SecureVac Bar Adapter is perfect for locking down smaller Vacuum Cushions to your couch top. The medium profile offers enough depth for precise reproducibility and localization; and is small enough that it will not be felt by the patient. Simply attach the Bar Adapter to your Lockdown Bar utilizing the locator holes, and then lock the unit down to the couch top as normal.

Item #	Description
244-432	SecureVac™ Bar Adapter

244-434

244-435

Item 244-434 T-Form SecureVac™ Box Adapter
This radiolucent adapter is easy to use and more cost effective than the carbon fiber alternative. This box adapts right on top of a SecureFit Bar which locates on most treatment couches. Place the SecureVac Bag on top of the adapter as you mold. You will utilize the T-Form SecureVac Box Adapter for each subsequent set-up to ensure maximum reproducibility.

Item 244-435 Carbon Fiber SecureVac™ Box Adapter
This carbon fiber adapter is easy to use and very cost effective. This box adapts right on top of the SecureFit™ Bar which locates on the Varian Couch. Place the SecureVac™ Bag on top of the adapter as you mold. After you mold, detach The SecureVac Box Adapter and use again.

Item #	Description
244-434	T- Form SecureVac™ Box Adapter
244-435	Carbon Fiber SecureVac™ Box Adapter

High quality rack available to safely and conveniently store your SecureVac™ cushions. The rack is very mobile and holds up to 7 to 10 bags. S-hooks are also available to hang your SecureVac™ bags for easy handling.

Specifications

Size: 61" L x 23" W x 65" H (155 x 58.5 x 165 cm)

Item #	Description
244-436	Storage Cart for Vacuum Cushions

S Hooks are available to hang your bags. They include plastic-covered tips which protect the bags.

Item #	Description
244-438	“S”- Hooks for Storage Cart, 5/Pkg

VAC FIX SYSTEM

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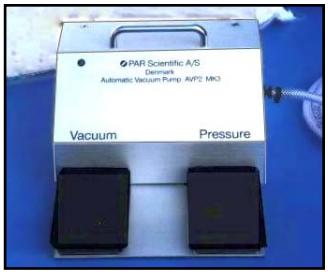
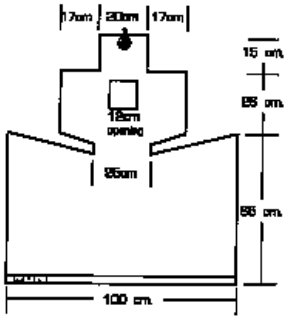
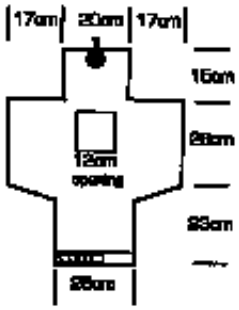
- **Reuseable**
- **Precise**
- **Comfortable**
- **Non-toxic**
- **Fast and easy to use**
- **Maintains shape throughout the 6 week treatment period**
- **Custom shapes and sizes available**



Vac Fix Pump



Type S1



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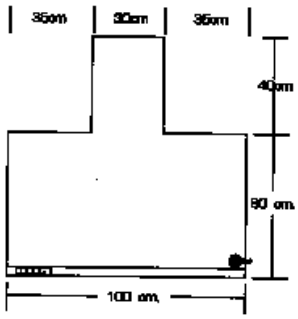
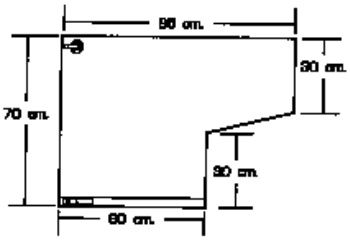


Type S3



Type S4

Save time and money with Vac Fix
The Vac Fix bag consists of an airtight bag filled with small polystyrene spheres. The Vac Fix bags are almost air equivalent and will only increase the build-up effect by a few percent.

The vacuum-based Vac Fix System is fast and comfortable to work with and consists of only a few components. The reusability of the bags combined with the fast and clean fixation gives your department the best cost-benefit ratio. Correction of positioning can be done in a few minutes.

Maximum accuracy
Radiotherapy treatment is moving towards an increased use of multi-fractioned, multi-field and rotational treatment based on sophisticated computer technology. This demands maximum fixation accuracy.

Tests made at several oncology centers have shown that with only a few weeks of practice, the same accuracy in day-to-day reproducibility of positioning can be obtained using the Vac Fix System as with any other fixation system which has been used for years. A standard deviation of the center cross of 1.5 mm was achieved.

Perfect fixation in less than 5 minutes
Place the patient on the air-filled bag in the treatment position, evacuate the bag for a few seconds, mold the bag to the desired shape giving the patient the best fixation and points of support, evacuate the bag until it becomes rigid and you have a perfectly shaped mold cushion in just a matter of minutes.

Vac Fix Pumping Station
The Vac Fix Pumping Station was designed to leave your hands free to mould the Vac Fix Cushions quickly and efficiently.

The Vac Fix Pumping Stations ensures ideal vacuum for firm and stable shells: A tone sounds when the correct vacuum has been reached so there is no need to guess when a complete vacuum has been achieved. The pump's compact lightweight design (just 25 lb or 11.3 kg) and handles for easy carrying make it ideal for the most crowded department.

When the right side of the foot pedal (vacuum side) is depressed once, the pump will start and evacuate the air. When it is depressed again the pump will stop.

When the left side (inflate side) is pressed, the pump will force air into the bag as long as the pedal is pressed down.

Using an existing form of vacuum
Your wall vacuum connection or an existing pump must be able to pull down to approximately 23" of mercury. If an in house vacuum system is to be used an adapter can be supplied upon request. This adapter will enable an existing 1/4" ID air hose to mate with the vac fix valve.

Positioning Guides For Accelerator and Simulator Tables
In order to position the vac fix shell precisely on the therapy table, positioning guides can be used between the shell and table.

Females guides (blue), attach to the vac fix shell and have a self adhesive backing. Males guides (white) are available with a self adhesive backing or with a dowel base and are attached to the treatment table.

Item	Vac Fix Cushion	Size	Liter Fill
244-108	Extra Large	100 x 150 cm	65
244-109	Extra Large	100 x 150 cm	70*
244-110	Extra Large	100 x 150 cm	75
244-111	Extra Large	100 x 100 cm	35
244-112	Extra Large	100 x 100 cm	40*
244-113	Extra Large	100 x 100 cm	45
244-114	Extra Large	100 x 100 cm	50
244-116	Extra Large	70 x 100 cm	25
244-117	Extra Large	70 x 100 cm	30*
244-118	Extra Large	70 x 100 cm	35
244-119	Extra Large	70 x 100 cm	40
244-121	Extra Large	25 x 100 cm	6.5*
244-122	Extra Large	25 x 100 cm	7.5
244-131	Extra Large	25 x 50 cm	1.75
244-132	Extra Large	25 x 50 cm	2*
244-133	Extra Large	25 x 50 cm	2.25
244-140	Extra Large	60 x 70 cm	12
244-142	Extra Large	50 x 70 cm	12.5
244-143	Extra Large	50 x 70 cm	15

Specify if a Gromment is needed to Hang the Cushion. ***Suggested Liter fill for 1st order.** **Special sizes, shapes, and liter fill available.**

Item	Vac Fix Cushion	Size	Liter Fill
244-150	Head and Neck	Type S1	15
244-151	Head and Neck	Type S1	17.5*
244-152	Head and Neck	Type S1	20
244-153	Head and Neck	Type S1	25
244-160	Head	Type S2	3*
244-161	Head	Type S2	4
244-162	Head	Type S2	5
244-163	Head	Type S2	6
244-171	Neck and Thorax	Type S3	22.5*
244-172	Neck and Thorax	Type S3	25
244-173	Neck and Thorax	Type S3	30
244-188	Breast	Type S4	27
244-189	Breast	Type S4	30
244-190	Breast	Type S4	50

Specify if a Gromment is needed to Hang the Cushion. ***Suggested Liter fill for 1st order.** **Special sizes, shapes, and liter fill available.**

Item	Accessories
244-195	VacFix Valve Clamp, 10/Pkg
244-214	Vac Fix Cushion Repair Kit, Includes enough material for approximately 12 repairs and 1 tube of Glue
244-220	Vac Fix Pump
244-230	Vac Fix Air Hose Assembly f/ use w/Hosp. Central Vac

VACUUM CUSHION STORAGE RACK

- **Keeps molded cushion safe and clean for increased cushion life**
- **Suitable for space limited treatment areas**
- **Hooks allow for quick, easy removal and hanging**
- **Highly mobile rack can go just about anywhere**
- **Supports any size of vacuum cushion**
- **4-inch casters for easy movement over a variety of surfaces**
- **Folds flat for storage when not in use**

The hook and rod system safely stores and organizes the molded cushions, keeping them off the floor and within easy reach. The rack also ensures that the cushions remain clean and are protected from damage, thereby extending cushion life.

Specifications

Hooks: 10 per unit, steel
Dimensions: 48" (122 cm) L with two 12" (30.5 cm) extensions, 22" (56 cm) W, Height Adjustable to 55, 60, or 65" (140, 152.5, 165 cm).
Weight: 35 lb (16 kg)
Caster Set: 4" (10.2 cm), ball-bearing
Construction: Chrome-plated, one-inch steel tubing.

Item	Description
244-348	Vacuum Cushion Storage Rack
244-349	Additional Hooks, Pkg/10

VACUUM CUSHION STORAGE SHELVING

- **Convenient storage for all sizes of vacuum cushions**
- **4 inch casters provide mobility**
- **No hooks necessary**
- **Easy to assemble**
- **Adjustable rail height and straps**

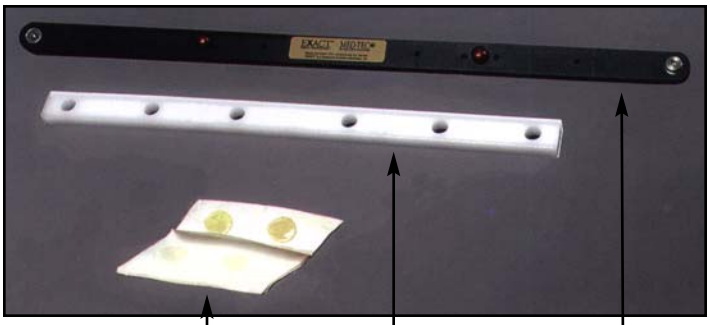
The Vacuum Cushion Storage Shelf was made to meet the need of storing the vacuum cushions used in radiation oncology departments. The shelves allow the molded cushions to be stored flat and off the floor, which prolongs the life of the cushions.

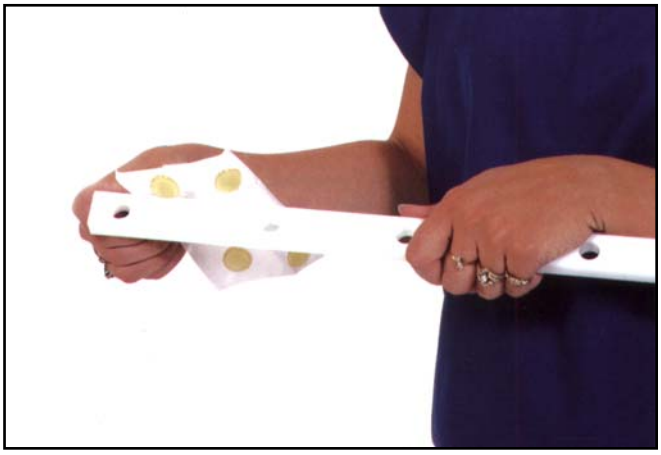
Specifications

Material: PVC and Nylon Straps
Casters: 2" (5.08 cm) Swivel
Dimensions: 88" W x 24" D x 75" H (223.5 x 61 x 190.5 cm)

Item	Description
244-360	Vacuum Cushion Storage Shelving

EXACT ENHANCE BAR





This product was designed to “ENHANCE” the EXACT BAR used with the Varian Accelerator Exact Treatment Couch. The EXACT BAR can be adapted to the vacuum bags, 2 part foam cushions, bellyboards or any number of body support cushions with the use of the Glue Dots™.

The Enhance Bar is made of high-density polyethylene material. Measurements are 1" W x 16" L and 0.5" T (2.5 x 40.6 x 1.3 cm).

There are 6 holes drilled in the enhance bar. You have the choice of centering or shifting laterally 2.75" (6.9 cm) in either direction.

- Consistent in accurate positioning
- Easier location of “EXACT Bar” and vacuum bags, foam or support cushions
- Replacement guarantee against chipping, breaking or warping.

Preparation of the EXACT Enhance Bar

1. Seat your Varian EXACT Lok-Bar or similar bar in a “notch” along the length of the couch/table top.

2. Place the EXACT Enhance Bar onto the Lok-Bar matching the “two pegs” or similar design unit.

3. Now use “Glue Dots” to adhere the EXACT Enhance Bar to your immobilization form. This is done by taking two or three “Glue Dots” and pressing the open side into the EXACT Enhance Bar. Remove the wax paper and repeat for each glue dot.

4. Place the patient immobilization form on top of the Bar/Glue Dots. When your form is completed, the EXACT Enhance Bar will be attached to your form and can easily be removed and reseated onto the Lok-Bar when needed.

The EXACT Enhance Bar can be used repeatedly. The Glue Dots are easily replaced by simply “rolling” them off the bar or form and discarding them.

Item #	Description
244-250	Exact Enhance Bar

GLUE DOTS™

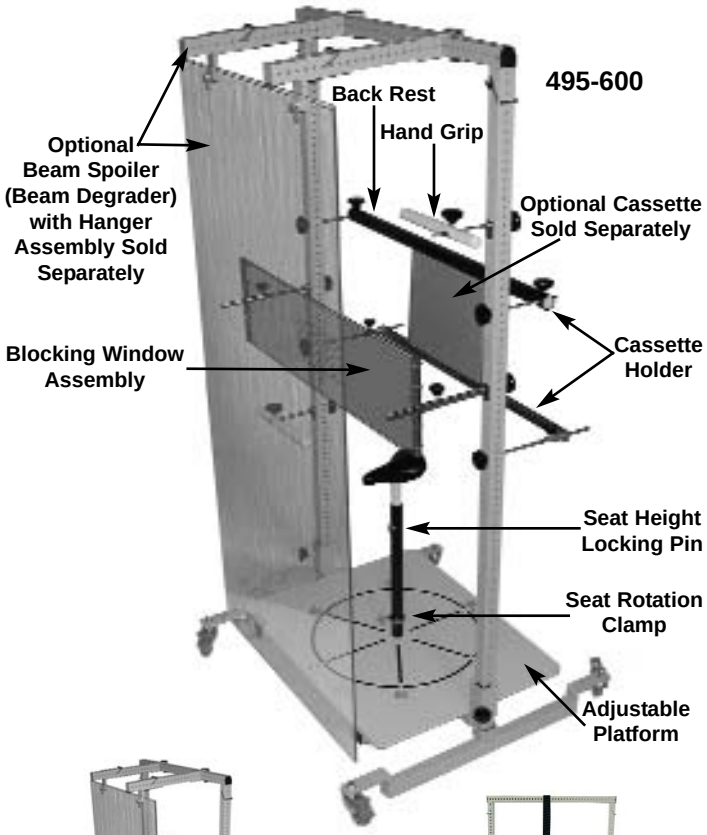
- **Permanent**
- **Certified AP Nontoxic**
- **FDA Compliant**

Bond instantly to most clean, dry surfaces Double-sided and pressure-sensitive bonding. Cleaner and safer than liquid glues or hot glue guns. Clear, perforated liner for easy dispensing and placement.

Item #	Description
244-256	Glue Dots, 60/Pkg

TOTAL BODY IRRADIATION STAND

Custom Made to Customer Specifications



495-602

495-6061 Safety Harness Shown with Patient in Distress

The platform of the Total Body Stand is in the lowest position at 3" (7.6 cm) from the floor and is adjustable upward in 1" (2.5 cm) increments. This will allow centering the patient to the central axis of the beam. The platform is made of plywood covered in formica and has a mounting hole for the seat post. Long and short seat posts are included to provide maximum adjustment, in 1/4" (0.64 cm) increments, of the seat height. The seat height is determined and the seat is locked to the seat post. The seat angle is set by rotating seat post and locking when position is selected.

The Total Body Stand frame is made of 2" (5 cm) steel tubing. The frame consists of 2 “T” vertical posts and a top stabilizer bar. Holes spaced 1" (2.5 cm) apart on the vertical posts allow easy adjustment of all attachments. The top stabilizer bar and vertical “T” posts are removable for easy breakdown and storage. The stand has 4 swivel locking casters which allow easy movement and positioning.

A polycarbonate block holder can be mounted on the front of the vertical posts to support lung blocks or other shields. A stainless steel cassette holder can be mounted on the rear of the vertical posts. The back rest and hand grips can be used at any location on the vertical posts.

The polycarbonate block holder and the block tray for the blockroom have the exact same hole pattern. Tungsten pins can be inserted into the block holder as alignment markers.

Item 495-600 Total Body Irradiation Stand for Photons or Electrons includes: Frame and platform, 2 adjustable seat posts, seat, 2 hand grips, back rest, cassette holder, polycarbonate block holder, tungsten pins, a block tray for the blockroom and 2 beam spoiler hanger assemblies.

Item 495-602 Total Body Irradiation Stand for Electrons includes: Frame and platform, 2 adjustable seat posts, seat, 2 hand grips, back rest and 2 beam spoiler hanger assemblies.

Optional Accessories

Item 495-603 - Electron Flattening Filter for 6 MeV Varian III Accessory Mount

Item 495-604 - Wedge Tray Scale for TBI Isodose Curve, 6 MeV, Varian III Accessory Mount

Item 495-6061 - Safety Harness

Attaches to the top rail and prevents a patient from falling.

Item 495-607 - Electric Room Heater

To keep patient warm while being treated.

Items 495-600-83 to 495-600-86

The optional Beam Spoiler (beam degrader) is available in 3/8" (1 cm) or 1/2" thick (1.3 cm) acrylic or polycarbonate. The beam spoiler measures 38" W x 86" L (96.5 x 218.4 cm).

Specifications

Overall Size: 43.25" L x 47" W x 90.75" H (110 x 119 x 231 cm)
Platform Size: 30.5" L x 38" W (77 x 97 cm)
Adjustment from Floor: 3" (7.6 cm) and up in 1" (2.5 cm) increments
Acrylic Density: 1.185 g/cc
Polycarbonate Density: 1.2 g/cc

Item #	Description
495-600	Total Body Irradiation Stand for Photons or Electrons
495-602	Total Body Irradiation Stand for Electrons

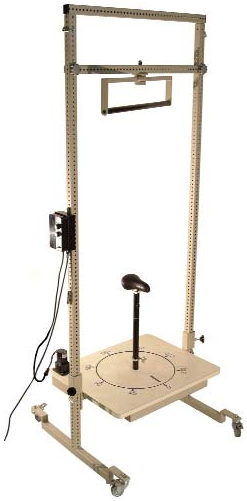
Items are Made to Order and Nonreturnable

Item #	Optional	Thickness
495-603	Flattening Filter, Total Body, 6 MeV, Varian III	
495-604	Wedge Tray Scale for TBI Isodose Curve, 6 MeV, Varian III	
495-6061	Safety Harness	
495-607	Electric Room Heater	
495-600-83	Acrylic Beam Spoiler	3/8" (1 cm)
495-600-84	Polycarbonate Beam Spoiler	3/8" (1 cm)
495-600-85	Acrylic Beam Spoiler	1/2" (1.3 cm)
495-600-86	Polycarbonate Beam Spoiler	1/2" (1.3 cm)

Beam Spoilers are Made to Order and Nonreturnable

ROTATIONAL TOTAL BODY IRRADIATION STAND

Custom Made to Customer Specifications



Shown with Optional Item 495-606 Safety Harness

The Rotational Total Body Irradiation Stand was designed for use when treating the total body with electrons.

The stand has an adjustable rotating platform that adjusts vertically based on the patient's height and will rotate 360°. The platform is marked in 45° increments. The adjustable rotating platform is in the lowest position at 3" from the floor and is adjustable upward in 1" increments. This allows centering the patient to the central axis of the beam. The rotating platform is made of plywood covered in Formica and has a mounting hole for the seat post. The Rotation Motor attaches to the rotating platform with four (4) mounting screws and the Motor Speed Controller attaches to the vertical "T" leg. The Motor Speed Controller is variable speed and adjustable from 3 to 7 RPM with scale markings at 3, 4, 5 and 6 RPM. A slow Start-up and Slow-down is designed into the Motor Speed Controller for patient stability. A 60' On/Off Rotation Remote Control Cable with a switch allows the therapist to start and stop the platform rotation from the control area.

Long and short seat posts are included to provide maximum adjustment, in 1/4" increments, of the seat height. The seat post to be used is determined by the patient's leg inseam. The seat height is determined and the seat is locked to the seat post. The seat direction is set by rotating the seat post and locking when desired direction is selected.

The rotational hand rail assembly rotates freely with patient rotation and accommodates the optional Safety Harness (Item 495-606).

Item	Description
495-605	Rotational Total Body Irradiation (TBI) Stand

Item is Made to Order and Nonreturnable

Item	Optional
495-603	Flattening Filter, Total Body, 6 MeV, Varian III
495-604	Wedge Tray Scale f/TBI Isodose Curve, 6 MeV, Varian III
495-606	Safety Harness
495-607	Electric Room Heater

Item	Beam Spoiler	Thickness
495-605-83	Acrylic	3/8" (1 cm)
495-605-84	Polycarbonate	3/8" (1 cm)
495-605-85	Acrylic	1/2" (1.3 cm)
495-605-86	Polycarbonate	1/2" (1.3 cm)

The Rotational Total Body Stand frame is made of 2" steel tubing. The frame consists of two (2) "T" legs with casters and a top brace bar. Holes spaced 1" apart on the vertical "T" legs allow easy adjustment of the rotating platform and hand rail assembly. The Rotational TBI Stand can be taken apart easily for storage. The rotation motor is easily removable from the rotating platform by removing the four (4) mounting screws and the motor speed controller easily lifts off the vertical "T" leg. The top brace bar, vertical "T" legs, adjustable rotating platform and rotational hand rail assembly are all removable for easy breakdown. The stand has 4 swivel locking casters which allow easy movement and positioning.

Item 495-605 Rotational Total Body Irradiation Stand Includes

- Frame
- Adjustable Rotating Platform
- 2 Adjustable Seat Posts
- Seat
- Rotational Hand Rail Assembly
- Rotation Motor
- Variable Motor Speed Controller 3-7 RPM
- On/Off Rotation Remote Control Cable and Connector
- 2 Beam Spoiler Hanger Assemblies

Optional Accessories

Item 495-603 Electron Flattening Filter for 6 MeV Varian III Accessory Mount

Item 495-604 Wedge Tray Scale for TBI Isodose Curve, 6 MeV, Varian III Accessory Mount

Item 495-606 Safety Harness
Attaches to the rotational hand rail assembly and prevents a patient from falling.

Item 495-605-83 through 495-605-96 Beam Spoiler/Degrader Assembly
The optional beam spoiler is available in 3/8" or 1/2" (0.97 or 1.27 cm) acrylic or polycarbonate. The beam spoiler measures 42" W x 96" L (106.7 x 243.8 cm).
Acrylic Density: 1.185 g/cc
Polycarbonate Density: 1.2 g/cc

Item 495-607 Electric Room Heater
To keep patient warm while being treated.

Item 936-583 through 936-627 Tungsten Eye Shields with Aluminum Caps

Specifications

Overall Size: 43.25 L x 44" W x 110" H (110 x 111.75 x 279.4 cm)
Platform Size: 31" L x 38" W (78.7 x 96.5 cm)
Rotating Area: 22" Diameter (56 cm)
Power: 120 VAC
Shipping Weight: 485 lb (221 kg)

Item	Tungsten Eye Shield with Aluminum Caps
936-583	11.6 mm Inside Dimension x 2 mm Thick
936-585	13.3 mm Inside Dimension x 2 mm Thick
936-587	15.0 mm Inside Dimension x 2 mm Thick
936-589	16.7 mm Inside Dimension x 2 mm Thick
936-591	18.4 mm Inside Dimension x 2 mm Thick
936-596	11.0 mm Inside Dimension x 3 mm Thick
936-598	12.7 mm Inside Dimension x 3 mm Thick
936-601	14.4 mm Inside Dimension x 3 mm Thick
936-623	16.1 mm Inside Dimension x 3 mm Thick
936-627	17.8 mm Inside Dimension x 3 mm Thick

BEAM SPOILER FRAME AND BEAM SPOILERS

The Beam Spoiler Frame holds a beam spoiler for Total Body Irradiation. The frame is made of 1" (2.54 cm) square and 1.25" (3.18 cm) square steel tubing. The vertical legs are telescoping to allow a 13" (33 cm) vertical range of movement. Two hangers welded on the top horizontal bar are positioned to hold a beam spoiler in either the vertical or horizontal direction. The frame can support 1" (2.54 cm) thick (2 plates for Photons) weight up to 250 pounds (114 kg). Four 6" (15.25 cm) diameter swivel locking casters allow for easy movement of the Beam Spoiler. The frame can be dismantled for storage.

The Beam Spoiler is available in acrylic or polycarbonate in 0.375" (0.95 cm) or 0.50" (1.27 cm) thickness. The beam spoiler has two key holes on the 60" (152 cm) side and on the 80" (203 cm) side to allow for positioning on the frame in either direction. The key holes can also be used to hang the beam spoiler from wall hooks for storage.

Specifications

Item 495-004 Beam Spoiler Frame for TBI
Overall Size: 94" L x 24" W x 81" to 94" H
(238.8 x 61 x 205.7 to 238.8 cm) not including casters
Finish: Durable tan textured polyurethane enamel paint

Beam Spoilers
Size: 80" L x 60" H (203 x 152.5 cm)

Item	Description
495-004	Beam Spoiler Frame for TBI

Item	Beam Spoiler	Thickness	Weight
495-005	Polycarbonate	0.375" (0.95 cm)	77 lb (35 kg)
495-006	Polycarbonate	0.50" (1.27 cm)	103 lb (47 kg)
495-007	Acrylic	0.375" (0.95 cm)	77 lb (35 kg)
495-008	Acrylic	0.50" (1.27 cm)	103 lb (47 kg)

SELF HOLDING BEAM SPOILER WITH FLEXIBLE ARM

The Self Holding Beam Spoiler has a flexible 18" (45.7 cm) or 24" (61 cm) arm that manually adjusts for easy use. The acrylic plate has an arm rotation lock that secures the acrylic plate to the desired position. The acrylic plate is 30 cm square x 0.25" (0.64 cm) or 0.375" (0.95 cm) thick and is mounted at the end of the flexible arm. The whole assembly attaches to the table rail with a rail clamp.

Specifications

Acrylic Density: 1.185 g/cm³

Item	Description
495-053-20	Siemens Flexible 18” Beam Spoiler
495-053-32	Varian Flexible 18” Beam Spoiler
495-053-50	Philips Flexible 18” Beam Spoiler
495-054-20	Siemens Flexible 24” Beam Spoiler
495-054-32	Varian Flexible 24” Beam Spoiler
495-054-50	Philips Flexible 24” Beam Spoiler

Customer to Specify Acrylic Thickness

CARFUSION DYE AND ANTI-SPILL HOLDER

464-040

463-000

464-080

Carfusion Dye/Castellanis Paint is a long lasting skin marking dye. It dissolves skin oils and penetrates into the pores and will resist mild washings. To apply use Item 464-080, Pointed Wood Stick Applicators. On rare occasion, a patient's skin could react to this chemical, forming small water blisters where the dye was applied. To reduce the risk of spills, the dye can be used with the Item 463-000, Carfusion Dye Holder. Easy removal of Castellanis Paint is accomplished by using Erado-Sol Stain Remover (Item 466-000 or 466-100).

The Carfusion Dye Holder is an aluminum container which stands 4" (10 cm) high and has a 3 1/2" (9 cm) square base with four rubber feet. The screw-on cap with seal has a 2" (5 cm) stainless steel tube that goes down into the container. Therefore, if the holder is knocked to the floor, due to the vacuum seal and tube design, only a few drops will spill and the holder will not break.

Item	Description	Quantity
463-000	Carfusion Dye Holder	1
464-040	Carfusion Dye/Castellanis Paint, 4 oz (118 mL)	6
464-040-1	Carfusion Dye/Castellanis Paint, 4 oz (118 mL)	1
464-080	Pointed Wood Stick Applicators	100

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SECURLINE

- **Fine tip**
- **Non-toxic**
- **Gentian violet ink**
- **Single patient use**
- **High visibility**

Item	Description	Quantity
467-102	Securline	1

SKIN/FILM MARKING PENS

Single patient use.

Item	Marking Pen	Quantity
467-410	Black	1
467-410-12	Black	12
467-415	Green	1
467-420	Red	1
467-430	Blue	1

DECOCOLOR™ PAINT MARKERS

These markers are solvent-based and dry instantly.
Single patient use.

Item	DecoColor™ Paint Markers	Quantity
467-200	Fine Tip, Black	1
467-202	Fine Tip, Violet	1
467-204	Fine Tip, Yellow	1
467-206	Fine Tip, Red	1
467-207	Fine Tip, Aqua	1
467-208	Fine Tip, Green	1
467-210	Fine Tip, Orange	1
467-212	Fine Tip, Blue	1
467-214	Fine Tip, White	1

TATTOO ACCESSORIES AND INK

468-009

468-002

468-016

The Black Tattoo Ink, Item 468-016, contains alcohol and two stainless steel balls inside for better mixing by shaking.

Item	Description	Quantity
468-002	18 Ga. Disposable Tattoo Needles	100
468-009	Cups for Holding Tattoo Ink, NON-STERILE	100
468-016	Black Tattoo Ink with Stainless Steel Balls, NON-STERILE	0.5 oz / 15 ml

STERITATT® TATTOO CARTRIDGE

Item 468-1022 with No UV Light | Item 468-1022 with UV Light

SteriTatt® is a single-use device that contains sterile, non-toxic, permanent ink. Each SteriTatt® device contains low-allergy ink that is safety-sealed and gamma irradiated to guarantee sterility for the highest quality of patient care.

SteriTatt's® pen-like design offers ease and comfort of use and helps standarize the methods therapists employ to administer tattoo markings. The ink flow is easily regulated so too much ink will not be dispersed.

SteriTatt® can be used two different ways: it can be applied to a prepared site using the "dropping method", or a hypodermic needle can be attached to the SteriTatt® unit so the ink can be injected under the patient's skin.

Note: Needles not included

- **Sterile, Non-toxic, Low-allergy Ink**
- **Neat and Easy to Use**
- **Supports Precision of Treatment**
- **Single-use for Patient Safety**
- **Standardizes the Tattooing Method**

Item	SteriTatt® Tattoo Cartridge	Quantity
468-100	Black	25/Box
468-1012	Medium Brown	5/Box
468-1022	UV Pink	5/Box

STERITATT® DROPPERS

- **3 cc Dropper Bottles**
- **Sterile**
- **Available in Black**
- **10 Bottles/Box**

Item	Description	Quantity
468-105	SteriTatt® 3 cc Droppers, Black	10/Box

UV LIGHT

- **Water Resistant - With "O" Ring sealed on both ends**
- **Shock Resistant - Hard anodized finish for extreme corrosion impact**
- **Made by High Quality 6061T CNC aluminum**
- **Water & Scratch resistance glass lens**

Specifications

Color: Black
Dimensions: 1.2" W x 1.1" H x 5.2" L (3.06 x 2.8 x 79.38 cm)
Weight: 3.2 oz (90.7 g) without batteries
Power: Two Lithium Batteries (included)

Item	Description
468-120	UV Lamp

ALCOHOL PREP PADS

Individually sealed, single use PVP wipes, comparable to betadine. Help prevent infection on all types of wounds, scrapes, cuts and abrasions.

Specifications

Formula: 70% Isopropyl Alcohol, 30% Water
Sheet Size: 1" W x 2" L (2.54 x 5.09 cm)
Quantity: 100 per Box

Item #	Description	Quantity
119-700	Alcohol Prep Pads	100

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STAIN REMOVER

Erado-Sol Stain Remover rapidly removes carfusion dye markings and it is non-irritating to skin.

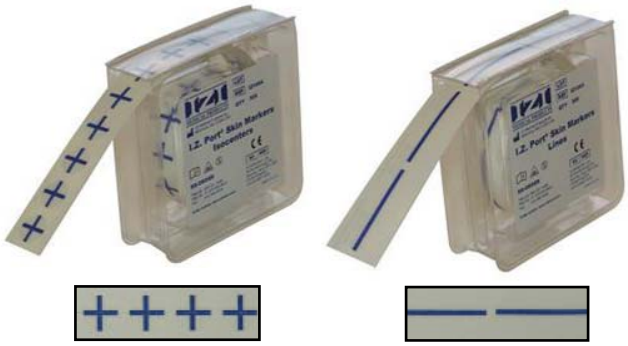
Item	Description	Size
466-000	Liquid Erado-Sol Stain Remover	16 oz
466-100	Cream Erada-Stain Remover	6 oz

ADHESIVE REMOVER WIPES

This Adhesive Remover Wipe dissolves and removes adhesive residue from skin and surfaces. It will also easily remove the marks from a Decocolor Paint Marker. This wipe does leave a slightly oily residue so if re-marking it is recommended to clean the residue with alcohol before re-marking. The wipe has a fresh scent, is latex-free, nonirritating and is 1.25" x 3" (3.2 x 7.6 cm) in size.

Item #	Description	Quantity
466-103	Adhesive Remover Wipes	75/Box

IZ PORT® RADIATION THERAPY MARKERS



- **Clear adhesive backing for precise application**
- **Hypoallergenic medical grade adhesive**
- **Highly visible blue ink**
- **Split liner for easy application**
- **Water resistant**

Pre-marked, these hypoallergenic tapes are easily applied on the skin to outline the treatment field. They remain in place between 7-10 days on most patients.

Specifications

Item 462-002 Isocenters, Blue
Line Width: Approximately 0.075" (0.19 cm)
Isocenter Diameter: Approximately 0.56" (1.43 cm)

Item 462-003 Lines, Blue
Line Width: Approximately 0.075" (0.19 cm)
Line Length: Approximately 1.75" (4.46 cm)

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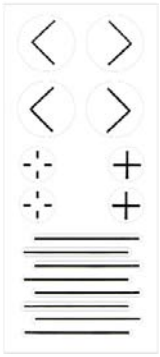
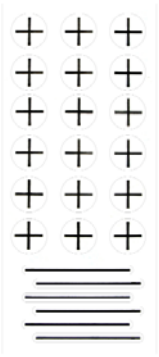
Item #	IZ Port® Markers	Quantity
462-002	Isocenters, Blue	300
462-003	Lines, Blue	150

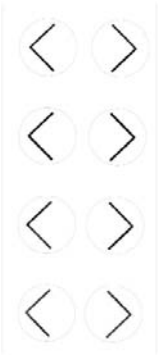
PORTALMARK™ RADIATION THERAPY MARKERS



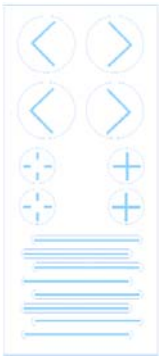
462-150



462-151



462-152



462-155

462-156

462-157

462-180
462-181

462-182
462-183

462-185
462-186

462-187
462-188

- **Medical grade adhesive**
- **Hypo-allergenic**
- **Latex-free**
- **Minimizes tattooing**
- **Water-proof**

PortalMark™ labels are constructed of water-proof, yet breathable material for maximum performance and comfort for up to two weeks. The unique Suregrip™ applicator discs ensure easy and accurate placement of PortalMark™ labels without contaminating the adhesive.

The Alternate Material/Adhesion PortalMark™ markers are used in humid conditions and particular skin surfaces.

Item 462-150, 462-155 Variety, Each Sheet Includes
8 field lines, 4 corners, 2 set up points and 2 isocenters

Item 462-151, 462-156 Isocenters/Lines, Each Sheet Includes
18 isocenters and 6 field lines

Item 462-152, 462-157 Cornors, Each Sheet Includes
8 corners

CE

Item #	PortalMark™	Sheets/Box
462-150	Variety	50
462-151	Isocenters/Lines	50
462-152	Corners	50
462-155	Variety, Dark Skin	50
462-156	Isocenters/Lines, Dark Skin	50
462-157	Corners, Dark Skin	50
462-180	Set-Up Point	110
462-181	Set-Up Point, Alternate Material/Adhesion	110
462-182	Set-Up Point, Dark Skin	110
462-183	Set-Up Point, Dark Skin, Alternate Material/Adhesion	110
462-185	Isocenter	110
462-186	Isocenter, Alternate Material/Adhesion	110
462-187	Isocenter, Dark Skin	110
462-188	Isocenter, Dark Skin, Alternate Material/Adhesion	110

SUREMARK RELIEF TABS™

The unique adhesive-free center won't stick to sensitive areas of the skin. Available in 1.5 mm, 2.0 mm and 2.5 mm lead ball sizes.

CE

Item	Suremark Relief Tabs™	Quantity
462-100	1.5 mm Ball	110
462-101	2.0 mm Ball	110
462-102	2.5 mm Ball	110

SUREMARK TABS™

This design maintains all of the advantages of our regular Suremark™ labels, with the added benefit of a a "tabbed" feature that enables natural and conforming placement where more skin contact is preferred. Available in 1.5 mm, 2.0 mm and 2.5 mm lead ball sizes.

CE

Item	Suremark Tabs™	Quantity
462-120	1.5 mm Ball	110
462-121	2.0 mm Ball	110
462-122	2.5 mm Ball	110

POWERMARK™

This design maintains all of the advantages of our regular Suremark™ labels, with larger lead ball sizes for visibility in radiation therapy. Available in 3.0 mm, 4.0 mm, and 5.0 mm lead ball sizes on a 15 mm round label.

The 1/2" (1.27 cm) lead cross marker is excellent for central axis and other anatomical skin reference points. Easy placement and removable tab feature.

CE

Item	Powermark™	Quantity
462-110	3.0 mm Ball	50
462-111	4.0 mm Ball	50
462-112	5.0 mm Ball	50
462-115	Cross (+)	50

SUREMARK™

The most common style for general use, Suremark™ 1.0 mm, 1.5 mm, 2.0 mm and 2.5 mm lead balls on 15 mm round labels are perfect for many uses in radiation therapy.

CE

Item	Suremark™	Quantity
462-105	1.0 mm Ball	110
462-106	1.5 mm Ball	110
462-107	2.0 mm Ball	110
462-108	2.5 mm Ball	110

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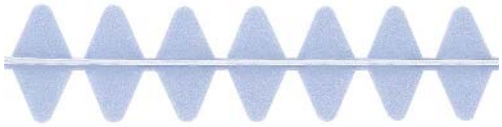
SUREMARK ARROW™

This 1 mm x 8 mm lead arrow on a 15 mm round transparent, disposable label is the best tool to use when a directional marker is preferred.

CE

Item	Description	Quantity
462-130	Suremark Arrow™	100

SUREMARK WIRE™



Available in 0.3 mm, 0.4 mm, 0.8 mm and 1.5 mm covered lead wire sizes. **1.5 mm not recommended for CT**.

CE

Item	Suremark Wire™	Quantity
462-134	0.3 mm	330 cm
462-135	0.4 mm	330 cm
462-136	0.8 mm	330 cm
462-137	1.5 mm	330 cm

VISIONMARK™ CT

The VisionMark™ CT markers offer the perfect combination of tack surfaces and easy-peel corners, keeping the markers correctly positioned with minimal discomfort to the patient on removal. These **NON-METALLIC** markers reduce read time on CT scans with virtually no scatter. These sizes and ball densities are perfect for all CT skin marking applications. Available in 3 mm, 4 mm, and 5 mm ball sizes. No lead means they are safer for yourself, your patient and the environment.

CE

Item	Visionmark™ CT	Quantity
680-305	2.0 mm Ball	50
680-310	2.5 mm Ball	50
680-312	3.0 mm Ball	50
680-314	4.0 mm Ball	50
680-316	5.0 mm Ball	50

CT Mark
Wire and Dots

The CT Mark wire and dots are a new blue formation designed specifically for CT. These markers are lead free, will not cause artifact (scatter) on CT scans and the labels are latex-free.

CE

Item	Description	Quantity
680-349	CT Mark Wire, 1.0 mm	330 cm
680-350	CT Mark Wire, 2.0 mm	300 cm
680-352	CT Mark, 2.3 mm	110
680-354	CT Mark, 4.0 mm	50

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CT MARKER-INDICATOR RADIOPAQUE

680-401

680-402

680-403

680-404

680-405

680-406

680-408

680-410

680-411

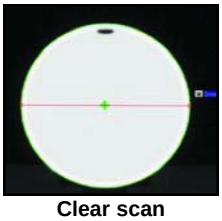
680-412

- **Use in CT, RT Simulation, Treatment Planning, Diagnostic Radiology, Angiography, Mammography and Fluoroscopy**
- **Use to identify masses, scar tissue, moles, birth marks or any point of interest**
- **Provides a clear and accurate reference point with no spray artifacts**
- **Flat marker - will not indent tissue**
- **Disposable**
- **Clear adhesive backing**
- **Multiple sizes available**
- **Lead Free**
- **Crosses - 0.38" L (9.5 mm)**
- **Dots - 0.125" diameter (3 mm)**
- **Lines - cut to desired length**
- **NOT for use in MRI**

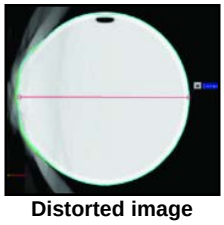
Item #	CT Marker-Indicator Radiopaque	Quantity
680-401	Crosses, 10 mm	130
680-402	Crosses, 20 mm	130
680-403	Dots, 1.5 mm	115
680-404	Dots, 2.0 mm	115
680-405	Dots, 2.5 mm	115

Item #	CT Marker-Indicator Radiopaque	Quantity
680-406	Dots, 3.0 mm	115
680-408	Dots, 4.0 mm	115
680-410	Line, 0.5 mm	69" (175 cm)
680-411	Line, 1.0 mm	66" (167 cm)
680-412	Line, 1.50 mm	62.5" (159 cm)

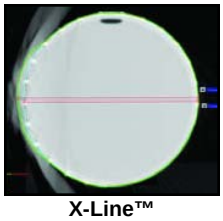
X-LINE™
PRECISION RADIOTHERAPY TAPE FOR CT SIMULATION



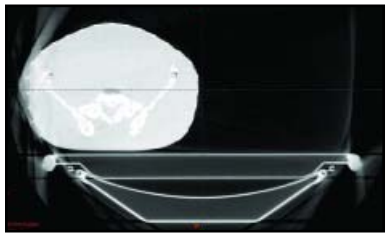
Clear scan within sFOV

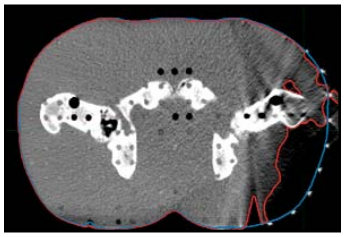


Distorted image in 65cm eFOV



X-Line™ connect-the-dots body contour





Siemens HDFOV PRO Phantom

A Solution to CT Simulation Image Distortion in Obese Patients

- **More Accurate**
- **Fast and Simple**
- **Low-Cost**
- **Optimal Dosage**
- **Latex Free**

X-Line™ allows accurate contouring within distorted regions of the CT image, improving radiotherapy outcomes.

Obese patients must be imaged with the extended field of view (eFOV), often resulting in distorted body contours. X-Line™ provides a series of reliable dots within the distorted sections of the eFOV, allowing for easy identification of the true body contour. The radiopaque lines on X-Line™ show up as hyperdense in CT simulation. Connect underneath the dots to get an accurate body contour - it's that easy!

Body contour distortion from large patients in the eFOV

- GE Discovery CT590 RT, Optima CT580 RT and LightSpeed RT have a scan FOV (sFOV) of 50cm and a 65cm extended FOV (eFOV) option
- Siemens Somotom models have a 50cm sFOV and eFOV up to 80cm
- Body regions within the eFOV is distorted and contains artifact, resulting in an inaccurate body contour
- Body contour inaccuracies can lead to incorrect SSD and dosage calculations

X-Line™ General Instructions

- Apply X-Line™ to all body regions that might fall outside of the scan field of view
- Tear a strip length that fully encompasses the region of interest
- Expect to use 3-5 strips per patient, depending on their size

Step 1 - Peel

- Peel away the protective backing
- X-Line™ is kiss cut to make for easier removal

Step 2 - Apply

- Apply X-Line™ to the region of interest
- Orient the radiopaque lines perpendicular to the direction of the CT cross section
- Space the X-line™ strips approximately 1 inch apart
- Only apply each X-Line™ strip once

Step 3 - Scan

- Then, perform the CT scan as usual
- Remove and discard the X-Line™ strips after the scan

Step 4 - Connect

- Finally, connect just underneath the bright, hyperdense dots in the resulting CT images
- Connecting underneath the dots avoids including these hyperdense regions in the radiation dose planning

Specifications

Size: 2" wide (5.08 cm) with three equally spaced radiopaque lines 1" apart (2.54 cm)
Quantity: Rolls are 50' long (15.24 m) with perforations spaced every 2" (5.08 cm).

Item	Description
680-470	X-Line Tape, Full Adhesive
680-475	X-Line Tape, Partial Adhesive

CT MARKING WIRE

682-090 682-100 682-102 682-104

Item	China Markers	Length
682-080	Aluminum Wire 0.080" (2.03 mm) Diameter	42' (12.8 m)
682-090	Aluminum Wire 0.040" (1.02 mm) Diameter	165' (50.3 m)
682-100	Aluminum Wire 0.064" (1.63 mm) Diameter	67' (20.4 m)
682-102	Copper Insulated Wire, Black 0.055" (1.40 mm) Diameter	100' (30.5 m)
682-104	Copper Insulated Wire, Red 0.080" (2.03 mm) Diameter	100' (30.5 m)

E

LIQUIMARK MRI MARKERS

684-100 684-105 684-107

684-110 684-112 684-114

The LiquiMark MRI markers are non-metallic, latex-free, and perform consistently and accurately in a variety of applications.

CE

Item	LiquiMark MRI Markers	Quantity
684-100	8 mm Round	40/Box
684-105	15 mm Tube	40/Box
684-107	30 mm Tube	40/Box
684-110	10 mm Square	40/Box
684-112	10 mm x 24 mm	40/Box
684-114	10 mm x 38 mm	40/Box

MULTI-MODALITY MARKERS

462-029 462-030

Item 462-029 Multi-Modality Markers for Radiology/Radiation Therapy

- Appears as bright object on CT, MRI and Diagnostic Imaging scans
- Inner center hole affords passage of needle through central hole
- 15 mm outer diameter and 3.5 mm thick
- 5 mm axial hole with 2 mm central hole
- Composed from hydrogel with medical grade adhesive

Item 462-030 Multi-Modality Markers for Nuc Med/PET

- Visible on Nuclear Medicine, CT and MRI scans
- Liquid-containing well suitable for injection of short-life radionuclide using a conventional hypodermic needle
- 15 mm outer diameter and 3.5 mm thick
- 5 mm axial hole
- Composed from hydrogel with medical grade adhesive

Item #	Description	Quantity
462-029	Multi-Modality Markers for Radiology/Radiation Therapy	50
462-030	Multi-Modality Markers for Nuc Med/PET	50

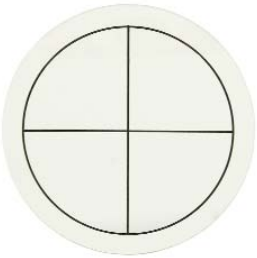
BOX HOLDER

The Box Holder holds five standard Suremark™ boxes. It can be placed on a desktop or mounted to a wall.

CE

Item	Description
462-140	Box Holder

MAGNIFICATION RING
High Density



The clear polycarbonate Magnification Ring has a 5 cm diameter circle with cross hairs of high density material for simulator use.

Item	Description	Quantity
459-000	Magnification Ring	1

BRASS CHAIN

The Brass Chain is a 36" (91 cm) long chain and will show the surface contour of the patient on a radiograph.

Item	Description	Quantity
459-004	Brass Chain	36"

EXIT DOT MARKER

The 2.5 cm diameter Dot Marker has a 1/8" (0.32 cm) diameter tungsten pin which shows on a simulator or port film.

Item	Description	Quantity
461-001	Dot Marker	1

SIMULATOR LEAD FOIL TAPE

Simulator Lead Foil Tape is used on the patient to outline the treatment field. It sticks to patients and is easily removable.

Item	China Markers	Quantity
428-250	Simulator Lead Foil Tape 0.25" (0.635 cm) Wide	36 Yds (33 m)

FILM MARKING PENCILS

Marks on paper, glass, plastic or metal

Item	Description	Quantity
467-440	Film Marking Pencils	12

CHINA MARKERS

Item	China Markers	Quantity
467-450	Red	12
467-451	White	12
467-452	Green	12
467-453	Yellow	12
467-455	Black	12

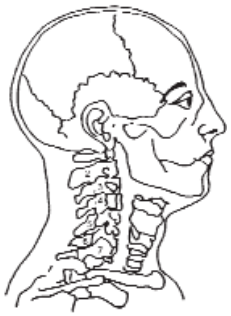
E

STABILO® COLORED PENCILS

Writes on glass, plastic, ceramics, metal, film, coated paper, cellophane, photos. Wax based yet sharpens to a point. Water soluble colors wipe off instantly with a damp cloth.

Item	Stabilo® Colored Pencil	Quantity
467-840	Red	12
467-841	Blue	12
467-844	Yellow	12
467-846	Black	12
467-852	White	12

ANATOMICAL DRAWINGS



Use anatomical drawings in the patients chart to record the treatment fields. Minimum order of 25 sheets. The 25 sheets can be any combination of drawings. Visit RPDinc.com for a list of drawings available.

Item	Description
400-000-_ _	Anatomical Drawings, Specify Drawing Number

ACCELERATOR LEAD MARKERS
And Storage Board

The Accelerator Lead Markers are mounted on a plastic frame with a hole, for easy placement on the storage board. The storage board will hold 14 markers.

Item 401-000 Accelerator Lead Marker Set with Storage Board Includes

(1) L
(1) R
(1) AR
(1) PR
(1) AL
(1) PL
(1) LAO
(1) RAO
(1) LPO
(1) RPO
(1) MED
(1) LAT
(1) Storage Board

Specifications

Marker Size: 3/4" H x 1/4" T (1.9 x 0.6 cm)
Board Size: 11 3/4" W x 7 1/4" H x 3/4" T (29.8 x 18.4 x 1.9 cm)

Item	Accelerator Lead Markers
401-000	Set with Storage Board
401-010-L	L
401-010-R	R
401-020-AR	AR
401-020-PR	PR
401-020-AL	AL
401-020-PL	PL
401-020-AP	AP
401-020-PA	PA
401-030-LAO	LAO
401-030-RAO	RAO
401-030-LPO	LPO
401-030-RPO	RPO
401-030-MED	MED
401-030-LAT	LAT
401-100	Storage Board

Custom Characters Available Up to 10 Characters.
Items are Custom Made and Nonreturnable.

SIMULATOR LEAD MARKERS
And Storage Board

The Simulator Lead Markers are mounted on an aluminum frame with a hole, for easy placement on the storage board. The storage board will hold 14 markers.

Item 405-000 Simulator Lead Marker Set with Storage Board Includes

(1) L
(1) R
(1) AR
(1) PR
(1) AL
(1) PL
(1) LAO
(1) RAO
(1) LPO
(1) RPO
(1) MED
(1) LAT
(1) Storage Board

Specifications

Marker Size: 3/8" H x 1/32" T (0.95 x 0.08 cm)
Board Size: 11 3/4" W x 7 1/4" H x 3/4" T (29.8 x 18.4 x 1.9 cm)

Item	Simulator Lead Markers
405-000	Set with Storage Board
405-010-L	L
405-010-R	R
405-020-AR	AR
405-020-PR	PR
405-020-AL	AL
405-020-PL	PL
405-030-LAO	LAO
405-030-RAO	RAO
405-030-LPO	LPO
405-030-RPO	RPO
405-030-MED	MED
405-030-LAT	LAT
401-100	Storage Board

Custom Characters Available Up to 10 Characters.
Items are Custom Made and Nonreturnable.

STOCKMAN (ZIPSER) PENIS CLAMP

Specifications

Material: Stainless steel

CE

Item	Description
467-480	Stockman (Zipser) Penis Clamp

CUNNINGHAM INCONTINENCE CLAMP

Constructed of soft sponge rubber and can be adjusted to fit comfortably. Reusable, non-sterile. This product contains dry natural rubber.

Item	Description
467-485	Cunningham Incontinence Clamp, Regular 2"
467-486	Cunningham Incontinence Clamp, Large 3"

BAUMRUCKER INCONTINENCE CLAMP

The Greenwald Surgical Baumrucker Clamp is a hinged, frame supporting three foam rubber pads (two on one side and one on the other), and a Velcro closure.

Item	Description
467-490	Baumrucker Incontinence Clamp

E

HIGH DENSITY RECTAL MARKER

Rectal - Vaginal - External

460-000

Shown with Latex Cover

460-010

The Rectal Marker is a flexible tube packed with lead balls spaced at 1 cm intervals from center to center. The CT Rectal Marker has teflon balls with same spacing. The Rectal Marker is used to accurately obtain both the rectum position and magnification by counting the balls. This determines the rectum location relative to the radiation field. An adjustable anus marker can be utilized during simulation or port filming. The Rectal Marker can be used in the vagina or as an external marker.

Specifications

Sterilization: Gas
Tubing: 5/16" (8 mm) diameter x 30 cm flexible
Balls: 3/16" (5 mm) diameter spaced every cm
Anus Locator: Adjustable stainless steel or delrin

Item	Description
460-000	High Density Rectal Marker with Anus Marker
460-010	CT Rectal Marker with Anus Marker
460-006	Latex Cover for Rectal Marker, 1/pkg
460-006-12	Latex Covers for Rectal Marker, 12/pkg

SHADOWFORM MARKERS

460-501 **460-502** **460-503**

- **T-Bar handle which can be removed for insertion of barium**
- **Disposable**
- **Rectal markers are available in two lengths and are marked at 1 cm intervals**
- **No cross contamination**
- **Outlines the soft tissue of the pelvic region**
- **Latex-free**
- **Markers are made from a soft, smooth, flexible plastic**
- **Used for Simulation and CT Planning**
  - **Provides excellent localization of pelvic structures**

CE

Item	Shadowform Markers	Quantity
460-501	18 cm Vaginal Marker	10
460-502	38 cm Rectal Marker	10
460-503	10 cm Rectal Marker	10

VAGINAL DEPTH SCALES

707-000

707-145

The vaginal depth scale can be used during simulation or for a port film. Position and magnification can be determined by counting the lead balls which are spaced 1 cm apart and are 5 mm in diameter.

The vaginal depth scales up to 3.2 cm diameter can be used with the standard holder (Item 707-020). The special vaginal depth scale holder (Item 707-030) is needed for the 3.8 cm diameter vaginal depth scale but will also accommodate all vaginal depth scales.

The CT Vaginal Depth Scale (Item 707-145) is 1.6 cm in diameter and 26 cm long and has teflon balls instead of the lead balls.

An introitus marker is included with the 1.6 cm diameter vaginal scale (Item 707-000) or can be purchased separately. Introitus markers for all other vaginal depth scales are sold separately.

A thumb screw holds the introitus marker in position.

Specifications

Scale Size: 26 cm L
Material: Acrylic
Acrylic Density: 1.1859 g/cm³
Lead Balls: 5 mm Dia. Spaced Every 1 cm
Lead Ball Density: 11.35 g/cm³
Material: Teflon
Teflon Density: 2.16 g/cm³
Latex Cover: 2.0 cm Dia. x 30 cm L

Item	Vaginal Depth Scale
707-000	Scale With Introitus Marker, 1.6 cm Diameter
707-120	Scale Only, 2.0 cm Diameter
707-125	Scale Only, 2.5 cm Diameter
707-132	Scale Only, 3.2 cm Diameter
707-138	Scale Only, 3.8 cm Diameter
707-145	CT Scale Only, 1.6 cm Diameter

Item	Accessories
460-006	Latex Cover for Vaginal Depth Scale, 1/pkg
460-006-12	Latex Covers for Vaginal Depth Scale, 12/pkg
707-010-6	Introitus Marker for Item 707-000
707-120-6	Introitus Marker for Item 707-120
707-125-6	Introitus Marker for Item 707-125
707-132-6	Introitus Marker for Item 707-132
707-138-6	Introitus Marker for Item 707-138

VAGINAL DEPTH SCALE HOLDER

The vaginal depth scale holder has a swivel, angling joint that slides up/down on the baseplate post. This allows the vaginal depth scale to be adjusted and held at the proper height and angle. The heavy steel base has a nickel chrome finish.

The standard holder accommodates all vaginal depth scales up to 3.2 cm in diameter. The large holder is needed for the 3.8 cm diameter vaginal depth scale and will accommodate all vaginal depth scales. Both holders can be used in CT if scanned area does not include the holder.

Item	Description
707-020	Vaginal Depth Scale Holder, Standard
707-030	Vaginal Depth Scale Holder, Large

TUNGSTEN MARKER

Specifications

Size: 3.18 mm Diameter x 5.08 mm Long (1/8" x 0.2")

Item	Description
461-020	Tungsten Marker

CERVIX MARKER IMPLANTER (ANDERSON)

Specifications

Material: Stainless Steel
Point Angle: 30° Beveled
Overall Length: 26.5 cm
Fixed Depth: 1 cm
Tip Outside Diameter: 1.47 mm
Inside Diameter: 1.07 mm
Stylet Diameter: 0.89 mm

Item	Description
455-010	Cervix Marker Implanter (Anderson)

Implanter Must Be Sterilized Before Use

ADJUSTABLE CERVIX MARKER IMPLANTER

The Adjustable Cervix Marker has an implanter with adjustable depth control that covers a 4 cm insertion range.

Specifications

Overall Size: 10 cm long
Stylus
Ouside Diameter: 2.1 mm
Inside Diameter: 0.94 mm
Stylet
Ouside Diameter: 0.89 mm
Inside Diameter: 0.58 mm

Item	Description
455-002-7	Adjustable Cervix Marker Implanter with 10Ga Depth Gauge

Implanter Must Be Sterilized Before Use

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CERVIX MARKERS AND FIDUCIAL MARKERS

Stainless Steel **Gold** **Titanium**

These markers can be used in any area of the body.

The Gold Markers are 99.9% pure gold. The 0.8 mm diameter Gold Markers can be used with digital imaging and CT without showing any artifact. The 1.2 mm diameter Gold Markers are for use with film.

The Titanium Markers do not cause artifacts in CT and MRI.

Item	Cervix Marker	Size	Quantity
455-050	Stainless Steel	0.8 mm Dia. x 5 mm L	50
455-100	Stainless Steel	0.8 mm Dia. x 5 mm L	100
455-103	Stainless Steel	0.8 mm Dia. x 3 mm L	50
455-105	Stainless Steel	0.8 mm Dia. x 3 mm L	100
455-500	Stainless Steel	0.8 mm Dia. x 3 mm L	500
455-201	Gold Marker	0.8 mm Dia. x 3 mm L	1
455-201-50	Gold Marker	0.8 mm Dia. x 3 mm L	50
455-206	Gold Marker	0.8 mm Dia. x 5 mm L	1
455-206-50	Gold Marker	0.8 mm Dia. x 5 mm L	50

Item	Cervix Marker	Size	Quantity
455-208	Gold Marker	1.2 mm Dia. x 8 mm L	1
455-208-50	Gold Marker	1.2 mm Dia. x 8 mm L	50
455-212	Gold Marker	1.2 mm Dia. x 5 mm L	1
455-212-50	Gold Marker	1.2 mm Dia. x 5 mm L	50
455-250	Titanium	0.8 mm Dia. x 5 mm L	10
455-251	Titanium	0.8 mm Dia. x 3 mm L	50
455-252	Titanium	0.8 mm Dia. x 3 mm L	10
455-255	Titanium	0.8 mm Dia. x 5 mm L	50

Cervix Markers Must Be Sterilized Before Use

CERVIX BALL MARKERS

455-300

455-301

The disposable Cervix Ball Marker is sutured to the cervix with a dissolving suture to allow the ball to fall out of the patient. The Delrin ball will not produce an artifact on a CT Image.

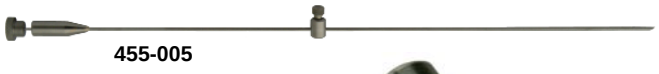
Specifications

Overall Size: 3/16" Diameter (0.48 cm)
Hole Diameter: 1/16" Diameter (0.16 cm)

Item	Cervix Ball Markers
455-300	Stainless Steel, 50/pkg
455-301	Delrin for CT, 50/pkg

Cervix Ball Markers Must Be Sterilized Before Use

PROSTATE MARKER IMPLANTER WITH ADJUSTABLE STOP



455-005

455-009

Specifications

Material: Stainless Steel
Point Angle: 30° Beveled
Overall Length: 26.3 cm
Outside Diameter: 1.47 mm
Inside Diameter: 1.07 mm
Stylet Diameter: 0.89 mm

Item	Description
455-005	Prostate Marker Implanter w/ Adjustable Stop
455-009	Adjustable Stop for 17ga. Needle f/Cervix/Prostate

Implanter MUST be Sterilized Before Use

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FLEXIMARC™ GOLD FIDUCIAL MARKERS

456-100

456-110

- **Uses node technology for better visibility**
- **Specifically shaped to prevent migration**
- **Available in 2 or 3 node configurations**
- **One marker provides 2 distinct reference points**
- **Visible in TRUS, BAT, Portal, MRI, CT and x-Ray**
- **Multiple diameters and needle gauges to meet your needs**
  0.9 MM diameter with 18 GA needle
  1.2 MM diameter with 17 GA needle

FlexiMarc™ fiducial marker is the first of its kind, this implantable marker produces a unique non-boiological node based projection. The FlexiMarc™ combines 99.99% pure, biocompatible, gold connectors and 3 mm long gold nodes. Unlike regular linear or coiled markers, FlexiMarc™ has nodes that inhibit migration and are easily recognized by the human eye and IGRT software.

The unique patent pending shape allows soft tissue to anchor the marker in place thus greatly reducing the probability of marker migration.

Items 456-100 and 456-110 with 0.9mm diameter have a spacing of 10 mm and are in a 18GA, 20 cm long needle

Items 456-120 and 456-130 with a 1.2 mm diameter have a spacing of 10 mm and are in a 17GA, 20 cm long needle.

The FlexiMarc™ Fiducial Markers are preloaded in the needles and sterile.

Item	Description
456-100	FlexiMarc™Marker, 0.9 mm Dia and 2 Node
456-110	FlexiMarc™Marker, 0.9 mm Dia and 3 Node
456-120	FlexiMarc™Marker, 1.2 mm Dia and 2 Node
456-130	FlexiMarc™Marker, 1.2 mm Dia and 3 Node

DIGITAL BREAST BRIDGE

The Digital Breast Bridge aids in setting up tangential breast treatment fields. After the borders of the tangential fields are determined place the digital breast bridge to these skin marks. The digital readout will give the angles needed for the gantry. The field separation is determined by the scale on the rails.

The acrylic plates are 20 cm wide x 15 cm high and have 1 cm inscribed markings.

Separations can be measured from 13 cm to 31 cm.

Weight: 3.2 lbs

Item #	Description
270-001	Digital Breast Bridge

BREAST BRIDGE

The Breast Bridge aids in setting up portals for tangential breast treatment. After the area to be treated has been marked, the bridge is placed on the patient's chest and adjusted to the skin markings, thus, determining the separation of the fields. The angulation of the portals is determined from the ball protractor.

The acrylic plates are 20 cm wide x 15 cm high and have 1 cm inscribed markings.

Separations can be measured from 15 cm to 35 cm.

The ball protractor provides angulation readings from 15º to 80º.

Item #	Description
270-000	Breast Bridge

BREAST BRIDGE COMPRESSOR

The Breast Bridge Compressor is used to compress the breast, particularly when it is desired to increase the dose to the residual mass at the end of a course of treatment. The aluminum mesh and frame are coated with a smooth blue vinyl plastic for minimum skin dose.

Specifications

Treatment Area Size: 10 cm H x 15 cm W
Compression Distance: 1 cm to 13 cm

Item #	Description
272-100	Breast Bridge Compressor

MAMMO CALIPER WITH DIGITAL LEVEL

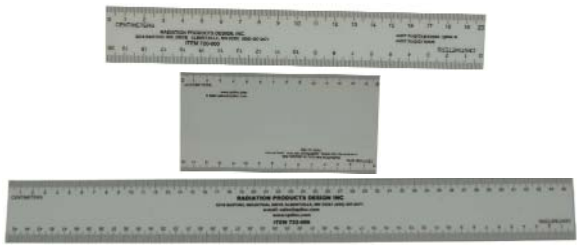
The Mammo Caliper is a rugged and accurate caliper designed to provide measurements for breast simulation or as general purpose caliper. Separations can be measured between 0 cm and 45.5 cm. The measurement is locked in position by tightening a thumb screw attached to the slide.

The digital level measures the angle of a line drawn between the tips of the caliper jaw.The HOLD button freezes the measurement on the level display. The level is attached with a thumb screw and can easily be removed. The level also has a magnetic base.

The Mammo Caliper has an accuracy measurement of ±0.1°.

Item	Description
705-801	Mammo Caliper with Digital Level

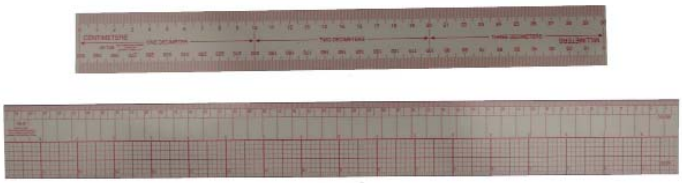
WHITE RULERS



The white plastic rulers start at zero, and allow easy viewing of the light field edges. Rulers are checked for total accuracy of 1 mm.

Item	Description	Quantity
720-000	2.9 cm W x 20 cm L Rulers	12
721-000	7.6 cm W x 15 cm L Rulers	12
722-000	5.1 cm W x 45 cm L Ruler	1
722-000-12	5.1 cm W x 45 cm L Rulers	12

TRANSPARENT PLASTIC RULERS



Item	Description	Quantity
723-001	30 cm Transparent Plastic Rule	1
723-001-12	30 cm Transparent Plastic Rules	12
723-002	45 cm/18" Transparent Plastic Graph Rule	1
723-002-12	45 cm/18" Transparent Plastic Graph Rules	12

ALUMINUM RULERS

The Aluminum Rulers are extremely accurate and have large, easy to read black numbers.

Item	Description	Graduations
723-020	30 cm Aluminum Ruler, 35 mm Wide	1 mm - 1 cm
723-022	60 cm Aluminum Ruler, 35 mm Wide	1 mm - 1 cm
723-024	100 cm Aluminum Ruler, 35 mm Wide	1 mm - 1 cm
723-026	200 cm Aluminum Ruler, 35 mm Wide	1 mm - 1 cm

STAINLESS STEEL FLEXIBLE RULERS

723-030
723-031
723-032
723-033
723-034

Item	Description	Graduations
723-030	150mm Ruler with Pocket Clip	1mm - 0.5mm
723-031	6"/15cm Ruler w/o Pocket Clip	1/16" - 1mm
723-032	12"/30cm Ruler w/o Pocket Clip	1/32"-1/64" & 1mm-0.5mm
723-033	6" Ruler with Pocket Clip	1/32" - 1/64"
723-034	150mm Ruler with Plastic Case	1mm - 0.5mm

METRIC TAPES

Graduations in Millimeters

723-044

723-045

Item	Description	Scale
723-044	Wooden Metric/Inch Folding Rule	2m/78"
723-045	Metric Measuring Tape	5m/196"

TRIANGLES

723-010 **723-013** **723-016**

Item	Description	Degree
723-010	6" Plastic Triangle	30/60
723-013	12" Plastic Triangle	30/60
723-016	12" Plastic Triangle	45/45

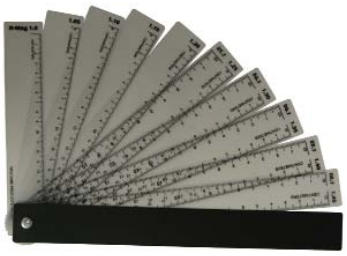
RADIOLOGIST'S POCKET CALIPER/ANGLE RULE

Inches: Up to 6.5"
cm: 16 cm closed, 32 cm open
mm: Up to 50 mm
Angle: Measurements

Item	Description
718-000	Radiologist's Pocket Caliper/Angle Rule

F

MAGNIFICATION RULES



The Magnification Rules includes 15 cm scales (1.0, 1.05, 1.10, 1.15, 1.20, 1.25, 1.30, 1.35, and 1.40) magnified in increments of hundredth from 1.0 to 1.75. One scale will correspond to the magnification of most films to allow direct measurements. All scales are printed on clear mylar and can be superimposed on the area of interest, enabling measurements to be taken directly on the film.

Item	Description
719-000	Magnification Rules

CT-MAG RULES
For CT and MRI Images

The CT-Mag Rules consist of 22 point scales (3.5-5, 5.5-6, 6.5-7, 7.5-8, 8.5-9, 9.5-10, 10.5-11, 11.5-12, 12.5-13,and 13.5-14), and can be expanded to 40 cm for use with CT and MRI images.

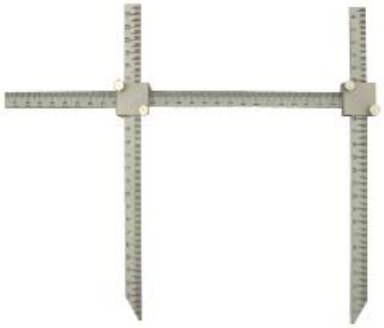
Item	Description
719-002	CT-Mag Rules

D-MAG RULES

The D-Mag Rules consist of 11 scales (0.50, 0.55, 0.60, 0.65, 0.70, 0.75, 0.80, 0.85, 0.90, 0.95 and 1.00), graduated in de-magnification from 1 to 0.5 cm.

Item	Description
719-003	D-Mag Rules

HEAD-NECK CALIPER



The Head-Neck Caliper is useful in measurements of either patient diameter or surface to tumor depth. The depth of a tumor or intraoral structure relative to either the lateral or anterior/posterior surfaces can be easily determined.

Specifications

Vertical Adjustment: 23 cm
Horizontal Adjustment: 26 cm

Item	Description
706-000	Head-Neck Caliper

HEAD AND NECK PLASTIC CALIPER

The Head and Neck Plastic Caliper can be locked tight in any opening. Measurement is accomplished by using a separate scale to measure between the rounded tips.

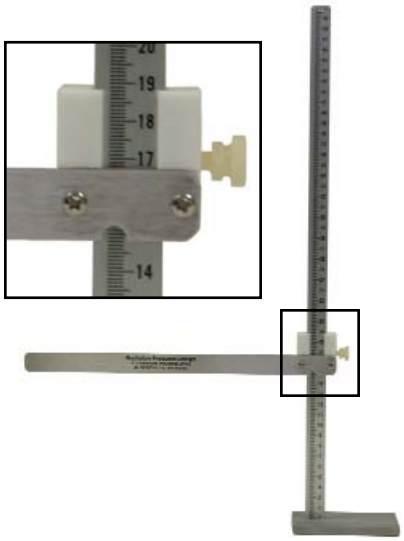
Item	Description
704-000	Head and Neck Plastic Caliper

CURVED STAINLESS STEEL CALIPER
With Scale

The 45cm Curved Stainless Steel Caliper with Scale can be locked tight in any opening. Centimeter and inch scales are easy to read. The centimeter scale is checked for calibration from 0 to 40cm. Scale accuracy is within ±0.4cm.

Item	Description
704-450	Curved Stainless Steel Caliper

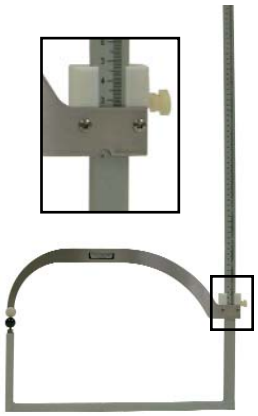
TABLE TOP CALIPER



The 55cm Table Top Caliper measures from the table top to the surface of patient.

Item	Description	Scale
705-660	Table Top Caliper	55 cm

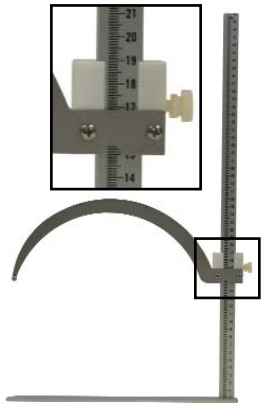
UNDER/OVER TABLE BODY CALIPER



The 55cm Under/Over Table Body Caliper measures 6.5" from the base plate to the curved blade. The blade is 15.5" long.

Item	Description	Scale
705-700	Under/Over Table Body Caliper	55 cm

CURVED BLADE BODY CALIPERS



This lightweight precision Curved Blade Body Caliper has one scale and a non-removable slider which prevents errors caused by reading the wrong scale on a dual scale caliper. The slider can be locked at any position. The rigid leg that slips under the patient is 1/8" thick and 11" long.

Item	Description	Scale
705-546	Curved Blade Body Caliper	45 cm
705-551	Curved Blade Body Caliper	55 cm

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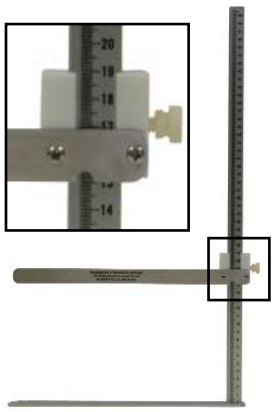
FLAT BLADE BODY CALIPERS



The lightweight Body Caliper with flat blade has one scale on a non-removable slider that prevents errors caused by reading the wrong scale on a dual scale caliper. The slider can be locked at any position. The rigid leg that slips under the patient is 1/8" thick and 11" long.

Item	Description	Scale
705-545	Body Caliper with Flat Blade	45 cm
705-550	Body Caliper with Flat Blade	55 cm

DIGITAL CALIPER

705-555 **705-556**

This precision digital caliper has a scale on one side and a non-removable slider with a digital display. The caliper is 74.5cm or 29.3" long. The scale reads to 600mm or 24". The maximum reading of the digital display is 643mm/25.31". The slider can be locked at any position. The flat blade base that goes under the patient is 1/8" thick and 11" long. Includes a replacement battery.

Slider Functions
ON / OFF, ABS / INC, ZERO, mm/in, SET, and HOLD.
RS232 output for connection via cable to computer.

Cable and software are sold separately from the caliper.

Item	Description
705-555	Digital Caliper with Curved Blade
705-556	Digital Caliper with Straight Blade
705-557	Digital Caliper with Level and Straight Blade
705-558	RS-232 Output Cable w/Software for Digital Caliper

DIGITAL CALIPERS

723-062

723-063

The main body is made of hardened steel and the reference scale is marked with easy to read lines and numerals in millimeter and inches. A thumb screw on top of the caliper locks the display unit in position anywhere along the scale. Flashing digits shows low battery. Uses 1.55 V button cell battery (p/n 357) - included.

The LCD Display mode functions include:

- "IN/MM" inches or millimeters measurement
- "H" for the HOLD function
- Power On/Off and Zero Setting

Specifications

The Caliper Offers: Outside, inside, depth measurement
Resolution: 0.01 mm / 0.0005"
Accuracy: ±0.02 mm / 0.001" (<100 mm): ±0.03 mm / 0.001" (>100-200 mm): ±0.04 mm / 0.0015" (>200-300 mm)

CE

Item	Description	Scale
723-062	Digital Caliper	20 cm/8"
723-063	Digital Caliper	30.5 cm/12"

DUAL SCALE VERNIER CALIPER

The Dual Scale Vernier Caliper is made of polished hardened steel with permanent black graduations and comparison scales. It has an automatic thumb lock, and can be used for inside, outside, and depth measurements. The upper bar scale is graduated in mm with vernier to 1/20 mm. The lower bar scale is graduated in inches with vernier to 0.001". Plastic case included.

Item	Description	Scale
723-060	Dual Scale Vernier Caliper	15 cm/6"

MICROMETERS

723-051

723-052

Specifications

Item 723-051
Scale: 1"
Graduations: 0.001"

Item	Description
723-051	Inch Economy Micrometer
723-052	Digital Micrometer

RETRACTABLE TAPE MEASURE TRAY

The 3 meter Retractable Tape Measure Tray is used to measure the distance between the source of radiation and the point of interest on a patient. It is very useful in extended field dosimetry, enabling one to obtain an accurate measurement of source to skin distance. It can also be used for setting source to phantom distances for calibration and experimentation.

This measuring device is mounted on a lexan (polycarbonate) tray which slides into the block tray slot. Attached to the center of the tray is a 3 meter tape measure. The tape measure has an adjustable stainless steel end. This can be positioned at any point along the tape, allowing the tape to be cut at the desired length to compensate for the source to tape measure distance.

Item	Retractable Tape Measure Tray
701-620	for Siemens, Screw Coding
701-622	for Siemens, Digital Coding
701-623	for Siemens, Coding By-pass
701-631	for Varian Clinac, No Coding
701-632	for Varian II, No Coding, no MLC
701-633	for Varian III, Optical Coding with MLC
701-634	for Varian III - Wedge Slot with MLC
701-635	for GE Saturne, No Coding

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INCLINOMETER

The dial of the 10cm diameter Inclinometer swings 0 to 90 in either direction for fast accurate readings up to 1°. It is constructed of high impact plastic. The pointer and face are enclosed and protected with clear tough plastic. It can magnetically attach itself to the treatment machine or it can be used to set the angle of a film cassette.

Item	Description
352-118	Inclinometer

PLUMB BOB - NICKEL-PLATED

The Plumb Bob can be used to align gantries, couches, laser lights and more. Gantry vertical alignment can be accomplished by marking the cross hair projection spot on the ceiling and floor, then dropping the Plumb Bob line from the ceiling spot to the floor spot. The machine alignment is vertical when the Plumb Bob line intersects with the ceiling and floor spots.

Item	Description
352-120	Plumb Bob, Nickel-Plated

BULLS EYE CIRCULAR LEVEL

The all purpose Bulls Eye Circular Level will show level of any surface in all directions at once.

Item	Description
352-104	Bulls Eye Circular Level

6CM LEVEL

The 6cm Level has a level vial mounted in an anodized hard drawn 3/8" (0.97 cm) hexagonal aluminum tubing. The bottom surface is perfectly flat for accurate surface leveling.

CE

Item	Description
352-108	6cm Level

POCKET LEVEL

The pen-size, 12cm Pocket Level comes in a hexagonal aluminum case. The bottom surface is perfectly flat for accurate surface leveling. A large easy to read glass vial is mounted in an anodized hexagonal tube with a black plastic clip.

Item	Description
352-112	12cm Pocket Level with Clip

MAGNETIC GANTRY LEVEL WITH LIGHT

The easy viewing Magnetic Gantry Level with light is 9" long with three lined vials (plumb, level and 45°). It is made of tough shock resistant material. The base utilizes a strong magnetic strip that secures to iron and steel surfaces. Requires 2 AAA batteries. Batteries not included.

CE

Item	Description
352-234	Magnetic Gantry Level with /Light

HIGH PRECISION FOUR-SIDED GANTRY LEVEL

1/40 Degree Accuracy

Case

The four-sided High Precision Gantry Level has a main vial that has graduated divisions of 0.005" per foot per division and is wrench adjustable. The level housing consists of a satin chrome brass tube with a friction fit closing cover to prevent breakage. The level frame is made of aluminum with a black anodized finish, accurately machined and finished on all four sides.

This level is used to check the gantry angle indicators at four locations: 0, 90, 180, and 270 degrees, with accuracy to 1/40 of a degree.

Specifications

Size: 6" square x 0.75" thick (15.29 x 1.91 cm)

Item	Description
352-200	High Precision Four-Sided Gantry Level
352-201	Vinyl Case for High Precision Gantry Level

MAGNETIC DIGITAL LEVEL

Features and Functions

- Units of measure: degrees, percent, mm/m, in/ft in decimal, in/ft in fractional
- Small and handy
- Push button calibration
- Audible indicator for level 0° and plumb 90°
- Automatic digit inversion for overhead measurements
- Hold function to freeze measurement
- Strong holding magnetic edge allows hands free use on Ferrous metal surfaces
- Working range 4 x 90°
- ¼" - 20 thread for connection to tripod
- 6" Long (15.3 cm)

Specifications

Accuracy: ±0.1° for 0° and 90°, ±0.2° for 1° and 89°
Working Range: 0° to 90°
Power Supply: 3 "AAA" alkaline batteries (included)
Working Temperature: 14° to 113°F (-10° to 45°C)

Item	Description
352-240	Magnetic Digital Level

SELF LEVELING 5 BEAM DOT LASER LEVEL

- **Lock that turns laser off and secures mirrors for handling**
- **Self-leveling laser**
- **Laser projects five self-leveling beams simultaneously**
- **Audible alarms when beyond leveling range**
- **Laser can be rotated 360°**

This 5 Beam Laser Level projects a vertical beam straight up and straight down to easily transfer a point from the floor to the ceiling plus will project 3 horizontal beams, one from left, one from right and one straight on to give you a perfect 90° angle in a room. This level is self-leveling with accuracy of 1/8" at 50 feet, plus has locking compensators so the laser level won't shake or be damaged while not in use.

710-851 Includes
- Multi-functional magnetic base
- 3 "AA" alkaline batteries
- Mounting strap
- Magnetic target
- Tinted glasses
- Instruction manual with warranty card
- Soft-sided carrying case

Specifications

Number of Beams: 5
Leveling Method: Self-Leveling (Pendulum)
Laser Wavelength: 650nm ± 10nm (Red)
Laser Classification: Class IIIa
Maximum Power Output: <=5mW
Accuracy: ± 1/8"/50ft. (± 2mm/10m)
Interior Range: Up to 200ft. (60m) depending on light conditions
Self-Leveling Range: ± 4.5°
Power Supply: 3 "AA" alkaline batteries (included)
Battery Life: Approximately 20 hours with alkaline batteries
Dimensions: 3.15" x 3.858" x 4.0" (80 x 98 x 101.6mm)
Weight: 1.1 lb (0.5 kg)
Working Temperature: 14°F to 113°F (-10°C to +45°C)
Center Screw Thread: 5/8"-11, 1/4"-20
IP Protection Class: 55

Item	Description
710-851	Self-Leveling Laser Level with 5 Beam Dot Laser

TRACEABLE JUMBO DIGIT STOPWATCH

Largest stopwatch digits ever developed (0.5" or 1.3 cm high) provides ease in reading. Times to 24 hours. Unit features single-action, time-out, cumulative-split, and continuous timing. Timing resolutions is 1/100 of a second for the first 30 minutes, continues timing to 23 hours, 59 minutes, 59 seconds with a 1-second resolution.

Accuracy is 0.001%. To assure accuracy an individually serial-numbered Traceable Certificate is provided from our ISO 17025 calibration laboratory accredited by A2LA. It indicates traceability to standards provided by NIST (National Institute of Standards and Technology). Water-resistant, O-ring sealed, and shock resistant ABS plastic case has non-slip rubber sides. Supplied with a detachable clip for clipping onto notebooks or clipboards. Also comes with Velcro™ for vertical mounting anywhere.

As a chronograph, the unit displays time of day in hours, minutes, seconds, AM/PM, date, and day of the week. It also has a time-of-day alarm. Supplied with Traceable Certificate, 2-year, “always-on” battery, lanyard, and clip.

Specifications

Size: 3" x 2.5" x 7/8" (7.65 x 6.37 x 2.24 cm)
Weight: 2.5 oz (70.9 g)

Item	Description
469-510	Traceable Jumbo-Digit Stopwatch

THERMOMETERS

470-207

470-052

Thermometers are accurate to within N.I.S.T tolerances and are individually serialized.

Item #	Thermometer	Length	Degrees	Accuracy	Graduations	Fill	Immersion
470-207	Pocket Test	165 mm / 6.5"	+30°F to 120°F	±2.0°F	1.0°F	Spirit	Total
470-052	Room	300 mm / 11.8"	-35°C to 50°C	±1.0°C	1.0°C S/B 0.5°C	Enviro-Safe(R)	Total
470-121	Room	305 mm / 12"	-30°F to 120°F	±2.0°F	1.0°F	Spirit	Total
470-133	Room	460 mm / 18"	-1°C to 51°C	±0.3°C	0.1°C	Blue Organic	Total
470-260	Room	305 mm / 12"	-50°C to 50°C	±2.0°C	1.0°C	Red Spirit	Total
470-266	Room	305 mm / 12"	-58°F to 120°F	±5.0°F	1.0°F	Spirit	76 mm

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THERMOMETER ARMORS

The thermometer armors are Nickel Plated Brass. They are open cases that have a screw cap with ring and small openings around bulb for circulation.

Item	Thermometer Armor
470-075	for 12" (305 mm) Thermometer
470-077	for 15.9" (405 mm) Thermometer
470-079	for 18" (460 mm) Thermometer

DIGITAL LOLLIPOP™ THERMOMETERS

- **Water-Resistant**
- **Shockproof**
- **Max/Min Temperature Memory**

The new heads-up Lollipop™ Traceable® Water-Resistant/Shockproof Thermometer replaces hazardous mercury units. Stainless-steel probe is resistant to most laboratory chemicals.

Records minimum/maximum reading
At the touch of a button, memory recalls highest and lowest temperature readings over any time period.Solid-state construction eliminates dangers inherent in breakable glass and toxic mercury thermometers.

All-weather compatible
Operates without fail in any lab condition-outdoors too. Water-Resistant construction is ideal for wet labs, wash-down areas, and virtually all field applications. Engineered to be shockproof in drop tests up to 5 feet. Bright 1/4" (0.635 cm) high display is easy to view.

Traceable to NIST for accuracy
To assure accuracy an individually serial-numbered Traceable® Certificate is provided from an ISO 17025 calibration laboratory accredited by A2LA. It indicates traceability to standards provided by NIST (National Institute of Standards and Technology).

Supplied complete with stainless-steel probe, probe cover, and silver-oxide battery (runs continuously for one year).

Specifications

Range: -58 to 572°F and -50 to 300°C
Resolution: 0.1° from -20 to 200°; 1° outside this range
Stem Diameter: 0.14"
Stem Length: 8"
Overall Size: length: 1 ¾" W x 10 ¼"L x ½" D
Weight: 7/8 oz (0.03 kg)

Item #	Description	Accuracy
470-350	Thermometer, Digital Lollipop, Water-Resistant	±1°C
470-351	Thermometer, Digital Ultra Lollipop, Water-Resistant	±0.4°C

TRACEABLE WORKHORSE THERMOMETER WITH TYPE-K PROBE

High accuracy meter.

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Thermometer offers sharp readout in dim or bright light and covers a wide temperature range. Compatible with all Type-K probes.

Includes
- Type-K probe
- Bench stand
- 9V Battery with 150 to 200 hours continuous-use life span
- Carrying case

Specifications
- Front-panel adjustable offset allows setting of temperature, in-house calibration, or particular sensor for increased accuracy
- HOLD button freezes display to capture current reading
- Range: -58° to +2372°F (-50° to +1300°C)
- Accuracy: ±1°C + 0.75% between 0° and 500°C; ±1°C +1% between 500° and 750°C; ±1°C + 2% between 750° and 1000°C; ±3°C + 4% between 1000° and 1200°C; ±2°C at -20°; ±3°C at -40°; ±4°C at -50°
- Resolution: 0.1° between -50° and +200°; (otherwise 1°)
- Dimensions: 2.75" x 5.5" x 1.25" (69 x 138 x 31mm)
- Weight: 6 oz. (0.2kg)
- Probe dimensions: 1/8" dia. x 5" overall length (0.32 x 12.7 cm)
- Cable Length: 40" (101.6 cm)
- Stainless Steel probe is waterproof

Certifications

Certificate of traceability to NIST* standards. Calibrated by an ISO 17025 calibration laboratory accredited by A2LA*.

Item	Description
470-315	Traceable Workhorse Thermometer w/Type-K Probe

DIGITAL THERMOMETER

For those applications where only one temperature is read at a time, the Digital Thermometer is an industry standard. It features Min/Max memory, hold, auto shut-off. It is housed in a rugged polyethylene storage case with a sealed membrane and has a backlight for dark environments. This hand-held thermometer is a battery powered unit with a detachable immersion probe. Temperature readings appear in Centigrade or Fahrenheit with ± 0.2 °C/0.3 °F or ± 0.5 % of reading, which ever is greater. The LED display eliminates problems that can result from the misreading of stem-type thermometers.

Detachable immersion probes are time savers for x-ray departments that have several film processors. The use of multiple probes, each remaining in a specific tank, also eliminates the possible cross-contamination of chemicals. You can quickly and easily display the lowest and highest temperatures measured by the probe since the unit was turned-on. Our digital thermometer also enables you to "freeze" the current temperature reading on the display. The thermometer display can be easily illuminated, making it perfect for use in the darkroom. You can also program the Digital Thermometer for auto or manual shut-off.

The Digital Thermometer is a shock resistant, solid-state unit that needs no adjustments to maintain accuracy. Calibration is traceable to the National Institute of Standards and Technology (NIST). The unit includes a high-impact plastic case with a recess for storing one probe, and is equipped with a power jack that will accept the optional AC power supply. The jack should be used when the unit will be in use for extended periods of time (in order to prevent battery failure).

Item 470-320 Digital Thermometer includes
- Thermometer
- General purpose probe
- Carry case

Specifications

Instrument
Display: Four-digit LED, plus decimal point
Auto Shut-Off: After 5 minutes of non-use (can be disabled)
Switchable °F/°C
Temperature Range: -40° to 302°F / -40° to 150°C
Temperature Accuracy: ±0.3°F/0.2°C or ±0.5% of Reading which ever is greater
Resolution: 0.1°F/°C
Battery Type: 9v (2) AAA
Battery Life: 1800 hrs
Housing Material: ABS plastic
Dimensions: 5" x 2" x 10" (12.75 x 5.1 x 25.5 cm)
Weight: 5oz (without probe)
Warranty: 5 year instrument warranty
Certifications: CE, Rohs, NIST, WEEE

Probe
Temperature Accuracy: ± .4°F
Max Tip Temperature: 300°F (149°C)
Max Cable Temperature: 200°F (93°C)
Response Time: 6 seconds in liquid
Shaft Length: 3.75" (9.525cm)
Shaft Diameter: 0.140" (.356cm)
Cable Length: 6' (1.8 m) uncoiled
Cable Material: Polyurethane
Dimensions: 7.1" x 1" x 0.7" (18.1 x 2.5 x 1.8 cm)
Weight: 1.764 oz (50 g)
Warranty: 1 year probe warranty

Item	Description
470-320	Digital Thermometer

TRACEABLE® THERMOMETER/BAROMETER PEN

- **Measures temperature, humidity, barometric pressure, and dew point**
- **Portable - Easy Operation**
- **Quick Response**
- **Minimum and Maximum**
- **Lightweight and compact**

Compact design features an electronic capacitance polymer film sensor not affected by condensation. Tough ABS plastic housing and water-resistant design with O-ring seal and membrane keypad assure a long life in severe lab or harsh plant environments. HOLD button freezes the reading on the display. High contrast LCD digits are easy to read. At the press of a button, unit recalls minimum/maximum readings.

User selectable dual display shows humidity/temperature, humidity/dew point, barometer/temperature, or barometer/humidity.

To assure accuracy an individually serial-numbered Traceable® Certificate is provided from our ISO 17025 calibration laboratory accredited by A2LA. It indicates traceability to standards provided by NIST (National Institute of Standards and Technology). Supplied with a Traceable® Certificate and batteries.

Specifications

Temperature range: 32.0 -122.0°F (0.0 - 50.0°C), resolution of 0.1°; accuracy of ±1°C.
Relative humidity range: 10.0 - 95.0%, resolution of 0.1% ; accuracy of ±3% RH mid-range to ±4% RH elsewhere.
Barometer measures pressure in 3 different units:
Inches of mercury (inHg): 0.29 to 32.48, resolution of 0.01
Millibars (hPa): 10.0 to 1100, resolution of 0.1 and 1 hPa
Millimeters of mercury (mmHg): 7.5 to 825.0, resolution of 0.1 mmHg**.**
Accuracy: ±4 hPa between 550 to 1100 hPa.
Dew point range: 13.5 to 120.1°F (-25.3 to 48.9°C), resolution of 0.1°.
Power: 4 AAA batteries
LCD digits: 3/8" H (0.97 cm)
Size: 1.5" diameter x 8" L (3.82 x 20.39 cm)
Weight: 5 oz (142 g)

Item	Description
469-007	Traceable Thermometer/Barometer Pen

ANEROID PRECISION BAROMETER

- **Anti-parallax ring**
- **Previous setting indicator hand**
- **Rack and pinion movement**
- **Extremely accurate ±0.76mm Hg (±0.03" Hg or 1mb)**

The Aneroid Precision Barometer comes in a 5" diameter (12.75 cm) chromed/brass case with an easy to read dial. It has an adjustable previous setting indicator hand and high precision due to the rack and pinion movement.

The dual range is 930-1090 hPa and 700-820 mm Hg. Instrument accuracy is ± 0.76 mm Hg. or ± 0.03" Hg. This will indicate the actual pressure from 0 to 2000 feet. **MERCURY FREE**.

Aneroid barometers operate on the principle of a capsule which changes dimension as barometric pressure rises or falls. This capsule is sealed cell made of special alloys which minimize the effects of temperature. Such barometers are said to be “temperature compensated.” The cell expands during periods of low pressure, and contracts with high pressure. A mechanical linkage between the cell and the dial pointer amplifies very small changes in cell dimension into pointer movement.

Calibration instructions are included, for in house calibration.

Item	Description
469-021	Aneroid Precision Barometer, 700-820mm, ±0.3" Hg

TRACEABLE® HANDHELD DIGITAL BAROMETER

The Handheld Digital Barometer measures altitude, temperature, and barometric pressure. It also has a stopwatch/time-of-day clock and graphically displays the barometric pressure trend. A Traceable Certificate is provided to indicate instrument traceability to NIST (National Institute of Standards and Technology).

BAROMETER
Measures barometric pressure from 15.90 to 31.01 in inches of mercury (inHg) with a resolution of 0.03 inHg and from 400 to 1070 millibars (mbar) with a resolution of 1 mbar. Accuracy is ± 0.1477 inHG (± 5 mbar). Display may be switched to inHg or mbar.

Barometric pressure trend shows present readings and previous 2, 4, 6, 8, 10, and 12 hours in bar-chart format. Barometric pressure reading is updated every 15 minutes.

ALTIMETER
The handheld digital unit measures altitude from -500 to 7000 meters and - 1640 to 22,965 feet, with a resolution of 1 meter from - 500 to 1000 meters and a resolution of 2 meters from 1001 to 7000 meters. Altitude is displayed in meters or feet. Reading is updated every 2 seconds. Features a minimum maximum memory for the altitudes reached during any time period, and the altitude trend shows present reading and previous 2, 4, 6, 8, 10, and 12 hours in bar-chart format.

THERMOMETER
Thermometer displays from -4.0 to 158.0°F and -20.0 to 70.0°C with a resolution of 0.1°, accuracy is ± 1°C. Temperature display is updated every 10 seconds.

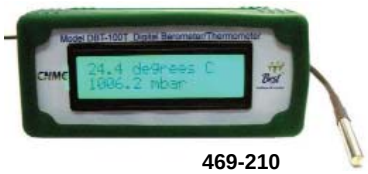
STOPWATCH AND CLOCK
Stopwatch times events from 1 second to 99 hours, 59 minutes, 59 seconds. Resolution is 1 second and accuracy is 0.01%. Clock displays the time of day to the minute, and shows the day and month. The clock also features a format of 12-/24 hour timing and an alarm.

Rugged shock-resistant case, compact size (4" x 2.5" x 0.75" or 10.2 x 6.4 x 1.9 cm), and lightweight (3.7 oz or 105 g) make this the perfect portable unit. Supplied complete with lanyard, batteries, and instructions.

Item	Description
469-005	Traceable® Handheld Digital Barometer

PRECISION DIGITAL BAROMETER / THERMOMETER

469-200



469-210

- **Employs the latest in pressure and temperature sensor technology**
- **Wide Range: 300 mbar to 1100 mbar**
- **± 0.5 mbar accuracy**
- **± 0.2° C accuracy**
- **Lightweight, rugged, hand-held design**

Item 469-200 is a portable digital barometer/thermometer possessing a combination of handheld calculator size, digital display, high accuracy and wide choice of units, making it ideal as a portable absolute pressure reference. It operates on two 9-Volt alkaline batteries for 100 hours. The TOGGLE UNITS button allows the user to choose mmHg or mbar. The rugged, ABS molded case has been designed for handheld use in field applications.

Item 469-210 features a variety of pressure scales to enable the operator to display the atmospheric pressure in units of mmHg or mbar, as the most widely used units in radiation therapy. It also displays ambient temperature in °C with 0.1 degree resolution. A wall adapter is also included with this unit. It is enclosed in a sturdy metal enclosure for bench top application.

Specifications

Display: 16x2 LCD, 0.2" high segments
Selectable units: mmHg or mbar,
Range, Resolution: 600 to 790 mmHg, 0.1mmHg, 800 to 1050mbar, 0.1 mbar, 0 - 70° C, 0.1° C
Accuracy: ±0.5 mbar, includes non-linearity, hysteresis, and repeatability; ±0.2° C, includes non-linearity
Altitude Range: infinite
Operating Range: -9 to 49° C
Power: Two 9.0 Volt alkaline cells (469-200 only), 9 Volt wall adapter (Included with 469-210)
Battery Life: 100 hours of use (469-200 only)
Dimensions:
Item 469-200: 8" L x 4.6" W x 2.1" H (20.3 x 11.7 x 5.3 cm)
Item 469-210: 3.6" L x 4.5" W x 2.0" H (9.1 x 11.4 x 5.1 cm)
Weight:
Item 469-200: 1.1 lb (0.5 kg)
Item 469-210: 1.1 lb (0.5 kg)

Item	Description
469-200	Handheld Precision Digital Barometer/Thermometer
469-204	Case for Digital Barometer/Thermometer
469-210	Bench Top Precision Digital Barometer/Thermometer

HANDHELD DIGITAL BAROMETER-ALTIMETER

- Easy to use
- Rugged and sensitive
- Highly accurate
- Ideal portable pressure reference for weather station site certification and production process monitoring
- Displays station or sea level pressure
- Altitude in feet or meters
- NIST certificate included
- CE compliant

The Handheld Digital Barometer-Altimeter combines accurate pressure sensing with the power of microprocessor-based computations to provide instantaneous pressure and altitude readings. A combination of small size, digital display, versatility, and high accuracy make it ideal for field measurements or as a portable pressure reference.

Keypad controls provide access to the operating functions. Pressure or altitude may be displayed in a variety of units. The LCD display shows the data output and operating mode. Data logging mode stores up to 240 readings for future recall. The unit is powered by four AA alkaline batteries (included) which provide approximately 100 hours of continuous use.

The Barometer - Altimeter includes features for minimum and maximum (Min/Max) value capture, tare readings, and user selectable engineering units. A selectable altitude function allows users to enter site altitude above sea level in order to display local barometric pressure or barometric pressure corrected to sea level. User referenced altitude (referenced to map or trig markers) or altitude based on US Standard Atmosphere of 1962 can be selected for display. Using the altitude function with the Min/Max and Tare features makes the 230-M202 very useful for accurately measuring changes in altitude.

This instrument measures atmospheric pressure very accurately, to within 0.015" Hg. The 316 stainless steel pressure sensor has extremely low sensitivity to shock, vibration, acceleration, and changes in orientation or temperature, yet features high sensitivity to pressure variations. The device is temperature compensated over its operating temperature range. Each unit comes with a certificate of calibration traceable to NIST.

Specifications

Units	Full Scale	Accuracy	Resolution
Pressure			
mm Hg	1000	± .015	.1
in Hg	39.37	± .01	.01
mb	1333	± .2	.1
kPa	133	± .02	.01
psi	19.33	± .01	.001
Altitude			
feet	36,000	± 9	1.0
meters	10,973	± 3	1.0

Approvals: CE compliant
Display: 5 significant digit LCD (0.25" high) 2 line x 16 alphanumeric characters
NIST traceability: NIST certificate supplied
Power: 4 AA alkaline batteries (included) with user enabled automatic shut-off
Temperature:
Storage: -40° to +140° F (-40° to +60° C)
Operating: 23° to +122° F (-5° to +50° C)
Process connections: 1.8" female NPT, 316SS
Enclosure: 14 ounce (6.5" x 3.6" x 2.25") ABS plastic case
Media compatibility: Isolated AI sensor for fluids compatible with 316SS
Pressure limits: 77 PSIA (4,000 mm Hg Abs)
Tare: Nulls applied pressure to allow measurement of vacuum, gauge pressure, or change in pressure or altitude from a reference point
Min/Max capture: Capture speed is equal to the selected damping rate
Damping rates: User selectable from 0.1 to 25 seconds
Backlight: Green, changes to Red for over pressure
Engineering unit selection: mm Hg, PSI, in Hg, mbar, bar, kPa, Torr, feet, meters
Altitude: Displayed in feet or meters. Can be set by user based on map or trig marker information or standard altitude uses U.S. Standard Atmosphere of 1962 data
Contrast Adjustment: Adjusts display for best viewing
Accuracy: (Full Scale = 38.674 PSIA or 2,000 mm Hg Abs)
± 0.015% F.S. from 0-1,000 mm HgA
± 0.025% F.S. 0-1,000 - 2,000 mm HgA
Field recalibration: Supported through firmware feature
Weight/shipping: 1.6 lb/3 lbs

Item #	Description
469-455	Handheld Digital Barometer - Altimeter

705 HANDHELD DIGITAL BAROMETER

- **Employs the latest in pressure sensor technology**
- **Wide range: 0 to 1551 mmHg**
- **±0.1% of F.S. accuracy**
- **16 pressure units**
- **Impact resistant, sealed to Type 12/IP54**
- **Rugged, lightweight handheld design**
- **Leak test, tare, max/min and filter**
- **Ambient temperature measurement in °F or °C**

The 705 is a portable digital barometer possessing a combination of handheld calculator size, digital display, high accuracy and wide choice of units, making it ideal as a portable absolute pressure reference. It combines tough and rugged design with accurate and reliable pressure measurement. New materials and technical innovations from over fifteen years experience with portable pressure testers has resulted in this advanced new product. The 705 pressure indicator uses a micro-machined silicon transducer to produce a pressure reading in units of pressure measurement.

Compact, robust and lightweight with a rugged, ABS molded case, the 705 is designed for single handed operation and provides many essential features required for routine maintenance and system troubleshooting. The unit has an integral folding stand.

The 705 features a variety of pressure scales to enable the operator to display the atmospheric pressure in a variety of units, including inHg, mmHg, mb, as the most widely used units in radiation therapy. It also displays ambient temperature in °C and °F with one degree resolution.

The 705 operates on three AA alkaline batteries for 300 hours. The Auto-Off automatic timeout prolongs battery life, but the feature can be disabled by holding the LEAK button while pressing the ON-OFF button. The UNITS button sequentially selects up to 16 units of measurement. The LEAK button sequentially selects maximum reading, minimum reading and initiates a 60-second countdown for leak test. The TARE button sets a zero reading for use as reference.

Calibration Standards: Instruments are calibrated against precision pressure calibration equipment, which is traceable to the international standards.

740 HANDHELD PRECISION DIGITAL BAROMETER

- **Accuracy: 0.02% FS or ±0.004 inHg absolute**
- **22 - 34 inHg absolute(558 - 863 mmHg)**
- **6 Digit resolution LCD display**
- **Multiple pressure scales and aeronautical units**
- **Alkaline or rechargeable batteries**
- **Lightweight hand-held rugged design**
- **RS232 output**
- **Ambient temperature measurement in °F or °C**

The 740 is a portable battery powered precision barometer, providing outstanding capabilities in a handheld package. The fundamental sensor technology employed within this instrument is a resonant pressure transducer (RPT). This vibrating element sensor not only provides accuracies of ±0.004 inHg (±0.15 mbar) but equally important has a calibration stability of better than 100 ppm per year. The 740 is widely used in laboratory and remote field applications for precision pressure reference.

The 740 precision pressure indicator uses a silicon resonant pressure transducer producing a pressure reading in units of pressure measurement and altitude. The instrument is contained in a moulded enclosure of a composite ABS material and can be used as a hand-held indicator or, using a retractable stand, as a bench instrument. The instrument can also communicate, through a serial RS232 connector, with a compatible computer system or printer.

The 740 barometer has an accuracy of ±0.02% FS for all pressure ranges including combined non-linearity, hysteresis, repeatability, and temperature effects over an operating temperature range of 15° to 120°F.

The 740 barometer is calibrated against precision pressure calibration equipment, which is traceable to National Institute of Standards and Technology (NIST). The 740 barometer can confidently be used as a first-class barometric reference device, with the recommended recalibration period being one year.

BAROMETER COMPARISON

Specifications	Item 469-100 705 Handheld Digital Barometer	Item 469-110 740 Handheld Precision Digital Barometer
Selectable Units	inHg, mmHg, mHg, mbar, bar, Pa, hPa, KPa, MPa, psi, inH2O (4°C, 20°C and 60°F), ftH2O (4°C, 20°C and 60°F), mH2O, Kgf/cm2 and an optional user defined scale	inHg, mmHg, mHg, mbar, bar, Pa, hPa, kPa, Mpa, psi, inH2O20, (20°C), inH2O04, (4°C), ftH2O20, (20°C), ftH2O04, (4°C), inH2O60, (60°F), kgf/cm2, kgf/m2, , cmHg, mmH2O, cmH2O, mH2O, torr, atm, lbf/ft2 plus altitude in feet (ft) or meters (m)
Operating Range	0 to 1551 mmHg	22 - 34 inHg absolute(558 - 863 mmHg)
Ambient Temperature	°F and °C reading of local condition ±3°F (±1.5°C)	°F and °C reading of local condition
Accuracy	±0.1% (± 1.55 mmHg) FS non-linearity, hysteresis and repeatability.	±0.02% (±0.0068 inHg; ±0.173 mmHg) FS For all pressure ranges includes: Combined non-linearity, hysteresis, repeatability, and temperature effects over 15°F to 120°F (-10°C to 50°C). Optional Enhanced Accuracy: 0.004 inHg (±0.101 mmHg) Absolute.
Display	5-digit Clear high resolution LCD, 12.7 mm high, with additional unit legends.	6-digit LCD, 0.54 in (13.6 mm) high with additional 16 text characters.
Over Range	Safe to 2 x FS. Display flashes at 110% FS.	
Resolution	0 to 1551 mmHg, 0.1 mmHg 0 to 2068 mb, 0.1 mb 0 to 61 inHg, 0.001 inHg	0.0003 inHg (0.0076 mmHg)
Temperature Range	Operating: 15°F to 122°F (-10°C to 50°C) Storage: -5°F to 140°F (-20°C to 60°C)	Operating: 15°F to 120°F (-10°C to 50°C) Storage: -40°F to 160°F (-40°C to 71°C)
Power	Three 1.5 V alkaline AA batteries	Three 1.5 V alkaline AA batteries
Battery Life	300 hours of use, selectable Auto-Off powers down after 10 minutes of inactivity	20 hours nominal continuous operation. Programmable power down prolongs battery life.
Battery Low Indicator	Display symbol	Display symbol
Readout	Max/Min-captures both maximum and minimum readings	Maximum/Minimum, tare and programmable filter available in all operating modes.
Operating Modes		A) Local pressure (QFE) B) Sea level pressure (QFF) from user set height C) Altitude above user set datum
Altitude Range	Infinite	Infinite
Communication Interface		RS232 via six-way LEMO socket
Pressure Connection	6 mm O.D. and 4 mm I.D. hose, G1/8 or 1/8" NPT female thread	Accepts 1/4" OD / 5/32" ID tubing (6 mm OD / 4 mm ID)
Reading Sensor	Micro-machined silicon transducer	Resonant pressure transducer (RPT)
Includes	User guide, carrying case and calibration certificate	Handbook and calibration certificate
Safety Conformance	EN61010, EN50081-1, EN50082-2, CE marked	EN61010, EN50081-1, EN50082-2, CE marked
Dimensions	7.5" x 3.5" x 1.4" (19 x 8.9 x 3.5 cm)	7.5" x 3.5" x 1.4" (19 x 8.9 x 3.5 cm) nominal
Weight	1.1 lb (0.5 kg)	1.1 lb (0.5 kg) nominal

Item #	Description
469-100	705 Handheld Digital Barometer
469-110	740 Handheld Precision Digital Barometer
469-112	Enhanced Barometric Accuracy Option (±0.004 inHg) for 469-110 Barometer
469-114	Battery Pack and Charger for 469-110 Barometer
469-116	Adapter Lead for RS-232 for 469-110 Barometer
469-118	Transit Case for 469-110

MERCURY-FREE ECO-CELLI BAROMETER / THERMOMETER

The Eco-celli is a new concept in liquid barometers with the precision of a mercury barometer without the mercury hazard. The Eco-celli looks similar to a traditional mercury barometer but the basic principle is completely different, based on the compressibility of gasses instead of the weight of liquid mercury.

The Eco-celli barometer reads altitude adjusted barometric pressure. It does not read absolute or true pressure for altitudes above sea level. If your facility requires altitude adjusted barometric pressure at any altitude or is at or near sea level, then the Eco-celli is the perfect replacement for the mercury barometers you currently use.

The Eco-celli barometer consists of a 64-inch long U-shaped tube filled with a red fluid and gas. The pressure of this red fluid on the gas is principle upon which the barometer operates (Boyles Law). Adjacent to the barometer tube is a 32-inch long blue methyl-alcohol thermometer. A unique scale that slides between the thermometer and barometer compensates for thermal expansion of the fluid and glass tubing due to changes in room temperature and allows for accurate measurement of air pressure. Finally, the barometer scale is four times larger than a mercury barometer, making it much easier to make readings of air pressure. The pressure scale measures in both millimeters and inches. and is constructed of durable clear acrylic with very easy to read scales. The glass tubes are easily replaceable if broken.

A calibration kit is included to adjust the unit for an altitude above sea level. The frame and glass tubes are packaged separately in the same box and require simple assembly by the final purchaser.

The Eco-celli barometer costs 1/3 to 1/2 less than a comparable mercury barometer. Given the low cost and and **non-mercury** operation, replacing mercury barometers now is a sensible option.

The precision thermometer is filled with blue colored methyl alcohol. An increase or decrease in temperature can cause the fluid in the barometer to expand and affect the pressure reading. This is corrected by setting the movable scale, which is attached to both the barometer and thermometer, to the top of the blue fluid in the thermometer and then taking your reading from the red barometer tube. The temperature scale measures in Degrees F and C.

Specifications

U-Shaped Tube: 1.57” W, 32.28” L
Thermometer Tube: 32.28” L
Thermometer Scale: 32° - 122° F, 0° - 51° C
Barometer Scale Readings: 28.80 - 31.00 in, 732 - 782 mm
Frame Size: 5.75” W x 36.5” L

Item #	Description
469-002	Eco-celli Barometer

INNOVACELLI® PRECISION BAROMETER

- **Mercury-Free - Completely Non-Toxic**
- **Reads Absolute Pressure at any Altitude**
- **NIST/ BALAC Traceable Calibration**
- **Expanded Scale for Easy, Accurate Readings**
- **Simple to Use - No Offsets or Calculations**
- **Developed for Hospital/Lab Use**
- **Sturdy Acrylic Protective Frame**
- **Adjustable Mounting Plate for Plum/Leveling**
- **No Batteries or Mechanical Gears, Just Physics**
- **Hospital Tested in Major US and Canadian Cancer Centers**

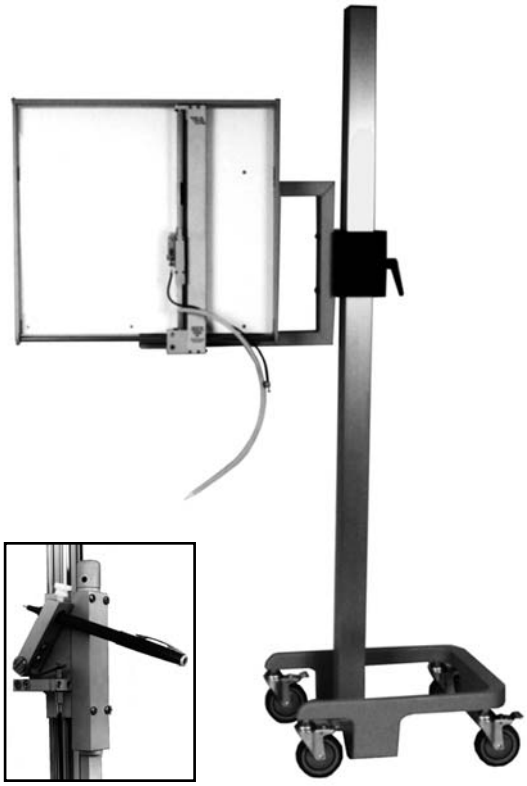
The new Innovacelli Precision Barometer (pronounced inno-va-chelly) is the latest development in true pressure, pure physics barometers. Developed especially for hospitals and laboratories, these barometers contain no hazardous mercury and are just as accurate as a fine mercury barometer. They may be even more accurate as they require no offsets or calculations that can lead to errors. Also, the Innovacelli scale is 4 times larger than a mercury barometer, allowing for a more precise reading of the actual air pressure. Eight vacuum chambers sense the smallest pressure changes and translate those changes to a liquid readout scale. The dual scale has a 70mm/950 hPa range centered on your altitude. For example, sea level locations have a scale reading from 720 - 790 mm and 960 - 1055 hPa. The entire barometer is surrounded by a protective clear acrylic frame.

Specifications

Accuracy: ±1 mm
Height: 31" (79 cm)
Diameter: 4.25" (10.8 cm)
Distance from wall In mounting bracket: 6.5" (16.5 cm)
Scale Range: 70mm/95hPa
Weight: 9 lb (4.1 kg)

Item	Description
469-300	Innovacelli Precision Barometer

MOBILE CONTOUR PLOTTER



- **Accepts all types of pens**
- **Finger plunger engaged pen**
- **360° rotatable drawing board**
- **Counterbalanced drawing board**
- **Counterbalanced base**

The Mobile Contour Plotter was designed as a simple system to accurately and rapidly transfer the patient's surface contour to a sheet of paper while the patient is on a simulator table or treatment table. This contour drawing can then be used on treatment planning computers and in conjunction with CT information for the treatment plan. It can be a permanent part of the patient's record.

The contour plotter has a mechanical mechanism which links a drawing pen to a stylus arm. Upon contact with the body, it translates body contours to an overhead drawing board. When the finger plunger is depressed, engaging the pen, a continuous plot is drawn as the operator follows the physical contour of the patient. Marks can be made along the contour to indicate beam entry and laser light locations.

The pen can be any type of pencil, ball point pen, or fine felt tip marker. The pen is secured in a special holder with a thumb screw so that the pen tip is about 1/2" (1.3 cm) or less from the paper. The pen to paper engagement is made through a cable by a finger controlled plunger or locked in place by a locking screw. The finger engaging system is attached to the aluminum stylus arm, allowing easy engagement of the finger plunger while following the contour with the stylus. The nylon stylus tip is not cold to the touch. It is designed to permit skin contact even in the close spacing between the table top and the patient.

The drawing board can rotate 360°. It can lock at any angle, enabling lateral and sagittal contours. The counterbalanced drawing board is easily adjustable in height to accommodate different patient thicknesses and table heights commonly encountered in radiotherapy departments.

It is recommended that computer plotting paper be used for taking contours due to its paper surface hardness and smoothness (Items 146-900 or 146-902). Other paper with the same characteristics will also work. The paper can be secured to the board with masking tape.

Four 5" (12.8 cm) diameter swivel and locking casters allow the unit to be easily positioned or transported to various areas of the department.

Maintenance Check

Routinely rotate the stylus arm around a point to check the accuracy of the white plastic tip. There should be no more than a 2 mm wobble. Check for fraying of the counterweight cable in the post once a year.

Specifications

Drawing Board Size: 26 7/8" W x 24" H (68.5 x 61 cm)
Paper Size: 21" x 24" (54 x 61 cm)
Mechanical Tolerance: 2 mm
Drawing Pen: Pencil, ball point pen, or felt tip marker with a maximum diameter of 13/32" (1 cm)
Base Size: 19" W x 24" L (48.5 x 61 cm)
Height: 82.75" (210 cm)
Weight: 187 lb (85 kg)
Shipping Weight: 230 lb (105 kg)

Item	Description
146-801	Mobile Contour Plotter

CONTOUR WIRE

149-081 149-125

Item	Lead Contour Wire	Weight
149-081	2.36 mm (0.093") Dia x 1 lb Spool	1 lb (0.5 kg)
149-125	3 mm (0.125") Dia x 1 lb Spool	1 lb (0.5 kg)

AQUAPLAST™ CONTOUR TUBE

- **Combines the ease of lead solder wire with the accuracy of plaster strips**

These hollow, low-temperature thermoplastic tubes heat and cool quickly to form rigid contours in minutes. Contour Tubes™ allow for easy application and removal without altering the shape of the finished contour. The shape is retained until reheated. To revise contours, simply reheat and remold the softened Contour Tube™ against the patient's skin.

Item	Aquaplast™ Contour Tube
RT-1100	4.8 mm Dia x 3' (1 m) L

AQUAPLAST RT® CUSTOM BOLUS

- **No mixing, No wet gauze**
- **Available in sheet or pellet form**
- **Won't dry out or change shape**

Ideal for hard-to-bolus areas such as: chest wall, nose, parotid, groin, ears, and any irregularly surfaced anatomical feature. The attenuation characteristics of this product are comparable to other polymer-based products; however, its physical properties are superior.

The Aquaplast RT® Custom Bolus softens in hot water and becomes moldable just like Aquaplast. It reduces setup time, and unlike other products, it minimizes air gaps and day-to-day variability.

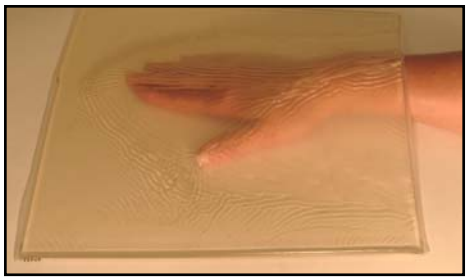
3.2 mm thickness is equivalent to 0.32 cm bolus.
4.8 mm thickness is equivalent to 0.5 cm bolus.
9.6 mm thickness is equivalent to 1.0 cm bolus.

Item #	Thickness	Dimensions
RT-1910-3	3.2 mm	20 cm x 23 cm (8" x 9")
RT-1913-3	3.2 mm	30 cm x 30 cm (12" x 12")
RT-1930-3	3.2 mm	43 cm x 43 cm (17" x 17")
RT-1931-3	3.2 mm	30 cm x 45 cm (12" x 18")
RT-1908-4	4.8 mm	7 cm x 22 cm (3" x 9")
RT-1909-4	4.8 mm	10 cm x 10 cm (4" x 4")
RT-1910-4	4.8 mm	20 cm x 23 cm (8" x 9")
RT-1913-4	4.8 mm	30 cm x 30 cm (12" x 12")
RT-1917-4	4.8 mm	15 cm x 15 cm (6" x 6")
RT-1930-4	4.8 mm	43 cm x 43 cm (17" x 17")
RT-1931-4	4.8 mm	30 cm x 45 cm (12" x 18")
RT-1910-9	9.6 mm	20 cm x 23 cm (8" x 9")

SUPER-FLEX TRANSPARENT BOLUS (BOLX)

With (Bolx I) or Without (Bolx II) Transparent Film

Superflex Bolus without Film (Bolx II)



Superflex Bolus with Film (Bolx I)

- **Latex Free**
- **Calibrated**
- **Equivalent to soft tissue in radiation interaction**
- **Transparency allows visual beam location**
- **May be cut with scissors and stacked to increase thickness**
- **Unaffected by one million rads of radiation**
- **Non-allergenic and non-toxic**
- **Conforms to body contours with minimal change to thickness**
- **Easily cleaned with soap and water**
- **1.03 density**
- **1.02 electron density**

Item	Superflex Bolus without Film (Bolx II)
486-405	0.5 cm T x 35 cm sq
486-410	1.0 cm T x 35 cm sq
486-415	1.5 cm T x 35 cm sq
486-420	2.0 cm T x 35 cm sq
486-425	2.5 cm T x 35 cm sq
486-430	3.0 cm T x 35 cm sq
486-440	4.0 cm T x 35 cm sq

Superflex material is calibrated with photon and electrons in the energy range greater than 1 MeV. This assures accurate measurement and administration of the prescribed dose of radiation. Close quality control of the thickness promotes quality results time after time. The materials do not flow, creep, or sag out of shape and may be cut with scissors to fit the patient and layered as required to build up the thickness.

Ultrasound

Super-Flex is used because of its excellent ability to conform to body surfaces. As a transducer array stand off it makes a smoother surface and acts as a separator in near-surface imaging, making the imaged objects appear clearer.

Radiation Therapy

In the energy range greater than 1 MeV using photons or electrons, Super-Flex calibrations curves are available. Calibration allows greater accuracy in dosimetry and in therapy. In use, a bolus is placed over or around the irradiated area to provide build-up, energy reduction/attenuation, or extra scattering. Super-Flex conforms well to most human surfaces without significant change in thickness. The soft tissue equivalence density, approximately 1.03, results from its chemical composition which is mostly carbon, oxygen, and hydrogen.

Miscellaneous

Super-Flex is nearly the ideal material for use as the matrix for test-object phantoms. The material can also be used as missing tissue or as internal heterogeneity compensation in x-ray imaging techniques that require the compensator to be on or near the patient.

Additional Items

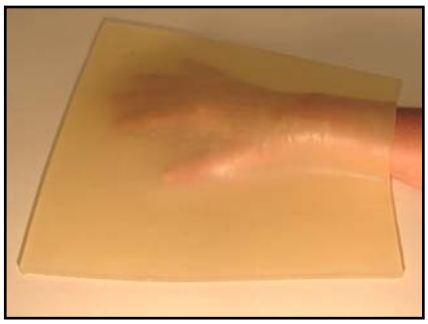
When using bolus on a curved area such as the chest wall, the use of Spandage (Items 674-308 through 674-312) or gauze will hold the bolus against the skin to prevent gaps.

Item	Superflex Bolus with Film (Bolx I)
486-505	0.5 cm T x 30 cm sq
486-510	1.0 cm T x 30 cm sq
486-515	1.5 cm T x 30 cm sq
486-520	2.0 cm T x 30 cm sq
486-525	2.5 cm T x 30 cm sq
486-530	3.0 cm T x 30 cm sq

Item	Superflex Bolus with Film (Bolx I)
486-605	0.5 T x 30 x 50 cm
486-610	1.0 T x 30 x 50 cm

SUPERFLAB BOLUS MATERIAL

Density: 1.02 g/cm^3



- **Latex Free**
- **Conforms to patient's contour**
- **Tissue equivalent**
- **Flexible, will not dry out**

This material is a synthetic oil gel with a specific gravity of 1.02. It is based on vinyl plastic containing a large amount of di-isodecyl phthalate. It contains only materials approved by the FDA for human contact.

Superflab comes in thicknesses which provide maximum dose buildup for relevant photon energies. It does not suffer inelastic strain for normal stresses and does not have to be bagged or wrapped in plastic film to maintain its shape. It can be washed with soap and water followed by an application of talcum powder or it can be wrapped.

Since Superflab has both an electron build-up characteristic and a density closer to that of water than polystyrene, it is widely used in radiotherapy clinics. Superflab is not tissue equivalent at diagnostic x-ray energies.

Custom sizes are available and would incur a set-up per size and per piece cost. Please contact RPDinc to request custom sizes.

Additional Items

When using bolus on a curved area such as the chest wall, the use of Spandage (Items 674-308 through 674-312) or gauze will hold the bolus against the skin to prevent gaps.

CE

Item	Superflab Bolus
486-302	0.2 cm T x 30 cm sq
486-303	0.3 cm T x 30 cm sq
486-305	0.5 cm T x 30 cm sq
486-310	1.0 cm T x 30 cm sq
486-315	1.5 cm T x 30 cm sq
486-320	2.0 cm T x 30 cm sq
486-325	2.5 cm T x 30 cm sq
486-330	3.0 cm T x 30 cm sq
486-340	4.0 cm T x 30 cm sq
486-370	Custom SuperFlab Bolus Set-up

ELASTO-GEL

Density 1.20 gm/cm^3

Materials are frequently used in high-energy radiation therapy in order to deliver the prescribed dose to the patient's skin surface. Elasto-gel is easy to work with, reusable on the same patient, is mildly adhesive, and conforms exceptionally well to body contours. It may be easily cut with a scissors to the desired size and shape. Standard backing is stretch cloth on one side and clear plastic on the other. The stretch backing may be removed by first moistening with a damp cloth and then peeling the cloth from the gel. Because of the self-adhesive nature of the gel pieces, they may be layered together for various thicknesses. **Note:** Single patient use only - Not to be used on multiple patients.

Item	Elasto-Gel
486-970	0.5 cm T x 30 cm sq
486-971	1.0 cm T x 30 cm sq
486-979	0.3 cm T x 20 cm x 40 cm
486-980	0.5 cm T x 20 cm x 40 cm
486-981	1.0 cm T x 20 cm x 40 cm

ADAPT-IT™ THERMOPLASTIC PELLETS

Adapt-It™ Pellets soften quickly in hot water for easy shaping. Fabricate custom bolus, build-up, and bite blocks with these easy-to-mold pellets. Just pour them into a strainer (Item 878-163) then place strainer with pellets into hot water and allow pellets to turn clear. The pellets will form into a solid mass.

The mass, in its solid state, will bond to any head and neck mask or breast support to form a permanent fixture. Thus, allowing for better positioning and repositioning of bolus or build-up material.

To mold softened pellets in the patients mouth, place the pellets in a sealed plastic bag before insertion to prevent accidental bonding to dental compounds.

Item	Description	Pounds
RT-7001	Adapt-It™ Thermoplastic Pellets	1
RT-7003	Adapt-It™ Thermoplastic Pellets	3

SUPER STUFF BOLUS MATERIAL

Density: 1.02 g/cm^3

Super Stuff Bolus Material has a density of 1.02g/cm^3. Item 489-050 is 50 - 1 ounce packages of powder which are packaged in a plastic bag with a black water fill line indicated on the bag. Item 489-100 is a 10 lb bulk package of powder. After mixing, Super Stuff takes on the consistency of Jello®. Wrap with plastic wrap and shape to fit the patient.

Item	Super Stuff Bolus Material
489-050	1 oz (0.03 kg) Packages, 50
489-100	10 lb (4.5 kg) Package, 1

BRASS MESH BOLUS

Density: 0.25 g/cm^2

Brass Mesh Bolus can be used for post-mastectomy chest walls using 4 MV and 6 MV photons.

When placing Brass Mesh over breast and a gap is between breast, use a piece of double stick tape on the patient between the breasts to secure the brass mesh down.

When wrapping the Brass Mesh Bolus around the side of a chest wall, use a product such as Spandage (Items 674-308 through 674-312), gauze or clear plastic wrap to hold the Brass Mesh Bolus against the skin which will prevent hanging gaps.

If you are using 15MV or 18MV, there might be neutron activation which may increase the skin dose and/or give dose to the hands of the therapist who handles the bolus. Some patients have had skin reactions. See paper on "Skin dose effects of post mastectomy chest wall etc." The Brass Mesh Bolus can be cut with an Aviation Snips.

This material can be cut. It can be cleaned with soap and water.

Specifications

Material: Brass
Size: 18"x18" (45x45 cm)
Thickness: 1.5 mm
Tissue Equivalent Thickness: 2.0 mm

Item	Super Stuff Bolus Material
489-600	Brass Mesh Bolus 18" x 18" (45x45 cm)

MT SPANDAGE™ ELASTIC NET

Latex Free Elastic Retainer Net

When wrapping bolus around the side of a chest wall or head, use the Spandage to hold the bolus against the skin to prevent gaps.

Tubular elastic stretch net can accommodate a wide variety of medical needs involving virtually every part of the body. Size should be determined by patient's shirt size.

Item #	Size	Length Stretched
674-308	Medium Chest	10 yards
674-311	XX-Large Chest	10 yards
674-312	3X-Large Chest	10 yards

Others Sizes Available

RED ROPE WAX

Specifications

Size: 3/16" Dia x 11" L (0.5 x 28 cm)
Quantity: 55 Strips
Specific Gravity (H_2O = 1): 0.90
Package Weight: 0.5 lb (0.23 kg)

Item	Description
488-001	Red Rope Wax

DENTAL BASE PLATE WAX

Specifications

Size: 0.15 x 7.5 x 14.2 cm
Quantity: 35 sheets
Specific Gravity (H_2O = 1): 0.90
Weight: 1 lb (0.5 kg)

Item	Description
933-122	Wax Sheets, 1 lb

BEES WAX PELLETS

At 25° C or solid state, Density is 0.954 g/cc.

Specifications

Color: Bleached White
Package Weight: 5 lb (2.3 kg)

Item	Description
488-005	Bees Wax Pellets

CLEAR PLASTIC WRAP

- **Made of 100% polyethylene**
- **High cling; low tangle**

The high-cling properties of this film enables wrapping with an extraordinarily tight seal that stays in place. Low-tangle properties ensure that it won't ball up when being handled. Carton has convenient metal tear-off bar.

Specifications

Size: 12" W x 100' L (30.5 cm x 30.5 m)

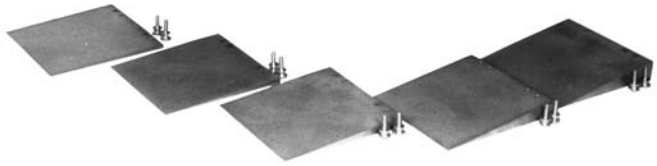
Item	Description
119-750	Clear Plastic Wrap

SIEMENS WEDGE CODING PLUGS FOR .DECIMAL® BRASS COMPENSATORS

Item	Description	Quantity
1884-10-11R	Siemens 3 3/8" Wedge Coding Plug with Threaded Holes for Block Tray Slot, Specify code 1 to 18	Single
1884-10-11R-32771-01	Siemens Wedge Coding Plug S2N01 for Brass Compensator	Single
1884-10-11R-32771-02	Siemens Wedge Coding Plug S2N02 for Brass Compensator	Single
1884-10-11R-32771	Siemens Wedge Coding Plugs for Brass Compensators	Set of 18

Other Codes Available, Specify Code

CUSTOM BRASS COMPENSATOR WEDGES



The Brass Compensator Wedges are custom made for Varian, Siemens, AECL, Philips, Toshiba, ATC, Mitsubishi, and ADAC accelerators.

Specifications

Density: 8.515 g/cm^3
Composition: 61.5% Copper, 35.5% Zinc, 3.0% Lead

Item	Custom Brass Compensator Wedges
243-415	15° x W x L x H
243-420	20° x W x L x H
243-430	30° x W x L x H
243-440	40° x W x L x H
243-445	45° x W x L x H
243-450	50° x W x L x H
243-460	60° x W x L x H

Extra Charge for Compensator Trays

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STORAGE CART FOR VARIAN BRASS COMPENSATORS

The Storage Cart for Varian brass compensators stores up to 88 compensators on Varian wedge trays from 9.75" wide to 10.75" wide (25 to 27.5 cm). The depth of the cart allows for the placement of two trays in each slot. The front of each rail has a mechanical stop that prevents the trays from sliding out.

The cart comes complete with sturdy handle, four corner bumpers, and four 5" (12.75 cm) lockable swivel casters.

Specifications

Overall Dimensions: 48.75" W x 50.4" H x 24" D (124.25 x 128.5 x 61 cm)
Weight: 230 lb (105 kg)
Density: 1.20 gm/cm^3

Item	Description
880-9896	Storage Cart for Varian Brass Compensators

STORAGE CART FOR SIEMENS BRASS COMPENSATORS

The Storage Cart for Siemens brass compensators stores up to 88 compensators on Siemens wedge trays 8.75" (22.3 cm) wide. The depth of the cart allows for the placement of two trays in each slot. The front of each rail has a mechanical stop that prevents the trays from sliding out.

The cart comes complete with sturdy handle, four corner bumpers, two 5" (12.75 cm) lockable swivel casters, and two fixed casters.

Specifications

Overall Dimensions: 39.25" W x 50.5" H x 24" D (100 x 129 x 61 cm)
Weight: 250 lb (114 kg)

Item	Description
880-9897	Storage Cart for Siemens Brass Compensators

BEAM SPOILER FRAME AND BEAM SPOILERS

The Beam Spoiler Frame will hold up to 1" (2.54 cm) thickness of beam spoiler for Total Body Irradiation. The frame is made of 1" (2.54 cm) square and 1.25" (3.18 cm) square steel tubing. The vertical legs are telescoping to allow a 13" (33 cm) vertical range of movement. Two hangers that are adjustable on the top horizontal bar are positioned to hold a beam spoiler in either the vertical or horizontal direction. The frame can support 1" (2.54 cm) thick (2 plates for Photons) weight up to 250 pounds (114 kg). Four 6" (15.25 cm) diameter swivel locking casters allow for easy movement of the Beam Spoiler. The frame can be dismantled for storage.

Optional Beam Spoiler plates are available in acrylic or polycarbonate in 0.375" (0.95 cm) or 0.50" (1.27 cm) thickness. The beam spoiler has two key holes on the 60" (152 cm) side and on the 84" (213 cm) side to allow for positioning on the frame in either direction. The frame can support two beam spoiler plates. The key holes can also be used to hang the beam spoiler from wall hooks for storage.

Specifications

Item 495-004 Beam Spoiler Frame for TBI
Overall Size: 94" L x 24" W x 81" to 94" H
(238.8 x 61 x 205.7 to 238.8 cm) not including casters
Finish: Durable tan textured polyurethane enamel paint

Beam Spoilers
Size: 84" L x 60" H (213 x 152.5 cm)

Item	Description
495-004	Beam Spoiler Frame for TBI

Item	Beam Spoiler	Thickness	Weight
495-005	Polycarbonate	0.375" (0.95 cm)	77 lb (35 kg)
495-006	Polycarbonate	0.50" (1.27 cm)	103 lb (47 kg)
495-007	Acrylic	0.375" (0.95 cm)	77 lb (35 kg)
495-008	Acrylic	0.50" (1.27 cm)	103 lb (47 kg)

SELF HOLDING BEAM SPOILER WITH FLEXIBLE ARM

The Self Holding Beam Spoiler has a flexible 18" (45.7 cm) or 24" (61 cm) arm that manually adjusts for easy use. The acrylic plate has an arm rotation lock that secures the acrylic plate to the desired position. The acrylic plate is 30 cm square x 0.25" (0.64 cm) or 0.375" (0.95 cm) thick and is mounted at the end of the flexible arm. The whole assembly attaches to the table rail with a rail clamp.

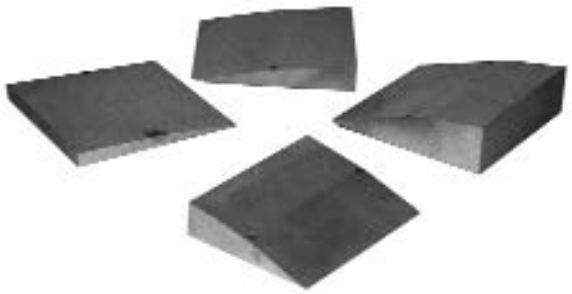
Specifications

Acrylic Density: 1.185 g/cm³

Item	Description
495-053-20	Siemens Flexible 18” Beam Spoiler
495-053-32	Varian Flexible 18” Beam Spoiler
495-053-50	Philips Flexible 18” Beam Spoiler
495-054-20	Siemens Flexible 24” Beam Spoiler
495-054-32	Varian Flexible 24” Beam Spoiler
495-054-50	Philips Flexible 24” Beam Spoiler

Customer to Specify Acrylic Thickness

CUSTOM WEDGES



Custom Wedges are made for Varian, Siemens, AECL, Philips, Toshiba, ATC, Mitsubishi and ADAC accelerators. For high energy linear accelerators, wedges can be made of stainless steel, cold roll steel, lead with antimony, brass, tungsten or aluminum. When ordering state the height for each step in the wedge and give the overall width and length, central axis, type of material, contact person and phone number.

NOTE: The degree angle of the wedge is not the physical angle. The radiation angle must be calculated by the physicist.

TUNGSTEN WEDGES
Density: 17 g/cm³/ Machinable Grade

Item #	Description	Size
243-215	Tungsten Wedge	15º x W x L
243-220	Tungsten Wedge	20º x W x L
243-230	Tungsten Wedge	30º x W x L
243-240	Tungsten Wedge	40º x W x L
243-245	Tungsten Wedge	45º x W x L
243-250	Tungsten Wedge	50º x W x L
243-260	Tungsten Wedge	60º x W x L

ALUMINUM WEDGE
Density: 2.718 g/cm³

Item #	Description	Size
243-315	Aluminum Wedge	15º x W x L
243-320	Aluminum Wedge	20º x W x L
243-330	Aluminum Wedge	30º x W x L
243-340	Aluminum Wedge	40º x W x L
243-345	Aluminum Wedge	45º x W x L
243-350	Aluminum Wedge	50º x W x L
243-360	Aluminum Wedge	60º x W x L

LEAD WEDGES
Density: 11.35 g/cm³

Item #	Description	Size
243-515	Lead Wedge	15º x W x L
243-520	Lead Wedge	20º x W x L
243-530	Lead Wedge	30º x W x L
243-540	Lead Wedge	40º x W x L
243-545	Lead Wedge	45º x W x L
243-550	Lead Wedge	50º x W x L
243-560	Lead Wedge	60º x W x L

STEEL WEDGES
Density: 7.83 g/cm³

Item #	Description	Size
243-615	Steel Wedge	15º x W x L
243-620	Steel Wedge	20º x W x L
243-630	Steel Wedge	30º x W x L
243-640	Steel Wedge	40º x W x L
243-645	Steel Wedge	45º x W x L
243-650	Steel Wedge	50º x W x L
243-660	Steel Wedge	60º x W x L

STAINLESS STEEL WEDGES
Density: 7.916 g/cm³

Item #	Description	Size
243-715	Stainless Steel Wedge	15º x W x L
243-720	Stainless Steel Wedge	20º x W x L
243-730	Stainless Steel Wedge	30º x W x L
243-740	Stainless Steel Wedge	40º x W x L
243-745	Stainless Steel Wedge	45º x W x L
243-750	Stainless Steel Wedge	50º x W x L
243-760	Stainless Steel Wedge	60º x W x L

BRASS WEDGES
Density: 8.515 g/cm³

Item #	Description	Size
243-415	Brass Wedge	15º x W x L
243-420	Brass Wedge	20º x W x L
243-430	Brass Wedge	30º x W x L
243-440	Brass Wedge	40º x W x L
243-445	Brass Wedge	45º x W x L
243-450	Brass Wedge	50º x W x L
243-460	Brass Wedge	60º x W x L

There is an extra charge for wedges over 2.5 cm thick or 15cm wide - Wedge tray must be ordered separately.

VARIAN CLINAC 4, 6, 12, 18 & 20
Replacement Wedge Trays

Item #	Description	SIZE
1846-010	Acrylic Wedge Tray	1/8" x 7" x 9 3/4"
1846-020	Lexan Wedge Tray	1/8" x 7" x 9 3/4"
1846-025	Replacement 15 3/4" Ball Chain for Coding Plug	

Custom Trays Available

When placing an order please specify wedge mounting hole spacing, contact person, and phone number.
Standard wedge mounting hole spacing: 7.5"

Item #	Description
1846-098	Varian II S.S. In-Plane Wedge Tray
1846-099	Varian II S.S. Cross Plane Wedge Tray

Custom Trays Available

VARIAN TYPE II IN-PLANE WEDGES
Standard and Custom

When placing an order please state the size needed, a contact person, phone number and tray coding.

Specifications

Tray: Coded metal tray
Materials: Brass, steel, stainless steel, or lead
Toe to Heel Size: 15 cm, 20 cm, 30 cm and 40 cm
Width: 40 cm

Item #	Description	Size
1846-150	15° Brass In-Plane Wedge w/Plug	40 cm x 40 cm
1846-151	30° Brass In-Plane Wedge w/Plug	40 cm x 40 cm
1846-152	45° Brass In-Plane Wedge w/Plug	40 cm x 40 cm
1846-153	60° Brass In-Plane Wedge w/Plug	40 cm x 40 cm
1846-155	15° Brass In-Plane Wedge w/Plug	20 cm x 40 cm
1846-156	30° Brass In-Plane Wedge w/Plug	20 cm x 40 cm
1846-157	45° Brass In-Plane Wedge w/Plug	20 cm x 40 cm
1846-158	60° Brass In-Plane Wedge w/Plug	15 cm x 40 cm
1846-215	15° Steel In-Plane Wedge w/Plug	20 cm x 40 cm
1846-216	15° S.S. In-Plane Wedge w/Plug	20 cm x 40cm
1846-230	30° Steel In-Plane Wedge w/Plug	20 cm x 40 cm
1846-231	30° S.S. In-Plane Wedge w/Plug	20 cm x 40 cm
1846-245	45° Lead In-Plane Wedge w/Plug	20 cm x 40 cm
1846-246	45° S.S. In-Plane Wedge w/Plug	20 cm x 40 cm
1846-260	60° Lead In-Plane Wedge w/Plug	15 cm x 40 cm
1846-315	15° Steel In-Plane Wedge w/Plug	30 cm x 40 cm
1846-330	30° Steel In-Plane Wedge w/Plug	30 cm x 40 cm
1846-345	45° Steel In-Plane Wedge w/Plug	30 cm x 40 cm
1846-346	45° Lead In-Plane Wedge w/Plug	30 cm x 40 cm
1846-360	60° Lead In-Plane Wedge w/Plug	30 cm x 40 cm

40 cm sq. Wedge May Have An Additional Charge

Radiation Products Design, Inc. I Albertville, MN 55301 I (800) 497-2071 I Fax: (763) 497-2295 I www.rpdinc.com

VARIAN CROSS-PLANE WEDGE
Type II Accessories

Item #	Description	Size
1846-251	15° Brass Cross-Plane Plug Coding	20 x 40 cm
1846-252	30° Brass Cross-Plane Plug Coding	20 x 40 cm
1846-253	45° Brass Cross-Plane Plug Coding	20 x 40 cm
1846-254	60° Brass Cross-Plane Plug Coding	15 x 40 cm
1846-261	15° Steel Cross-Plane Plug Coding	30 x 40 cm
1846-262	30° Steel Cross-Plane Plug Coding	30 x 40 cm
1846-263	45° Steel Cross-Plane Plug Coding	20 x 40 cm
1846-264	45° Lead Cross-Plane Plug Coding	20 x 40 cm
1846-265	60° Lead Cross-Plane Plug Coding	15 x 40 cm

Custom Sizes Available

VARIAN IN-PLANE HALF WEDGES
Type II Accessories

Item #	Description	Size
1846-370	15° Steel In-Plane Half Wedge w/Plug	20 cm x 40 cm
1846-372	30° Steel In-Plane Half Wedge w/Plug	20 cm x 40 cm
1846-374	45° Steel In-Plane Half Wedge w/Plug	20 cm x 40 cm
1846-375	45° Lead In-Plane Half Wedge w/Plug	20 cm x 40 cm
1846-376	60° Lead In-Plane Half Wedge w/Plug	20 cm x 40 cm
1846-378	15° Brass In-Plane Half Wedge w/Plug	20 cm x 40 cm
1846-379	30° Brass In-Plane Half Wedge w/Plug	20 cm x 40 cm
1846-380	45° Brass In-Plane Half Wedge w/Plug	20 cm x 40 cm
1846-377	60° Brass In-Plane Half Wedge w/Plug	20 cm x 40 cm

Option: Wedge maybe put on center line or 2mm off center line

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VARIAN 4-WAY WEDGE
Type III Accessories

Item #	Description	Size
1846-600-2	Optical Coded S.S. Wedge Tray, Hole Spacing 8.688”	
1846-600-8	Handle for Four Sided Optical Coded Wedge Tray	
1846-601	Optical Coded 1/4” Lexan Wedge Tray with Handle	
1846-602	15° 4-Way Steel Wedge on Opt Coded Tray	30 x 40 cm
1846-603	15° 4-Way S.S. Wedge on Opt Coded Tray	30 x 40 cm
1846-604	30° 4-Way Steel Wedge on Opt Coded Tray	30 x 40 cm
1846-605	30° 4-Way S.S. Wedge on Opt Coded Tray	30 x 40 cm
1846-606	45° 4-Way Lead Wedge on Opt Coded Tray	20 x 40 cm
1846-608	60° 4-Way Lead Wedge on Opt Coded Tray	20 x 40 cm

Custom Sizes Available

VARIAN 4-WAY HALF-WEDGE
Type III Accessories

Item #	Description	Size
1846-622	15° Steel 4-Way Half Wedge Opt Coded Tray	20 x 40 cm
1846-624	30° Steel 4-Way Half Wedge Opt Coded Tray	20 x 40 cm
1846-625	45° Steel 4-Way Half Wedge Opt Coded Tray	20 x 40 cm
1846-626	45° Lead 4-Way Half Wedge Opt Coded Tray	20 x 40 cm
1846-628	60° Lead 4-Way Half Wedge Opt Coded Tray	20 x 40 cm

Option: Wedge maybe put on center line or 2 mm off center line

SIEMENS MEVATRON - SCREW CODING - 20 CM , 30 CM AND 40 CM.

The Wedge Filter System is designed to be used with all Mevatrons with lower independent jaws.
The wedges are mounted on screw coded trays which verify the wedge direction and the wedge angle on the 20 cm and 30 cm
The 40 cm Wedges are coded with auxiliary codes, which will not limit the field size.

1880-4907
In-Plane

1880-3902
Cross-Plane

Steel In-Plane With Screw Coding
Head to Foot (#1 & 2)

Steel In-Plane With Screw Coding

Item #	Wedge Description	Size
1880-2901	15º In-Plane Screw Coding	20 cm x 20 cm
1880-2902	30º In-Plane Screw Coding	20 cm x 20 cm
1880-2903	45º In-Plane Screw Coding	20 cm x 20 cm
1880-2904	60º In-Plane Screw Coding	15 cm x 20 cm

Steel In-Plane With Screw Coding

Item #	Description	Size
1880-4906	15º In-Plane Screw Coding	25 cm x 30 cm
1880-4907	30º In-Plane Screw Coding	25 cm x 30 cm
1880-4908	45º In-Plane Screw Coding	25 cm x 30 cm
1880-4909	60º In-Plane Screw Coding	20 cm x 30 cm

Steel In-Plane With Screw Coding

Item #	Description	Size
1881-4916	15º In-Plane Screw Coding	25 cm x 40 cm
1881-4917	30º In-Plane Screw Coding	25 cm x 40 cm
1881-4918	45º In-Plane Screw Coding	25 cm x 40 cm
1881-4919	60º In-Plane Screw Coding	20 cm x 40 cm

Steel Cross-Plane With Screw Coding
Side to Side (#3 & 4)

Steel Cross-Plane With Screw Coding

Item #	Description	Size
1880-3901	15º Cross-Plane Screw Coding	20 cm x 20 cm
1880-3902	30º Cross-Plane Screw Coding	20 cm x 20 cm
1880-3903	45º Cross-Plane Screw Coding	20 cm x 20 cm
1880-3904	60º Cross-Plane Screw Coding	15 cm x 20 cm

Steel Cross-Plane With Screw Coding

Item #	Description	Size
1880-5906	15º Cross-Plane Screw Coding	25 cm x 30 cm
1880-5907	30º Cross-Plane Screw Coding	25 cm x 30 cm
1880-5908	45º Cross-Plane Screw Coding	25 cm x 30 cm
1880-5909	60º Cross-Plane Screw Coding	20 cm x 30 cm

Steel Cross-Plane With Screw Coding

Item #	Description	Size
1881-5916	15º Cross-Plane Screw Coding	25 cm x 40 cm
1881-5917	30º Cross-Plane Screw Coding	25 cm x 40 cm
1881-5918	45º Cross-Plane Screw Coding	25 cm x 40 cm
1881-5919	60º Cross-Plane Screw Coding	20 cm x 40 cm

SIEMENS MEVATRON - DIGITAL CODING - 20 CM , 30 CM AND 40 CM.

The Wedge Filter System is designed to be used with all Mevatrons with lower independent jaws.
The wedges are mounted on screw coded trays which verify the wedge direction and the wedge angle on the 20 cm and 30 cm.
The 40 cm Wedges are coded with auxiliary codes, which will not limit the field size.

1880-8908
In-Plane

1880-9917
Cross Plane

Steel In-Plane With Digital Coding Plug
Head to Foot (#1 & 2)

Steel In-Plane With Digital Coding Plug

Item #	Description	Size
1880-6901	15° In-Plane Digital Coding	20 cm x 20 cm
1880-6902	30° In-Plane Digital Coding	20 cm x 20 cm
1880-6903	45° In-Plane Digital Coding	20 cm x 20 cm
1880-6904	60° In-Plane Digital Coding	15 cm x 20 cm

Steel In-Plane With Digital Coding Plug

Item #	Description	Size
1880-8906	15° In-Plane Digital Coding	25 cm x 30 cm
1880-8907	30° In-Plane Digital Coding	25 cm x 30 cm
1880-8908	45° In-Plane Digital Coding	25 cm x 30 cm
1880-8909	60° In-Plane Digital Coding	20 cm x 30 cm

Steel In-Plane With Digital Coding Plug

Item #	Description	Size
1880-8916	15° In-Plane Digital Coding	25 cm x 40 cm
1880-8917	30° In-Plane Digital Coding	25 cm x 40 cm
1880-8918	45° In-Plane Digital Coding	25 cm x 40 cm
1880-8919	60° In-Plane Digital Coding	20 cm x 40 cm

Steel Cross-Plane With Digital Coding Plug
Side to Side (#3 & 4)

Steel Cross-Plane With Digital Coding Plug

Item #	Description	Size
1880-7901	15° Cross-Plane Digital Coding	20 cm x 20 cm
1880-7902	30° Cross-Plane Digital Coding	20 cm x 20 cm
1880-7903	45° Cross-Plane Digital Coding	20 cm x 20 cm
1880-7904	60° Cross-Plane Digital Coding	15 cm x 20 cm

Steel Cross-Plane With Digital Coding Plug

Item #	Description	Size
1880-9906	15° Cross-Plane Digital Coding	25 cm x 30 cm
1880-9907	30° Cross-Plane Digital Coding	25 cm x 30 cm
1880-9908	45° Cross-Plane Digital Coding	25 cm x 30 cm
1880-9909	60° Cross-Plane Digital Coding	20 cm x 30 cm

Steel Cross-Plane With Digital Coding Plug

Item #	Description	Size
1880-9916	15° Cross-Plane Digital Coding	25 cm x 40 cm
1880-9917	30° Cross-Plane Digital Coding	25 cm x 40 cm
1880-9918	45° Cross-Plane Digital Coding	25 cm x 40 cm
1880-9919	60° Cross-Plane Digital Coding	20 cm x 40 cm

SIEMENS PRIMUS WEDGE

The wedges are mounted on coded trays which verify the wedge direction and the wedge angle.

In-Plane
1882-9917

Steel In-Plane With Digital Coding Plug
Head to Foot (#1 & 2)

Item #	Description	Size
1882-9906	15º In-Plane Digital Coding	25 cm x 30 cm
1882-9907	30º In-Plane Digital Coding	25 cm x 30 cm
1882-9908	45º In-Plane Digital Coding	25 cm x 30 cm
1882-9909	60º In-Plane Digital Coding	20 cm x 30 cm

Item #	Description	Size
1882-9916	15º In-Plane Digital Coding	25 cm x 40 cm
1882-9917	30º In-Plane Digital Coding	25 cm x 40 cm
1882-9918	45º In-Plane Digital Coding	25 cm x 40 cm
1882-9919	60º In-Plane Digital Coding	20 cm x 40 cm

Cross-Plane
1882-8908

Steel Cross-Plane With Digital Coding Plug
Side to Side (#3 & 4)

Item #	Description	Size
1882-8906	15º Cross-Plane Digital Coding	25 cm x 30 cm
1882-8907	30º Cross-Plane Digital Coding	25 cm x 30 cm
1882-8908	45º Cross-Plane Digital Coding	25 cm x 30 cm
1882-8909	60º Cross-Plane Digital Coding	20 cm x 30 cm

Item #	Description	Size
1882-8916	15º Cross-Plane Digital Coding	25 cm x 40 cm
1882-8917	30º Cross-Plane Digital Coding	25 cm x 40 cm
1882-8918	45º Cross-Plane Digital Coding	25 cm x 40 cm
1882-8919	60º Cross-Plane Digital Coding	20 cm x 40 cm

In-Plane Half Wedge
1881-030

SIEMENS MEVATRON HALF WEDGE - SCREW CODING

Steel In-Plane With Screw Coding

Item #	Description	Size
1881-015	15º Half In-Plane Screw Coding	20 cm x 40 cm
1881-030	30º Half In-Plane Screw Coding	20 cm x 40 cm
1881-045	45º Half In-Plane Screw Coding	20 cm x 40 cm
1881-060	60º Half In-Plane Screw Coding	20 cm x 40 cm

Specify Tray Coding

Steel Cross-Plane With Screw Coding

Item #	Description	Size
1881-215	15º Half Cross-Plane Screw Coding	20 cm x 40 cm
1881-230	30º Half Cross-Plane Screw Coding	20 cm x 40 cm
1881-245	45º Half Cross-Plane Screw Coding	20 cm x 40 cm
1881-260	60º Half Cross-Plane Screw Coding	20 cm x 40 cm

Specify Tray Coding

In-Plane Half Wedge
1881-130

SIEMENS MEVATRON & PRIMUS HALF WEDGE - DIGITAL CODING

Mevatron Steel In-Plane With Digital Coding Plug
Primus Steel Cross-Plane With Digital Coding Plug

Item #	Description	Size
1881-115	15º Half Digital Coding	20 cm x 40 cm
1881-130	30º Half Digital Coding	20 cm x 40 cm
1881-145	45º Half Digital Coding	20 cm x 40 cm
1881-160	60º Half Digital Coding	20 cm x 40 cm

Specify Tray Coding

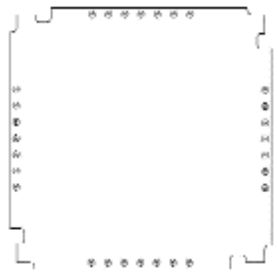
Mevatron Steel Cross-Plane With Digital Coding Plug
Primus Steel In-Plane With Digital Coding Plug

Item #	Description	Size
1881-315	15º Half Digital Coding	20 cm x 40 cm
1881-330	30º Half Digital Coding	20 cm x 40 cm
1881-345	45º Half Digital Coding	20 cm x 40 cm
1881-360	60º Half Digital Coding	20 cm x 40 cm

Specify Tray Coding

Custom Sizes Available

ELEKTA (PHILIPS) 4-SIDED WEDGE AND TRAY



Item #	Description	Size
1883-214	4 Sided Polystyrene Wedge Tray	
1883-215	15° 4-Sided Steel Wedge, Dig. Coding	20 cm x 40 cm
1883-230	30° 4-Sided Steel Wedge, Dig. Coding	20 cm x 40 cm
1883-245	45° 4-Sided Steel Wedge, Dig. Coding	20 cm x 40 cm
1883-260	60° 4-Sided Steel Wedge, Dig. Coding	20 cm x 40 cm

Tray Coding is programmed

SIEMENS DIGITAL CODING PLUGS

Item #	Description	Size
1884-10-1	Threaded Mounting Holes	3 3/8”
1884-10-5	Threaded Mounting Holes	3 1/8”
1884-10-6	Countersunk Mounting Holes	3 1/8”
1884-10-7	Countersunk Mounting Holes	3 3/8”
1884-11-1	Double Coded Threaded Mounting Holes (MLC)	3 3/8”
1884-11-5	Double Coded Threaded Mounting Holes (MLC)	3 1/8”
1884-11-6	Double Coded Countersunk Mounting Holes (MLC)	3 1/8”
1884-11-7	Double Coded Countersunk Mounting Holes (MLC)	3 3/8”

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SIEMENS WEDGE CODING PLUGS FOR .DECIMAL® BRASS COMPENSATORS

Item	Description	Quantity
1884-10-11R	Siemens 3 3/8" Wedge Coding Plug with Threaded Holes for Block Tray Slot, Specify code 1 to 18	Single
1884-10-11R-32771-01	Siemens Wedge Coding Plug S2N01 for Brass Compensator	Single
1884-10-11R-32771-02	Siemens Wedge Coding Plug S2N02 for Brass Compensator	Single
1884-10-11R-32771	Siemens Wedge Coding Plugs for Brass Compensators	Set of 18

Other Codes Available, Specify Code

CODING STUD

For GE Saturne Wedge Trays

Item #	Description
1910-400	Coding Stud

WEDGE BOX

The Wedge Box can be made for any manufacturer's wedges.

Specifications

4 Rubber Feet
Material: 3/4" T plywood w/vinyl covering outside.
Color: Beige

Item #	Description
880-990	Varian Type II Wedge Box for 6 Wedges Box Size: 13 5/8" W x 17 9/16" W x 12 3/4" D
880-991	Varian Type III Standard Wedge Box for 8 Wedges Wedge Tray Size: 10 5/8" W x 1/8" T Box Size: 13 9/16" W x 22" H x 12 1/4" D
880-992	Varian Type III Lower Wedge Box for 6 Wedges Wedge Tray Size: 12 1/2" W x 14" L x 1/4" T Box Size: 15 7/16" W x 14 1/2" H x 15" D
880-996	Varian Type III Upper Wedge Box for 6 Wedges Wedge Tray Size: 10 5/8" Sq. x 1/8" T Box Size: 13 5/8" W x 17 5/8" H x 12 13/16" D
880-995	Siemens Wedge Box for 6 Wedges Box Size: 11 1/4" W x 14 1/4" H x 10 7/16" D

EQUINOX WEDGES

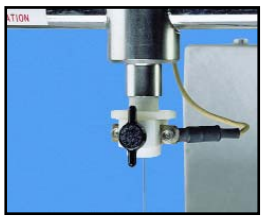
Item #	Description	Size
1846-6815	15° Brass Equinox Wedge Tray	25 cm x 43 cm
1846-6930	30° Lead Equinox Wedge Tray	25 cm x 43 cm
1846-6945	45° Lead Equinox Wedge Tray	25 cm x 43 cm
1846-6960	60° Lead Equinox Wedge Tray	25 cm x 43 cm

STEEL ATTENUATOR FOR VARIAN III FULL FIELD

1.9 cm Thick

Item	Description
1846-650	Attenuator Varian lll, Full Field, Steel 1.9 cm Thick

HUESTIS STYRO-FORMER®



Quick Change Wire System

Convenient Power Lift LT Controls

869-160 Styro-Former® with Power Lift LT

Renowned as the worldwide industry standard, more Styro-Formers® are in use than all other shielding block mold cutters combined. Styro-Former® offers accurate, easy and fast cutting with minimal training. A hand-held tracing stylus allows quick radiograph outlining to provide a smooth and efficient block cutting procedure.

Styro-Former® Power Lift LT features panel-mounted drive controls for both source and block arm distances. A quick change wire system uses unique thumb screws and a table-mounted measuring template for quick, easy wire changes.

Accurate Cutting
- Manual tracing produces smooth, accurate cuts with minimal training
- Accurate cuts save time and material
- Verification light included

Rigid Box Frame
- Short cutting wire is kept tight in a rigid box frame to eliminate bowing
- Never necessary to apply downward pressure to keep the wire tight
- Rigid box frame ensures that cutting wire is precisely aligned between the source point and the block tray
- Nichrome cutting wire fits into the frames unique electro-mechanical bushings
- Bushings hold wire with a flat grip, for long wire life and easy wire changes
- Free cutting wire for life of machine

The manual lift is a rotating friction drive and calibrated tie-rod system to adjust the source point and block tray position.

Quick, Smooth Operation
- Spring-loaded, Teflon tracing stylus moves freely in every direction
- Unhampered by limitations of an X or Y axis for complete maneuverability
- Can be adjusted to any treatment machine for universal application
- Work area remains stationary at a comfortable desktop working height
- Free-standing table and calibrated column can be placed in almost any small area without wall attachment

Standard Foam Block Holders
Included holders position standard 8", 10", or 12" foam blocks.

Power Lift LT
- Drive controls are panel mounted for quick, push-button height adjustments
- Position measurements are easily read directly from the vertical column
- Easily adjustable thumb screws allow quick cutting wire changes
- Wire measuring template included
- Convenient storage bin holds up to three tracing tips

Auto Boost Option
- Automatically boosts wire temperature to adjust for wire deflection
- Simple switching system reroutes the current through another circuit with its own potentiometer
- Can be pre-set to minimize distortion and maximize productivity
- Inexperienced operators can have limits set by supervisor
- Audio/visual alarm warns when too much pressure is applied by operator

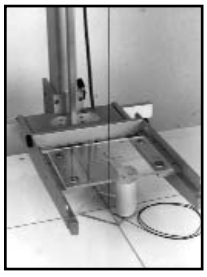
Specifications

Electrical: 120 Vac, 60 Hz, 5 A
Table Size: 33.5" W x 24" D x 29.5" H (85.1 x 60.9 x 74.9 cm)
Column Height: 8.75' (2.67 m)

The Styro-Former® is FDA registered and CE certified.

Item	Description
869-100	Huestis Styro-Former®
869-110	Huestis Styro-Former® with Auto Boost
869-160	Huestis Styro-Former® with Power Lift LT
869-162	Huestis Styro-Former® with Power Lift LT and Auto Boost

ALIGNMENT SYSTEM
For Huestis Styro-Former



The Alignment System will check the target to film alignment with the block tray moving over its entire range.

Item #	Description
869-180	Alignment System For Huestis Styro-Former

COMPU-CUTTER® III

Radiotherapy departments can now take advantage of the cost savings and versatility of a compact tabletop Compu-cutter® system. The Compu-cutter® III is less than half the size of its predecessor without sacrificing quality and accuracy. Available as a complete package or as a single unit which can plug and play with your existing configuration. Huestis software is compatible with any Windows® based O/S, allowing for easy image manipulation, correction and cutting. The Compu-cutter® III is a CE certified radiotherapy shielding block cutter.

Precision Accuracy
- Computerized, four-axis cutter ensures accuracy of ±1 mm.
- Built-in checks minimize operator error and time consuming re-cuts.
- Allows review of outline on monitor.
- Drawing package feature allows for easy image manipulation and correction.
- Cut path simulation prior to actual block cut.
- All functions and set ups are completely computer controlled.
- Radiograph printout verifies tracing.
- Template printout facilitates mounting shielding block on tray.

Treatment Planning Interfaces
- Digitized block outlines can be easily transferred from treatment planning.
- Eliminates redundant input of block outlines from radiographs.
- Imported outlines may be cut immediately or stored for later use.

Radiograph Digitizing (optional)
- Radiograph is aligned on crosshairs and traced with a digitizing mouse.
- Windows® based program digitizes and stores data and patient files for easy reference or modifications.
- Easy input of patient/block information.
- Pre-set operational function keys.
- User may select any cut path to connect multiple block outlines.

Quick Modifications
- Ability to “flip” image for fast AP/PA or L/R lateral blocks, or change any parameter without re-digitizing.

Hot Wire Cutting
- Image can be moved to any position on the block to allow for the conservation of styrofoam use.
- Fast 0.45 in/sec (1 cm/sec) cut speed.
- Cutter is safely enclosed in cutting bay.
- Adjustable temperature for variations in foam densities.
- Safety interlock for open door position.
- Custom defaults: S.F.D., S.A.D., S.T.D.
- Distance changes can be factored in after digitizing or TPS import.
- Determines smallest block required for shape or combination of shapes.
- System can accommodate from 8"x8" to 12"x12" size blocks.

Versatile Configurations
- Our full system for the Compu·Cutter® III includes the cutter, computer, custom software, printer, digitizer and an optional label printer.

Easy Installation
- Footprint is smaller than our Styro-former®.
- Size: 15.75" W x 30" D x 30" H (40 x 76.2 x 76.2 cm)
- Weight: Approximatley 60 lb (27.27 kg)
- Electrical Requirements: 120 VAC, 60 Hz, 10A (Optional 220 VAC, 50 Hz, 5A)

Modular Design
Designed for versatility, our stand-alone cutting bay is supplied as a fully integrated system.

Extremely Accurate
Fully articulating and gimbaled cutting mechanism is accurate ±1 mm at the block tray level for precise, divergent cuts.

Compu-cutter® III Digital Versatility
Operators can easily transfer digitized block outlines from treatment planning systems or may trace radiographs with a digitizing mouse. The outline is visible on the monitor and can be sent to the printer for examination of the printout, or to the hot wire cutter for block cutting. Operator may select any cut path to connect multiple block outlines.

Ensured Accuracy
Multiple verification checks include a paper printout to verify the tracing and a second paper template to mount the shielding block on a lexan tray.

User friendly
Characteristics include Windows® compatibility allowing for easy image manipulation, correction and cutting.

Versatile Configurations
Modular design includes standalone cutting bay, computer, monitor, printer and digitizer.

Compu-Cutter III™ Block Cutting System Includes
- Automatic 4 axis computer driven hot wire cutter including beam divergence.
- Data collection can be obtained directly from radiograph via digitizer.
- Import of patient information provided through interface with the most common Treatment Planning Systems.
- Free standing, back-lit digitizer.
- Printer (for verification purposes)
- Computer System with a Pentium processor, network card and flat panel monitor.
- Windows XP Operating System and Huestis Custom Software with drawing package feature that allows for easy manipulation and correction of images.
- System includes electron beam capability.
- 1 Carton (52pcs), 8” X 8” X 3" foam blocks
- System may be vented to atmosphere. Fan is included.
- Electrical requirement: 120 VAC / 220 VAC
- Product is CE marked.
- Includes Installation & Training.
- CBC DICOM, DICOM-RT interface

Item	Description
868-000	Compu-Cutter® III, 120 VAC
868-005	Compu-Cutter® III , 220 VAC

FOAM CUTTER WITH ADJUSTABLE HEAT

- **A slippery work surface that is Alu Corbond compound making it easier to push Styrofoam around the large table.**
- **Very fine cut**
- **Solid aluminum overarm.**
- **The holder and wire spool may be shifted and adjusted along the overarm to enable miter cutting.**
- **An LED indicates operation and thus reminds you not to touch the hot wire to prevent burnt fingers (the wire heats to the maximum temperature in less than 1 second).**
- **Printed grid and protractor on worktable assist with division and cutting.**

- **On/Off switch**
- **Electronic variable temperature control knob.**
- **Lockable feed bar/fence for angle cuts.**
- **One spool of NiChrome wire, 0.008" diameter x 98 ft L**
- **One year warranty**

Includes: Hotwire Cutter, Miter Guide, Fence/Feed Bar, Spool of Wire, and Users Guide.

Specifications

Transformer Secondary Volts: 10V at 1.0A (Double Insulated)
Cutting Wire Temperature: 210 - 390°F (100 - 200°C)
Worktable Size: 15 3/8" x 11" (390 x 280mm)
Throat: 13 3/4" (350mm)
Cutting Height: 5 1/2" (140mm)
NiChromeWire: 0.008" dia. x 98 Ft (0.02 cm x 30 m)
Voltage: Item 869-910 - 110-120V AC, 60 Hz, 1 Amp, 50/60 Hz
Item 869-912 - 230V, 50/60 Hz, 20 watt
Weight: 6.6 lb (3 kg)
Item 869-912: CE marked

Item	Description
869-910	Foam Cutter w/Adjustable Heat, 110-120V
869-9101	NiChrome Wire, 0.008" Dia. x 98 ft. on spool
869-912	Foam Cutter w/Adjustable Heat, 230V, 50/60Hz

ELECTRON BLOCK FOAM CUTTER

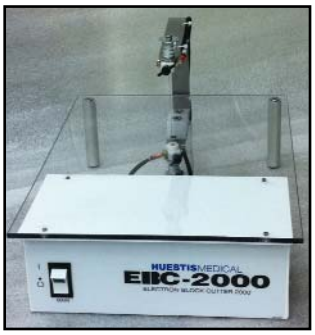
The Electron Block Foam Cutter's white formica cabinet includes a lighted power switch and an 8' grounded power cord. The unit has an easily replaceable nic-chrome cutting wire. Recommended maximum Styrofoam thickness is 1" (2.54 cm)

Specifications

Size: 11 3/4" W x 14" L x 7" H
Weight: 8 lbs

Item #	Description
869-900	Electron Block Foam Cutter Power: 110 VAC, 50/60 Hz & 3 Amp
869-902	Electron Block Foam Cutter Power: 220/240 VAC, 50/60 Hz, 1.5 Amp

EBC-2000 ELECTRON BLOCK CUTTER



The EBC-2000 Electron Block Cutter is a manual tabletop cutter for electron block cutouts. It provides clean hot wire cutting of radiotherapy foam shapes with no divergence angle. It is capable of cutting foam blocks from 1cm thick to 3 inches thick. This unit is also easily field convertible to be used with 120 or 220VAC power so there is no need to order a special unit.

Specifications

Size: 12" W x 16.5" L x 9.9" H (30.48x41.9x25.1 cm)
Weight: 10 lb (4.5 kg)

Item	Description
869-920	EBC-2000 Electron Block Cutter

NIC-CHROME CUTTING WIRE

The Nic-chrome Cutting Wire is 26 gauge x 10' long. It is used with the styroformers.

Item #	Description	Quantity
875-026	Nic Chrome Cutting Wire	1
875-026-6	Nic Chrome Cutting Wire	6

STYROFOAM BLOCKS

The Dow Chemical 25 and 40 PSI Styrofoam Blocks have planed flat top and bottom surfaces. This extremely smooth surface, when placed against a flat Cooling Plate, does not allow the alloy to leak out when filling the styrofoam.

Item #	Block Size	PSI	Quantity
870-708	3/4" x 8" x 8" (1.9 x 20.4 x 20.4 cm)	25	48
870-708-12	3/4" x 8" x 8" (1.9 x 20.4 x 20.4 cm)	25	12
870-710	3/4" x 10" x 10" (1.9 x 25.5 x 25.5 cm)	25	36
870-710-12	3/4" x 10" x 10" (1.9 x 25.5 x 25.5 cm)	25	12
870-711	3/4" x 11.5" x 11.5" (1.9 x 29.3 x 29.3 cm)	25	60
870-711-12	3/4" x 11.5" x 11.5" (1.9 x 29.3 x 29.3 cm)	25	12
871-008	1" x 8" x 8" (2.5 x 20.4 x 20.4 cm)	25	48
871-008-12	1" x 8" x 8" (2.5 x 20.4 x 20.4 cm)	25	12
871-010	1" x 10" x 10" (2.5 x 25.5 x 25.5 cm)	25	36
871-010-12	1" x 10" x 10" (2.5 x 25.5 x 25.5 cm)	25	12
871-012	1" x 12" x 12" (2.5 x 30.6 x 30.6 cm)	25	96
871-012-12	1" x 12" x 12" (2.5 x 30.6 x 30.6 cm)	25	12
872-008	2" x 8" x 8" (5 x 20.4 x 20.4 cm)	25	72

Item #	Block Size	PSI	Quantity
872-010	2" x 10" x 10" (5 x 25.5 x 25.5 cm)	25	36
872-010-12	2" x 10" x 10" (5 x 25.5 x 25.5 cm)	25	12
873-008	3" x 8" x 8" (7.6 x 20.4 x 20.4 cm)	40	72
873-008-12	3" x 8" x 8" (7.6 x 20.4 x 20.4 cm)	40	12
873-010	3" x 10" x 10" (7.6 x 25.5 x 25.5 cm)	40	48
873-010-12	3" x 10" x 10" (7.6 x 25.5 x 25.5 cm)	40	12
873-012	3" x 12" x 12" (7.6 x 30.6 x 30.6 cm)	40	32
873-012-12	3" x 12" x 12" (7.6 x 30.6 x 30.6 cm)	40	12
874-807	3" x 7 5/8" x 7 5/8" (7.6 x 19.4 x 19.4 cm)	40	72
874-807-12	3" x 7 5/8" x 7 5/8" (7.6 x 19.4 x 19.4 cm)	40	12
874-811	3" x 11.5" x 11.5" (7.6 x 29.3 x 29.3 cm)	40	32
874-811-12	3" x 11.5" x 11.5" (7.6 x 29.3 x 29.3 cm)	40	12

DIGITAL ALLOY MELTING DISPENSERS
For High (203°F) and Low (158°F) Melting Alloy

- **Alloy Temperature Stability ± 4°**
- **Microprocessor PID Temperature Control**
- **"J" Thermocouple**
- **Open Thermocouple Sensor Will Shut Unit Down**
- **Over Temperature Bi-Metal Disc Thermostat**
- **Temperature is Displayed in Fahrenheit or Celsius**
- **Easy View Temperature Controls**
- **Set Point Reading Is Green and Alloy Temperature Is Red**
- **Insulated Container Preserves Power Consumption**
- **Exterior Stays Cool Even After Hours of Operation**
- **Easy to Clean Round Container**
- **Stainless Steel Corrosion-Resistant Interior and Exterior**

The compact yet rugged design makes this alloy dispenser universally ideal for clinical use. It features polished stainless steel corrosion-resistant interior and exterior housing, a stainless steel cover and a side mounted, easy to view temperature control. Power switch, fuses and cord receptacle are mounted on the back side.

The EZ-Zone® Digital Proportional-Integral-Derivative (PID) Temperature Controller has two digital readouts, temperature and set point. It can maintain alloy at controlled temperature sets at a maximum of 250°F (121°C). The heating element provides even temperatures throughout the entire unit.

Controlling the power to the heater is done with a heavy duty Triac with Zero Crossover Switching to prevent noise from being induced into other equipment thru the AC Line.

The units are constructed with a ball valve faucet with hose barb connector for easy alloy removal. An optional 3/8" ID x 18" long (0.96 x 45.88 cm) drain tube (Item 878-158) can be attached to the faucet hose barb fitting when the dispenser is set on a shelf over the alloy blocks.

The temperature displayed is set to Fahrenheit at the factory; however, this can be changed to Celsius by the end user.

A 6' (1.8 m) AC Cord with grounded hospital grade plug is standard.

All units are single phase.

This product is not ISO certified or UL listed.

Specifications

Item	878-060	878-065
Gallons	1.5	1.5
120 VAC 50/60 Hz	X	
208/240 VAC 50/60 Hz		X
Watts	665	576/665
Amps	5.6	3.2/2.8
Alloy Capacity	120 lb (54 kg)	120 lb (54 kg)

Alloy Temperature Range: 0° to 250°F (-18° to 121°C)
Temperature Accuracy: ± 4°F
Temperature Controller Type: PID
Thermocouple: J
Electronic Switching: Triac with Zero Crossover Switching
Over Temperature: 250°F Bi- Metal Disc Thermostat - Manual Reset
On/Off Switch: 10 Amp Rating
Fused: Two Line Fuses for AC Lines
Power Cord: 6' (1.8 m) 3 Wire, 10 Amp, 300 Volt, SJT, with Hospital Grade Plug
Faucet: Ball Valve with Hose Barb
Optional Faucet Hose: 3/8" ID x 12" (0.96 x 30.59 cm)
Interior Dimension: 7 1/8" Dia. x 8 5/8" Deep (18 x 21.9 cm)
Interior Material: Stainless Steel
Exterior Dimensions: 9.75" D x 12" W x 14.5" High (25 x 30.5 x 37cm)
Exterior Material: Stainless Steel
Weight: 17.5 lbs (8 kg)
Environmental Conditions
Altitude Limits: 2000 Meters
Ambient Temperature Range: 32° - 104°F (0° - 40°C)
Relative Humidity Range: 0 to 75%
Pollution Degree: 2
FOR INDOOR USE ONLY

Item	Description
878-060	1.5 Gal, 158°/203°F, 120VAC
878-065	1.5 Gal, 158°/203°F, 208/240V

FAUCET REPLACEMENTS

878-109-111

878-109-114

Item #	Description
878-109-111	Replacement Faucet for 158/203°F Alloy Dispenser, 120 VAC with 15 Watt Heater and Set Screw
878-109-114	Replacement Faucet for 158/203°F Alloy Dispenser, 240 VAC with 20 Watt Heater and Set Screw

BLOCK CASTING STATIONS

878-350

878-352

The Block Casting Station maximizes the size of your block room and can improve labor and production efficiencies while improving block quality.

FEATURES

- **A 1.5 gallon alloy dispenser with a digital readout, precise digital temperature control and a no-drip heated ball valve dispenser. The alloy dispenser base plate is a roller carriage which allows for easy side-to-side movement over a range of 28" (71.37cm) over the cold plate**
- **A large capacity, precision surfaced refrigerated cold plate measuring 42" x 23 7/8" (l06.7 x 59.3cm) that accommodates up to six photon blocks. Cold water is recirculated by means of a closed loop system through a pump and refrigeration system**
- **The sturdy cabinet has a convenient storage space on the left side underneath the cold plate that measures 20.5" W x 23" D x 23" H (52 x 58.4 x 58.4 cm). The right side underneath cabinet houses the refrigeration system and has two (2) air vents on the side of the cabinet. These air vents need a 2" minimum clearance on the right side of the cabinet. All front and sides of the cabinet are covered with Formica brand oyster gray laminate. The back side is covered with a Formica brand phenolic resin backing sheet.**
- **An electronic air cleaner provides safer, cleaner air in your block room – 98% efficient at 0.03 microns.**
- **Power Cord: 8' (2.4m) 3 Wire, 16ga.**
- **Power Swich to turn on pump and compressor**
- **Two Power Switches**
  A. Turns on electronic air cleaner
  B. Turns on pump and compressor
- **No plumbing is required**

Items 878-350 and 878-351 Includes

- An electronic air cleaner provides safer, cleaner air in your block room – 98% efficient at 0.03 microns.
- Power Switch to turn on electronic air cleaner

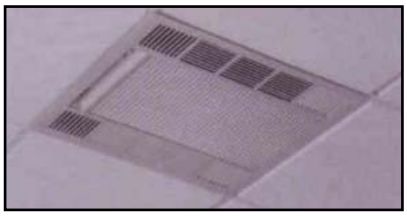
Specifications

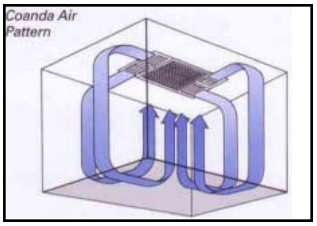
Items 878-350 and 878-351
Overall Size: 85" H x 28" D x 43.5" W (216x71x110.5 cm)

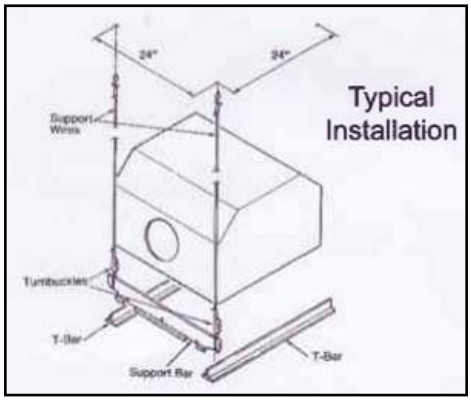
Items 878-352 and 878-353
Overall Size: 50" H x 28" D x 43.5" W (127 x 71 x 110.5 cm)

Item	Description
878-350	Block Casting Station, 120 VAC, 85" High
878-351	Block Casting Station, 220 VAC, 85" High
878-352	Block Casting Station, 120 VAC, 50" High
878-353	Block Casting Station, 220 VAC, 50" High

X-400 SMOKEMASTER ELECTRONIC AIR CLEANER







- **Totally self-contained air cleaner**
- **Ultimate 'flush with ceiling' mounted workhorse**
- **Features industrial-rated electronic filtration cell**
- **The X-400 quietly captures both airborne particles and gaseous contaminants**

The X-400 air cleaner features a high efficiency electrostatic cell designed to capture both particulate and gaseous contaminants. Contaminant particles, such as those in tobacco smoke, receive an electrical charge as they pass into the electronic cell and are then attracted to oppositely charged collector plates, where they are held, similar to the way that metal filings collect to a magnet. The air vent provides dilution control of gaseous contaminants. Standard activated carbon filter adsorbs odors and gases to further freshen the air.

The attractive grille fits flush with the ceiling and is completely inconspicuous. The cabinet is hidden in the unused space above the drop ceiling tile.

The X-400 success is due to the "Coanda Aerodynamic Principle". Effective 360° airflow gently and evenly distributes clean air and returns dirty air to the unit. The unique 4-way method of air recirculation gets the maximum amount of contaminated air to the machine most efficiently. More air reaches the Smokemaster while eliminating annoying drafts. This eliminates "stuffy" air pockets and creates people comfort as well as much better air cleaning results.

FEATURES

- **High Efficiency:** Removes dust, smoke, pollen and other particles using high efficiency electronic collector cells.
- **Quiet:** Three-speed controller is standard and allows for quiet operation without sacrificing effectiveness.
- **Easy Installation:** Special mounting brackets simplify the installation and do not require any additional space above the cabinet height of 13-5/8".
- **Economical:** Permanent electronic collector cells assure low operating cost by eliminating costly filter replacements. Moreover, because collector cells offer no airflow restriction, only limited horsepower is necessary, thus reducing noise and electrical draw.
- **Comprehensive:** Includes 2 Carbon Post Filters for odor control

Specifications

Electrical Rating: 120v / 60 Hz (220v / 50Hz)
Low Speed: 175 CFM / .4 amps (175 CFM / .45 amps)
Medium Speed: 275 CFM / .6 amps (275 CFM / .5 amps)
High Speed: 400 CFM / .8 amps (400 CFM / .7 amps
Color: White
Motor: 0.05 Hp Thermally Protected
Dimensions: 24" x 24" x 13 5/8" (61 x 61 x 34.6 cm)
Installed Weight: 44 lb (20 kg)
Shipping Weight: 54 lb (24.5 kg)
Primary Filter Collection Area: 52.9 square feet (133 cm)
Sorbent Media: 2 Carbon Post Filters
Air Cleaning Efficiency: Up to 99.7% ASHRAE 52.2

Item	Description
878-370	X-400 Smokemaster Electronic Air Cleaner, 120 VAC
878-371	X-400 Smokemaster Electronic Air Cleaner, 220 VAC

MELTING ALLOY
158°F and 203°F

On average approximately 20 pounds (9.1 kg) of Melting Alloy is needed per patient.

Note: To dispose of melting alloy, place the used alloy in a container or box (Item 879-301) and send it to RPDinc. RPDinc also recycles alloy, call for details. **THIS IS HAZARDOUS AND TOXIC WASTE, DO NOT THROW IT INTO THE GARBAGE.**

Specifications

158°F Low Melting Alloy
Density: 9.38 g/cm^3
Composition: Bismuth 50%, Lead 26.7%, Tin 13.3%, Cadmium 10%

203°F High Melting Alloy - Cadmium Free
Density: 9.83 g/cm^3
Composition: Bismuth 52.5%, Lead 32%, Tin 15.5%

Item #	Description	Quantity
879-158	158°F Low Melting Alloy	50 lb (22.7 kg)/Pkg
879-202	203°F High Melting Alloy	50 lb (22.7 kg)/Pkg

GALLON BUCKETS AND BOX CARTONS FOR RETURNING USED ALLOY

To comply with Federal, State and Local Laws used alloy should be recycled or stored in sealed containers for future disposal. To properly dispose of alloy, contact your hospital hazardous waste department or your local Pollution Control Agency.

To aid in disposal, Radiation Products Design will accept all slag and used alloy.

The gallon plastic bucket has a handle for easier carrying and includes the lid. Cartons must be ordered separately to ship the buckets to Radiation Products Design for disposal.

Item #	Description
879-309	Gallon Plastic Bucket with Cover, Qty 4
879-311	Cartons for Gallon Plastic Buckets, Qty 4
879-302	Shipping Tape, 2" Wide, Clear
879-303	Tape Dispenser for 2" Wide Tape, Plastic

PTFE - COATED SAFETY THERMOMETER
For Alloy Dispenser

- **Total immersion**
- **Spirit filled**
- **2° graduations**
- **12" (30.48 cm) long**

Item #	Description
878-153	PTFE-Coated Safety Thermometer

THERMOMETER
T-Handle, Waterproof, Drop-Proof

- **Waterproof construction**
- **Top-reading design**
- **Stainless steel probe**
- **Drop-proof from 5' (1.5 m)**
- **Large, bright, highly readable LCD display is 0.25" (6.3 mm) High**
- **Reading is updated every second**
- **With a silver-oxide battery**
- **Range: -58° to +536°F (-50° to + 280°C)**
- **Resolution: 0.1° from -20° to + 200°; 1° outside this range**

Item #	Description
878-155	Thermometer, T-Handle, Waterproof, Drop-Proof

SOLDERING IRON

875-200

875-224

875-240

Specifications

Power: 120 VAC, 50/60 Hz, 175 Watts
Chisel Tip: 5/8" (1.6 cm) Diameter - Included
Length: 12.5" (31.75 cm)
Weight: 1 lb (.45 kg)

Item #	Description
875-200	Soldering Iron with Chisel Tip
875-224	5/8" Replacement Chisel Tip for Soldering Iron
875-240	Stand for Soldering Iron

SOLDERING GUN

Dual Heat

875-100

875-122

875-126

Specifications

Power: 120 VAC, 50/60 Hz
UL Listed

Item #	Description
875-100	Soldering Gun (260/200 Watts)
875-122	Unbent Tip End for Soldering Gun, Replacement, Pair
875-126	Pre-bent Tip w/Nuts for Soldering Gun, Replacement, Each

HEAT GUN

876-186

876-186-2

Specifications

Item 878-186
Power: 120 VAC, 12 Amps, 1440 Watts

Item 878-186-2
Power: 120 VAC, 14 Amps, 1680 Watts

Item #	Description	Degrees
878-186	Heat Gun	300° to 500°F
878-186-2	Heat Gun	500° to 750°F

EMERGENCY ALLOY MELTER

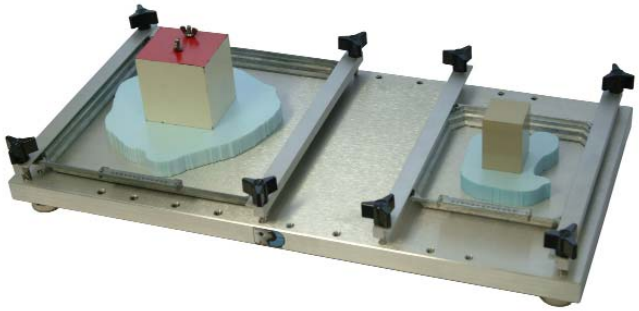
The Emergency Alloy Melter works on all alloy dispensers. Easy to use, just plug in and insert tip into alloy.

Specifications

Power: 110-120 VAC, 50/60 Hz, 500 watts

Item #	Description
875-250	Emergency Alloy Melter

COOLING PLATE FOR VARIAN III ELECTRON CONE INSERT FRAMES



This cooling plate will accomodate up to two 25 cm electron cone frame inserts at one time. The two end bars are spring raised and need not be removed. The two center bars can be moved to fit the insert frame being used. The bars are made to fit the tri-step of the insert frame. The cooling plate sits on four leveling pads.

Specifications

Overall Size: 24" W x 12" D x 1" H (61.2 x 30.6 x 2.5 cm)
Bar Size: 0.75" W x 12" D x 1/2" H (1.9 x 30.6 x 1.3 cm)
Material: Aluminum
Knobs: Four (4) Three-Arm, 1.5" diameter (3.8 cm)

Item	Description
896-042	Cooling Plate f/Varian lll Electron Cone Insert Frames

ALUMINUM COOLING PLATE

The Aluminum Cooling Plate aids in the cooling process of alloy blocks. It has 4 leveling feet.

Specifications

Size: 1" x 12" x 24" (2.5 x 30.6 x 61.2 cm)
Weight: 24.6 lb (11.2 kg)

Item	Description
878-270	Aluminum Cooling Plate

WATER COOLED ALUMINUM PLATES

The Water Cooled Aluminum Plate with corrosion resistance inside liner uses an external water supply to rapidly cool alloy blocks. It is anodized black for faster heat absorption. The Water Cooled Plate has a vinyl intake and discharge hose with shut off valve. The unit can be attached to a sink faucet or it can be used with our Water Transfer Tank (Item 695-000) for use in rooms without plumbing.

Specifications

Size: 1" x 12" x 24" (2.54 x 30.48 x 60.96 cm)
Fits: 3/8" (0.97 cm) Inside Diameter Hose
Weight: 28 lb (12.7 kg)

Item	Description
878-271	Water Cooled Aluminum Plate

STYROFOAM LEAD WEIGHT

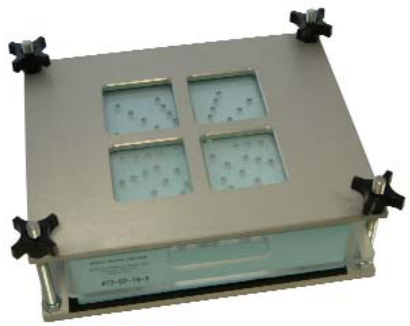
The Styrofoam Lead Weight with handle is used to hold down the blocking tray when molds are being poured. Use the Aluminum Cooling Plate (Item 878-270 or 878-271) to aid in the cooling process and the Aluminum Tray (Item 878-182) to catch any excess alloy leakage. Both are pictured in use.

Specifications

Size: 2" W x 7" L x 3" H (5.1 x 17.8 x 7.6 cm)
Finish: Painted polyurethane tan
Weight: 16 lb (7.3 kg)

Item	Description
878-274	Lead Weight w/Handle for Styrofoam

STYROFOAM BLOCK COMPRESSOR



The Styrofoam Block Compressor is used to hold the styrofoam block and the treatment tray while pouring in the alloy. The block compressor will hold a maximum styrofoam block size of 12 3/4" (32.5 cm) square and a maximum treatment tray width of 12 3/4" (32.5 cm).

A 3/16" (0.5 cm) thick rubber pad is placed under the styrofoam to seal all voids when using styrofoam that does not have a planed surface. The top plate can be tightened by turning the knobs on the threaded rods.

Item	Description
878-273	Styrofoam Block Compressor

ALUMINUM TRAY

The Aluminum Tray is used under the Aluminum Cooling Plate (Item 878-270 and 878-271) or the Alloy Dispensers (Item 878-015 thru 878-048) to catch the alloy leakage.

Size: 25.75" L x 17.75" W x 1" D (65.4 x 45.1 x 2.54 cm)

Item	Description
878-182	Aluminum Tray

D-LEAD® HAND SOAP

876-400

876-403

D-Lead® Hand Soap quickly and efficiently removes heavy metal dusts, lead and contaminants from the skin and hands. The mild formula with skin conditioning coconut oil is designed for frequent clean up throughout the day. Fast acting and economical D-Lead® Hand Soap is the hand and skin care choice for cleanup anywhere rinse water is available.

Item	Description
876-400	D-Lead Hand Soap with Hand Pump, 8 oz
876-402	D-Lead Hand Soap Refill, 32 oz
876-403	D-Lead Hand Soap Packets, 10/Pkg

D-LEAD® ALL PURPOSE CLEANER CONCENTRATE

Multi-purpose, concentrated, low sudsing, phosphate free cleaning formula quickly lifts and suspends metals, grease, oil, dirt, paint dust and firing range residue in a single application.

Item	Description
876-405	D-Lead® All Purpose Cleaner Concentrate, 32 oz Bottle

D-WIPE TOWELS

876-450 and 876-453

876-452

876-450 and 876-454

Disposable towels are generously saturated with a gentle pH balanced cleaner to quickly remove lead and heavy metal dusts from skin and most surfaces. The soft towels lift, bind and hold lead and other heavy metal dusts and take them away without smearing. With Aloe skin moisturizers, D-Wipe towels are the portable and convenient way to clean the hands, arms, face and body.

Use D-Wipe Towels to clean
- Hands and face
- Respirators and personal protective equipment
- Desks, tables and work benches
- Telephone and keyboards
- Tools and field instruments
- Environmental and industrial health equipment
- Smooth, water washable surfaces

Item	Description
876-450	D-Wipe Towels, 6" x 6.5", 150/Pkg
876-452	Stainless Steel Wall Bracket
876-453	Plastic Wall Bracket
876-454	Locking Stainless Steel Wall Bracket

SCOTCH-BRITE CLEANING PADS

Specifications

Size: 3" x 4 1/2" (7.62 cm x 11.43 cm)

Item #	Description	Quantity
878-160	Scotch-Brite Cleaning Pads	10

TUBE/FAUCET CLEANING BRUSH

Item #	Description	Size
878-156	Tube Cleaning Brush	3/8" (0.96 cm) Diameter
878-157	Faucet Cleaning Brush	3/4" (1.9 cm) Diameter

ALLOY POURERS

Item #	Description
878-169	14 oz. Stainless Steel Alloy Pourer
878-170	16 oz. Plastic Alloy Pourer
878-174	32 oz. Stainless Steel Alloy Pourer

SILICONE SPRAY RELEASE AGENT

Item #	Description	Size
876-125	Silicone Spray, Stoner Brand	12 oz

PLASTIC FUNNEL

Item #	Description
878-178	Plastic Funnel

WIRE STRAINER

For Low Melting Alloy

Item #	Description
878-163	Wire Strainer for Low Melting Alloy, 5" (12.7 cm) Dia.

SKIMMING SPOON

Item #	Description
878-164	Skimming Spoon

RASP

Item #	Description
878-165	Rasp, 10" (25.4 cm)

BLOCK GRIP TOOL

The Block Grip Tool is used to lower alloy blocks into the alloy melting dispenser.

Item #	Description
878-166	Block Grip Tool

RUBBER MALLET

Item #	Description
878-167	Rubber Mallet

UTILITY KNIFE WITH RETRACTABLE BLADE

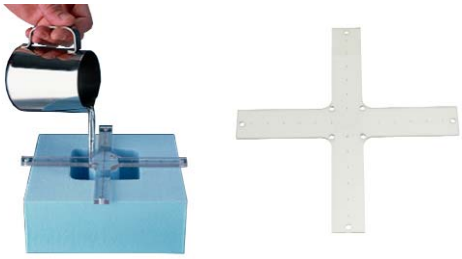
Item #	Description
878-168	Utility Knife with Retractable Blade

POLYPROPYLENE WASTE P-TRAP
For Standard 1 1/2" (3.8 cm) Plumbing

The Polypropylene Waste P-Tray can be used on sinks in the block/mold room to retain alloy that may possibly get into the drain.

Item #	Description
879-100	Polypropylene Waste P-Trap

ISLAND BLOCKING DEVICE
10" (25.4 cm)



Item #	Description
878-275	Island Blocking Device, 10" (25.4 cm)

SCREWS AND WASHERS

878-2565

878-264

878-266

The stainless steel screws are used to secure the alloy blocks to the treatment trays. The nylon washers are used under the screw head to prevent the tray from cracking.

Item	Description	Quantity
878-256	S.S. Screw-Hex/Washer Head, #12 x 1"	100
878-2565	S.S. Screw-Hex/Washer Head, #12 x 1 1/2"	100
878-264	Nylon Washer for 1/4" diameter Holes	100
878-266	Nylon Washer for 3/8" diameter Holes	100

NEEDLE NOSE PLIERS
With Cutter

Item	Description
878-730	Needle Nose Pliers with Cutter, 6"

CUSHION GRIP NUTDRIVER

Item	Description
878-930	Cushion Grip Nut Driver, 5/16"

STANDARD HEX KEY SETS

Specifications

Tool Type: Hex End Keys
Fastener Type: Standard Hex
Measurement Type: Inch
Handle Type: L-Key Long Arm
Hex Size Range: 1/20 - 3/8
Container Type: Plastic Holder
Number of Pieces: 13
Fractional Hex Sizes: 0.050; 1/16; 5/64; 3/32; 7/64; 1/8; 9/64; 5/32; 3/16; 7/32; 1/4; 5/16; 3/8

Item #	Description
878-757	Hex Key Set, Long Arm - 13 pc, Standard (Inch)

METRIC HEX KEY SETS

Specifications

Tool Type: Hex End Keys
Fastener Type: Standard Hex
Measurement Type: Metric
Handle Type: L-Key Long Arm
Hex Size Range: 1.5 - 10.0mm
Container Type: Plastic Holder
Number of Pieces: 9
Metric Hex Sizes: 1.5; 2; 2.5; 3; 4; 5; 6; 8; 10

Item #	Description
878-758	Hex Key Set, Long Arm - 9 pc, Metric

62-PIECE TOOL SET WITH TOOL BOX

- **3/8" drive**
- **Works on fastener sizes 3/8" through 7/8"**

This Tool Set has 62 tools and a general purpose storage box with tray.

Contains the following:
(21) Sockets and accessories
(10) Striking and struck tools
(12) Wrenches
(5) Pliers
(5) Screwdrivers
(9) Miscellaneous tools

Specifications

Storage Box: 9" H x 8" D x 20" W (22.9 x 20.4 x 51 cm)
Weight: 45.5 lb (20.6 kg)

Item	Description
878-745	62 Piece Tool Set with Tool Box

CORDLESS DRIVER DRILL AND DRIVER KIT

- **Heavy-duty 3/8" single sleeve ratcheting chuck**
- **Dual speed range for maximum versatility**
- **15-position adjustable clutch**
- **Rubber Grip**
- **Compact size and lightweight design**

Specifications

Voltage: 9.6 volt
Speed: 0-300 / 0-1,100 RPM
Weight: 3.4 lb (1.54 kg)

Item	Description
878-220	Cordless Driver Drill with Torque Control
878-220-2	Replacement Battery for Cordless Drill

3/8" ELECTRIC DRILL

Variable Speed and Reversible

- **DW223G: 7.0 Amps; 0-1200 rpm**
- **Helical-cut, steel gears for smooth operation**
- **Metal gear housing for increased durability**
- **Two-finger anti-slip trigger for increased comfort**
- **3/8" chuck capacity for a wider range of accessories**
- **DIN nose for acceptability of side handle or rig mount**

Specifications

Power: 120 VAC, 50/60 Hz

Item	Description
878-230	3/8" Electric Drill

HEX HEAD DRIVER SOCKET
For Drill

Item	Description
878-240	5/16" Hex Head Driver Socket

DRILL BITS
*****Specially Modified*****

These Drill Bits are specially modified for plastic, lead or cerrobend.

Item	Description
878-257	11/64" Dia. Drill Bit for Item 878-256 Screw
878-258	1/4" Dia. Drill Bit for Plastic ONLY
878-259	3/8" Dia. Drill Bit for Plastic ONLY

SNIPS

The Bulldog Aviation snips can be used to cut lead sheets up to 1/8" thick. This bulldog snip cuts straight and can be used in either hand. It has serrated blades.

Specifications

Nominal Length: 9" (22.9 cm)
Cut Length: 7/8" (2.22 cm)
Weight: 1 lb (0.5 kg)

Item	Description
878-738	Snips, Bulldog Aviation, 9" L

These Bulldog Blade Snips can be used to cut 1/4" thick lead sheets. This bulldog snip cuts straight and wide curves and can be used in either hand.

Specifications

Nominal Length: 16" (40.64 cm)
Cut Length: 2.5" (6.35 cm)
Weight: 3.5 lb (1.6 kg)

Item	Description
878-740	Snips, Bulldog Blade, 16" L

LEATHER GLOVE - UNLINED

Item #	Description
878-285	Leather Glove, Unlined - Small
878-286	Leather Glove, Unlined - Medium
878-287	Leather Glove, Unlined - Large
878-288	Leather Glove, Unlined - X-Large

LEATHER GLOVES - HEAVY DUTY

Item	Description
878-298	Leather Gloves, Heavy Duty

LEATHER APRON

The leather apron is 24” wide x 36” long with cotton ties at the neck and back.

Item	Description
878-290	Leather Apron

SAFETY GOGGLES

These anti-fog Safety Goggles with indirect venting are designed to be worn over existing glasses. One size fits all.

Item	Description
878-294	Safety Goggles

FACE SHIELD

The Headgear has a ratchet adjustment that can be tightened while wearing. The shield is attached with durable quarter turn retainers. The shield is replaceable and is unbound and clear.

Meets ANSI287.1 Standards

Item	Description
878-335	Head Gear with Face Shield
878-336	Head Gear
878-337	Face Shield

3M™ RESPIRATOR

- **Meets NIOSH 42 CFR 84 N100 requirements**
- **3M™ Cool Flow Exhalation Valve has patented one-way valve offering easy exhalation and cool, dry comfort**
- **Adjustable nose clip for custom fit and reduces the potential for eyewear fogging**
- **Lightweight construction with an all filter design**

The 3M™ Particulate Respirator is well suited for those who want NIOSH’s highest rated filtration efficiency in a maintenance free respirator. It provides a minimum filter efficiency of 99.97% against non-oil based particles. This respirator is an excellent choice for lead abatement, pharmaceutical manufacturing, welding and work involving substance specific regulated particles including lead, cadmium, and arsenic, excluding those containing oil aerosols and asbestos.

Note: This respirator contains no components made from natural rubber latex.

Item	Description
878-296	3M Dust/Mist Respirator Mask

AIR SAMPLING TEST KIT

Air sampling is required by OSHA safety standards. Air sampling must be conducted within an 8 hour accumulated time period. Test results will indicate the lead and cadmium levels an individual is being exposed to. If results indicate levels that exceed OSHA guidelines, action must be taken to lower the lead and/or cadmium levels within the work area and testing should be repeated. Results of all tests should be kept on file. Testing should be conducted every 3 years.

Item	Description
879-520-RENTAL	RENTAL UNIT Air Sampling Pump Kit
879-521	Air Sampling Filter ONLY
879-522	Testing of Sample Filter, Cadmium & Lead

CLEANLINE® STICKY MAT AND FRAME

CLEANLINE® Sticky Mat
- **Prevents tracking of Alloy**
- **Numbered corner tabs**
- **Smooth, effective surface**
- **Simple to install**
- **No sheet delamination**
- **No adhesive transfer**

Specifications

Mat Size: 18" x 36" (45.9 x 91.8 cm)
Quantity: 40 sheets to a mat
Color: White

Frame
- **Provides uniform base for adhering Sticky Mats**
- **No maintenance required**
- **Enhances appearance of mats**
- **Pre-assembled, ready for use**

The CLEANLINE® Sticky Mat Frame consist of a sloping, 3" anodized aluminum edge with a permanently secured plastic base. Overall height is 5/16".

Item	Description
877-900	CLEANLINE® Sticky Mat, 40sheets/mat
877-901	Frame for CLEANLINE® Sticky Mat

U.L.P.A. FILTERED LEAD VACUUM

877-110004

877-110005

877-384003

877-761177

877-800056

- **Equipped with U.L.P.A. (Ultra Low Penetration Air) filter which is 99.999% efficient at 0.12 microns**
- **Non-woven, embossed, polyester filter bag provides 50% more filtration area than standard bags**
- **State-of-the-Art polypropylene lid assembly is acousitcally designed to minimize noise to 74 dba**
- **Polyethylene tanks are durable, non-corrosive and dent-proof for years of reliable service**
- **Convenient 50' (15.25 m) cord**

U.L.P.A Filtered Vacuum is used for the recovery of lead, dust, paint chips, and other hazardous materials. Conventional vacuum cleaners exhaust unseen lead particles back into the environment, compounding the exsisting hazard, while the U.L.P.A Filtered Vacuum collects particles directly in a disposable collection bag. The lead vacuum has been specifically designed for safe and efficient daily use in commerical and industrial sites.

Item 877-115 U.L.P.A. Vacuum Includes

- 3 cm x 2.4 m Crush-Proof Hose
- 3 cm Telescopic Wand
- 30 cm Crevice Tool
- 8 cm Round Dust Brush
- 13 cm Uphostery Tool
- Combintion Floor Tool
- U.L.P.A Filter
- Pre-Filter Assembly for U.L.P.A. Filter, 6/pkg
- Paper Collector Bags, 10/pkg
- Polyester Filter with Wire Frame
- Protector Bags for Polyester Filter, 10/pkg

Specifications

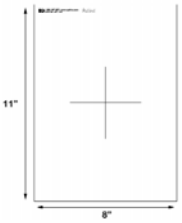
Tank Size: 6 gallons (22 liters)
Power: 1.25 hp
Air Flow: 95 CFM
Water Lift: 2159 mm (85")
Dry Capacity: 0.46 ft^3 (0.01 m^3)
Cord: 50' (15.25 m)
Casters: 1.13 cm
Weight: 17 lb (8 kg)

Item	Description
877-115	U.L.P.A. Vacuum

Item	Replacement Parts
877-110004	U.L.P.A Filter, Replacement
877-110005	Pre-Filter Assembly for U.L.P.A. Filter, Replacement, 6/pkg
877-384003	Paper Collector Bags, 10/pkg
877-800056	Polyester Filter with Wire Frame
877-761177	Protector Bags for Polyester Filter, 10/pkg

MYLAR TEMPLATES

457-200



457-300

457-310

The Mylar Templates can be cleaned with Alcohol for reuse. The thickness of Items 457-200 and 457-300 has been increased to 0.010" (0.0254cm). Package Quantity: 100

Item	Mylar Template	Mark
457-200	8" x 6" x 0.010" (20.32 x 15.24 x 0.0254 cm)	+
457-300	8" x 11" x 0.010" (20.32 x 27.94 x 0.0254 cm)	+
457-310	8" x 10" x 0.005" (20.32 x 25.49 x 0.0127 cm)	+

CUSTOM BLOCK TRAY

All of the Block Trays are custom machined. Once Manufacturing begins, an order can not be canceled. RPDinc may request a sample tray be sent in for exact measurements with any first time tray order. Indicate the slot or hole pattern, if it is different from the sample tray. The specifications will be kept on file for any future orders.

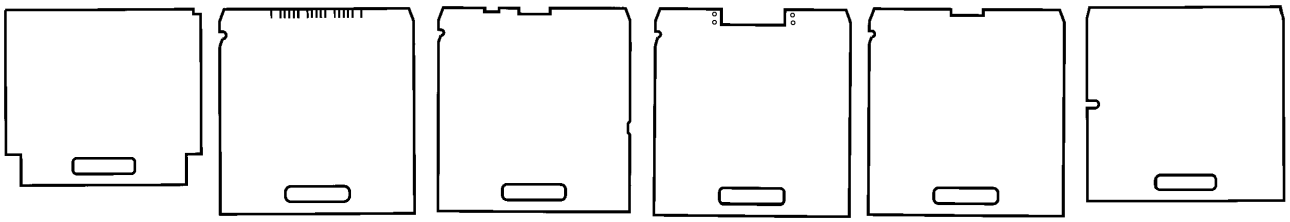
To build your Custom Block Tray:

- Choose a Tray Style and the number associated with it
- Choose scribing and the number associated with it
- Choose a pattern and the number associated with it
- Choose the material and thickness desired and the number associated with it

When you've made your choices, the item number should look like AAA - BB - CC - D.

Tray Styles (AAA)

All Trays Are Shown In Target View. Tray Pictures Are Not Proportionally Scaled.



070
Siemens Mev 12

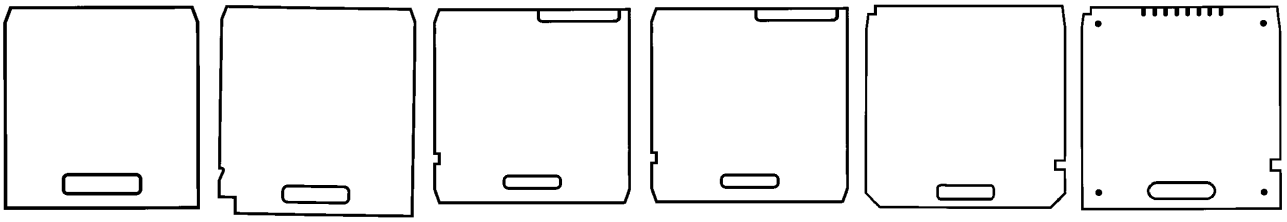
071
Siemens
Screw Coding

072
Siemens
Screw and Digital
Coding By-Pass

073
****Siemens**
Digital Coding
Socket

084
Siemens
Digital Coding
By-Pass

140
Mitsubishi



085
10" Wide
Varian CL 4

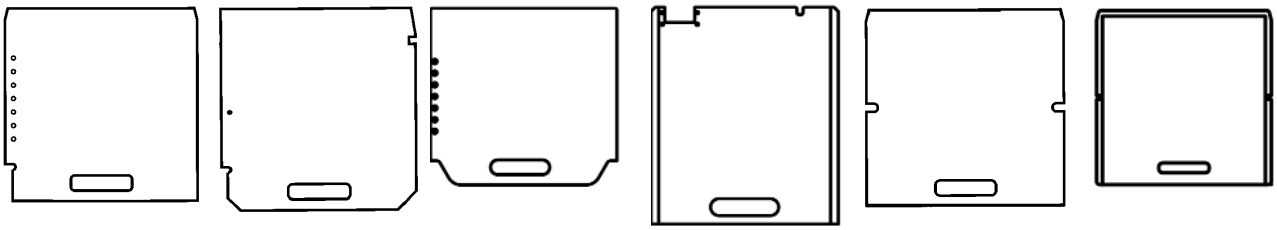
086
Varian Type II
11 3/4" Wide Tray

087
***Varian Type III**
Optical Coded
No Holes

089
Varian Type III
MLC
Lower wedge slot

100
G.E. Saturn

101
*****G.E. Saturn**



120
Elekta/Philips SL
25/75

121
Elekta/Philips SL
75/5

122
Elekta
Synergy/Precise

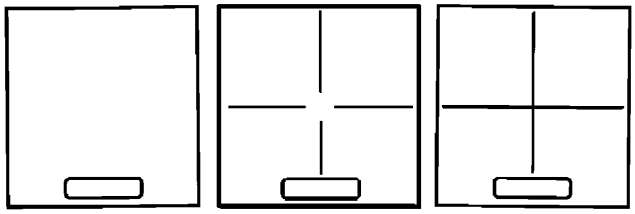
090
MDS Nordian/
Best Theratronics

160
AECL/MDSNordion/
Best Theratronics

161
Best Theratron-
Phoenix

* Coding Labels Optional **Accepts 3 1/8" coding plugs: 1884-10-5, 1884-11-5 ***Coding Plugs Optional

Scribing (BB)



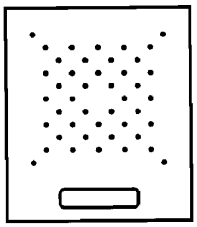
00
No Scribing

60
Open CA Scribing
Target Side

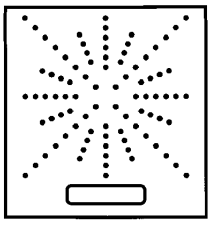
62
CA Scribing
Target Side

Hole and Slot Pattern (CC)

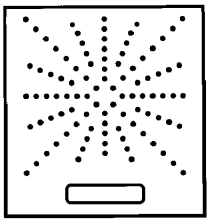
Hole Diameters available in 1/4", 3/8", or custom. Slot Widths available in 1/4", 7/32", or custom. Hole patterns available in 44 holes, 88 holes, 96 holes, or custom)



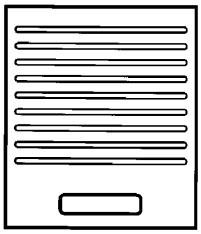
16 - 44 Holes
1/4" Dia.
17 - 44 Holes
3/8" Dia.



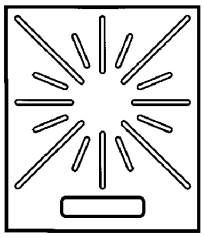
18 - 88 Holes
1/4" Dia.
19 - 88 Holes
3/8" Dia.



20 - 96 Holes
1/4" Dia.
21 - 96 Holes
3/8" Dia.



40 - 9 Slots 7/32" W
41 - 9 Slots 1/4" W



44 - 16 Slots 7/32" W
45 - 16 Slots 1/4" W

Block Tray Material and Thickness (D)

1/4" and 3/8" thick trays are most common. For very heavy blocks you may want to use 3/8" or 1/2" thick trays. Thicker trays are machined along the edges to fit the slots of the tray holder.

Acrylic
Acrylic is more rigid and scratch resistant than Lexan, however, it will break if dropped. Acrylic block trays will discolor from large amounts of radiation and may become brittle. Cracked trays should be removed from patient use, however, they could be used in the block room as set-up trays.

Acrylic Density: 1.17 to 1.20 g/cm^3

Polycarbonate (Lexan)
Polycarbonate (Lexan) is virtually unbreakable, scratches easily and will flex more under a heavy load.

Polycarbonate (Lexan) Density: 1.2 g/cm^3

Thickness	1/4"	3/8"	1/2"
Acrylic	1	3	5
Polycarbonate (Lexan)	2	4	6

Coding Labels and Plugs for Some Tray Styles

087-000

087-001

For Use on 087 Varian Trays ONLY

Item	Labels
087-000	Solid Black (Varian Light Blocking)
087-001	Black with Varian Coding Hole Pattern

1884-10-X

1884-11-X

For Use on 073 Siemens Trays ONLY

Plugs with threaded holes will be used on a tray that has countersunk through holes with no thread.

Plugs with countersunk holes are used on a tray that has threads in the hole.

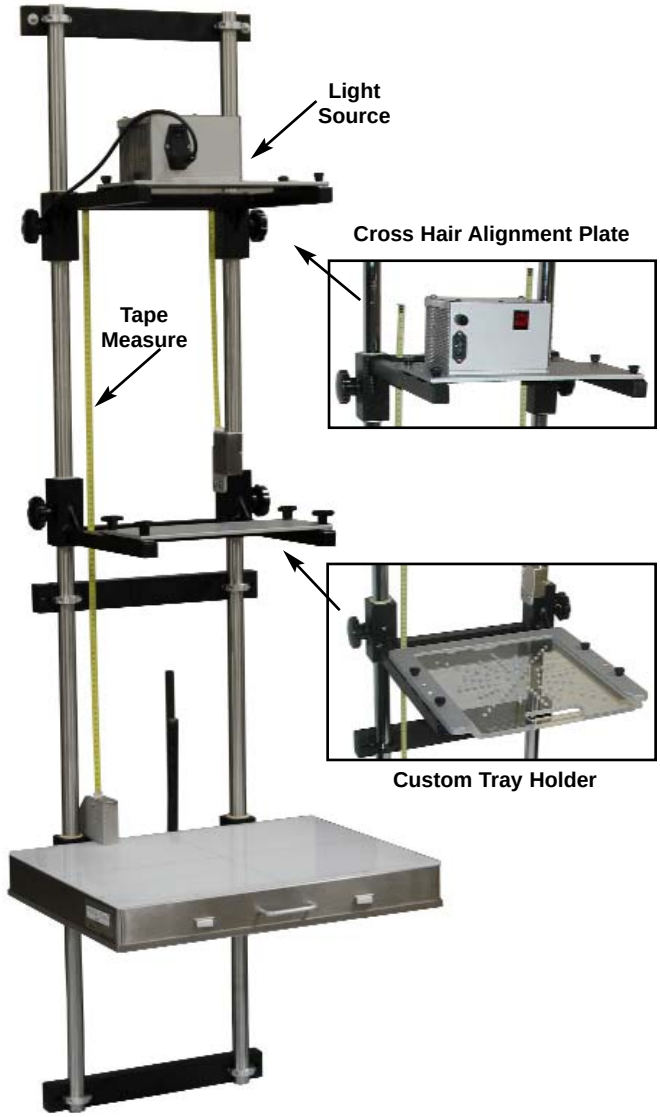
Item	Siemens Digital Coding Plugs
1884-10-1	Threaded Mounting Holes, 3 3/8"
1884-10-5	Threaded Mounting Holes, 3 1/8"
1884-10-6	Countersunk Mounting Holes, 3 1/8"
1884-10-7	Countersunk Mounting Holes, 3 3/8"
1884-11-1	Double Coded Threaded Mounting Holes (MLC), 3 3/8"
1884-11-5	Double Coded Threaded Mounting Holes (MLC), 3 1/8"
1884-11-6	Double Coded Countersunk Mounting Holes (MLC), 3 1/8"
1884-11-7	Double Coded Countersunk Mounting Holes (MLC), 3 3/8"

1910-400

For Use on 101 GE Saturn Trays ONLY

Item	Coding Stud
1910-400	GE Saturne Block Tray

TREATMENT BLOCK VERIFICATION SYSTEM
with Halogen Target Lamp and View Box



The wall mounted Treatment Block Verification System is used to verify patient treatment blocks to a port film. Due to the system's openness it gives a less confined area to work in. This adjustable system covers long target to film and target to block tray distances.

This unit uses a high intensity quartz lamp (12 volt, 50 watt) with power switch and indicator light. The Halogen lamp and power supply are mounted on a removable tray for easy replacement of the lamp. The lamp aperture hole is 2 mm in diameter and is adjustable in both the X and Y plane. A lock holds the vertical position over a 30 cm range.

The blocking tray is adjustable from 8 cm to 95 cm and has an adjustable scale that reads the target to tray distance. A vertical lock holds the tray in position. Different type treatment tray frames are available for all manufacturer's machines. This block verification unit allows inter-mixing of treatment type frames, allowing for verification of all blocks. Adjustability of each frame to central axis is mechanically done by a removable metal plate.

This high intensity view box has four 20 watt lamps with a high and low intensity switch. This allows easy viewing and alignment of the x-ray films over the crosshairs inscribed on top of the view box. The view box sits inside an adjustable metal pan which allows for easy removing and insertion, but retains alignment when re-installed. This pan is adjustable in the X and Y directions and fixed in place by locking four knobs on the bottom. A scale along the side reads target to film distance. For easier viewing of the treatment field areas, the film can be held in place with masking tape and a thin white sheet of paper can be taped down over the film. By tracing the x-ray film outline through to the white sheet of paper, visibility of the blocking area is easily seen under the high intensity light.

Both the block holding tray scale and the view box scale adjust when either the lamp tray, block tray or view box is moved.

Calibration
Central axis alignment is accomplished by using the stationary crosshair alignment plate and securing it to the block holding tray. When the target and view box are adjusted properly, the cross-hairs on the blocking tray will superimpose over the view box cross-hairs and over its entire range of travel (8 cm to 95 cm). When calibration is complete, remove the crosshair alignment plate and install the block holding tray.

Specifications

Target to Block Tray Distance: 8 cm to 95 cm
Target to Film Distance: 45 cm to 195 cm
Ceiling Height: 8 ft. 2 1/2" (unit can be made shorter if requested)
Light Source
Halogen Lamp: 12 V, 50 watt
Power: 115 VAC 60 Hz or 220 VAC 3 Amp
View Box
Lamps: Four (20 watt)
Size: 18" x 24 3/4" x 2 3/4"
Power: 115 VAC 60 Hz or 220 VAC 3 Amp

Item	Description
869-400	Treatment Block Verification System, 115 VAC
869-401	Treatment Block Verification System, 220 VAC

TUNGSTEN EYE SHIELDS
For Electron or Superficial Shielding

• Tungsten eye shields have less transmission than other eye shields

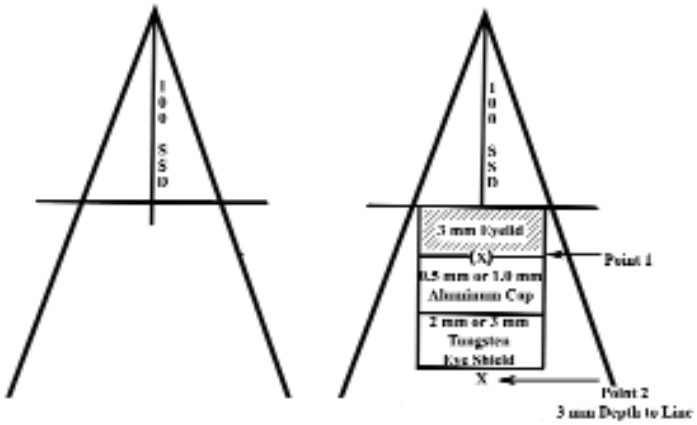
The Tungsten Eye Shield can use either the 0.5 mm or 1 mm thick anodized aluminum cap (both are included with each tungsten eye shield) to reduce the electron backscatter to the eyelid. The eye shield can be used without the aluminum cap when placed superficially.

Recommendations Based on Transmission Values:
The 2 mm tungsten eye shield should be used for 6 MeV, and the 3 mm tungsten eye shield should be used for 9 MeV. **These tungsten eye shields are not recommended for use above 9 MeV.**

Specifications

Tungsten Density: 17 g/cm³
Aluminum Density: 2.718 g/cm³

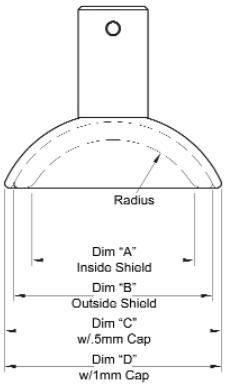
The user will have to determine an acceptable amount of backscatter to decide whether to use 0.5 mm or 1 mm aluminum cap. See diagram and table below.



The doses are normalized to d_{max} without the eye shield (Diagram 1) using a 10 x 10 cone. When 1.00 Gy is delivered to d_{max} using 6 MeV with the shield, you get 1.08 Gy to the undersurface of the eyelid (Point 1) and 3.4% transmission to the lens (Point 2) (See table).

TRANSMISSION USING XV-2 FILM*		DOSE IN Gy When 1.00 Gy is Delivered to d_{max} AT 3mm DEPTH*** USING TLD'S**			
6 MeV	9 MeV	6 MeV	9 MeV		
		0.72	0.77	Surface, No shield	
		0.79	0.81	No Shield, Dose at Interface	Point 1
3.4%	5.6%	1.08	1.11	2 mm Tungsten	Point 1
3.0%	4.8%	1.03	1.06	2 mm Tungsten + 0.5 mm Aluminum	Point 1
3.0%	4.4%	0.95	1.02	2 mm Tungsten + 1 mm Aluminum	Point 1
2.5%	3.3%	1.12	1.13	3 mm Tungsten	Point 1
2.4%	2.9%	1.02	1.05	3 mm Tungsten + 0.5 mm Aluminum	Point 1
2.5%	2.8%	0.97	1.06	3 mm Tungsten + 1 mm Aluminum	Point 1

Unreferenced data on this product is preliminary findings of Radiation Products Design, Inc. and **is not** to be used as a technical reference.
*XV-2 Film placed under/below tungsten eye shield at 3 mm depth (anterior surface of lens)
**TLD Microcubes placed under simulated eye lid using tungsten eye shields



Item #	Size	Thickness	Radius	Dim A	Dim B	Dim C	Dim D
936-583	XS	2	6.5	11.6	15.7	17.3	18.3
936-585	S	2	7.5	13.3	17.4	18.7	20.0
936-587	M	2	8.5	15.0	19.1	20.6	21.7
936-589	L	2	9.5	16.7	20.8	22.7	23.2
936-591	XL	2	10.5	18.4	22.5	23.9	25.1
936-596	XS	3	6.5	11.0	17.4	18.9	19.9
936-598	S	3	7.5	12.7	19.1	20.8	21.7
936-601	M	3	8.5	14.4	20.8	22.7	23.5
936-623	L	3	9.5	16.1	22.5	23.9	25.1
936-627	XL	3	10.5	17.8	24.2	25.9	27.1

All Dimensions In Millimeters

Reference: Evaluation of Eye Shields made of Tungsten and Aluminum in High-Energy Electron Beam - Randi D. Weaver B.S. Fairview - University Med. Ctr. PO Box 494, 420 Delaware St. SE, Mpls., MN 55455 Int. J. Radiation Oncology Biol. Phys, Vol. 41 Nal, pp 233-237-1998

CT DUMMY EYE SHIELD

For Simulating a Tungsten Eye Shield

CT Image

The CT Compatible Dummy Eye Shields for simulating the Tungsten Eye Shields are made of a non-metallic material and can be used in CT and MR.

Item	CT Compatible Dummy Eye Shield
935-5831	Simulates a 936-583 with 0.5 mm Al Cap
935-5832	Simulates a 936-583 with 1.0 mm Al Cap
935-5851	Simulates a 936-585 with 0.5 mm Al Cap
935-5852	Simulates a 936-585 with 1.0 mm Al Cap
935-5871	Simulates a 936-587 with 0.5 mm Al Cap
935-5872	Simulates a 936-587 with 1.0 mm Al Cap
935-5891	Simulates a 936-589 with 0.5 mm Al Cap
935-5892	Simulates a 936-589 with 1.0 mm Al Cap
935-5911	Simulates a 936-591 with 0.5 mm Al Cap
935-5912	Simulates a 936-591 with 1.0 mm Al Cap

Item	CT Compatible Dummy Eye Shield
935-5961	Simulates a 936-596 with 0.5 mm Al Cap
935-5962	Simulates a 936-596 with 1.0 mm Al Cap
935-5981	Simulates a 936-598 with 0.5 mm Al Cap
935-5982	Simulates a 936-598 with 1.0 mm Al Cap
935-6011	Simulates a 936-601 with 0.5 mm Al Cap
935-6012	Simulates a 936-601 with 1.0 mm Al Cap
935-6231	Simulates a 936-623 with 0.5 mm Al Cap
935-6232	Simulates a 936-623 with 1.0 mm Al Cap
935-6271	Simulates a 936-627 with 0.5 mm Al Cap
935-6272	Simulates a 936-627 with 1.0 mm Al Cap

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SILVER-PLATED EYE SHIELDS FOR SUPERFICIAL

1/16" Thick With Handle

934-012

934-014

934-016

934-018

934-020

Eye Shields protect the patient's lens during radiation therapy treatments. They come in four different sizes and are highly polished.

The small and medium solid lead shields fit under the eyelid to protect the lens, while permitting irradiation to the entire thickness and width of the eyelids in the treatment of superficial basal cell carcinomas of the skin. Large solid lead shields are used when areas surrounding the eyes require irradiation, in which case, the shields are placed over the lid. When only a portion of the eyelid requires irradiation, an extra large shield with a window is properly placed over the eyelid.

Eye Shields are fabricated of virgin lead and are silver-plated for life long protection. Using a soft contact lens or coating the eye shield with dental wax will give a smooth surface on the eye to prevent scratching or irritation to the eye. The lead permits less than 1% transmission of the radiation intensity at 120 kVp (3 mm Al HVL).

Always consult the Radiation Physicist when using eye shields in electrons.

Please refer to Khan, F.M. Ph.D. (1976). Field Shaping in Electron Beam Therapy. *British Journal of Radiology*.

Specifications

Silver-Plated Lead Eye Shield
Density Lead: 11.35 g/cm³
Thickness: 1.7 mm
Warranty: One year

Storage Box for Eye Shields
Size: 7.75" W x 3.8" D x 2.4" H

Item	Silver-Plated Lead Eye Shield	Size
934-012	Small	2 x 2.3 cm
934-014	Medium	2.3 x 2.5 cm
934-016	Large	2.8 x 3 cm
934-018	Extra Large with Window	3.1 cm Dia.

Item	Optional Items
934-020	Storage Box for Eye Shields, 8 Compartments
933-122	Wax Sheets, 1 lb
937-700	Soft Contact Lenses, 6/Pkg

LEAD AND TUNGSTEN EYE SHIELDS

External Shield - No Handle or Plating

Tungsten Eye Shields do not include the aluminum caps.

Specifications

Lead Density: 11.35 g/cm³
Tungsten Density: 17 g/cm³

Item	Lead Eye Shield	Thickness
936-320	2.00 cm Diameter	5 mm
936-322	2.25 cm Diameter	5 mm
936-325	2.50 cm Diameter	5 mm
936-330	3.00 cm Diameter	5 mm
936-333	3.30 cm Diameter	5 mm
936-337	3.00 cm Diameter	6 mm
936-425	2.50 cm Diameter	7 mm
936-427	2.70 cm Diameter	7 mm
936-430	3.00 cm Diameter	7 mm
936-433	3.30 cm Diameter	7 mm
936-434	3.40 cm Diameter	7 mm

Item	Tungsten Eye Shield	Thickness
936-641	11.6 cm Diameter	2 mm
936-642	13.3 cm Diameter	2 mm
936-643	15.0 cm Diameter	2 mm
936-644	16.7 cm Diameter	2 mm
936-645	18.4 cm Diameter	2 mm
936-651	11.0 cm Diameter	3 mm
936-652	12.7 cm Diameter	3 mm
936-653	14.4 cm Diameter	3 mm
936-654	16.1 cm Diameter	3 mm
936-655	17.8 cm Diameter	3 mm

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WARMING PLATE, STAINLESS STEEL CUP AND WAX SHEETS

933-140-1

933-122

933-140-2

The Warmer Plate and Stainless Steel Cup are used for melting wax to coat eye shields.

The wax is melted in a small stainless steel cup with a wide top on a small electric warmer plate. When the wax is melted grip the eye shield with a forceps and dip into the wax for ten seconds and then remove. Constantly rotate it in all directions while the wax is cooling to prevent wax from building up in any one place. If the wax temperature is too low, it may go on the eye shield too thick and cause it to become bumpy. If the wax temperature is too high, it will not coat the eye shield evenly with a smooth surface layer.

Refer to “Wax Coatings”, The Physics of Radiation Therapy by F.M. Khan, Ph.D., under 14.6 Field Shaping part D. Internal Shielding, last paragraph on page 340.

Specifications

Item 933-122 Wax Sheets
Size: 1.5 mm (0.15 cm) x 7.5 cm x 14.2 cm
Quantity: 35 sheets
Specific Gravity (H2O = 1): 0.90
Weight: 1 lb (0.5 kg)

Item 933-140-1 Stainless Steel Cup
Capacity: 2.5 oz
Finish: Polished Stainless Steel

Item 933-140-2 Warming Plate
Heating Surface: 3.5" Diameter (8.9 cm) Non-Stick
On-Off Switch
Power Indicator light
Overall Size: 4.5" Diameter x 5" H (11.4 x 12.7 cm)
Color/Finish: Black
Energy Star Compliant: No
Housing Material: Plastic
Weight: 0.5 lb (0.3 kg)
Voltage Rating: 120 V
Watts: 20 W

Item #	Description
933-122	Wax Sheets, 1 lb
933-140-1	Stainless Steel Cup, 2.5 oz
933-140-2	Warming Plate

SOFT CONTACT LENSES

The Soft Contact Lenses are used to prevent scratches to the cornea when using eye shields.

Immediately remove the lens if the patient has any of the following problems

- Eye pain
- Eye stinging, burning, itching, excessive watering, dryness, etc
- Unusual eye secretions

Specifications

Size: 14 mm diameter
Center Thickness: 0.09 to 0.12 mm
Base Curve: Spherical surface flatter than the corneal curvature

Item #	Description
937-700	Soft Contact Lenses, 6/Pkg

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CONTACT LENS CASE AND SOLUTION

Item 937-706 Contact Lens Cases
Not suitable for heat disinfection

937-711 Opti-Free Express Contact Lens Solution

- No-rub solution
- Cleans and disinfects
- Kills bacteria that can cause eye infections
- Removes protein daily
- Provides lasting moisture and comfort
- For use with both soft and silicone hydrogel contact lenses
- 4 oz (120mL)

Item #	Description
937-706	Contact Lens Cases, 3/Pkg
937-711	Opti-Free Pure Moist Contact Lens Solution, 4 oz

CIDEX® OPA

Proven Efficacy

CIDEX® OPA Solution has been tested and cleared as a high-level disinfectant for use with the most widely used endoscopes.

- Designed for either manual or automatic reprocessing
- Manufactured to the highest standards for purity
- Effective against a wide array of microorganisms

Proven Safety

CIDEX® OPA Solution protects both patients and technicians, with a demonstrated safety profile that is backed by the heritage of Advanced Sterilization Products (ASP).*

- Safe to use for patients, healthcare professionals and instruments
- Low vapor pressure for minimal inhalation exposure risk
- No need for special ventilation
- Near-neutral pH level ensures compatibility with endoscopic instruments

Proven Value

CIDEX® OPA Solution is the number-one[1] product in high-level disinfection, offering more ways to make the most of your budget.

- Rapid disinfection improves productivity, allowing more endoscopes to be processed in less time[2]
- Noncorrosive formula protects your investment in instrumentation[2, 3]
- Long-lasting efficacy allows reprocessing of more devices per gallon than with glutaraldehyde[2]

**Please read and follow the Instructions For Use prior to using CIDEX® OPA Solution for important information, including contraindications, warnings and proper directions for use.*

Rapid Action, Reliable Disinfection

Multiple studies have shown the efficacy of CIDEX® OPA Solution against bacteria, fungi, and viruses.[4, 5] CIDEX® OPA Solution works within minutes and provides broad spectrum killing power-even in the presence of human serum.[2]

CIDEX® OPA Solution can be used straight from the bottle for extra efficiency.

- Requires no activation or mixing
- 5-minute soak time at 25°C in automatic endoscope reprocessors*
- 12-minute soak time at 20°C for manual reprocessing

Long Life, Lasting Power

A long shelf life and high reusability make CIDEX® OPA Solution a great value.

- 2-year unopened shelf life
- 75-day shelf life after opening the bottle

Using CIDEX® OPA Solution in an automatic reprocessor can mean 20% more cycles in a 14-day reuse cycle, compared with other solutions.[5]

- Sensitive test strips make it easy for you to test the minimum effective concentration (MEC) of ortho-phthalaldehyde, the active ingredient in CIDEX® OPA Solution

**When used or reused in a legally marketed automatic endoscope reprocessor that can be set to a minimum of 25° C.*

Microbicidal Activity

The following table indicates the spectrum of activity as demonstrated by testing of CIDEX® OPA Solution using prescribed test methods.

Viruses Non-Enveloped		
Poliovirus Type 1	Rhinovirus Type 42	Adenovirus Type 2
Vaccinia (Wyeth)	Coxsackievirus Type B-3	
Viruses Enveloped		
Coronavirus	Cytomegalovirus	Influenza Virus [Hong Kong]
HIV-1	Herpes simplex Types 1,2	
Vegetative Organisms		
Staphylococcus aureus	*Salmonella choleraesuis*	*Pseudomonas aeruginosa*
Mycobacterium bovis		
Fungi		
Trichophyton mentagrophytes		

Materials Compatibility

Metals		
Aluminum	Anodized aluminum	Brass
Carbon steel	Chrome-plated brass	Chrome-plated steel
Copper	Nickel-plated brass	Nickel-silver alloy
Stainless steel	Titanium	Tungsten carbide
Vanadium steel		
Plastics		
Acetal	Acrylonitrile-butadiene-styrene (ABS)	Nylon
Polyamide	Polycarbonate	Polyethylene
Polyethylene terephthalate (polyester)	Polymethylmethacrylate (acrylic)	Polypropylene
Polystyrene	Polysulfone	Polyvinylchloride (PVC)
PTFE		
Elastomers		
Kraton G	Natural rubber latex	Polychloroprene (Neoprene)
Polyurethane	Silicone rubber	
Adhesives		
Cyanoacrylate	EPO-TEK 301 epoxy	EPO-TEK 353 epoxy
Polyether Polysulfide		

Testing CIDEX® OPA Solution

To verify the efficacy of CIDEX® OPA Solution, ASP recommends testing for the minimum effective concentration (MEC) prior to each use. ASP offers test strips designed specifically for use with CIDEX® OPA Solution. Easy to use and read, CIDEX® OPA Test Strips are the most reliable means to verify that CIDEX® OPA Solution will effectively destroy microorganisms, including the highly resistant Mycobacterium.

References
1. 2008 Healthcare Products Information Services (HPIS) data, HLD Market Assessment. 2. Hession SM. Endoscope disinfection by ortho-phthalaldehyde in a clinical setting: an evaluation of processing time and costs compared with glutaraldehyde. Poster presented at: Society of Gastroenterology Nurses and Associates; May 18-23, 2001; Tampa, FL. 3. Vollmer C. New high-level disinfectant reduces equipment-repair costs. Infect Control Today. August 2002. 4. Akamatsu T, Minemoto M, Uyeda M. Evaluation of the antimicrobial activity and materials compatibility of orthophthalaldehyde as a high-level disinfectant. J Int Med Res. 2005;33:178-187. 5. Rutala WA, Weber DJ. New disinfection and sterilization methods. Emerg Infect Dis. 2001;7:348-353.

Item	Description
466-401	Cidex OPA, 1 gal
466-403	Cidex OPA Solution Test Strips, 60 strips/bottle

EYE PLAQUES

971-XXX-01

971-XXX-05

971-XXX-10

971-XXX-15

971-XXX-20

971-XXX-25

The eye plaques are solid 18 kt. gold. Each eye plaque has 6 suture tabs. The eye plaques can be ordered with or without a notch for the optic nerve. The clear template metal ring is made of a high nickel alloy (78%).

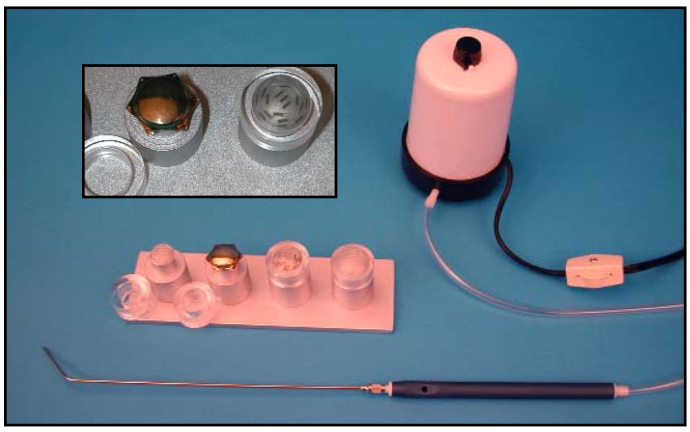
Note: Silicone seed carrier must be ordered separately and is not returnable.

Specifications

18 Kt Gold Density: 15.58 g/cm^3
Nickel Density: 8.912 g/cm^3

Item	Description	Size
971-012-01	Gold Eye Plaque	12 mm
971-012-05	Gold Eye Plaque, Notched	12 mm
971-012-10	Clear Template Eye Plaque	12 mm
971-012-15	Clear Template Eye Plaque, Notched	12 mm
971-012-20	Silicone Seed Carrier	12 mm
971-012-25	Silicone Seed Carrier, Notched	12 mm
971-014-01	Gold Eye Plaque	14 mm
971-014-05	Gold Eye Plaque, Notched	14 mm
971-014-10	Clear Template Eye Plaque	14 mm
971-014-15	Clear Template Eye Plaque, Notched	14 mm
971-014-20	Silicone Seed Carrier	14 mm
971-014-25	Silicone Seed Carrier, Notched	14 mm
971-016-01	Gold Eye Plaque	16 mm
971-016-05	Gold Eye Plaque, Notched	16 mm
971-016-10	Clear Template Eye Plaque	16 mm
971-016-15	Clear Template Eye Plaque, Notched	16 mm
971-016-20	Silicone Seed Carrier	16 mm
971-016-25	Silicone Seed Carrier, Notched	16 mm
971-018-01	Gold Eye Plaque	18 mm
971-018-05	Gold Eye Plaque, Notched	18 mm
971-018-10	Clear Template Eye Plaque	18 mm
971-018-15	Clear Template Eye Plaque, Notched	18 mm
971-018-20	Silicone Seed Carrier	18 mm
971-018-25	Silicone Seed Carrier, Notched	18 mm
971-020-01	Gold Eye Plaque	20 mm
971-020-05	Gold Eye Plaque, Notched	20 mm
971-020-10	Clear Template Eye Plaque	20 mm
971-020-15	Clear Template Eye Plaque, Notched	20 mm
971-020-20	Silicone Seed Carrier	20 mm
971-020-25	Silicone Seed Carrier, Notched	20 mm

EYE PLAQUES LOADING STAND



The Eye Plaque Loading Stand is designed to hold the Silicone Seed Carriers (971-xxx-20 or 971-xxx-25) for easier loading of the seeds into the Carriers and Eye Plaques. The Eye Plaque Loading Stand is comprised of an aluminum base with aluminum and acrlyic holders. The aluminum base is 2" (5.08 cm) wide and 3/16" (0.188 cm) thick with the length dependant on the number of holders. The holders have a 1" diameter x 0.9" high (2.54 x 2.29 cm) aluminum base with a 0.5" (1.27 cm) high acrylic ring on top. The acrylic ring can be made for the following sizes of Seed Carriers: 10 mm, 12 mm, 14 mm, 16 mm, 18 mm, 20 mm and 22mm.

This item is custom made to the customer's specifications as to the size and number of holders needed on the stand. Customer must specify the size of holders needed, 10 mm, 12 mm, 14 mm, 16 mm, 18 mm, 20 mm and 22mm.

Item	Description
971-050	Eye Plaque Loading Stand

TUNGSTEN EYE SHIELD FOR EYE PLAQUE

The Tungsten Eye Shield with 3 suture holes is placed on top of the eye plaque for shielding behind the eye.

Specifications

Tungsten Density: 17 g/cm^3
Thickness: 1 mm
Radius: 10.2 mm
Diameter: 18.3 mm

Item	Description
971-110	Tungsten Eye Shield for Eye Plaque

SHIELDED EYE PLAQUE BOX

For Gas Sterilization

The outer box of the Shielded Eye Plaque Box is made of stainless steel which has a handle, latch, and piano hinge. The top, bottom, and two sides are lined with 1/16" (0.16 cm) thick lead. The two ends are perforated stainless steel to allow the gas to flow through the box. The inside liner is perforated stainless steel and the two ends are lined with 1/16" (0.16 cm) thick lead. There are two compartments for the eye plaques, each compartment size is 1.25" x 1.25" x 7/8" deep (3.175 x 3.175 x 2.23 cm).

Item	Description
936-950	Shielded Eye Plaque Box for Gas Sterilization

PHOTON LEAD EYE/EAR SHIELD

With Tray Post

Picture Shown with Items 588-000, 588-002 and 588-007

The Lead Eye/Ear Shield is an 8 cm lead cylinder attached to a 20 cm long stainless steel rod. The rod inserts into a hole in the swivel clamp which is connected to a 13 cm post that attaches to the treatment tray through a 1/4" (0.635 cm) diameter hole and is secured with a threaded knob.

Setting the lead cylinder shield for the proper divergence is accomplished by turning the collimator light on and adjusting the shield for a circular shadow on the patient. Two Eye Shields can be used on a tray for anterior eye shielding. A 13 cm or 30 cm extension (Item 588-002 or 588-003) can be added to the post to bring the shield closer to the patient.

The 13 cm Tray Post (Item 588-000) and the Lead Eye/Ear Shield (Item 588-007 to 588-020) must be ordered separately.

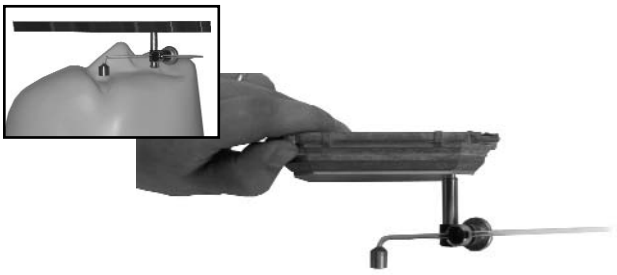
Item	Description
588-000	13 cm Tray Post with Swivel Clamp for Lead Eye/Ear Shield
588-002	13 cm Tray Post Extension
588-003	30 cm Tray Post Extension

Item	Lead Eye/Ear Shield
588-007	0.75 cm Diameter x 8 cm
588-010	1 cm Diameter x 8 cm
588-012	1.25 cm Diameter x 8 cm
588-015	1.5 cm Diameter x 8 cm
588-017	1.75 cm Diameter x 8 cm
588-020	2 cm Diameter x 8 cm

Custom Lead Eye/Ear Shields Available

ADJUSTABLE TUNGSTEN EYE SHIELD FOR IRIS

Used For Electron Treatment



Adjustable Tungsten Eye Shield mounted to an electron cerrobend block as shown.

The eye shield is attached to a 5" (12.75 cm) long acrylic rod. Which connects to a clamp on the support rod. The support rod screws into the electron cerrobend mold.

The tungsten eyeshield sits approximately 5 mm above the eye. Instructed the patient to stare at the bottom of the eye shield, which can be marked with a dot. Dental wax can be used if build-up is needed.

This eyeshield is supplied with two support rods measuring 3.8 cm and 9 cm in length. These rods create the option to treat at an extended distance.

To use the Adjustable Tungsten Eye Shield it must be mounted to the electron cerrobend block by drilling a hole through the electron cerrobend block. Instructions and mounting tools are included with the Adjustable Tungsten Eye Shield.

Specifications

Material: Tungsten
Density: 17 g/cm³
Acrylic Density: 1.185 g/cm³
Size of Tungsten: 12 mm Dia x 10 mm Thick

Item	Description
936-925	Adjustable Tungsten Eye Shield for Iris

Custom Sizes Available Upon Request

TANGENTIAL BREAST CONE, BEST THERATRONICS THERATRON

598-001

599-000

The Tangential Breast Cone for the Best Theratronics Theratron machines is a device designed to eliminate penumbra and beam divergence for the breast tangential portals. The device consists of a support plate and lead block for shielding of the contralateral side. An extension plate projects from the source head to the treatment distance. The extension plate is set to be off-center of the radiation source by one-half the diameter of the radiation souce. This allows the entire radiation source to be utilized for treatment. Lateral adjustable lead trimming bars are provided to block the sides of the tangential fields, to insure that no overlapping with the supraclavicular field occurs. The end of the breast cone has an acrylic plate of 9.5mm thickness to provide equilibrium when treating the breast wall with Cobalt 60. The acrylic plate is removable for treatments without bolus.

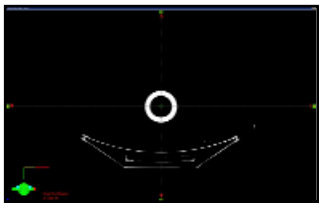
The Back Pointer (Item 599-000) is a versatile device for accurately determining the exit points of the radiation beam when setting up a patient using the tangential breast cone. It is a light weight rigid device made of a Polycarbonate (lexan) material.

Specifications

Finishes: Tan textured polyurethane, Nickle plate, Clear anodized
Weight (without trimmers): 27.5 lb (12.5 kg)

Item	Description
598-001	Tangential Breast Cone, Theratronics Theratron-80cm
598-002	Tangential Breast Cone, Theratronics Theratron-100cm
599-000	Back Pointer for Tangential Breast Cone

ROUND TESTICLE SHIELDS AND ADJUSTABLE TESTICLE SHIELD STAND



CT Image

- **1/2" (1.27 cm) lead wall thickness**
- **An open sector is provided in each shield to allow comfortable positioning on the patient**
- **Lugs cast into each half of the shield unit provide anchor points for the two rubber straps used to hold the unit together**
- **All surfaces of the shields are coated with a tan polyurethane paint**

The lead testicle shields are designed with a tongue and groove interlock to eliminate radiation leakage where the blocks are joined together and to prevent the halves from sliding apart. The shields top and bottom halves can be secured together with two rubber straps (supplied with each unit) or with nylon tape. Rotating the entrance of the shield toward the ceiling will reduce scatter radiation from entering the shield. A soft cotton sock or the Kianni cover (Item 928-150) can be used to cover the testicles when placing them inside a cold shield. The testicle shields are available in three sizes: small, medium and large. When using the Adjustable Stand with the shields, no rubber straps are needed.

This easily Adjustable Testicle Shield Stand will cradle all 3 sizes of the round testicle shields. A hand knob allows for easy vertical adjustment from 1" to 10" (five turns per inch). The counter weighted base is made of cast iron. A plastic plate, secured to the base, provides easy positioning. The unit can be used for anterior and posterior treatments.

It is recommended that the Adjustable Testicle Shield Stand (Item 928-505) be used while raising and lowering the testicle shields, as this will reduce patient discomfort.

Set-up:
1. Place half of shield in the stand cradle.
2. Adjust height and place testicles on the shield.
3. Fit the other half of the shield with the first half over the testicles and adjust height of stand if needed.
4. Rotate the opening of the shield toward the ceiling to reduce scatter from entering the shield.

The CT Testicle Shields are identical to the Lead Testicle Shields in size and shape but not weight. They are made of blue silicone rubber with shore hardness of 50A. The CT Testicle Shields do not use the rubber straps as the straps are too strong for the silcone rubber. The CT Testicle Shields should be used with the Adjustable Stand.

Reference: Testicular Doses in Definitive Radiation Therapy for Localized Prostate Cancer - C.J. Amies, M. App.Sc, H. Mameghan, F.R.A.C.R., A. Rose, M.A.I.P. and R. J. Fisher, Ph.D Radiation Oncology Biol. Phys, Vol. 32, No.3 pp. 839-846, 1995

Specifications

Item 928-200 (Small)
Size: 2" I.D. x 3" O.D. (5.09 x 7.65 cm)
Opening: 0.6" x 1.25" (1.53 x 3.19 cm)
Weight: 4 lb (1.8 kg)

Item 928-250 (Medium)
Size: 2.5" I.D. x 3.5" O.D. (6.37 x 8.92 cm)
Opening: 0.75" x 1.6" (1.91 x 4.08 cm)
Weight: 5.7 lb (2.6 kg)

Item 928-300 (Large)
Size: 3" I.D. x 4" O.D. (7.65 x 10.2 cm)
Opening: 1" x 2" (2.55 x 5.09 cm)
Weight: 7.25 lb (3.3 kg)

Item 928-505 (Stand)
Size: 5" W x 10" D x 13.5" H (12.7 x 25.5 x 34.4 cm)
Weight: 10.6 lb (4.8 kg)

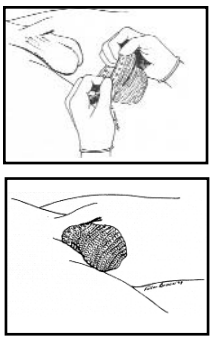
Item 926-200 (Small)
Size: 2" I.D. x 3" O.D. (5.09 x 7.65 cm)
Opening: 0.6" x 1.25" (1.53 x 3.19 cm)

Item 926-250 (Medium)
Size: 2.5" I.D. x 3.5" O.D. (6.37 x 8.92 cm)
Opening: 0.75" x 1.6" (1.91 x 4.08 cm)

Item 926-300 (Large)
Size: 3" I.D. x 4" O.D. (7.65 x 10.2 cm)
Opening: 1" x 2" (2.55 x 5.09 cm)

Item	Description
928-200	Testicle Shield (Small) 2" I.D.
928-250	Testicle Shield (Medium) 2 1/2" I.D.
928-300	Testicle Shield (Large) 3" I.D.
928-500	Testicle Shields, Set of 3 (Small, Med, Large)
928-505	Adjustable Stand For Round Testicle Shields
926-200	CT Testicle Shield, Silicone (Small) 2" I.D.
926-250	CT Testicle Shield, Silicone (Medium) 2-1/2" I.D.
926-300	CT Testicle Shield, Silicone (Large) 3" I.D.

THE KIANNI SCROTUM COVER



BENFITS

- It covers the entire scrotum area, creating an insulated barrier between the scrotum skin and the cold metal shield. The warm feeling relaxes the testicles.
- It is made of an elastic netting (non-sterile) and threaded with an elastic drawstring. This elasticity allows expansion many times the actual dimensions of 3" x 3".
- It is sanitary, prevents the scrotum skin from coming in contact with the lead shields.

Individual plastic containers are included for patient identification.

Item	Description
928-150	The Kianni Scrotum Cover, 10/Pkg

TESTICLE RETRACTOR

The Testicle Retractor excludes a part or all of the testicle and scrotum from the direct beam while irradiating a portion of the scrotum.

This T-shaped device with a groove along the vertical support, allows a narrower blade (also with a groove) to be positioned in any vertical or angled orientation to the patient. It is fixed in position by a locking knob.

Item	Description
275-000	Testicle Retractor

WALL PLUGS

200-009

200-010

200-011

These wall plugs are designed to fit into the conduit used for cables running from the linac vault to the control area. The plugs provide a lead barrier in the wall conduit. The plugs have a channel for the cables so they can remain in the conduit permanently. The wall plug is made to the customer specified diameter and wall thickness.

Specifications

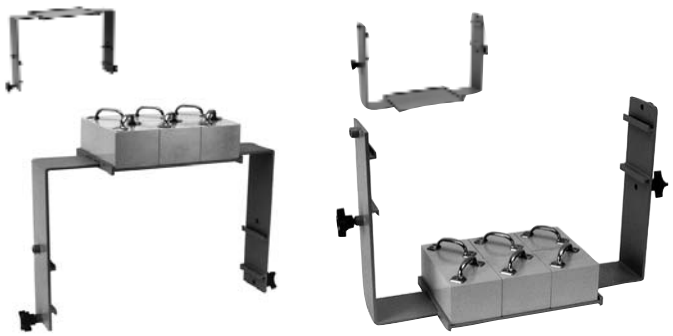
Item 200-009 Plug, Wall
Material: Lead and Stainless Steel
Lead Dimensions: 3" (7.62 cm) Thick x Customer Specified Diameter

Item 200-010 Plug, Outside Wall and 200-011 Plug, Inside Wall
Material: Lead, 5% Borated Polyethylene and Stainless Steel
Plug Dimensions: 1" (2.54 cm) Thick 5% Borated Polyethylene and 3" (7.62 cm) Thick Lead x Customer Specified Diameter

Item	Plug	Lead	5% Borated Polyethylene
200-009	Wall	3" (7.62 cm) T	
200-010	Outside Wall	3" (7.62 cm) T	1" (2.54 cm) T
200-011	Inside Wall	3" (7.62 cm) T	1" (2.54 cm) T

Items are Custom Made and Nonreturnable

ANTERIOR AND POSTERIOR TREATMENT TABLE SHIELD



This unit attaches to the couch rails with two hand knobs. It can be used above or below the couch. Six lead blocks with handles are included. Each lead block weighs 21 pounds (9.5 kg) and is 8 cm thick x 10 cm square. A 1/4" (0.64 cm) high rail mounted around three sides prevents the lead blocks from sliding off. Anterior clearance to top of couch is 30 cm, posterior clearance is 20 cm. Each unit is custom made for the rail spacing. Please state the manufacturer and the model number of the couch when ordering.

Specifications

Shielded Area: 30 W x 20 L x 8 H cm

Item	Description
925-108	Anterior/Posterior Treatment Table Shield

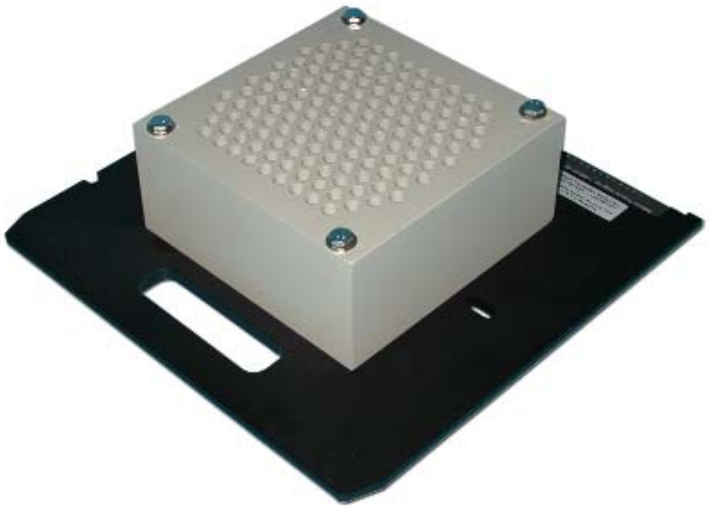
ADJUSTABLE SHIELDING TABLE

Lead Filled Front Vertical Shield: 34.5" W x 8" H x 2" T (87.9 x 20.4 x 5.09 cm)
Top Horizontal Tray: 36" W x 26" D x 2" T (91.7 x 66.3 x 5.09 cm)
Lead Bricks with Handles within Tray: (20) 2" x 4" x 8" (5.09 x10.2 x 20.4 cm)
Lead Filled Side Vertical Shields Qty. 2: 28" W x 16" H x 2" T (71.4 x 40.8 x 5.09 cm)
Opening Between Vertical Side Shields: 38" (96.86 cm)
Frame Construction Base: 2" (5.09 cm) square steel tubing
Overall Size: 47" W x 43" D x 77" H (119.8 x 109.6 x 196.3 cm)
Hand Crank Winches (2): Adjust the height of the top or side shields
Safety Lock Pins Included: 2
Casters: (4) 6" (15.3 cm) dia. swivel
Finish: Tan Textured Polyurethane
Weight: 1800 lb (817 kg)

Item	Description
925-020	Adjustable Shielding Table w/ Wheels

"GRID" PHOTON BLOCK

Special Fractionation Radiation (SFR)



Special fractionation (GRID) is a new paradigm in radiation therapy for effective treatment of tumors that defy conventional dose/time fractionation.

The Special Fractionation Radiation (SFR) approach recreates a virtual brachytherapy dose distribution using megavoltage external beam radiation. This method combines the direct cellular response to high dose radiation with the indirect by-stander-effects of human tissue responses to produce enhanced biological effects. This treatment is particularly beneficial for the treatment of radioresistant or large tumors. The "GRID" Photon Block is used to treat these bulky tumors with SFR.

In the Department of Radiation Medicine at the University of Kentucky, over 200 patients having bulky malignant tumors in various sites, such as head and neck, lung and pelvis were treated. Excellent clinical results were obtained using the SFR technique. The efficacy and safety of using a large fraction of SFR are published in scientific journals[1].

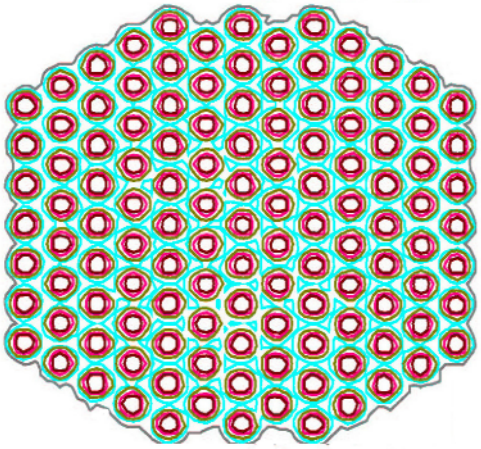
The "GRID" Photon Block is made of a low melting alloy with the divergent holes spaced in a honeycomb fashion. At 100 cm each hole has a beam width of 14 mm and the distance from center to center of each hole is 21 mm.

[1]High-Dose Spatially-Fractionated Radiation (GRID): A New Paradigm in the Management of Advanced Cancer by Mohammed Hohiuddin, M.D., Mihoko Fujita, M.D., PH.D., William F. Regine, M.D., Ali S. Megooni, PH.D., Goeffrey S. Ibbott, PH.D., and Mansoor M. Ahmed, PH.D. - Department of Radiation Medicine, University of Kentucky, College of Medicine, Lexington, KY Int. J. Radiation Oncology Biol. Phys, Vol. 45, No. 3, pp 721-727. 1999

Weight: 48 lb (22 kg)

Item	"GRID" Photon Block
591-010	Varian Type III, 61.6 cm
591-011	Varian Type III 65.4 cm
591-020	Siemens 56 cm - Screw Coding
591-021	Siemens 68.6 cm - Plug Coding
591-022	Siemens 56 cm - Plug Coding
591-030	Philips Elekta SL-20 65.4 cm

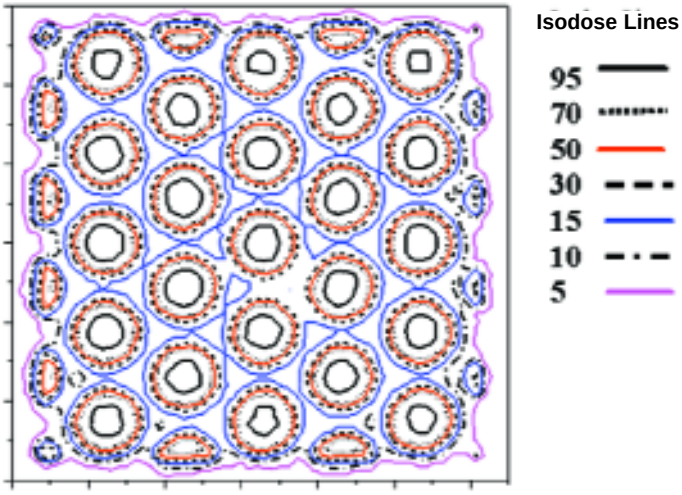
"GRID" Photon Blocks Can Be Manufactured for Any Accelerator



Isodose Lines

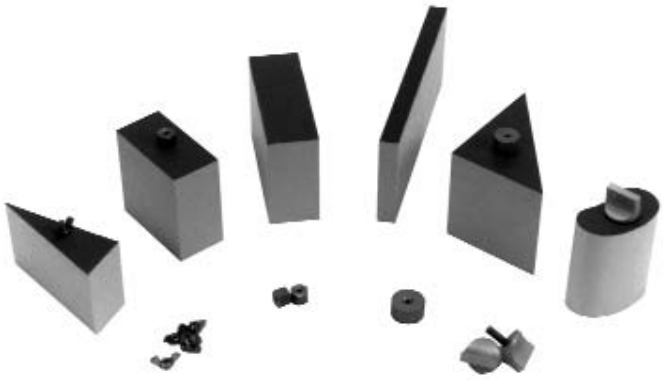
10% Gray
16 % Cyan
30% Dark Green
70% Pink
90% Wine

25 x 25 Field Size



10 x 10 Field Size

LEAD SHIELDING BLOCKS



We offer a large assortment of Lead Shielding Blocks for cobalt and linear accelerators. Custom sizes are also available.

All Lead Shielding Blocks on the following pages are made to order and are non-returnable.

NCRP Report No. 102 states the thickness of lead required reduce the beam to 5% is as follows:

4 MV - 6.4 cm	6 MV - 6.66 cm
10 MV - 7.31 cm	15 MV - 7.18 cm
20 MV - 7.05 cm	25 MV - 6.92 cm

Choose from three thicknesses: 5 cm (used with Cobalt 60 machines), 6 cm (used with 4 or 6 MV linear accelerators) and 8 cm (used with 6 MV accelerators and up). Blocks are made of gravity cast antimonial lead, resulting in harder blocks that resist scratching and corner breakage.

All surfaces are machined flat, square and smooth and are finished with a tough polyurethane paint. The bottom of each block is covered with thick vinyl to minimize scratching of the surface on which they are placed.

Blocks for use with a treatment tray can be studded with stainless steel bolts. The protruding stud of each block has a wing nut which secures the block to the treatment tray. This is necessary for rotational and angular treatments.

STUDS FOR LEAD BLOCKS

The studs are used to secure lead blocks to the treatment tray. The Heavy Duty T-Studs are recommended for lead blocks that are over 15 pounds. All lead blocks with a stud are sold with a wing nut for securing the block to the treatment tray. The area around the stud is packed with lead to prevent radiation leakage.

Specifications

1/4" (6 mm) Blocking Tray: Needs 1/2" long stud
3/8" (9-10 mm) Blocking Tray: Needs 5/8" long stud
1/2" (13 mm) Blocking Tray: Needs 3/4" long stud

Item #	Description
500-150	Standard Stud Protrudes 1/2" x 10-32
500-152	Standard Stud Protrudes 5/8" x 10-32
500-154	Standard Stud Protrudes 3/4" x 10-32
500-156	Medium Duty Stud Protrudes 1/2" x 1/4-20
500-158	Medium Duty Stud Protrudes 5/8" x 1/4-20
500-160	Medium Duty Stud Protrudes 3/4" x 1/4-20
500-162	Heavy Duty "T" Stud Protrudes 1/2" x 1/4-20
500-164	Heavy Duty "T" Stud Protrudes 5/8" x 1/4-20
500-166	Heavy Duty "T" Stud Protrudes 3/4" x 1/4-20

KNOBS FOR LEAD BLOCKS

Item #	Description
565-050	1/2" Hex x 1 cm S.S. Thumb Nut 10-32 Thread - Pkg/12
565-075	3/4" Round x 1/2" S.S. Knob 10-32 Thread - Each
565-100	1" Round x 1/2" S.S. Knob 10-32 Thread - Each
565-140	1" Round x 1/2" S.S. Knob 1/4-20 Thread - Each

KNOBS WITH STUDS AND INSERTS

Item #	Description
565-203	1/2" Stud with Knob 1/4-20 Thread - Each
565-205	5/8" Stud with Knob 1/4-20 Thread - Each
565-207	3/4" Stud with Knob 1/4-20 Thread - Each
565-220	1/4-20 Threaded Brass Insert Installed in Lead Block - Each
565-223	8-32 Threaded Brass Insert Installed in Lead Block - Each

LEAD SHIELDING BLOCK INFORMATION

Commonly Used Thicknesses

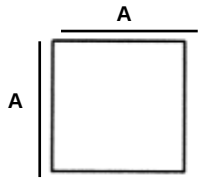
5 cm Thick - Cobalt 60
6 cm Thick - 4 MV - 6 MV Linear Accelerators
8 cm Thick - 10 MV & Higher Linear Accelerators

NCRP Report No. 102
Thickness of lead required to reduce beam to 5%

4 MV - 6.4 cm	6 MV - 6.66 cm
10 MV - 7.31 cm	15 MV - 7.18 cm
20 MV - 7.05 cm	25 MV - 6.92 cm

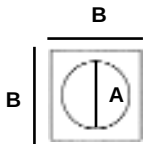
Please call or visit rpdinc.com for specific information on Lead Shielding Blocks

SQUARE BLOCKS



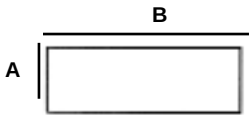
Item # Range	Description
510-015 thru 510-308	Square

DIVERGENT HOLE IN SQUARE BLOCKS



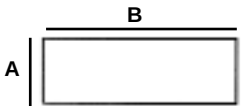
Item # Range	Description
535-055 thru 535-108	Divergent Hole in Square

RECTANGULAR/SPINAL CORD SHAPED BLOCKS



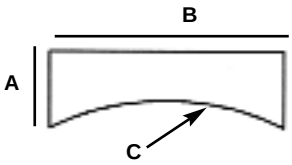
Item # Range	Description
511-025 thru 511-968	Rectangular/Spinal Cord

RECTANGULAR BLOCKS



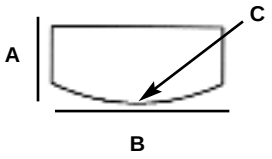
Item # Range	Description
512-025 thru 512-708	Rectangular

RECTANGULAR BLOCKS WITH CONCAVE SIDE



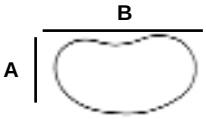
Item # Range	Description
525-155 thru 525-488	Rectangular with Concave Side

RECTANGULAR BLOCKS WITH CONVEX SIDE



Item # Range	Description
524-125 thru 524-458	Rectangular with Convex Side

KIDNEY SHAPED BLOCKS

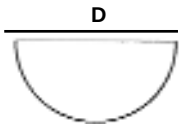


Item # Range	Description
526-135 thru 526-318	Kidney

ROUND BLOCKS

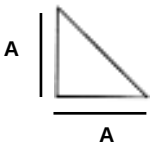
Item # Range	Description
513-005 thru 513-408	Round

HALF ROUND BLOCKS



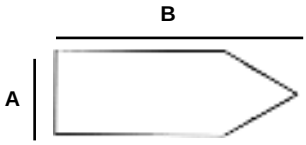
Item # Range	Description
514-085 thru 514-408	Half Round

TRIANGLE BLOCKS



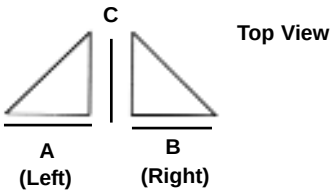
Item # Range	Description
515-025 thru 515-248	Triangle

POINTED RECTANGULAR BLOCKS



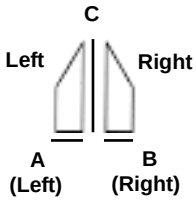
Item # Range	Description
519-115 thru 519-418	Pointed Rectangular

TRIANGLE BLOCKS



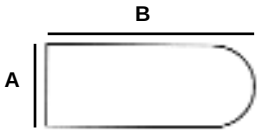
Item # Range	Description
516-115 thru 516-768	Triangle

ANGLED RECTANGULAR BLOCKS



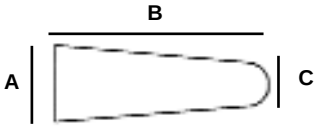
Item # Range	Description
518-105 thru 518-178	Angled Rectangular

ROUNDED RECTANGULAR BLOCKS



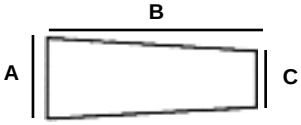
Item # Range	Description
520-105 thru 520-508	Rounded Rectangular

SALT CELLAR BLOCKS



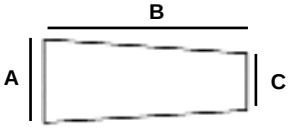
Item # Range	Description
521-115 thru 521-278	Salt Cellar

LARYNX BLOCKS



Item # Range	Description
523-135 thru 523-198	Larynx

TRAPEZOID BLOCKS



Item # Range	Description
522-125 thru 522-388	Trapezoid

INTERLOCKING LEAD BRICKS

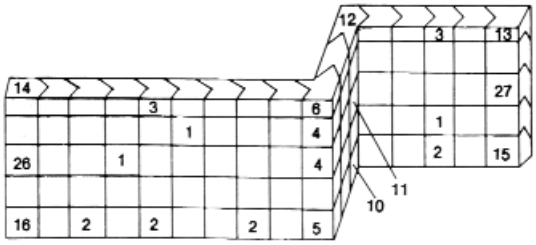
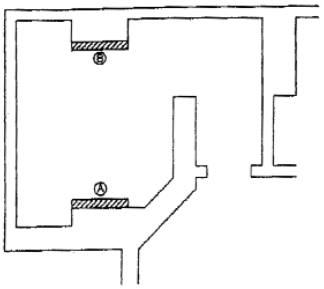
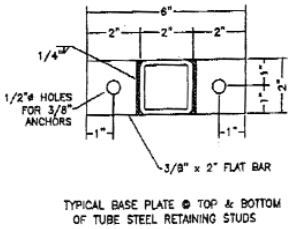


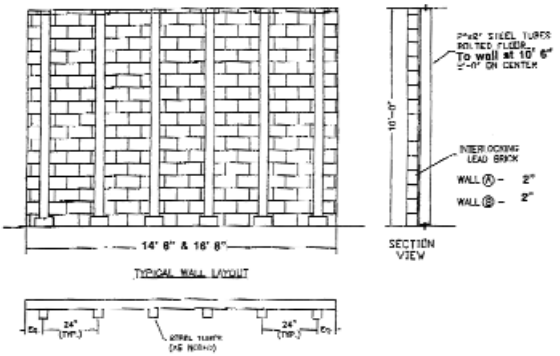
Diagram Shows Block Positions, Shape Function and Wall Alternatives

Interlocking lead bricks make it easy to erect, modify, and relocate protective walls and cells of any size. Interlocking V-shaped edges eliminate the danger of leakage common to straight-edged bricks. The interlocking design also creates a sturdier wall and minimizes the chances of toppling. The bricks have a durable paint finish to protect from direct lead contact.

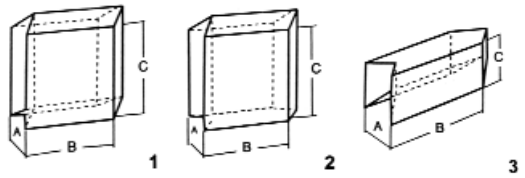


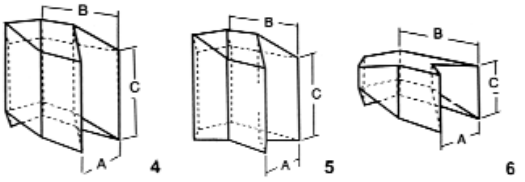


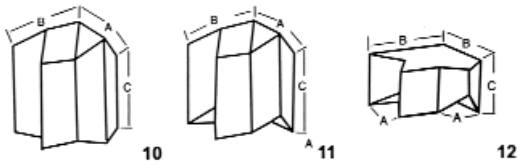
TYPICAL BASE PLATE @ TOP & BOTTOM OF TUBE STEEL RETAINING STUDS

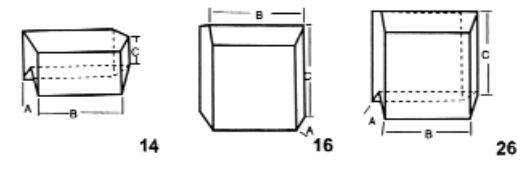


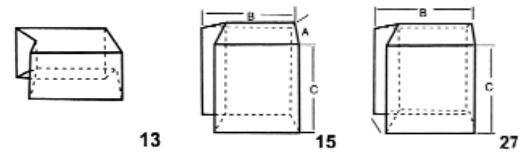
Extra wall shielding can be accomplished using the 2" interlocking lead bricks.
The customer must determine width, height, and thickness needed for extra shielding. Call for quote.











Item	Interlocking Lead Brick	Figure	AxBxC
001-100	Standard Wall, 13.2 lb (6 kg)	1	4x4x2"
001-200	Standard Base, 14.9 lb (6.77 kg)	2	4x4x2"
001-300	Standard Top, 5 lb (2.27 kg)	3	4x2x2"

Item	Interlocking Lead Brick	Figure	AxBxC
001-400	Corner for Wall, 13.2 lb (6 kg)	4	4x4x2"
001-500	Corner for Base, 14.9 lb (6.77 kg)	5	4x4x2"
001-600	Corner for Top, 5 lb (2.27 kg)	6	4x2x2"

Item	Interlocking Lead Brick	Figure	AxBxC
001-130	Reverse Corner for Base, 14.9 lb (6 kg)	10	4x4x2"
001-132	Reverse Corner for Wall, 13.2 lb (6.77 kg)	11	4x4x2"
001-135	Reverse Corner for Top, 5 lb (2.27 kg)	12	4x2x2"

Item	Interlocking Lead Brick	Figure	AxBxC
001-142	Left End Top, 5.2 lb (2.36 kg)	14	4x2x2"
001-147	Left End Base, 13.2 lb (6 kg)	16	4x4x2"
001-148	Left End, 14.9 lb (6.77 kg)	26	4x4x2"

Item	Interlocking Lead Brick	Figure	AxBxC
001-140	Right End Top, 5.2 lb (2.36 kg)	13	4x2x2"
001-145	Right End Base, 13.2 lb (6 kg)	15	4x4x2"
001-149	Right End, 14.9 lb (6.77 kg)	27	4x4x2"

LEAD BRICKS

All ends are saw cut to fit together practically eliminating open spaces between stacked bricks. Bricks of various sizes, other than the standard, will be quoted upon request.

Item #	Size	Thickness	Weight
910-000	2" W x 6" L (5.08 x 15.24 cm)	4" (10.16 cm)	19.8 lb (9 kg)
912-000	2" W x 8" L (5.08 x 20.32 cm)	4" (10.16 cm)	26.4 lb (12 kg)

LEAD SHEET

These pure, cold-rolled Lead Sheets can be formed/cut into any shape to shield areas of concern. They will conform to irregularities. Common applications include electron and superficial shielding to protect against small amounts of radiation. The sheets are 99.90% pure lead. The thickness tolerance is ±0.005" (0.0127 cm).

Electron Shielding Thickness

$$\frac{\text{Energy}}{2} = \text{Lead Thickness in Millimeters}$$

Unlimited scissors (RT-4932) will cut lead sheet thickness up to and including the 3.2mm thick lead sheet. The 6.3 mm thick lead sheet can be cut with a circular saw or jigsaw. Whenever cutting lead sheets be aware that cross contamination of lead particles may occur from the cutting tool. It is recommended to not use a cutting tool used on lead sheets to cut other non lead items.

Item #	Size	Thickness	Weight
3000-062	12" W x 24" L (30.48 x 60.96 cm)	0.063" (1.6 mm)	7.5 lb (3.4 kg)
3000-125	12" W x 24" L (30.48 x 60.96 cm)	0.125" (3.2 mm)	15 lb (6.8 kg)
3000-250	12" W x 24" L (30.48 x 60.96 cm)	0.25" (6.3 mm)	30 lb (13.6 kg)

FACE FORM FOR CONTOURING LEAD SHEETS

This solid cast iron face form can be used for contouring thicker lead sheets when needed. This face form will hold up to use of a hammer on the lead sheets.

There are four (4) rubber feet on the bottom to prevent the form from sliding.

Specifications

Size: 5.8" W x 8.8" L x 4.3" H (14.8 x 22.5 x 11.0 cm)
Weight: 28 lb (12.7 kg)

Item	Description
149-200	Face Form for Contouring Lead Sheets

SNIPS

The Bulldog Aviation snips can be used to cut lead sheets up to 1/8" thick. This bulldog snip cuts straight and can be used in either hand. It has serrated blades.

Specifications

Nominal Length: 9" (22.9 cm)
Cut Length: 7/8" (2.22 cm)
Weight: 1 lb (0.5 kg)

Item	Description
878-738	Snips, Bulldog Aviation, 9" L

These Bulldog Blade Snips can be used to cut 1/4" thick lead sheets. This bulldog snip cuts straight and wide curves and can be used in either hand.

Specifications

Nominal Length: 16" (40.64 cm)
Cut Length: 2.5" (6.35 cm)
Weight: 3.5 lb (1.6 kg)

Item	Description
878-740	Snips, Bulldog Blade, 16" L

J

LEAD FOIL

Lead Foil can be cut easily with scissors and formed into almost any shape for shielding areas, partial areas or objects of all types.

Electron Shielding Thickness

$$\frac{\text{Energy}}{2} = \text{Lead Thickness in Millimeters}$$

Item #	Size	Thickness	Weight
3000-020	12" W x 4.5' L (30.5 cm x 1.37 m)	0.020" (0.5 mm)	5.25 lb (2.4 kg)
3000-030	12" W x 4.5' L (30.5 cm x 1.37 m)	0.030" (0.76 mm)	8 lb (3.6 kg)
3000-040	12" W x 4.5" L (30.5 cm x 1.37 m)	0.040" (1.016 mm)	10.5 lb (4.8 kg)

LEAD FOIL FOR TG-51

691-175

691-176

691-177

691-190

The lead foil thickness is 1 mm ±10% and 25 cm square. The lead is sandwiched between two 0.025" PVC sheets. The lead foil is also available mounted to a tray.

Item #	Description
691-175	Lead Foil for TG-51
691-176	Lead Foil, Varian III Wedge Slot Tray
691-177	Lead Foil, Varian II or III Block Tray
691-178	Lead Foil, Varian II Wedge Slot-Coding By-Pass
691-180	Lead Foil, Siemens Screw Coding, Block Tray
691-184	Lead Foil, Siemens, Block Tray w/ By-Pass Coding
691-185	Lead Foil, Siemens, Block Tray w/Coding Plug Pocket
691-190	Lead Foil, Elekta, Acrylic, Block Tray

LEADED VINYL SHEETS

- **Uniform density throughout**
- **Acid and alkali resistant**
- **Odorless**
- **Abrasion resistant**

The Lead Vinyl Sheets are a flexible protective material available in a variety of lead equivalents for use wherever additional protection is required. It can be cut and shaped for many protective applications. It is 10% lighter in weight compared to that of lead rubber for the same lead equivalency. The sheets are sanitary and non-absorbing with smooth surfaces on both sides. The material is non-aging, therefore, it has an indefinite shelf life.

Item #	Size	Thickness	Weight	Lead Equivalence	Color
3051-902	2' W x 3' L (61 x 91.4 cm)	0.063" (1.6 mm)	1.5 lb (0.7 kg) per sq. foot	0.0196" (0.50 mm)	Gray
3051-903	2' W x 3' L (61 x 91.4 cm)	0.125" (3.2 mm)	3.0 lb (1.4 kg) per sq. foot	0.0392" (1.0 mm)	Cream

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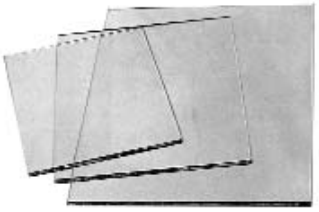
LEADED ACRYLIC - CLEAR Pb® LEAD - PLASTIC SHEET



Leaded Acrylic Clear Pb® Lead Plastic x-ray shielding can be used for viewing windows and radiation shielding.

Leaded Acrylic Clear Pb® shatter-resistant lead plastic x-ray shielding is a lead impregnated transparent plastic sheet that contains 30% lead by weight. Its physical properties are similar to those of conventional acrylic resins and routine acrylic fabrication techniques (machining and cementing) can be applied.

Leaded Acrylic Clear Pb® meets ANSI Standards, Z97.1 and US Consumer Product Safety Commission standards.

Standard sizes are:

12x12"	24x24"	32x40"	36x84"	48x84"
12x24"	24x30"	36x48"	48x48"	48x96"
18x24"	24x36"	36x60"	48x60"	72x96"
18x48"	24x48"	36x72"	48x72"	

Custom sizes must be ordered in quantities of 10 or more

Thickness	Lead Equivalency at 100 KV (Nominal)	Density (gm/cm^3)
12 mm	0.5 mm	1.6
18 mm	0.8 mm	1.6
22 mm	1.0 mm	1.6
35 mm	1.5 mm	1.6

Item	Description
3300	Leaded Acrylic- CLEAR Pb Lead-Plastic Sheet

Specify Size and Thickness When Ordering

LEAD GLASS (X-RAY PLATE GLASS)

Thickness	Lead Equivalency at 100 KV (Nominal)	Density (gm/cm^3)
1/4" (0.64 cm)	2.0 mm	4.8
1/2" (1.27 cm)	3.7 mm	4.8
3/4" (1.91 cm)	5.7 mm	4.8
3/4" (1.91 cm)	7.7 mm	6.2
1" (2.55 cm)	10 mm	6.2

Item	Description
3500	Lead Glass (X-Ray Plate Glass)

Specify Size and Thickness When Ordering

MATRIX THERMO-SHIELD™
Moldable Thermoplastic Radiation Shielding Material

MATRIX Material without Portal

MATRIX Material with Portal

MATRIX Material in 50 cc Syringe

The MATRIX patented shield is manually moldable thermoplastic material when heated in a water bath. MATRIX protects healthy tissues while allowing treatment to the exact treatment field during therapy. It may be quickly and repeatedly molded, adapted, shaped, stacked, or thinned directly on the patient at any time during therapy, thereby increasing treatment accuracy and decreasing clinical construction times.

Features:
- This material can be reshaped, readapted, thickened or thinned making it particularly adaptable for sensitive anatomy.
- Provides a time-saving factor as customized shields can be constructed in approximately 25 minutes.
- Provides a linear attenuation coefficient of approximately 34% of elemental lead.
- Eliminates fabrication of shields from plaster cast, cerrobend block or amorphous toxic leaded clay.
- Homogenous mix of hydrocarbon and bismuth particles provides uniform radiodensity.
- Material is non-toxic and biocompatible.
- Available as solid or with an “open” portal.
- Easily moldable to anatomic detail.
- Can be disinfected with glutaraldehyde spray (i.e. Cidex).
- Moldable at 108°- 132°F and becomes rigid at 102°F.
- Retains its shape and thickness for the course of treatment or can be modified if needed.

Usage:
The clinician chooses width, thickness, and either the solid or “open” portal shield, according to the determined therapy. The shield is then warmed in a water bath to 123° -128°F and molded to the healthy patient anatomy to protect it from electron or photon radiation during therapy. The shield sets at approximately 102°F and is removed from the patient. The shield is now rigid for accurate anatomic detail and can be placed repeatedly for multiple radiation sessions.

Specifications:
The only constituent used in the production of thermoplastic radiation shield is an FDA and ADA approved dental hydrocarbon impression compound for intro-oral usage and elemental bismuth-100 mesh, which is not absorbed through the skin. The thermoplastic dental compound and bismuth are blended in a volume ratio of approximately 66:33. The manufacturing process bonds the dental compound to the bismuth to produce the dense thermoplastic radiation shield.

Specifications:

Dimensions:
Slabs: 8 x 8 cm or 12 x 12 cm
Thickness: 13 or 16 mm
Portal diameter: 2.5 cm
Syringes: 50 cc
Color: Brown
Odor: Chocolate
Density: Approximately 4.2 gm/cc

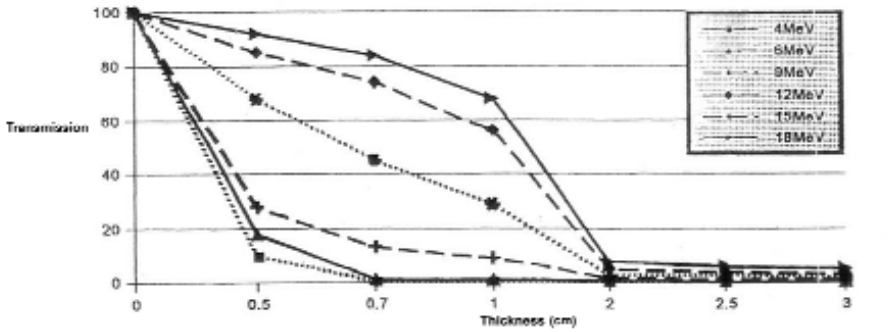
Environmental Factors:
MATRIX will maintain proper performance with normal use under the least favorable of the following conditions:
A. Ambient temperature range of 59°F to 95°F
B. Relative humidity range of 30% to 75%, including condensation
C. Atmospheric pressure range of 700 hpa to 1100 hpa

MATRIX will not be adversely affected for up to 15 weeks while packed for transport or storage or if exposed to:
A. Ambient temperature range of -40°F to 234°F
B. Relative humidity range of 10% to 100%, including condensation
C. Atmospheric pressure range of 500 hpa to 1060 hpa

Single patient use.
Not Sterilized.
Reimbursement is for a complex shield-CPT 77334.
The syringe of Hydrocarbon only (thermoplastic without bismuth; specific gravity of 1.66) can be used to fabricate a backscatter electron shield on a MATRIX shield.

Item #	Description
MX1-0813	Matrix Thermo-Shield™ 8 x 8 cm x 13 mm
MX1-0813P	Matrix Thermo-Shield™ 8 x 8 cm x 13 mm with Portal
MX1-0816	Matrix Thermo-Shield™ 8 x 8 cm x 16 mm
MX1-0816P	Matrix Thermo-Shield™ 8 x 8 cm x 16 mm with Portal
MX1-1213	Matrix Thermo-Shield™ 12 x 12 cm x 13 mm
MX1-1213P	Matrix Thermo-Shield™ 12 x 12 cm x 13 mm with Portal
MX1-1216	Matrix Thermo-Shield™ 12 x 12 cm x 16 mm
MX1-1216P	Matrix Thermo-Shield™ 12 x 12 cm x 16 mm with Portal
MX1-500	Matrix Thermo-Shield™ 50cc Syringe
MX2-500	Matrix Thermo-Shield™ Hydrocarbon ONLY 50cc Syringe
MX1-300	Matrix Thermo-Shield™ Parchment Paper

Relative Value at the depth of maximum dose in Solid Water® vs. thickness of MATRIX Thermo-shield



* This data is for reference only and should not be used for clinical purposes.

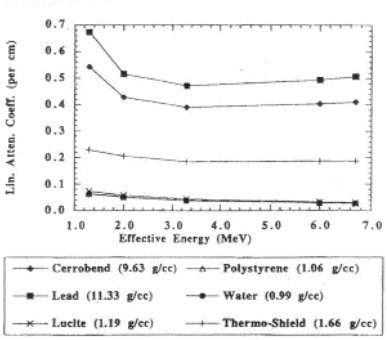
Attenuation characteristics of a new compensator material: Thermo-Shield for high energy electron and photon beams

Bhudatt R. Paliwal,[a] Stephen Rommelfanger, and Rupak K. Das
Med. Phys. 25 (4), April 1998 pp.484-487

TABLE I. Measurements of electron transmission (percentage) at depth of maximum dose through increasing thickness of Thermo-Shield. For each beam energy, the data are normalized to its corresponding value measured for 0 cm thickness.

	Electron beam energy					
Thickness (cm)	4 MeV	6 MeV	9 MeV	12 MeV	15 MeV	18 MeV
0.00	100.0	100.0	100.0	100.0	100.0	100.0
0.50	10.0	18.0	28.0	68.0	85.0	92.0
0.70	0.4	1.2	13.3	45.0	74.0	83.9
1.00	0.4	0.9	9.0	29.0	56.0	68.0
2.00	0.3	0.6	1.4	2.8	4.9	7.6
2.50	0.2	0.4	1.1	2.5	4.0	6.1
3.00	0.2	0.3	1.0	2.0	3.2	5.2

Comparison of linear attenuation coefficient of Thermo-Shield with other materials relevant to radiotherapy



The authors conclude that thermoshield is a desirable material for use in clinical radiation therapy as a compensator or shielding material for photon beams. For electrons Thermoshield acts as a good shielding material. The authors describe a new highly attenuating thermoplastic with extremely desirable physical and radiation shielding properties.

DIGITAL WATER BATH FOR MATRIX

Features:

- Hinged cover lifts to 90° stay-open position or can be removed completely.
- Units exterior remains cold to the touch to prevent accidental burns, even after extended use
- Temperature resistant plastic rim fits over seamless stainless-steel reservoir for a leak-free seal
- Stainless-steel exterior shell resists corrosion and has a tough enamel coating that cleans easily
- Rounded, seamless stainless steel reservoir resists rust and contamination.
- Hinged clear acrylic gable cover has fins to protect hands from hot vapors.

Operation:

- Temperature range from ambient to 100°C.
- Independent high-limit thermostat provides over-temperature protection.

Digital Operating System:

- The built-in proportional-integral-derivative control provides ± 0.24°C uniformity, ± 0.5°C stability, and ± 0.1° C control at 37° C.
- Digital temperature set and readout selectable display, resolution of 0.1°
- Able to be calibrated in the field.

Specifications:

Inside Dimensions: 12.9”L x 11.8”W x 6” Deep
Outside Dimensions: 16.4”L x 15.4”W x 8.9”H
Weight: Approximately 25 lbs
Capacity: 10L

CE

Item#	Description
MX3-18007	Digital Water Bath, 120V
MX3-18008	Digital Water Bath, 230V

All Block Cabinets are made of 3/4" thick plywood covered with beige plastic laminate on the outside.

BLOCK TRANSPORT CARTS

Mechanical Tray Stops Prevent Tray From Sliding Out
Dual Handles
Base Frame: Steel angle iron frame has four 5" dia. swivel w/lock, rubber covered casters for quiet movement in corridors
Shipping Weight: 150 lbs

Item #	Description	Cabinet Size	Tray Size	Holds	Spacing
880-989	Transport Cart	40 1/8" W x 52 1/2" H x 20" D	11 3/4" to 12 1/4"	28 Trays	4"
880-9891	Transport Cart	41 5/8" W x 52 1/2" H x 20" D	12 1/4" to 12 3/4"	28 Trays	4"
880-9892	Transport Cart	43 1/8" W x 52 1/2" H x 20" D	12 3/4" to 13 1/4"	28 Trays	4"

Custom Cabinets Available

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MOBILE STORAGE CABINETS

Items 880-950 to 880-952

Items 880-963 to 880-970

Base Frame: Steel angle iron frame has four 6" dia.heavy duty casters (two fixed and two swivel with locks)
Optional: Stainless steel handle is available at no extra charge
Shipping Weight: 400 lbs

Note: Please specify which side for handle and swivel caster placement

Item #	Description	Cabinet Size	Lower Storage Areas	Tray Size	Holds	Spacing
880-950	Mobile Cabinet	45 1/4" W x 58" H x 20" D	43 3/4" W x 18 1/2" H x 19 1/4" D	9 3/4" to 10 1/4"	28 Trays	4"
880-952	Mobile Cabinet	53 1/4" W x 58" H x 20" D	51 3/4" W x 18 1/2" H x 19 1/4" D	11 3/4" to 12 1/4"	28 Trays	4"

Item #	Description	Cabinet Size	Upper Storage Areas	Tray Size	Holds	Spacing
880-963	Mobile Cabinet	45 1/4" W x 73" H x 20" D	43 3/4" W x 12" H x 19 1/4" D	9 3/4" to 10 1/4"	36 Trays	5 3/8"
880-964	Mobile Cabinet	46 1/4" W x 73" H x 20" D	44 3/4" W x 12" H x 19 1/4" D	10" to 10 1/2"	36 Trays	5 3/8"
880-965	Mobile Cabinet	53 1/4" W x 73" H x 20" D	51 3/4" W x 12" H x 19 1/4" D	11 3/4" to 12 1/4"	36 Trays	5 3/8"
880-966	Mobile Cabinet	45 1/4" W x 73" H x 20" D	43 3/4" W x 12" H x 19 1/4" D	9 3/4" to 10 1/4"	44 Trays	4 3/8"
880-967	Mobile Cabinet	53 1/4" W x 73" H x 20" D	51 3/4" W x 12" H x 19 1/4" D	11 3/4" to 12 1/4"	44 Trays	4 3/8"
880-9671	Mobile Cabinet	55 1/4" W x 73" H x 20" D	53 3/4" W x 12" H x 19 1/4" D	12 1/4" to 12 3/4"	44 Trays	4 3/8"
880-9672	Mobile Cabinet	56 3/4" W x 73" H x 20" D	55 1/4" W x 12" H x 19 1/4" D	12 5/8" to 13 1/8"	44 Trays	4 3/8"
880-968	Mobile Cabinet	45 1/4" W x 73" H x 20" D	43 3/4" W x 12" H x 19 1/4" D	9 3/4" to 10 1/4"	48 Trays	4 3/64"
880-969	Mobile Cabinet	53 1/4" W x 73" H x 20" D	51 3/4" W x 12" H x 19 1/4" D	11 3/4" to 12 1/4"	48 Trays	4 3/64"
880-970	Mobile Cabinet	55 1/4" W x 73" H x 20" D	53 3/4" W x 12" H x 19 1/4" D	12 1/4" to 12 3/4"	48 Trays	4 3/64"

Custom Cabinets Available

DOUBLE-SIDED MOBILE STORAGE CABINETS

Front Side

Drawer View

Rear Side

Tray Size: 11 1/2” to 12 1/4”
Overall Size: 40 1/8” W x 73 1/2” H x 29” D
Base Frame: Steel angle iron frame has four 6” dia. heavy duty casters (two fixed and two swivel with locks)

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FRONT SIDE

Holds 30 Trays
Tray Height Spacing: 4”
Inside Depth: 14”
Large Drawer: Holds 10 - 20/25 cm cone electron blocks
Medium Drawer: Holds 10 - 10/15 cm cone electron blocks
Small Drawer: Holds 10 -6/10 cm cone electron blocks
Lower Storage: 25.5” W x 16” H x 14” D
(Holds 2 Electron Cones)

REAR SIDE

Holds 33 Trays
Tray Height Spacing: 4”
Inside Depth: 14”
Lower Storage: 38 5/8” W x 16” H x 14” D
(Holds three Electron Cones)
Optional: Stainless steel handle is available at no extra charge
Shipping Weight: 450 lbs

Note: Please specify which side for handle and swivel caster placement

Item #	Description
880-832	Double-Sided Mobile Storage Cabinet

Item 880 904 thru 880-914

Item 880 920 thru 880-928

Storage on both sides - front and back sides are the same.
Base Frame: Steel angle iron frame has four 6” dia. heavy duty casters (two fixed and two swivel w/locks
Optional: Stainless steel handle is available at no extra charge
Item 880-904 to 880-914: Have lower storage areas on both sides. Holds three electron cones
Shipping Weight: 400 lbs

Note: Please specify which side for handle and swivel caster placement

Item #	Description	Cabinet Size	Lower Storage Area	Tray Size	Holds	Spacing
880-904	Double-Sided Mobile Cabinet	34 1/8” W x 73 1/2” H x 29” D	32 5/8” W x 16” H x 14” D	9 3/4” to 10 1/4”	66 Trays	4”
880-906	Double-Sided Mobile Cabinet	34 7/8” W x 73 1/2” H x 29” D	33 3/8” W x 16” H x 14” D	10” to 10 1/2”	66 Trays	4”
880-908	Double-Sided Mobile Cabinet	40 1/8” W x 73 1/2” H x 29” D	38 5/8” W x 16” H x 14” D	11 3/4” to 12 1/4”	66 Trays	4”
880-912	Double-Sided Mobile Cabinet	34 1/8” W x 73 1/2” H x 29” D	32 5/8” W x 16” H x 14” D	9 3/4” to 10 1/4”	60 Trays	4 3/8”
880-914	Double-Sided Mobile Cabinet	40 1/8” W x 73 1/2” H x 29” D	38 5/8” W x 16” H x 14” D	11 3/4” to 12 1/4”	60 Trays	4 3/8”

Custom Cabinets Available

Item #	Description	Cabinet Size	Inside Depth	Tray Size	Holds	Spacing
880-920	Double-Sided Mobile Cabinet	34 1/8” W x 71 3/4” H x 29” D	14”	9 3/4” to 10 1/4”	84 Trays	4 9/32”
880-924	Double-Sided Mobile Cabinet	40 1/8” W x 71 3/4” H x 29” D	14”	11 3/4” to 12 1/4”	84 Trays	4 9/32”
880-926	Double-Sided Mobile Cabinet	41 5/8” W x 71 3/4” H x 29” D	14”	12 1/4” to 12 3/4”	84 Trays	4 9/32”
880-928	Double-Sided Mobile Cabinet	42 3/8” W x 71 3/4” H x 29” D	14”	12 1/2” to 13”	84 Trays	4 9/32”

Custom Cabinets Available

DOUBLE DEEP MOBILE STORAGE CABINET

Each slot holds two trays
Base Frame: Steel angle iron frame has four 6" dia. heavy duty casters (two fixed and two swivel with locks)
Optional: Stainless steel handle is available at no extra charge
Shipping Weight: 400 lbs

Note: Please specify which side for handle and swivel caster placement

Item #	Description	Cabinet Size	Lower Storage Area	Tray Size	Holds	Spacing
880-940	Double Deep Cabinet	34 1/8" W x 61 3/4" H x 28 3/4" D	32 5/8" W x 16" H x 28" D	9 3/4" to 10 1/4"	48 Trays	4"
880-942	Double Deep Cabinet	40 1/8" W x 61 3/4" H x 28 3/4" D	38 5/8" W x 16" H x 28" D	11 3/4" to 12 1/4"	48 Trays	4"

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BLOCK STORAGE CABINET

Item 880-340 thru 880-346

Item 880-440 thru 880-446

Item 880-680 thru 880-686

Tray Supports: 1" Wide Plastic
Backing: 1/4" Thick beige masonite board
Optional: Stainless steel handle is available at no extra charge

Items 880-440 thru 880-846: Top of cabinet has a 3" lip on 3 sides, providing additional storage area

Item #	Description	Cabinet Size	Inside Size	Tray Size	Holds	Spacing	Weight
880-340	Block Cabinet	23" W x 72 3/4" H x 14 1/4" D	10 3/8" W x 14" D	9 3/4" to 10 1/4"	34 Trays	4"	120 lbs.
880-342	Block Cabinet	27" W x 72 3/4" H x 14 1/4" D	12 3/8" W x 14" D	11 3/4" to 12 1/4"	34 Trays	4"	120 lbs.
880-346	Block Cabinet	28 1/2" W x 72 3/4" H x 14 1/4" D	13 1/8" W x 14" D	12 1/2" to 13"	34 Trays	4"	120 lbs.
880-440	Block Cabinet	45 1/4" W x 51" H x 14 1/4" D	10 3/8" W x 14" D	9 3/4" to 10 1/4"	44 Trays	4"	220 lbs.
880-442	Block Cabinet	53 1/4" W x 51" H x 14 1/4" D	12 3/8" W x 14" D	11 3/4" to 12 1/4"	44 Trays	4"	220 lbs.
880-446	Block Cabinet	56 1/4" W x 51" H x 14 1/4" D	13 1/8" W x 14" D	12 1/2" to 13"	44 Trays	4"	220 lbs.
880-680	Block Cabinet	45 1/4" W x 72 3/4" H x 14 1/4" D	10 3/8" W x 14" D	9 3/4" to 10 1/4"	68 Trays	4"	250 lbs.
880-682	Block Cabinet	53 1/4" W x 72 3/4" H x 14 1/4" D	12 3/8" W x 14" D	11 3/4" to 12 1/4"	68 Trays	4"	250 lbs.
880-686	Block Cabinet	56 1/4" W x 72 3/4" H x 14 1/4" D	13 1/8" W x 14" D	12 1/2" to 13"	68 Trays	4"	250 lbs.

MOBILE STORAGE CABINET WITH DOORS

Half Open View

Size: 42 1/2" W x 73" H x 20 3/4" D
Base Frame: Steel angle iron frame has four 6" dia. heavy duty casters (two fixed and two swivel with locks)
Eight Compartments: Each 20" W x 15 1/4" H x 19 1/4" D
Shelves: Center shelf is fixed, top and bottom shelves are adjustable
Shipping Weight: 405 lbs

Note: Please specify which side for swivel caster placement

Item #	Description
880-975	Mobile Storage Cabinet with Doors

ELECTRON CONE AND BLOCK STORAGE CABINET

Size: 45” W x 73 5/8” H x 20” D
Base Frame: Steel angle iron frame has four 6” dia. heavy duty casters (two fixed and two swivel with locks)
Five or six compartments for electron cones:
14” W x 17 3/4” H x 19 1/4” D
One compartment for 6 Wedges (only w/ 5 cones) Please specify wedges used
One compartment w/42 pockets for electron block inserts
Two Top Storage Compartments:
21 3/8” x 13” H x 19 1/4” D
Optional: Stainless steel handle is available at no extra charge
Shipping Weight: 510 lbs

Note: Please specify which side for handle and swivel caster placement

Item #	Description
880-9730	Storage Cabinet for Varian Type II- 5 Cones / 6 Wedges
880-9731	Storage Cabinet for Varian Type II - 6 Cones
880-9732	Storage Cabinet for Varian Type III - 5 Cone / 6 Wedges
880-9733	Storage Cabinet for Varian Type III - 6 Cones
880-9734	Storage Cabinet for Siemens - 5 Cones / 6 Wedges
880-9735	Storage Cabinet for Siemens - 6 Cones
880-9738	Storage Cabinet for Philips

Custom Cabinets Available

WEDGE BOX

The Wedge Box can be made for any manufacturer’s wedges.

Specifications

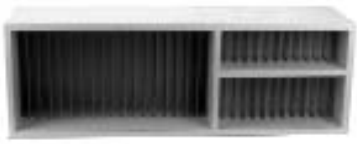
4 Rubber Feet
Material: 3/4” T plywood w/vinyl covering outside.
Color: Beige

Item #	Description
880-990	Varian Type II Wedge Box for 6 Wedges Box Size: 13 5/8” W x 17 9/16” H x 12 3/4” D
880-991	Varian Type III Standard Wedge Box for 8 Wedges Wedge Tray Size: 10 5/8” W x 1/8” T Box Size: 13 9/16” W x 22” H x 12 1/4” D
880-992	Varian Type III Lower Wedge Box for 6 Wedges Wedge Tray Size: 12 1/2” W x 14” L x 1/4” T Box Size: 15 7/16” W x 14 1/2” H x 15” D
880-996	Varian Type III Upper Wedge Box for 6 Wedges Wedge Tray Size: 10 5/8” Sq. x 1/8” T Box Size: 13 5/8” W x 17 5/8” H x 12 13/16” D
880-995	Siemens Wedge Box for 6 Wedges Box Size: 11 1/4” W x 14 1/4” H x 10 7/16” D

ELECTRON BLOCK STORAGE CABINET

Size: 43 1/4” W x 13 3/8” H x 11 3/4” D
Pocket Quantity: 42
Pocket Size: 0.9” W x 11 7/8” H x 11” D

Item #	Description
880-993	Electron Block Storage Cabinet



Size: 43 3/8” W x 14 3/4” H x 11 3/4” D
Pocket Quantity: 42
Pocket Size: 18 - 1 3/8” W x 11 7/8” H x 11” D
12 - 1 1/3” W x 7 1/16” H x 7” D
12 - 1 1/3” W x 5 1/4” H x 7” D

Item #	Description
880-997	Electron Block Storage Cabinet

ELECTRON CONE WALL SHELF

1830-25 or 1830-35

1830-26 Shown with Varian Type II Cones

1830-36 Shown with Siemens Digital Cones

This unit must be secured to the wall with six screws. Included with the unit are brackets, screws and a bottom support board.

Specifications

Material: 3/4" thick plywood covered with plastic laminate
Color: Beige

Items 1830-25 thru 1830-36
Size: 45" W x 38" H x 14 1/4" D

Item 1830-40
Size: 24 1/2" W x 41 3/4" H x 16 1/4" D

Item #	Description
1830-25	Holds 5 Varian Type II or III Electron Cones
1830-26	Holds 6 Varian Type II or III Electron Cones
1830-35	Holds 5 Siemens Mevatron Electron Cones
1830-36	Holds 6 Siemens Mevatron Electron Cones
1830-40	Holds 4 Philips Electron Cones

Custom Made For Other Manufacturers Electron Cones

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STORAGE CART FOR VARIAN BRASS COMPENSATORS

The Storage Cart for Varian brass compensators stores up to 88 compensators on Varian wedge trays from 9.75" wide to 10.75" wide (25 to 27.5 cm). The depth of the cart allows for the placement of two trays in each slot. The front of each rail has a mechanical stop that prevents the trays from sliding out.

The cart comes complete with sturdy handle, four corner bumpers, and four 5" (12.75 cm) lockable swivel casters.

Specifications

Overall Dimensions: 48.75" W x 50.4" H x 24" D
(124.25 x 128.5 x 61 cm)
Weight: 230 lb (105 kg)
Density: 1.20 gm/cm^3

Item	Description
880-9896	Storage Cart for Varian Brass Compensators

STORAGE CART FOR SIEMENS BRASS COMPENSATORS

The Storage Cart for Siemens brass compensators stores up to 88 compensators on Siemens wedge trays 8.75" (22.3 cm) wide. The depth of the cart allows for the placement of two trays in each slot. The front of each rail has a mechanical stop that prevents the trays from sliding out.

The cart comes complete with sturdy handle, four corner bumpers, two 5" (12.75 cm) lockable swivel casters, and two fixed casters.

Specifications

Overall Dimensions: 39.25" W x 50.5" H x 24" D
(100 x 129 x 61 cm)
Weight: 250 lb (114 kg)

Item	Description
880-9897	Storage Cart for Siemens Brass Compensators

STAINLESS STEEL UTILITY CART

Capacity: 650 lb (295 kg)
Size: 19 3/8" W x 32 5/8" L x 34.5" H (49.4 x 83.2 x 87.9 cm)
Material: Heavy duty stainless steel
Clearance Between Shelves: 10" (25.5 cm)
Stainless Steel Top: 18 ga.
Stainless Steel Legs: 1" x 1" x 1/8" (2.5 x 2.5 x 0.3 cm) Stainless Steel angle
Two Swivel Casters: 5" dia. (12.75 cm)
Two Fixed Casters: 8" dia. (20.4 cm)
Standard Bumper Equipment: Legs and handle
Shipping Weight: 63 lb (29 kg)

Item	Description
9722-000	Stainless Steel Utility Cart

PLASTIC UTILITY CART

Capacity: 200 lb (91 kg)
Size: 17 1/8" W x 32.5" L x 34 7/8" H (43.7 x 82.8 x 88.9 cm)
Material: Plastic
Clearance Between Shelves: 12 1/8" (31 cm)
Legs: ABS Plastic
Shelves: High Density Polyethylene
Four Swivel Casters: 4" dia. (10.2 cm)
Color: Beige
Shipping Weight: 32 lb (15 kg)

Item	Description
9722-020	Plastic Utility Cart

RIGID STEP STOOL WITH HANDRAIL

Height: 9" (23 cm)
Frame: X-design and all welded steel
Steel Top: 11.25" W x 14.5" L (28.68 x 37 cm)
Step Tread: Skid resistant black rubber mat
Legs: 1" (2.5 cm) O.D., 18 ga. steel tube and rubber tips
Leg Spread: Occupies 14.25" x 18" (36.3 x 45.9 cm) floor area
Hand Rail: 7/8" (2.23 cm) O.D., 18 ga. steel tube and bolts securely to stool, 35" (89.2 cm) height from floor
Weight Tested: Up to 350 lb (159 kg)
Finish: Bright chrome plating
Shipping Weight: 12 lb (5.5 kg)

Item	Description
9800-140	Rigid Step Stool with Hand Rail

MOBILE INSTRUMENT STAND

Adjustable: 27.5" to 48" (70 to 122 cm) positive action thumbscrew
Roll Rim Stainless Steel Tray: 12 5/8" W x 19 1/8" L x 0.75" T (32.2 x 48.75 x 1.9 cm)
Tray Ring: Round edge flat wire
Height Extension Post: 7/8" (2.23 cm) O.D. and 18 ga. steel tube
Base Post: 1" (2.5 cm) O.D. and 18 ga. steel tube
Heavy Bar Steel Base: Low sling for stability, 22" dia. x 1.75" x 5/16" (56.1 x 4.5 x 0.8 cm)
Five Swivel Casters: 2" dia. (5 cm)
Finish: Durable bright chrome plating (except S.S. tray)
Shipping Weight: 17 lb (7.75 kg)

Item	Description
9803-465	Mobile Instrument Stand

RESTRINGING OF TENNIS RACKETS AND MYLAR REPLACEMENT

The couch racket/panel should be sent to RPDinc. All panels will be returned within one to two weeks.

To determine what size racket/panel you have measure the outer frame. If the panel is under 55 cm long it will be considered a small racket/panel. Any racket/panel over 55 cm long will be considered a large racket/panel.

Some rackets may require modification before restringing can be done. This will be determined once the racket is received by RPDinc.

Tennis Racket Panels can be restrung with either nylon or kevlar 1.25 mm diameter string with tension to 65 pounds. The Kevlar string is an anti-stretch string and will retain its tautness after many uses.

Some Tennis Rackets are covered with 0.007" thick polyester (mylar) to prevent skin from protruding through the openings and give maximum support and comfort to the patient. The mylar panels are stretched extremely tight using 0.010" thick polyester (mylar) covering.

Item	Description
800-003	Restring Small Tennis Racket w/Kevlar String
800-005	Restring Large Tennis Racket w/Kevlar String
800-007	Restring Small Tennis Racket w/Kevlar String and Mylar Replacement
800-009	Restring Large Tennis Racket w/Kevlar String and Mylar Replacement

Item	Description
800-010	Small Panel Mylar Replacement
800-012	Large Panel Mylar Replacement
801-001-2	“H” Frame Racket Restrung w/Kevlar String
801-001-4	“H” Frame Racket Restrung w/Kevlar String and Mylar Replacement

Rental Tennis Rackets or Mylar Panels are Available for Some Panels. State the Size, Manufacture and Type of Couch When Renting.

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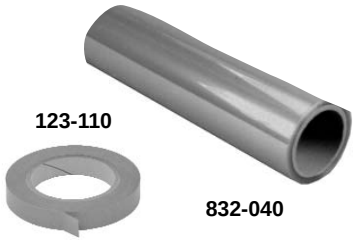
CLEAR MYLAR (POLYESTER)

801-005



123-110

832-040

Item	Description
801-005	Clear Mylar Sheet 40" W x 36" L x 0.005" T (101.6 x 91.44 x 0.0127 cm)
801-007	Clear Mylar Sheet 40" W x 36" L x 0.007" T (101.6 x 91.44 x 0.0178 cm)
801-010	Clear Mylar Sheet 40" W x 36" L x 0.010" T (101.6 x 91.44 x 0.0254 cm)
832-040	Varian Clear Mylar/PSA Couch 17" x 40' x 0.007" T (43.18 cm x 12.2 m x 0.0178 cm)
123-110	Double Coated Screen Tape 3/4" x 36 yards (1.9 cm x 0.9 m)

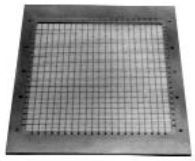
TENNIS RACKETS AND MYLAR PANELS

RPDinc manufactures a wide range of couch rackets and panels - Please call or visit our website to see the various styles we carry.

VARIAN CLINAC - MYLAR PANELS
Original Clinac Treatment Couch

Item #	Description
822-000	Varian Clinac

VARIAN CLINAC TENNIS RACKETS



Item #	Description
823-000 and 824-008	Varian Clinac

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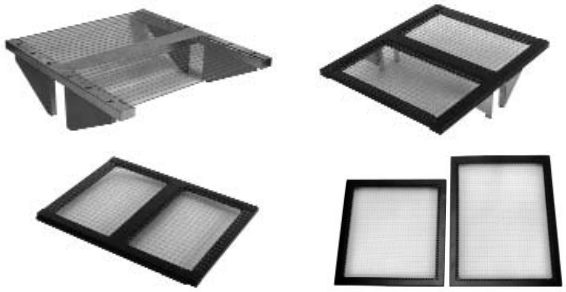
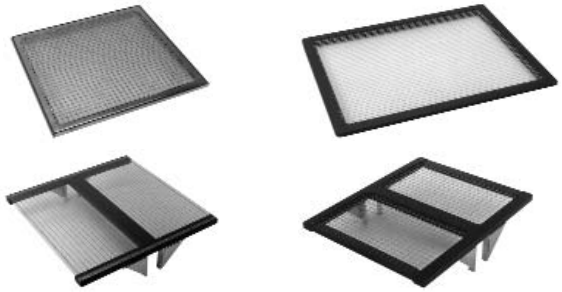
VARIAN PSA



Item #	Description
827-000 thru 831-100	Varian PSA Couch

VARIAN ETR



Item #	Description
831-100 thru 833-060	Varian ETR Couch

VARIAN XIMATRON

Item #	Description
831-000 and 834-000	Varian Ximatron

MITSUBISHI

Item #	Description
820-008 and 820-014	Mitsubishi

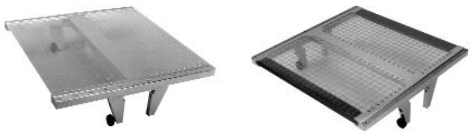
AECL THERATRON 780

Item #	Description
851-000 thru 856-000	AECL Theratron 780

TENNIS RACKETS AND MYLAR PANELS

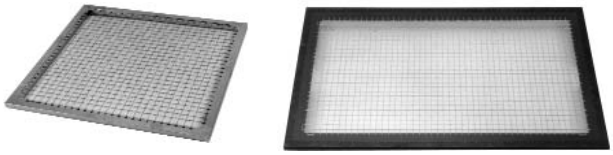
Radiation Products Design manufactures a wide range of couch rackets and panels - Please call or visit our website to see the various styles we carry.

SIEMENS Z-II AND Z-IV
Mevatron Panels



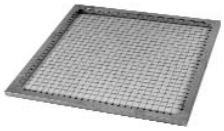
Item #	Description
805-000 thru 808-610	Siemens Z-II and Z-IV Mevatron Panels

SIEMENS Z-IV



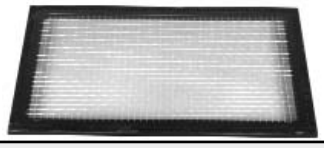
Item #	Description
808-100 thru 808-200	Siemens Z-IV

SIEMENS Z-II



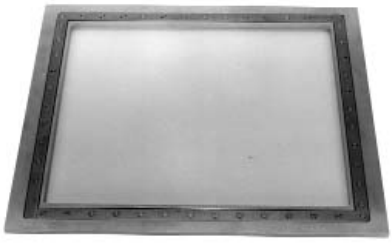
Item #	Description
807-000 thru 807-200	Siemens Z-II

SIEMENS Z-II MEVATRON



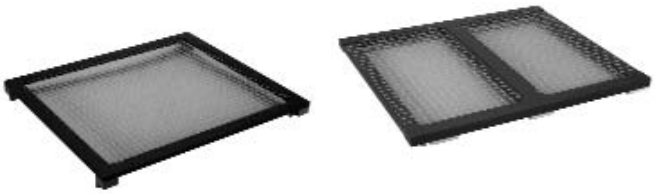
Item #	Description
804-200	Siemens Z-II Mevatron

SIEMENS Z-II MYLAR PANEL



Item #	Description
802-000	Siemens Z-II Mylar Panel

PHILIPS



Item #	Description
819-018 thru 819-110	Philips

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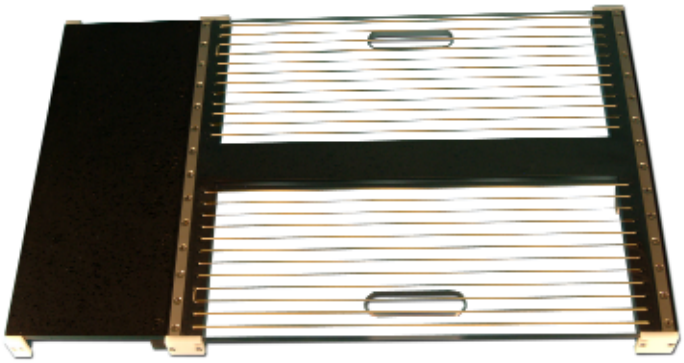
BEST THERATRONICS REMOVABLE COUCH INSERTS



The couch insert is available for either the 80 cm or 100 cm Best Theratronics Cobalt machines. The couch insert has an aluminum end plate, center and end bars. The open side areas have kevlar string with mylar covering and removable 0.5" (1.27 cm) polycarbonate support plates for each open area. The support plates are held in place by a spring plunger and are easily removable using the cutout handle.

Specifications:

Kevlar String: 0.010" (0.25 cm) Thick Mylar Covering

Item 857-400 Best Theratronics Removable Couch Insert, 100cm
Overall Size: 19.6" W x 27.5" L (49.8 x 69.85 cm)
Aluminum End Plate: 19.125" W x 6.3" L x 0.375" T (48.58 x 16 x 0.95 cm)
Aluminum Center Spine: 2.48" W x 17.7" L (6.30 x 44.96 x cm)
Open Area Size: 8.3" W x 17.7" L (21.08 x 44.96 cm)
Removable Panels: 8.8" W x 18.2" L x 0.5" T (22.35 x 46.23 x 1.27 cm), Polycarbonte Under Kevlar Strings
Finish: Black Anodized Aluminum and Black Textured Polyurethane Paint

Item 857-480 Best Theratronics Removable Couch Insert, 80cm
Overall Size: 17.1" W x 27.5" L (43.4 x 69.85 cm)
Aluminum End Plate: 16.625" W x 6.3" L x 0.375 T (42.23 x 16 x 0.95 cm)
Aluminum Center Spine: 2.48" W x 17.7" L (6.3 x 44.96 cm)
Open Area Size: 7.1" W x 17.7" L (18.03 x 44.96 cm)
Removable Panels: 7.6" W x 18.2" L x 0.5" T (19.3 x 46.23 x 1.27 cm), Polycarbonte Under Kevlar strings
Finish: Black Anodized Aluminum and Black Textured Polyurethane Paint

Item	Description
857-400	Best Theratronics Removable Couch Insert, 100cm
857-480	Best Theratronics Removable Couch Insert, 80cm

TANGENTIAL BREAST CONE, BEST THERATRONICS THERATRON

598-001

599-000

The Tangential Breast Cone for the Best Theratronics Theratron machines is a device designed to eliminate penumbra and beam divergence for the breast tangential portals. The device consists of a support plate and lead block for shielding of the contralateral side. An extension plate projects from the source head to the treatment distance. The extension plate is set to be off-center of the radiation source by one-half the diameter of the radiation souce. This allows the entire radiation source to be utilized for treatment. Lateral adjustable lead trimming bars are provided to block the sides of the tangential fields, to insure that no overlapping with the supraclavicular field occurs. The end of the breast cone has an acrylic plate of 9.5mm thickness to provide equilibrium when treating the breast wall with Cobalt 60. The acrylic plate is removable for treatments without bolus.

The Back Pointer (Item 599-000) is a versatile device for accurately determining the exit points of the radiation beam when setting up a patient using the tangential breast cone. It is a light weight rigid device made of a Polycarbonate (lexan) material.

Specifications

Finishes: Tan textured polyurethane, Nickle plate, Clear anodized
Weight (without trimmers): 27.5 lb (12.5 kg)

Item	Description
598-001	Tangential Breast Cone, Theratronics Theratron-80cm
598-002	Tangential Breast Cone, Theratronics Theratron-100cm
599-000	Back Pointer for Tangential Breast Cone

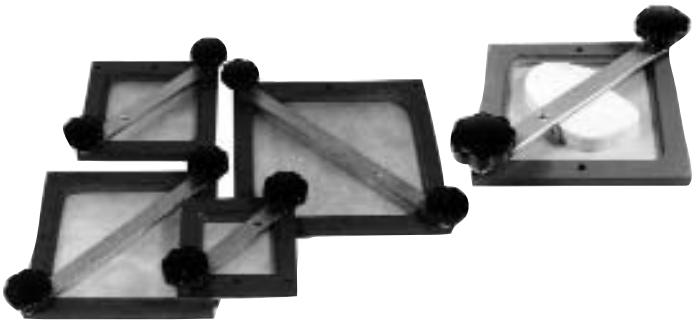
SIEMENS CAM LOCKS FOR SECURING ALLOY MOLDS TO ELECTRON CONES

Siemens Cam Locks are used to secure the alloy shield to the electron cone. Cam Locks can also be used to secure the acrylic drawing plates to the electron cone.

Item 894-420 would require sending your electron cone to RPD to have the Cam Locks mounted. **Item 894-422** is the Cam Locks ONLY and customer would have to mount on the electron cone.

Item #	Description
894-420	Mounted Cam Locks (Set of 2)
894-422	Unmounted Cam Locks (Set of 2)

ELECTRON BLOCK MOLDS FOR SIEMENS ELECTRON CONES



The molds are made of an aluminum base and crossbar and the frames are 3/4" PVC - 2 knobs are included. When an order is placed, the customer will be sent a specification form to be completed and returned to RPD prior to manufacturing of molds.

Item #	Description	Size
894-430	Siemens Electron Block Mold	5 cm Dia.
894-432	Siemens Electron Block Mold	10 cm sq.
894-434	Siemens Electron Block Mold	15 cm sq.
894-436	Siemens Electron Block Mold	20 cm sq.
894-438	Siemens Electron Block Mold	25 cm sq.

ELECTRON BLOCK MOLD FOR SIEMENS PRIMUS

Made For 1/2" Thick Brass Electron Cones

Item #	Description	Size
894-530	Siemens Primus Electron Block Mold	5 cm Dia.
894-531	Siemens Primus Electron Block Mold	10 cm sq.
894-532	Siemens Primus Electron Block Mold	15 cm sq.
894-533	Siemens Primus Electron Block Mold	20 cm sq.
894-534	Siemens Primus Electron Block Mold	25 cm sq.

ELECTRON BLOCK MOLD FOR SIEMENS MEVATRON (95 cm)

Made For 1" Thick Aluminum Electron Cones

Item #	Description	Size
894-630	Siemens Mevatron Electron Block Mold	5 cm Dia.
894-631	Siemens Mevatron Electron Block Mold	10 cm sq.
894-632	Siemens Mevatron Electron Block Mold	15 cm sq.
894-634	Siemens Mevatron Electron Block Mold	20 cm sq.
894-635	Siemens Mevatron Electron Block Mold	25 cm sq.

SIEMENS ACRYLIC DRAWING PLATES

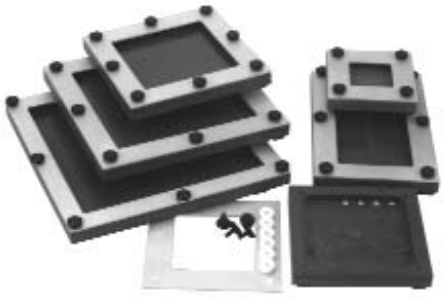
For Electron Cone Treatment Fields

Item #	Description	Size
894-500	Siemens Acrylic Drawing Plate Set Set Includes: 5, 10, 15, 20, and 25 cm sq. Plates	
894-506	Siemens Acrylic Drawing Plate	5 cm dia.
894-510	Siemens Acrylic Drawing Plate	10 cm sq.
894-515	Siemens Acrylic Drawing Plate	15 cm sq.
894-520	Siemens Acrylic Drawing Plate	20 cm sq.
894-525	Siemens Acrylic Drawing Plate	25 cm sq.

Item #	Description	Size
894-540	Siemens Primus Acrylic Drawing Plate Set Set Includes: 5, 10, 15, 20,and 25 cm sq. Plates	
894-535	Siemens Primus Acrylic Drawing Plate	5 cm dia.
894-536	Siemens Primus Acrylic Drawing Plate	10 cm sq.
894-537	Siemens Primus Acrylic Drawing Plate	15 cm sq.
894-538	Siemens Primus Acrylic Drawing Plate	20 cm sq.
894-539	Siemens Primus Acrylic Drawing Plate	25 cm sq.

Item #	Description	Size
894-600	Siemens Mevatron Acrylic Drawing Plate Set Set Includes: 5, 10, 15, 20, and 25 cm sq. Plates	
894-605	Siemens Mevatron Acrylic Drawing Plate	5 cm dia.
894-610	Siemens Mevatron Acrylic Drawing Plate	10 cm sq.
894-615	Siemens Mevatron Acrylic Drawing Plate	15 cm sq.
894-620	Siemens Mevatron Acrylic Drawing Plate	20 cm sq.
894-625	Siemens Mevatron Acrylic Drawing Plate	25 cm sq.

ELEKTA ELECTRON BLOCK MOLDS



The Elekta Electron Block Molds are made of a 3/4" (1.9 cm) PVC base, aluminum rails and knobs. Four adjustable coding pins are used to set code in low melting alloy.

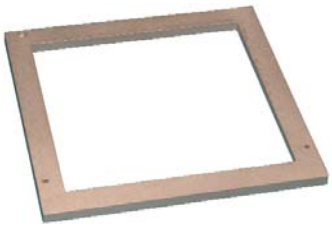
Item #	Description	Cone Size
896-160	Elekta Electron Block Mold	6 cm
896-161	Elekta Electron Block Mold	10 cm
896-162	Elekta Electron Block Mold	14 cm
896-163	Elekta Electron Block Mold	20 cm
896-164	Elekta Electron Block Mold	25 cm
896-165	Elekta Electron Block Molding Set	

ELEKTA ACRYLIC DRAWING PLATES

9 mm Thick

Item #	Elekta Acrylic Drawing Plate	Cone Size
896-140	Acrylic Drawing Plate Set, w/CA Scribe for Cone Sizes: 6, 10, 14, 20 and 25 cm	
896-141	Acrylic Drawing Plate w/CA Scribe	6 cm
896-142	Acrylic Drawing Plate w/CA Scribe	10 cm
896-143	Acrylic Drawing Plate w/CA Scribe	14 cm
896-144	Acrylic Drawing Plate w/CA Scribe	20 cm
896-145	Acrylic Drawing Plate w/CA Scribe	25 cm
896-146	Acrylic Drawing Plate w/CA Scribe	10 x 20 cm
896-147	Acrylic Drawing Plate w/CA Scribe	6 x 10 cm

ELEKTA ELECTRON CONE INSERT

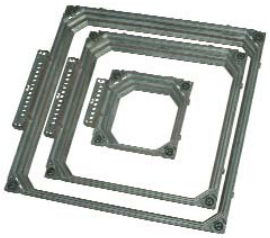


This electron cone insert collimates the field to 20 cm at 100 cm.

Item #	Description
896-170	Elekta 20 cm Electron Cone Insert

VARIAN III, INSERT FRAME FOR ELECTRON CONE BLOCK

Refurbished

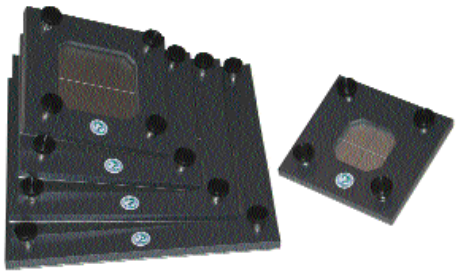


The insert frame sits in the Electron Cone and the electron Block sits in the frame. Electron block is held in place by means of the corner tabs.

Item #	Varian III, Insert Frame for Electron Block
896-040-01	6 x 6 cm
896-040-05	20 x 20 cm

For Varian with MLC

VARIAN TYPE II ELECTRON BLOCK MOLDING SYSTEM



Item #	Description	Size
896-300	Varian II Electron Block Molding System Set Includes: 6, 10, 15, 20, and 25 cm sq. Plates	
896-306	Varian II Electron Block Mold	6 cm sq.(75.3 mm O.D.)
896-310	Varian II Electron Block Mold	10 cm sq.(113.0 mm O.D.)
896-315	Varian II Electron Block Mold	15 cm sq. (160.4 mm O.D.)
896-320	Varian II Electron Block Mold	20 cm sq.(207.7 mm O.D.)
896-325	Varian II Electron Block Mold	25 cm sq.(255.1 mm O.D)

For Varian with No MLC

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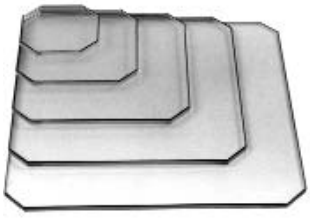
VARIAN TYPE II ACRYLIC DRAWING PLATES

No Notches for Block Frame



Item #	Description	Size
896-000	Varian II Acrylic Drawing Plate Set Set Includes: 6, 10, 15, 20, and 25 cm sq. Plates	
896-006	Varian II Acrylic Drawing Plate	6 cm sq.
896-008	Varian II Acrylic Drawing Plate	6 cm x 10 cm
896-010	Varian II Acrylic Drawing Plate	10 cm sq.
896-015	Varian II Acrylic Drawing Plate	15 cm sq.
896-020	Varian II Acrylic Drawing Plate	20 cm sq.
896-025	Varian II Acrylic Drawing Plate	25 cm sq.

For Varian with No MLC

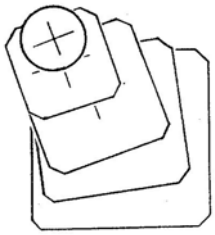
VARIAN TYPE III ACRYLIC DRAWING PLATES

2 Notches to Fit Block Frame

Item #	Description	Size
896-030	Varian III Acrylic Drawing Plate Set Set Includes: 6, 10, 15, 20, and 25 cm sq. Plates	
896-031	Varian III Acrylic Drawing Plate	6 cm sq.
896-032	Varian III Acrylic Drawing Plate	6 cm x 10 cm
896-033	Varian III Acrylic Drawing Plate	10 cm sq.
896-034	Varian III Acrylic Drawing Plate	15 cm sq.
896-035	Varian III Acrylic Drawing Plate	20 cm sq.
896-036	Varian III Acrylic Drawing Plate	25 cm sq.
896-040	Die Cast Frames for Alloy Pouring	

For Varian with MLC

MYLAR TEMPLATES FOR VARIAN ELCTRON CONES



The CAX is clearly marked on the clear mylar film.

Item	Description	Size
457-411	Mylar Templates for Varian Electron Cone	6 cm sq.
457-412	Mylar Templates for Varian Electron Cone	10 cm sq.
457-413	Mylar Templates for Varian Electron Cone	15 cm sq.
457-414	Mylar Templates for Varian Electron Cone	20 cm sq.
457-415	Mylar Templates for Varian Electron Cone	25 cm sq.

SIMULATOR ELECTRON CONE SETS

697-200 95 cm Siemens Cones

697-710 Two Piece Oldelft Simulator Cones

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The simulator electron cone set is used to simulate electron fields in the simulator. The cones are manufactured for all simulators to all accelerator electron cones. The set can include the following: 5 cm diameter, 6 cm x 10 cm , 5 cm, 6 cm, 10 cm, 14 cm, 15 cm, 20 cm, and 25 cm square. The set usually consists of 5 cones that will vary per manufacturer.

Item #	Description
697-100	Varian 1800 or 2100C Type II Cone Set
697-200	Siemens 95 cm Cone Set
697-210	Siemens KD-2 Digital Electron Cone Set
697-500	Mitsubishi Cone Set

Information needed from customer when placing order:

- Accelerator manufacturer and type
- Electron cone distance
- Simulator manufacturer and type
- Simulator target to bottom of tray slot
- Contact person and phone number

Item #	Description
697-000	AECL Simulator to Varian Cone Set
697-115	Varian Simulator (Type III Mount) to Siemens Cone Set
697-130	Varian Ximatron Sim. to Varian Type III (65.4 cm) Cone Set
697-300	Toshiba Simulator to Philips SL20 Cone Set
697-710	Oldelft Simulator to Varian Type III Cone Set
697-711	Oldelft Simulator to Varian Type II Cone Set

VARIAN TYPE III SIMULATOR CONE SET

Varian Simulator Cones use acrylic trays (Items 896-030 thru 896-036) that snap lock in place. Pull the lever back for easy removal. The Varian Type III Simulator Cone Set includes the following cones: 6 cm sq. ,10 cm sq.,15 cm sq., 20, cm sq. and 25 cm sq.

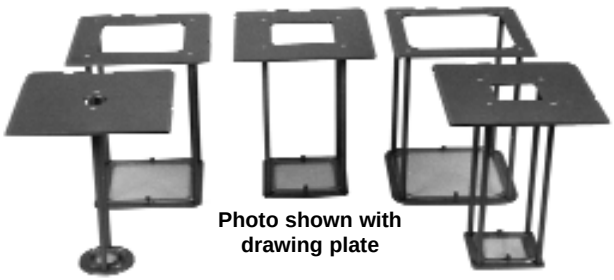


Photo shown with drawing plate

Information needed from customer when placing order:

- Simulator manufacturer and type
- Simulator target to bottom of tray slot
- Contact person and phone number

Item #	Description
697-105	Simulator Cone Set w/out Drawing Plates
697-107	Simulator Electron Cone (6 x 10)
896-030	Drawing Plates - Set of 5

ELECTRON MINI-CONES
AND ADAPTER PLATE FOR 14CM OR 15CM ELECTRON CONE

Picture shown with Adapter Plate and Electron Mini-Cone (sold separately).

895-402

895-41900

The Electon Cone Adapter Plates allow a 14 or 15cm electron cone to hold the Electron Mini-Cones, Items 895-41900 to 895-47045. The adapter plates are 1.88 cm thick steel with a nickle chrome plate finish. A 4" diameter opening in each adapter plate and three (3) spring plungers hold the brass ring base of each Electron Mini-Cone. If side or front pressure is presented, the spring plungers allow the Electron Mini-Cone to flip out.

The Electron Mini-Cones are made of 1/8" clear acrylic tubing and affixed to a 3/8" thick x 4" diameter nickel chrome brass ring base. The Electron Mini-Cones are available in diameters of 1.9 cm, 3.2 cm, 4.5 cm, 5.7 cm and 7.0 cm and can have angles of 0°, 15°, 30° and 45°on the bottom of the Electron Mini-Cone.

Isodose curves are available upon request.

Specifications

Energy Range: 6 MeV to 12 MeV, Transmission at 12 MeV is less than 5% outside of cone
Steel Density: 7.83 g/cm^3
Brass Density: 8.515 g/cm^3
Acrylic Density: 1.18 g/cm^3

Adapter Plate
Size: 5.5" x 5.5" or 5.9" x 5.9" (14x14 cm or 15x15 cm)
Opening: 4" Diameter (10.2 cm)
Material: 0.74" Thick Steel (1.88 cm)
Finish: Nickel Chrome Plated
Sterilization: Autoclave or Gas - Sterrad NX-100

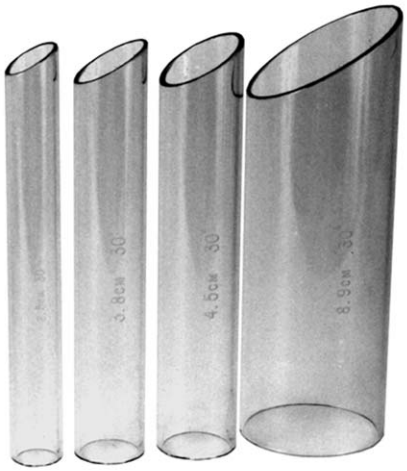
Electron Mini-Cone (Items 895-41915 to 895-47090)
Base: 3/8" Thick x 4" Diameter Brass Ring (0.96 x 10.2 cm)
Material: 1/8" (0.32 cm) Clear Acrylic
Sterilization: Gas - Sterrad NX-100

Item #	Electron Cone Adapter Plate
895-400	Varian Type III (with MLC) 15 cm
895-401	Varian Type II (no MLC) 15 cm
895-402	Elekta 14 cm

Item #	Electron Mini-Cone Inside Dimension
895-419_ _*	1.9 cm
895-432_ _*	3.2 cm
895-445_ _*	4.5 cm
895-457_ _*	5.7 cm
895-470_ _*	7.0 cm

***Specify Angle (0°, 15°, 30° or 45°)**

DUMMY MINI-CONES



The Dummy Mini-Cones are used to select the cone diameter and angle needed for treatment.

The Dummy Mini-Cones are made of 3.1 mm thick clear acrylic and are approximately 12 cm long. One end of the cone is flat and the other end is angled to 0°, 15°, 30° or 45°.

It is best not to use the Treatment Electron Mini-Cones in clinical setting because they could be dropped.

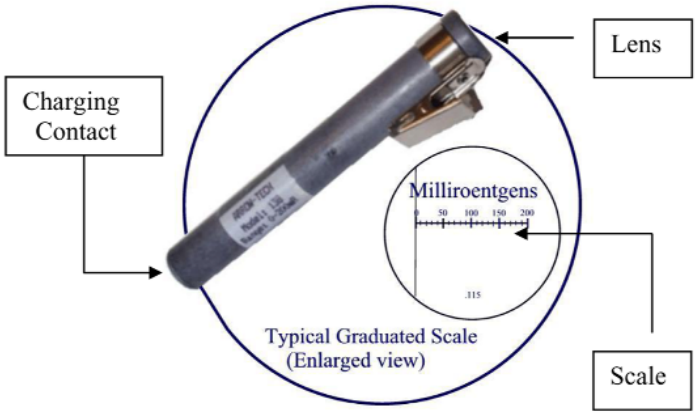
Specifications

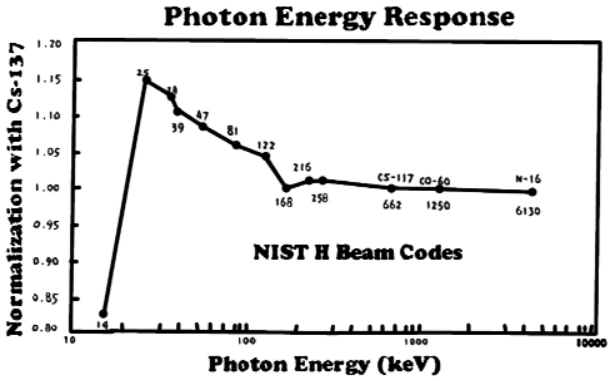
Sterilization: Gas, Sterrad NX-100
Material: 1/8" Clear Acrylic

Item #	Dummy Mini-Cone Inside Dimension
895-519_ _*	1.9 cm
895-532_ _*	3.2 cm
895-545_ _*	4.5 cm
895-557_ _*	5.7 cm
895-570_ _*	7.0 cm

***Specify Angle (0°, 15°, 30° or 45°)**

DIRECT READING DOSIMETER





The Direct Reading Dosimeter is a pocket-size, carbon fiber electroscope with an ion chamber for detecting and indication of integrated exposure to gamma and x-ray radiation. It has a thin wall which permits the penetration and detection of radiation. A yearly calibration of the Direct Reading Dosimeter is recommended, and is generally consistent with good health physics practices. More frequent calibration may be necessary should the user's license require a shorter calibration interval.

The way to read a dosimeter is to point it at a light source so that you can look through it and see the scale. The conductive fiber moves across a very clear, well-marked scale that produces the reading. Because the dosimeter scale is linear, it is possible to determine the total amount of radiation exposure for any selected period of time by merely subtracting the reading taken at the end of the selected period. It is not necessary to recharge the dosimeter after each reading unless the instrument reads close to full scale.

These dosimeters use an extremely sensitive fiber electrometer type voltmeter and a small volume of air to measure the total amount of radiation to which the instrument has been exposed. A reading may be made at any time by looking at the light source through the eyepiece end of the instrument.

Dosimeters are extremely sensitive instruments. Although they are constructed for rugged use and have a protective sapphire window, they should receive the same care as a wristwatch. Since dosimeters are hermetically sealed at the factory, they cannot be repaired or adjusted in the field. Therefore, if the instrument malfunctions in any way it should be returned to the dealer. Dosimeters may be maintained in operating condition simply by cleaning the eye piece lens and the charging switch insulator with water and a lint-free cloth that is free of grit.

Do not use any alcohol-based products to clean the dosimeter. Make sure the charging switch insulator is free of lint and moisture at all times.

Caution: Do not insert any sharp objects into the charging switch recess or tamper with its parts in any way.

Specifications

Radiation Detected: Gamma and X-ray from 16 keV to 2 MeV
Ranges: 0-200 mR to 0-500 R
Detector: Fiber electrometer mounted in an electrically conductive plastic ion chamber
Detector Housing: Very low permeability plastics - hermetically sealed
Accuracy: Within ± 10% of true exposure
Rate Response: Dose rate independent for gamma and X-ray
Electrical Leakage: Less than 1% of full scale for 24 hours at 50°C
Temperature Range: -20°C to + 50°C
Relative Humidity: Up to 90%
Dimensions: 0.6" Dia. x 4.5" (1.5 x 12.4 cm)
Weight: 1.0 oz (28.4 g)
Finish: Barrel and end caps are natural matte black with metal clips
Shelf Life: 20 years
Warranty: 2 year limited warranty
Specifications: ANSI N13.5 and ANSI N322-1997

Item	Description	Range
343-490	Direct Reading Dosimeter	0 - 200 mR
343-495	Direct Reading Dosimeter	0 - 2 mSv
343-500	Direct Reading Dosimeter	0 - 500 mR
343-505	Direct Reading Dosimeter	0 - 5 mSv
343-750	Battery Powered Dosimeter Charger	

909B DOSIMETER CHARGER

- **Capable of charging any direct-reading dosimeter**
- **Conforms to ANSI N42.6-1980**
- **Operates on two 1.5 V "AA" batteries**
- **Has the ability to "kick" or remove all residual charge from dosimeters properly, preventing spurious upscale fiber movement**
- **LED Reading light to allow for easy charging/viewing**
- **Residual static charge removed for improved accuracy**

Easier charging, viewing, dosimeter protection and improved accuracy are the biggest reasons the battery operated 909B Dosimeter Charger is the best value on the market today.

The charger's LED reading light reduces re-zeroing time and effort by eliminating the need to remove the dosimeter from the charger forreading. Simply view the scale while the dosimeter is resting lightly on the charger contact after re-zeroing. Reading in the same orientation as charging also minimizes the effect that gravitational induced fiber movement has on dosimeter accuracy and precision. The 909B Dosimeter Charger charging contact is spring-loaded and has a positive mechanical stop. This design feature makes it virtually impossible to damage dosimeters through excessive charging force.

The patented "kick" feature found on the 909B Dosimeter Charger automatically removes residual static charge from the dosimeter's charging pin every time the dosimeter is re-zeroed. This eliminates a major source of erroneous fiber movement (up to 5% full scale).

Specifications

Weight: 10.6 oz (302 g)
Size: 4" L x 4" W x 3.5" H (10.2 x 10.2 x 8.9 cm)
Case: ABS Plastic
Controls: One turn potentiometer
Reading: Spring-loaded push rod
Power: 1.5V "AA" Batteries
Charging Voltage: 40 V to 220 V
Operating Temperature: 0° to 120°F (-18° to 49°C)
Lamp: LED

Item #	Description
343-750	909B Dosimeter Charger

PDM-122 ELECTRONIC POCKET DOSIMETER

- **Light and compact to fit in a pocket**
- **Wide measurement range from 1µSv to 10 Sv**
- **Accumulated dose and dose rate measuring**
- **Data holding function**
- **Simple operation of only one button**

A highly sensitive, compact dosimeter to measure Gamma and X-rays. This direct-reading dosimeter displays an accumulated dose as well as dose rate and is suitable for measuring above 100kVp of X-ray tube voltage.

Item 343-122 PDM-122 Electronic Pocket Dosimeter Includes Main unit, Battery, Strap, Instruction manual, Calibration and Inspection certificate.

Specifications

Radiation Detected: Gamma and X-ray
Energy Threshold: 40 KeV
Detector: Silicon Semiconductor

Measurement Range:
Dose: 0.1 mrem - 1000 rem (1µSv to 10 Sv)
Dose Rate: 0.1 mrem/h - 100 rem/h (1µSv/h to 1Sv/h)
Accuracy: Within ± 10% 1 mrem - 1000 rem (10µSv to 10 Sv; Calibrated by Cs-137 using slab phantom
Linearity: Within ± 20% 1 mrem/h - 100 rem/h (10 µSv/h to 1Sv/h)
Energy Dependence: Within ± 30% from 50 keV - 1.5 MeV
Display: 4 digit LCD with unit and battery indications
Switch: Power on/off (including reset operation) and dose rate display
Immunity: 150V/m: 0.15MHz - 200MHz; 100v/M: 200MHz - 1000MHz (IEC61326-1:2006)
Power: One CRC2450 Lithium Battery (conforming to IEC60086-2)
Battery Life: Approx. 700 hrs of continuous use (at room temp 20°C)
Envirnomental Requirements: -10° to +50° C: relative humidity up to 90% non-condensing
Dimensions: 30 W x 11 D x 108 H mm excluding clip
Weight: 40 g

Please Note: Nonconforming battery may cause a malfunction of the instrument

Item #	Description
343-122	PDM-122 Electronic Pocket Dosimeter

N

PDM-127 ELECTRONIC POCKET DOSIMETER

- **Light and compact to fit in a pock**
- **Wide measurement range from 1µSv to 10 Sv**
- **Accumulated dose and dose rate measuring**
- **Data holding function**
- **Simple operation of only one button**

A highly sensitive, compact dosimeter for measurement of gamma X-ray. With an energy threshold that goes down to 20 keV, it is best suited for applications in X-Ray. The PDM-127 displays both accumulated dose and dose rate.

Item 343-127 PDM-127 Electronic Pocket Dosimeter Includes Main unit, Battery, Strap, Instruction manual, Calibration and Inspection certificate.

Specifications

Radiation Detected: Gamma and X-ray
Energy Threshold: 20 KeV
Detector: Silicon semiconductor

Measurement Range:
Dose: 0.1 mrem - 100 rem (1µSv to 1Sv)
Dose Rate: 0.1 mrem/h - 10 rem/h (1µSv/h to 100mSv/h)
Accuracy: Within ± 10% 1 mrem - 100 rem (10 µSv to 1Sv; Calibrated by Am-241 using a slab phantom
Linearity: Within ± 20% 1 mrem/h - 10 rem/h (10 µSv/h to 100 mSv/h)
Energy Dependence: Within ± 30% from 30 keV - 200 keV
Display: 4 digit LCD with unit and battery indications
Switch: Power on/off (including reset operation) and dose rate display
Immunity: 150V/m: 0.15MHz - 200MHz; 100v/M: 200MHz - 1000MHz (IEC61326-1:2006)
Power: One CRC2450 Lithium Battery (conforming to IEC60086-2)
Battery Life: Approx. 350 hrs of continuous use (at room temp 20°C)
Envirnomental Requirements: -10° to +50°C: relative humidity up to 90% non-condensing
Dimensions: 30 W x 11 D x 108 H mm excluding clip
Weight: 40 g

Please Note: Nonconforming battery may cause a malfunction of the instrument

Item #	Description
343-127	PDM-127 Electronic Pocket Dosimeter

DMC 2000S - ELECTRONIC PERSONAL DOSIMETER

Gamma

- **Features display of dose, dose rate and programmable alarms**
- **The DMC 2000S is user friendly, lightweight and waterproof**
- **Can be used as a Stand-alone device or integrated into a dosimetry system**
- **Audible and visual alarms**
- **Large internal histogram memory**
- **Self-testing diagnostics (battery, detector and parameters)**
- **Hands-free communication, pass-by exchangean incident**

The DMC 2000 Series Electronic Dosimeters are small, lightweight, cost effective personnel radiation monitoring devices. They are designed to be worn on the body and keep a live record of both dose and dose rate. The DMC 2000 Series Electronic Dosimeters are simple to use and have a top mounted LCD display.

The DMC 2000S - Personal Electronic Dosimeter - Gamma

The DMC 2000S features flat energy response to X-rays and gamma field from 50keV to 6Mev and linear response to dose rate fields from natural background up to more than 10 Sv/h. The pass-by data exchange feature gives unequal operational flexibility. In-motion reading allows dose management by sub-zone as well as real-time location tracking of personnel.

Specifications

Display Units: mrem, mSv or ìSv
Measurement Range:
Dose: 0.1 mrem to 1000 rem (1ìSv to 10 Sv)
Dose Rate: 0.01 mrem/h to 1000 rem/h (0.1 ìSv/h to 10 Sv/h)
Display Rate: 01 mSv/h to 10 Sv/h or 0.001 mSv/h to 10 Sv/h (extended option)
Linearity: < ± 20% up to 100 rem/h (1 Sv/h); < ± 30% up to 1000 rem/h (10 Sv/h)
X and Gamma Energy Range: 50keV to 6MeV
Accuracy: <± 10% (137Cs, ~ 25 mSv/h including ± 5% extended uncertainty K=2)
Environmental:
Temperature: 14°F to 122°F (-10°C to 50°C)
Humidity: < 90% at 108°F (42°C)
Storage: -22°F to 160°F(-30°C to 71°C)
Shock, Vibration, and Drop Resistant
Waterproof IP67
Power: Standard calculator battery LiMnO2 CR2450, one year battery life (typical, 8 hrs/day in run mode)
Dimensions: 3.4" L x 1.9" W x 1.1" T (8.7 x 4.8 x 2.8 cm)
Weight: < 1.9 oz (56 g) with battery
Worn by a Replacable Clip

EMC: complies and exceeds standards by a large margin
Compliant to IEC 1283, ANSI 4220A
PTB approved version, compliant with IEC1526 ed2
Factory calibration approved under ISO/CEI 17025

Item #	Description
343-2000	DMC 2000S Electronic Personal Dosimeter

DMC 2000X - ELECTRONIC PERSONAL DOSIMETERS

Low-Energy X-Ray and Gamma

- **X-ray and Gamma detection dosimeter**
- **Featuring dose rate and programmable alarms**
- **User friendly, lightweight and waterresistant.**
- **Can be used in autonomous mode or integrated into a dosimetry system**
- **Audible and visual alarms**
- **Detection active self-test**
- **High autonomy**
- **Integrated history**
- **Hand free communiation, pass-by data exchange**
- **Compact, rugged, economical**

The DMC 2000X is perfect for radiation monitoring in a medical environment (radiology, nuclear medicine). It features excellent response to Gamma and low energy XRay radiation. The best applications for the DMC 2000X is for personnel in Nuclear Medicine, Radiology and Lab Personnel.

For operational dosimetry in medical environment (radiology, nuclear medicine,...), the DMC-2000X has become the reference due to the quality of its response to X and Gamma radiations associated with its real immunity to electromagnetic fields. The DMC-2000X is also the best choice for industrial operators working with ionizing sources, and in certain cases for the nuclear industry or civil defense.

Specifications

Display units: mrem, mSvor ìSv
Measurement Range
Dose: 0.1 mrem to 10 rem (1 ìSv to 10 Sv)
Dose Rate: 0.01 mrem/h to 1000 rem/h (0.1 ìSv/h to 10Sv/h)
Display Rate: 0.01 mSv/h to 10 Sv/h or 0.001 mSv/h to 10 Sv/h (extended option)
Linearity: < ± 20% up to 100 rem/h (1Sv/h); < ± 30% up to 1000 rem/h (10Sv/h)
X and Gamma Energy Range: 20 keV to 6 MeV
Accuracy: < ± 10% (Cs-137, 30 mrSv/h, including ± 5%) of extended uncertainty K=2)
Environmental
Temperature: 14°F to 122°F (-10°C to 50°C)
Humidity: < 90% at 108°F (42°C)
Storage: -22°F to 160°F(-30°C to 71°C)
Shock, Vibration, and Drop Resistant
Water Resistant IP 42
Power: LiMnO2 CR2450 battery: battery life > 9 months (8 hrs/day in run mode)
Dimensions: 3.4" L x 1.9" W x 1.1" T (8.7 x 4.8 x 2.8 cm)
Weight: < 2 oz (59 g) with battery
Worn by a Replacable Clip

EMC: complies and exceeds CE standards by a large margin
Compliant to IEC 1283, ANSI 4220A
PTB approved

Item #	Description
343-2005	DMC 2000X Electronic Personal Dosimeter

DMC 2000XB - ELECTRONIC PERSONAL DOSIMETER

- **X and gamma: 20 keV to 6 MeV**
- **ß: E_{mean}> 60 keV**
- **Can be used in autonomous mode (stand alone device) or integrated into a dosimetry system**
- **Tracking by RCA or sub-zone**
- **Audible and visual alarms**
- **Self-testing (battery, detector and parameters)**
- **Remote dosimetry can be used as an area monitor**
- **Backwards compatible with previous MGPI equipment**
- **Internal memory "Histogram"**
- **Uses standard calculator battery with one year (2000 hrs) life**

The DMC 2000XB simultaneously measures, stores and displays both deep dose equivalent Hp(10) and shallow dose equivalent Hp(0.07). If features a flat response over all practical X-rays and gamma rays range and a unique beta range, down to the theoretical limit of penetration, including Co60 beta, major threat in plants. The units top mounted LCD clearly displays dose or dose rate for shallow or deep dose equivalent.

Applications
- Operational dosimetry for commercial, research, civil and defense personnel working w/ionizing radiation source.
- Operational dosimetry of medical personnel during X-rays monitoring and isotopic preparations
- The Histogram enables events to be reconstructed in detail, allowing the circumstances surrounding incident situations to be analyzed
- In motion reading allows dose management by sub-zone, as well as real-time location tracking of personnel, all without placing any restrictions on the dosimeter wearer

Specifications

Measurement Range
Dose: 0.1 mrem to 1000 rem(1 µSv to 10Sv)
Rate: 0.01 mrem/h to 1000 rem/h (0.1 µSv/h to 10Sv/h)
Linearity: < ± 10% up to 100 rem/h (1Sv/h)
< ± 25% up to 1000 mrem/h (10Sv/h) for X and gamma > 60 keV
Energy Response: X and Gamma from 20 keV to 6 MeV
Accuracy: < ± 5% (Cs 137, 20 mrem/h; 0.2 mSv/h)

Environmental
Temperature: 14°F to 122°F (-10°C to 50°C)
Humidity: < 90% at 108°F (42°C)
Storage: -22°F to 160°F (-30°C to 71°C)
Shock, Vibration, and Drop Resistant
Waterproof

Dimensions: 3.3" L x 1.9" W x 0.7" T (8.3 x 4.8 x 1.7 cm)
Weight: < 2.5 oz with battery
Worn by detachable clip

Item #	Description
343-2010	Personal Electronic Dosimeter - DMC 2000XB

N

DOSIMETER READER - LDM 220

The LDM 220 Dosimeter Reader is a wireless interface reader for the DMC 2000 family of electronic dosimeters. The LDM 220 Reader operates using a software package installed on your computer and communicates with the dosimeters in a pass-by data exchange mode.

Specifications:

Length: 70 mm
Width: 80 mm
Thickness: 32 mm
Weight: 120 g
Electrical Characteristics:
Self-powered through USB port
EMC: Complies with and exceeds CE standards
Operating Temperature: 0 C to +50 C
Storage Temperature: -10 C to +60 C
Humidity: 90% RH (without condensation)
Nominal Range: Between 20 cm and 30 cm
Reduced Range Setting: Between 5 cm and 20 cm

CE

Features

- No directional alignment required
- Indicator lamps for operation and access control
- Manageable digital inputs/outputs
- DSP based digital process
- Compatible with DMC 2000S, DMC 2000X, DMC 2000XB
- Compatible with DosiMass, DosiMed, and DosiFast operating software

Item #	Description
343-2020	Dosimeter Reader - LDM 220

RAD-60 PERSONAL ELECTRONIC DOSIMETER

- Gamma and X-Ray Detected from 60 keV to 6 Mev
- Individual Personal Alarming Dosimeter
- Digital Display for Integrated Dose or Alternatively Dose Rate
- User Selectable Alarm Levels for both Dose and Dose Rate

With a push of a button you can:
- Turn the unit on/off
- Change the digital display to read dose or dose rate
- Select from several Dose and Dose Rate Alarm levels
- Turn the Chirp function on/off
- Reset Integrated Dose
- Perform a Battery Test

The RAD-60 Personal Electronic Dosimeter is a precise and reliable instrument for ensuring the personal safety of the user. Ideally, the RAD-60 is used in everyday radiation monitoring, in stand-alone conditions. If your needs grow for a more sophisticated system, the versatile RAD-60 can also be integrated into an Access Control System. The RAD-60 can be switched into System Mode, for the purpose of tracking Personnel Dose records and generating compliance reports. The design includes state-of-the-art technology with built in memory for retrieving dose, even during power-down. It eliminates outside interference from shock and RF. The RAD-60 is easily programmed by the user, has a digital display, and operates with a single AAA alkaline battery.

This small, lightweight unit can accompany the user anywhere recording the accumulated dose constantly and reliably all the time. The pre-settable alarms alert the user when exposure limits are being exceeded.

The most important working parameters are stored in non-volatile EEPROM memory securing vital information even in power down situations. The RAD-60 is battery-operated and utilizes a single standard AAA size alkaline cell. The smooth and ergonomic design of RAD-60 casing is splash-proof and easy to decontaminate.

Specifications

Radiation Detected: Gamma and X-Ray
Detector Type: Energy-Compensated Si-Diode
Measurement Range
Dose: 1 microSv - 9.99 Sv or 0.1 mrem-999 rem
Dose Rate: 5 microSv/h - 3 Sv/h or 0.5 mrem/h - 300 rem/h
Calibrations: Better than ±5 % (Cs137, 662 keV at 2 mSc/h), Hp(10)
Energy Response: Hp(10), 60 keV - 3 Mev, better than ±25%, up to 6 MeV, better than ±35%
Dose Rate Linearity: Better than ±15%, up to 3 Sv/h (300 rem/h)
Audible Alarms: Seven separate alarms, sound level typically better than 85 dBa at 30 cm
Integrated dose
Dose rate
Dose overflow
Dose rate overflow at 3 Sv/h or 300 rem/h
Low battery 1 and 2
Defect
Alarm Thresholds: Six preset values each for integrated dose and dose rate, manually selectable.
Power Supply: One triple-A alkaline cell, life typically 1800 hrs in background field (dose mode)
Reader Communication: By infrared through bottom part; by using ADR-1 Reader Head in combination with RASDOS PC Software
Push-Button functions: Front panel push-button has the following selectable functions
Change display priority (dose/dose rate)
Switch ON/OFF
Chirp ON/OFF
Reset Integrated Dose
Change Alarm Thresholds
Activate Battery Test
Temperature Range: -20 to +50°C operational, humidity up to 90% RH, noncondensed; -20 to + 70°C storing
Dimensions: 3.06" x 2.63" x 0.86" (78 x 67 x 22 mm)
Weight: 2.82 oz (80 g) including battery

Note: The active alarm thresholds and configurations of push button functions can be changed by using ADR-1 Reader in combination with RADOS PC software.

Item #	Description
343-600	RAD-60 Personal Electronic Dosimeter

ADR-1 / 60 READER FOR RAD-60 DOSIMETERS

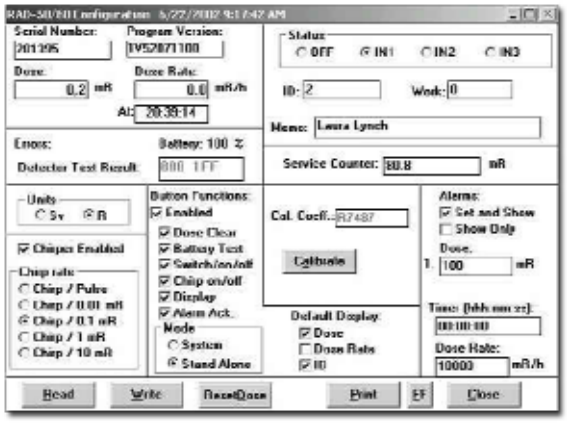
With the ADR-1/60 Reader for RAD-60 Dosimeters the user can:

- Change Dosimeter Settings
- Perform Calibration
- Assign Dosimeters
- Assign a User ID and Name

ADR-1/60 Reader for RAD-60 Dosimeters Includes:

- ADR-1 Reader
- Configuration Software
- Manual

The Reader connects to any PC via 9 Pin Serial port.



The configuration window is presented in the figure above. The window displays the configuration information of the dosimeter. You can change the configuration to meet the users equirements by choosing the options you want to include in the dosimeter.

Item #	Description
343-605	ADR-1/60 Reader for RAD-60 Dosimeters

PRIMALERT™ DIGITAL AREA MONITORS

- **LED digital display**
- **Low and high alarm indicators**
- **Programmable alarm indicators**
- **Optional remote**
- **Detector fail indicator**
- **Battery backup**
- **Data output / RS-232**
- **Two configurations available with internal energy compensated GM detectors**
- **CE tested. Meets applicable standards**

Features

- Simple installation and setup
- Anti-jam circuitry prevents erroneous readings at tube saturation
- Calibration controls easily accessed through front panel

The Primalert Digital Area Monitors are completely self-contained units with energy compensated GM detectors, AC powered with internal battery backup and have both low and high setting alarms. An optional remote alarm is available for added security.

The Primalert Digital Area Monitors can be used wherever there is a need to detect and warn personnel of increasing radiation levels and to control the exposure of personnel to gamma radiation.

Specifications

Internal GM Detector Range:
Item 337-443: 0.1 mR/hr to 1 R/hr
Item 337-444: 1 mR/hr to 4 R/hr
Display: 4 digit LED display with 0.8 in (2 cm) character height
Display Range: 000.0 to 9999
Display Units: Can be made to display in µR/hr, mR/hr, R/h, µSv/h, mSv/h, Sv/h, cpm, cps and others
Linearity: Reading within ± 10% of true value with detector connected
Response: Typically 3 seconds from 10% to 90% of final reading
Status: (green light) Indicates the instrument is functioning properly
Low Alarm: Indicated by a yellow light and slow beep (1 per sec) audible tone (can be set at any point from 0.0 to 9999)
High Alarm: Indicated by a red light and fast beep (4 per sec) audible tone (can be set at any point from 0.0 to 9999)
Note: Audible indicators can be configured as a single beep if desired.
Detector Fail: (red light and audible tone: > 68 dB at 2 ft) Indicates detector overload, no count from detector, or instrument failure
Low Battery: (yellow) Indicates < 2 hours of battery power remaining
Calibration Controls: Accessible from front of instrument (protective cover provided)
High Voltage: Adjustable from 200 to 2500 V
Threshold: Adjustable from 2 to 100 mV
Dead Time: Adjustable to compensate for dead time of the detector and electronics (can be read on the display)
Overload: Senses detector saturation (indicated by display reading "OL")
Overrange: Indicates the radiation field being measured has exceeded the counting range of the instrument (indicated by display reading "- - - ")
Data Output: 9 pin connector providing 5 decade log output, RS-232 output, signal ground connection, FAIL and Alarm signals (current sink), and direct connection to battery and ground
Power Requirements: 95 to 135 VAC, 50 to 60 Hz single phase (<100 mA), 6V sealed lead acid rechargeable battery (built-in)
Battery Life: Typically 48 hours in non-alarm condition, 12 hours in alarm condition
Battery Charger: Battery is continuously trickle charged when instrument is connected to line power and turned on
Construction: Aluminum housing with white polyurethane enamel paint
Temperature Range: -4° to 122° F (-20° to 50° C). May be certified for operation from -40° to 150° F (-40 to 65° C)
Size: 9.7" W x 2.5" D x 7.4" H
Weight: 6.5 lb

Optional Remote Display
Status: (green light) Indicates the instrument is functioning properly
High Alarm: (red LED) Indicates the radiation level exceeds the high alarm point
Detector Fail: (red LED) Indicates detector overload, no count from detector, or instrument failure
Audio: Unimorph type with ON/OFF switch (> 68 dB at 2 ft)
Power Requirements: Provided by PRIMALERT (20 ft cable included)
Construction: Aluminum housing with ivory polyurethane enamel paint
Temperature Range: -4° to 122° F (-20° to 50° C)
Size: 6" W x 2" D x 7" H
Weight: 1.5 lb

CE

Item #	Description
337-443	Primalert™ Dig. Area Monitor (0.1 mR/hr to 1R/hr GM Detector)
337-444	Primalert™ Dig. Area Monitor (1 mR/hr to 4 R/hr GM Detector)
337-446	Optional Remote Display

RADIATION AREA MONITOR SYSTEM, MODEL 375/2

337-100

337-106

- **Affordable Area Monitor**
- **1µSv/h-10 mS/h (0.1 mR/hr-1 R/hr)**
- **Integrated Design**
- **Built-in Rechargable Backup Battery Backup**
- **Networkable**
- **Audio & Visual Alarms and Indicators**
- **Audible Alarm may be disabled**
- **4-Digit LED display**
- **Alarm level may be preset in 0.1 mR/h increments**

The Model 375/2 Digital Wall-Mount Area Monitor is designed for visibility and ease of use. This monitor incorporates an internally housed energy compensated GM detector with a dual range digital display from 1µSv/h-10 mS/h (0.1 mR/hr-1 R/hr). The monitor features audible and visual alarms, low alarm and high alarm indicators, alarm setpoint adjustability over the entire range, and self diagnostic functions such as low battery, overrange, detector saturation and detector failure conditions. It features a wall-mount chassis and a four-digit LED display that is readable from 30' (9 m) away. It is designed to operate continuously from an AC power line. In the event of power failure, the built-in, continuously trickle charged sealed lead acid battery automatically switches in to begin supplying power immediately; assuring interruption-free operation at all times. The backlit indicators warn of low radiation (yellow), high radiation (red), instrument failure (red), and low battery (yellow), along with an alarm. A green status light is a positive indication of instrument operation.

A flashing red light with 180° visibility and a red LED indicator next to the digital display provide the visual alarm. The audible alarm (which may be disabled with a switch) consists of a single short beep at the beginning of the alarm mode. Optional features include SI units and 220 V operation.

Parameters are protected under a calibration cover. Calibration is easily accomplished by moving the cal dipswitch to the right, and using the pushbuttons to increment or decrement the calibration constant, dead time correction, and alarm point parameters. Parameters are stored in non-volatile memory (retained even with power disconnected). A five-decade logarithmic analog output is provided. A battery backup provides 48 hours of additional use after the primary power is removed

With the addition of the optional Remote Alarm, Item 337-105 or 337-106, the Model 375/2 can be used to provide continuous monitoring of (normal) background radiation in radioactive material preparation and work areas (ie. Nuclear Medicine Hot Labs). The system can also be used for monitoring of Teletherapy (Cobalt) Treatment rooms, notifying personnel that the source is exposed and in-use.

Remote Alarm (Item 337-105 or 337-106)
The optional Remote Alarm unit duplicates the alarm indication functions of the main unit at a remote location up to 1000 feet. It features a green status light, a red light for high alarm, and Sonalert for audible alarm with a disable switch. The remote unit is powered by the monitor and available with either a 20 ft or 50 ft cable.

Specifications:

Item 337-100 Radiation Therapy Area Monitor, Model 375/2
Indicated Use: General purpose area monitor
Detection Range: 0.1 mR/hr to 999.9 mR/h
Detector: Internally mounted energy compensated GM
Display: Four- digit LED, 0.8" H (2 cm) digits
Alarm: May be preset in 0.1 mR/h (1 µSv) increments
Visual: Red light
Audio: Sonalert, single beep, may be disabled
Data Output: Nine-pin connector providing five-decade logarithmic output, RS-232 output, signal ground connection, FAIL, and ALARM signals (current sink), and direct connection to battery and ground
Calibration Controls: Accessible from front of instrument (protective cover provided)
Power: 95-135 Vac, 50-60 Hz single phase
Battery: Built-in 6-volt rechargeable battery
Battery Life: Typically 48 hours in non-alarm condition; 12 hours in alarm condition
Battery Charger: Battery is continuously trickle charged when instrument is connected to line power and turned on
Construction: Wall mount aluminum housing with ivory powder coat paint
Size: 7.4" H x 9.7" W x 2.5" D (18.7 x 24.6 x 6.4 cm)
Weight: 6.5 lb (2.9 kg)

Remote Alarm (Item 337-106)
Indicated Use: Remote display/annunciator for the Model 375 Digital Area Monitors
Audio: Sonalert-type speaker with enable/disable switch (greater than 68 dB at 0.61 m [2 ft])
Radiation Readout Display: None
Status Indicators:
Status OK: Green LED
High Alarm: Red LED
Det Fail: Red LED
Controls: Audio: ON/OFF
Power Supplied By: Model 375/2 instrument
Construction: Aluminum with powder coat finish
Temperature Range: -4 to 122°F (-20 to 50°C), may be certified to operate from -40 to 150°F (-40 to 65°C)
Size: 7" H x 6" W x 2"D (17.8 x 15.1 x 5.1 cm)
Weight: 1.5 lb (0.7 kg)

Item #	Description
337-100	Radiation Therapy Area Monitor - GM Tube
337-105	Remote Alarm Unit with 20' (6.1 m) Cable
337-106	Remote Alarm Unit with 50' (15.24 m) Cable

RADIATION AREA MONITOR SYSTEM, MODEL 7008RT

337-110 and 337-112

- **Built-in rechargeable back-up battery**
- **Radiation rate indicated on an 8-digit LCD display**
- **Alarm level may be preset in 0.1 mR/h increments**
- **Visual and audible alarm indication**
- **Audible alarm may be disabled**

Item 337-110
Radiation Area Monitor - Internal Solid State Detector
The Radiation Area Monitor, Model 7008RT is a wall-mounted radiation monitor designed to meet the specifc needs of radiation therapy. It is designed to operate continuously from an AC power line. In the event of power failure, the built-in, continuously trickle charged NiMH battery automatically switches in to begin supplying power immediately, assuring interruption-free operation at all times. The monitor features a digital display of radiation rate, audible and visual alarms, and alarm indicator, alarm setpoint adjustability over the entire range, and self diagnostic functions such as low battery, overrange, detector saturation and detector failure conditions. A green status light is a positive indication of normal instrument operation.

A flashing red light with 180° visibility and a red LED indicator below the digital display provide the visual alarm. The audible alarm (which may be disabled with a switch) consists of a single short beep at the beginning of the alarm mode. Optional features include SI units.

Item 337-111 and 337-112 Remote Alarm
The optional Remote Alarm unit duplicates the alarm indication functions of the main unit It features a green status light, a red light for high alarm, and Sonalert for audible alarm with a disable switch. Item 337-111 is supplied with a 100' (30.5 m) cable and Item 337-112 is supplied with a 50' (15.25 m) cable. An optional 100' (30.5 m) cable is available if additional cable length is needed.

Specifications

Item 337-110 Radiation Area Monitor - Internal Solid State Detector
Detector: Internal solid state detector
Display: 8 digit, 12 mm high (0.5 in) LCD
Range: 0.1 to 999.9 mR/h (1 to 9999 µSv optional)
Alarm: May be preset in 0.1 mR/h (1 µSv) increments
Visual: Red light
Audio: Sonalert, single beep, may be disabled
Battery: Built-in rechargeable NiMH battery supplies 48 hours of non-alarm use under line power failure conditions. Low battery yellow LED on front panel
Power: 95 – 230 VAC, 50/60 Hz
Dimensions: 7.6" x 4.5" x 2.7" (19.4 x 11.5 x 6.8 cm)
Weight: 1.5 lb (0.7 kg)

Item 337-111 and 337-112 Remote Alarm
Alarm: Red lamp indicates, Sonalert provides audio for alarm and failure, toggle switch disables audio
Status OK: Green light indicates correct monitor operation
Power: 95 – 230 VAC, 50/60 Hz, 12 VDC from main unit
Cable: 50' (15.25 m) or 100' (30.5 m) length cable
Dimensions: 7.6" x 4.5" x 2.7" (19.4 x 11.5 x 6.8 cm)
Weight: 1.0 lb (0.5 kg)

Item #	Description
337-110	Radiation Area Monitor, Model 7008 RT
337-111	Remote Alarm Unit with 100' (30.5 m) Cable
337-112	Remote Alarm Unit with 50' (15.25 m) Cable
337-113	100' (30.5 m) Cable for 337-111 or 337-112

PRIMALERT™ 35 AREA RADIATION MONITOR

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- **Calibrated**
- **Monitor for Radioactive Material**
- **Compact**
- **Lightweight**
- **Optional PRIMALARM™ Remote Alarm**

The PRIMALERT™ 35 assures reliable, continuous monitoring wherever radioactive materials are present. It displays the radiation level in bright color-coded lights, and it emits audible and/or visible signals whenever the gamma radiation exceeds a user-preset alarm level.

Six range indicators (1, 2, 4, 8, 16 and 32 mR/hr) clearly display an increase or decrease in radiation levels. The alarm can be set at any of the six levels by a front-panel, screwdriver-adjustable control. The light for each level goes on when the radiation intensity reaches that level and goes out when the rate drops below the level. This permits instant radiation-level recognition not readily distinguishable on meter-type instruments.

When the preset level is exceeded, personnel are alerted by bright flashing red lights (visible over a 180° field) and a loud intermittent audio signal. Thealarms stop automatically when the radiation level falls below the preset value. A front-panel switch permits the selection of both the visible and audible alarms or just the visible alarm.

Fail-safe operation is assured by a light which continuously indicates background radiation and provides visual proof that the unit is functioning. The monitor will not jam or show false readings in high radiation fields.

The PRIMALERT™ 35 contains an energy-compensated GM detector, and features a convenient automatic alarm reset.

An optional PRIMALARM™ Remote Alarm (Item 337-138) provides the same audible and visible signals as the PRIMALERT™ 35, up to 100 feet from the monitor. The PRIMALARM™ allows personnel located away from the radiation area to be alerted the instant the preset radiation limits have been exceeded.

Item 337-137 Includes

- PRIMALERT™ 35 Monitor
- Self-Stick Wall-Mounting Bracket
- AC Adapter/Power Converter
- Informational CD
- Calibration Report

Additional Items Sold Separately

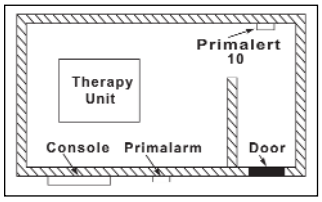
- PRIMALARM™ Remote Alarm (Item 337-138)
- Emergency Power Line Operated PRIMAPAK™ II Battery Back-up (Item 337-140)
- Check Source (Item 337-141)

Specifications

Power: Line operated with UL listed converter: 100-240 VAC, 50-60 Hz to 12VDC, 0.5 Amp
Size: 3.5" W x 6" H x 1.5" T (9 x 15 x 4 cm)
Weight: 2 lb (1 kg)
CE

Item #	Description
337-137	PRIMALERT™ 35 Area Radiation Monitor with AC Adapter

PRIMALERT™ 10 RADIATION MONITOR



- **Calibrated**
- **Monitor for Treatment Room**
- **Flashing Light Indicates Source is Exposed**
- **Optional Line Operated Emergency Battery Back-Up**

The NRC requires that every teletherapy room have a permanently-mounted, continuous, radiation monitoring device with an emergency back-up battery power source. The PRIMALERT™ 10 with a PRIMAPAK™ II Battery Back-Up (Item 337-140), meets this requirement.

The PRIMALERT™ 10 is a compact monitor that responds to scatter radiation and can be mounted anywhere in the teletherapy room. A pair of bright red lamps on the instrument face flash a warning when the source is exposed and continues to flash until safe conditions are re-established.

The PRIMALERT™ 10 is a compact monitor that responds to scatter radiation and can be mounted anywhere in the teletherapy room. A pair of bright red lamps on the instrument face flash a warning when the source is exposed and continues to flash until safe conditions are re-established.

The flashing green “Operation Indicator” light continuously monitors the background radiation and provides visible indication that the instrument is functioning.

The range of the PRIMALERT™ 10 may be modified from 2.5/20 mR/h which is the standard for the range switch LOW and HIGH positions. The customer can make the modification to provide any of the following two range positions: 2.5, 5 ,10, 20 or 40 mR/h.

An optional PRIMALARM™ Remote Alarm (Item 337-138) provides the same audible and visible signals as the PRIMALERT™ 10, up to 100 feet from the monitor. The PRIMALARM™ allows personnel located away from the radiation area to be alerted the instant the preset radiation limits have been exceeded.

Item 337-139 Includes

- PRIMALERT™ 10 Monitor
- Self-Stick Wall-Mounting Bracket
- AC Adapter/Power Converter
- Informational CD
- Calibration Report

Additional Items Sold Separately

- PRIMALARM™ Remote Alarm (Item 337-138)
- Emergency Power Line Operated PRIMAPAK™ II Battery Back-up (Item 337-140)
- Check Source (Item 337-141)

Specifications

Detector: Energy compensated GM tube
Accuracy: ±20% from 60 KeV to 2 MeV
Alarm Trip Level: Switch-selectable at 2.5 or 20 mR/hr
Alarm: Two flashing red lamps with 180° field of view, alarm ceases when radiation falls below trip level
Power: Line-operated with UL listed converter: 100-240 VAC, 50-60 Hz to 12 VDC, 0.5 Amp
Size: 3.5" W x 6" H x 1.5" T (9 x 15 x 4 cm)
Net Weight: 2 lb (1 kg)
CE

Item #	Description
337-139	PRIMALERT™ 10 Radiation Monitor with AC Adapter

PRIMALARM™ REMOTE ALARM

Mounts up to 100' (30.5 m) away from either PRIMALERT™ 35 or PRIMALERT™ 10

The PRIMALARM™ also serves as an additional safeguard because it will flash if power to the PRIMALERT™ Monitors (Item 337-137 or Item 337-139) is lost or if the cable from the latter is disconnected. The PRIMALARM™ Remote Alarm is ideal for mounting outside the therapy room entrance.

Item 337-138 Includes

- PRIMALARM™
- Self-Stick Wall-Mounting Bracket
- AC Adapter/Power Converter
- 100' (30.5 M) Cable
- Informational CD

Additional Items Sold Separately

- PRIMALERT™ 35 Area Radiation Monitor (Item 337-137)
- PRIMALERT™ 10 Radiation Monitor (Item 337-139)
- Emergency Power Line Operated PRIMAPAK™ II Battery Back-up (Item 337-140)

Specifications

Alarm Trip Level: Controlled by PRIMALERT™ Monitor
Alarms: Two flashing red lamps with a 180° field of view. The aural alarm is switch-selectable.
Power: Line operated with UL listed converter: 100-240 VAC, 50-60 Hz to 12VDC, 0.5 Amp. Can also be powered by Item 337-140 PRIMAPAK™ II.
Dimensions: 3.5" W x 6" H x 1.5" T (9 x 15 x 4 cm)
Weight: 1 lb (0.5 kg)

CE

Item #	Description
337-138	PRIMALARM™ Remote Alarm with AC Adapter

PRIMAPAK™ II BATTERY BACK-UP

PRIMAPAK™ II consists of rechargeable gel cells and circuitry that switches any PRIMALERT™ Monitor to battery operation if line power is lost. When AC is present, the battery is automatically recharged. Fully charged cells provide about eight hours of operation under alarm conditions or more than 32 hours of quiescent, no-alarm operation.

This unit works with the following instruments

Item 337-137 PRIMALERT™ 35 Radiation Monitor
Item 337-138 PRIMALARM™ Remote Alarm
Item 337-139 PRIMALERT™ 10 Radiation Monitor.

Item 337-140 Includes

- PRIMAPAK™ II
- Specify AC Adapter/Power Converter
  - USA/Japan: 110 VAC 12 VDC 500 mA
  - Europe: 230 VAC 12 VDC 500 mA
  - UK: 230 VAC 12 VDC 580 mA
  - Australia: 230 VAC 12 VDC 580 mA
- Interconnect Cable
- Informational CD

Specifications

Power: Line operated with UL listed converter: 100-240 VAC, 50-60 Hz to 12VDC, 1 Amp
Size: 4.5" W x 6" H x 2.75" T (11.5 x 15.25 x 7 cm)
Weight: 4.5 lb (2 kg)

CE

Item #	Description
337-140	PRIMAPAK™ II Battery Back-Up with AC Adapter

Specify AC Adapter/Power Converter

RAD ALERT 200 AREA MONITOR

- **Displays Integrated Time, Dose Rate, Integrated Dose**
- **Dual Independent Trigger Levels**
- **Linear Range 1-30,000 mR/hr**
- **Audible Buzzer with Adjustable Volume**
- **NiMH AA Battery Backup with Trickle Charge**

Item 337-210 RAD ALERT 200 Area Monitor Includes

- RAD ALERT 200 Area Monitor
- Remote Alarm and Battery Backup
- 100' (30 m) Cable
- 12 VDC Universal Power Supply

RAD ALERT 200 is the next generation area monitor that includes a built in GM Gamma detector for monitoring rooms where radio nuclides may be present or where devices producing radiation may be located. This unit includes separate panels to display exposure rate (mR/hr), total integrated exposure (mR) and total exposure time on a remote alarm that is tethered to the primary alarm. The primary alarm includes a digital timer that counts time when radiation is present and a room door is open. This feature can be useful for routing patient safety QA or as a stopwatch in the event of an emergency. The monitor has a backup powered by either rechargable NiMH or alkaline AA batteries. The rechargable batteries are maintained on a trickle charge. The detector unit has an adjustable trigger level with the level displayed on a digital display. The slave unit contains an audible buzzer with an adjustable volume control that can be turned on or off with a switch mounted on the side of the unit. A separate dose trigger is also included that can be set by the user. When the dose exceeds this level a separate yellow light turns on.

Specifications

RAD ALERT 200
Indicated Use: Radiation area monitoring
Internal Detector: Dual Halogen quenched GM detector. Basic sensitivity 100 cpm/mR/hr (Cs-137) Internal Operating Voltage 550 VDC
Internal GM Detector Range: 0.5 mR/hr to 30,000 mR/hr (utilizes 2 separate GM Tubes) Internal Detector
Display: 4 digit LCD display with 0.4" (1 cm) character height; Emergency counter 8 digit LED display with 0.8" (2 cm) character height
Display Range: 000.0 to 200
Display Units: mR/hr
Range: 0-1,000,000 sec, 1-30,000 mR/hr
Resolution: 1 sec
Linearity: Reading within ±10% of true value with detector connected
Sensitivity: Adjustable 1-100 mR/hr. User can adjust sensitivity via a small hole in the side of the unit. Trip level can be monitored by a digital display on the front of the unit.
Response: Typically 1 second from onset of radiation
Calibration Controls: Accessible from potentiometer on side of unit
Status: Green light indicates the instrument is functioning properly and power is on
Alarm: Indicated by a flashing red light and audible buzzer
Dead Time: <10% at max exposure rate
Data Output: Current sink and direct connection to battery and ground
Operating Voltage: 12VDC, 450mA
Power Requirements: 12 VDC universal adaptor may be plugged into either main detector unit or remote alarm
Battery: Indicated by red LED, 8 AA NiMH on trickle charge in remote station
Battery Backup: 8 AA (NiMH or Alkaline) batteries
Battery Charger: Battery is continuously trickle charged when instrument is connected to line power
Battery Life: 7-9 hours
Construction: ABS Plastic Enclosure
Temperature Range: 0° to 130°F (- 18° to 54°C)
Size: 4.4" W x 2.4" D x 8.5" H (11.2 x 6.1 x 21.6 cm)
Cable Length: 50-100'
Wall Mounting: #6 screw, 4/unit
Weight: 6.5 lb (2.3 kg)

Remote Station
Indicated Use: Remote display for RAD ALERT 100 and 200
Status: Green light indicates the instrument is functioning properly and power is on
Alarm: Flashing LED indicates the radiation level exceeds the alarm point; flashing yellow LED indicates exposure rate has exceeded the high alarm level.
Detector Fail: Indicated by red LED
Audio: Piezo Buzzer type with ON/OFF switch and adjustable volume
Power Requirements: 12 VDC universal adaptor
Construction: ABS Plastic Enclosure
Temperature Range: 0° to 130°F (- 18° to 54°C).
Size: 9.5" W x 2.5" D x 6" H (22.9 x 6.4 x 15.2 cm)
Weight: 1.5 lb (0.7 kg)

Item	Description
337-210	RAD ALERT 200 Area Monitor

RAD ALERT 50 AREA MONITOR

- **Adjustable Trigger Level**
- **Remote Alarm with Buzzer**
- **Battery Backup AAA NiMH**
- **100' (30 m) Connection Cable**

Item 337-200 RAD ALERT 50 Area Monitor Includes

- RAD ALERT 50 Room Monitor with Remote
- Alarm and Battery Backup
- 100' (30 m) Cable
- 12 VDC Universal Power Supply

Specifications

RAD ALERT 50 Area Monitor
Indicated Use: Radiation area monitoring
Internal GM Detector Range: 0.5mR/hr to 1000 mR/hr
Display: NA
Display Range: NA
Display Units: mR/hr
Linearity: Reading within ±10% of true value with detector connected
Response: Typically 3 seconds from 10% to 90% of final reading
Status: Green light indicates the instrument is functioning properly
Alarm: Indicated by 2 flashing red LED's (2 Hz) and audible buzzer (may be turned off)
Calibration Controls: Accessible from front of instrument (protective cover provided)
Dead Time: < 10% at maximum exposure rate
Data Output: Signals (current sink), and direct connection to battery and ground
Power Requirements: 12 VDC universal adaptor may be plugged into either main detector unit or remote alarm
Battery Life: 2 - 3 hours
Battery Charger: Battery is continuously trickle charged when instrument is connected to line power
Construction: ABS Plastic Enclosure
Temperature Range: 0° to 130°F (- 18° to 54°C)
Size: 5.8" W x 1.5" D x 3.7" H (17.7 x 3.8 x 9.4 cm)
Weight: 6.5 lb (2.3 kg)

Remote Station
Indicated Use: Remote display for RadAlert 50
Status: Green light Indicates the instrument is functioning properly and power is on
High Alarm: Dual red flashing LED indicates the radiation level exceeds the high alarm point
Detector Fail Audio: Piezo Buzzer type with ON/OFF switch and adjustable volume
Power Requirements: 12 VDC universal adaptor may be plugged into either main detector unit or remote alarm
Construction: ABS Plastic Enclosure
Temperature Range: 0° to 130°F (- 18° to 54°C)
Size: 5.8" W x 1.5" D x 3.7" H (17.7 x 3.8 x 9.4 cm)
Weight: 1.5 lb (0.7 kg)

Item	Description
337-200	RAD ALERT 50 Area Monitor

RAD ALERT 100 AREA MONITOR

- **Adjustable Trigger Level**
- **Remote Alarm with Buzzer**
- **Battery Backup AA NiMH**
- **100' (30 m) Connection Cable**
- **Remote Timer**

Item 337-205 RAD ALERT 100 Area Monitor Includes

- RAD ALERT 100 Room Monitor with Remote
- Alarm and Battery Backup
- 100' (30 m) Cable
- 12 VDC Universal Power Supply

Specifications

RAD ALERT 100 Area Monitor
Indicated Use: Radiation area monitoring
Internal GM Detector Range: 0.5 mR/hr to 1000 mR/hr
Display: 4 digit LED display with 0.4" (1 cm) character height
Display Range: 000.0 to 200
Display Units: mR/hr
Linearity: Reading within ±10% of true value with detector connected
Response: Typically 1 second from onset of radiation
Status: Green light indicates the instrument is functioning properly and power is on
Alarm: Indicated by a flashing red light and audible buzzer
Battery: Indicated by red LED 8 AA NiMH on trickle charge in remote station
Calibration Controls: Accessible from potentiometer on top of unit
Dead Time: < 10% at max exposure rate
Data Output: Current sink and direct connection to battery and ground
Power Requirements: 12 VDC universal adaptor may be plugged into either main detector unit or remote alarm
Battery Life: 7 - 9 hours
Battery Charger: Battery is continuously trickle charged when instrument is connected to line power
Construction: ABS Plastic Enclosure
Temperature Range: 0° to 130°F (- 18° to 54°C)
Size: 4.4" W x 2.4" D x 8.5" H (11.2 x 6.1 x 21.6 cm)
Weight: 6.5 lb (2.3 kg)

Remote Station
Indicated Use: Remote display for RAD ALERT 100 and 200
Status: Green light indicates the instrument is functioning properly and Power is on
Alarm: Flashing LED indicates the radiation level exceeds the high alarm point
Detector Fail: Incicated by red LED
Audio: Piezo Buzzer type with ON/OFF switch and adjustable volume
Power Requirements: 12 VDC universal adaptor
Construction: ABS Plastic Enclosure
Temperature Range: 0° to 130°F (- 18° to 54°C)
Size: 9.5" W x 2.5" D x 6" H (22.9 x 6.4 x 15.2 cm)
Weight: 1.5 lb (0.7 kg)

Item	Description
337-205	RAD ALERT 100 Area Monitor

CHECK SOURCE

338-122

338-120

Specifications

Item 337-141 and 338-120
Isotope: 137Cs
Size: 1" Dia. x 0.1" T (2.5 x 0.3 cm (1 x 0.1 in.)

Item 338-122
- Typically Mounted to Side of Instrument
- Holds 1" Dia. (2.5 cm) Check Sources

Item #	Description
337-141	Check Source, Cs-137, 10uCi
338-120	Check Source, Cs-137, 1uCi
338-122	Holder for Check Source

LEAD CASE FOR CS-137 CHECK SOURCE

Specifications

Item 994-078 Lead Case for Cs137 Check Source
Lead Wall: 0.39" Thick (10 mm)
Inside Dimensions: 1.22" Dia x 0.3" D (31 x 8 mm)
Overall Size: 2.16" Dia. x 1.22" H (55 x 31 mm)
Weight: 1.5 lb (0.7 kg)

Item 994-079 Lead Case for Cs137 Check Source
Lead Wall: 1.0" Thick (25.5 mm)
Inside Dimensions: 1.25" Dia. x 5/8" D (31.9 x 16 mm)
Overall Size: 3.35" dia. x 2.5" H (85.4 x 63.7 mm)
Weight: 8.5 lb (3.9 kg)

Item #	Description	Lead Thickness
994-078	Lead Case for Cs137 Check Source	0.39" (10 mm)
994-079	Lead Case for Cs137 Check Source	1" (25.5 mm)

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SURFACE SURVEY METER

- **Monitors alpha, beta and gamma**
- **Built-in pancake detector**
- **Built-in speaker**

This small 3 range surface rate meter has a built-in 2” diameter pancake GM detector. Read-out is in counts per minute (and mR/hr). The detector window is recessed and protected by an aluminum grill. The instrument will monitor alpha, beta and gamma radiation with a built-in audio to immediately signal the presence of radiation contamination. Anti-saturation circuitry keeps meter needle at full scale in high radiation fields. Tested to 100 R/hr. The small size, light weight and large detector area make this a very useful monitor for surveying bench tops or checking hands, clothes and fingertips for almost any radioactive contamination including: I-125, 1-131, P-32, C-14.

Item #	Description
343-055	Surface Survey Meter

Specifications

Meter: 2 1/2" (6 cm)
Ranges: 3 ranges, linear - 0-500, 0-5,000, 0-50,000 cpm (0-.15, 1.5, 15 mR/hr)
Switch Position: Off, Battery Test, x100, x10, x1
Audio: Internally mounted speaker
Detector: Halogen-quenched “Pancake GM tube”
Diameter: 2" (5 cm)
Window Diameter: 1 3/4" (5 cm)
Window Thickness: 1.5 mg/cm^2
Background: Typical 50 cmp, Thin profile of tube (13 mm) gives low background
Efficiency: 100% for all betas and alphas that have the energy to
penetrate the thin window.
Voltage: 900V nominal
Gamma Sensitivity: Nominal is 150 cpm/mr/h (based on CS-137)
Physical Dimensions: 3" W x 5 1/4" L x 2 1/4" T (8 x 13 x 6 cm) excluding meter and handle
Feet: Replaceable neoprene feet for easy sliding on bench or desk top without contaminating bottom face of instrument or detector
Calibration: Single master calibration pot as well as individual calibration pots for each scale
Power: 9 volt nominal “transistor battery” Eveready 1222 carbon or Eveready E146X mercury or equivalent
Current Drain: 3 mA typical
Handle: Swivel Type polished anodized aluminum
Weight: 22 oz (625 g.)
Battery Life: 100 hours in normal operation

DIGITAL CUTIE PIE

- **Digital readout - 4 digit-rate, 6 digits integrate**
- **Small and lightweight**
- **TBM package**
- **Flat response - air ion chamber**
- **Sees axially below 5 keV gamma or x-ray**
- **Reads alpha, beta, gamma, x-ray**
- **Fast response**
- **Wide range**

The Digital Cutie Pie consists of a 3.25" dia. x 3.25" long air ion chamber coupled to a stable solid state MOSFET input electrometer with built-in A to D converter to read out directly in mR/h or mR. Range is 0.1 mR/h to 999.9 mR/h and 1 mR/h to 9.999 R/h. 200 mg/cm^2 graphite lined phenolic walls give accurate "air equivalence". A thin (0.5 mg/cm^2) Mylar window allows high sensitivity readings for alpha and for low energy beta such as C-14 in addition to higher energy betas, gammas and x-rays.

Specifications

Dimensions: 5 1/2" x 3 1/2" x 8" including handles
Detector: Air ion chamber 3.25" dia. x 3.25" long, Internal Volume 270 cc
Wall & Cap: Phenolic, graphite lined 200 mg/cm^2 walls and 400 mg/cm^2 cap
Window: 2.87" dia. x 0.5 mg/cm^2 mylar
Readout: LCD 6 digits
Indicator Lamp: Red LED 10 pulses/min per mR/h
Range:
Rate: Four digits 0.1mR/h to 999.9 mR/h switchable to 1 mR/h to 9.999 R/h
Integrate: 6 digits
Electrometer: Solid State MOSFET input
Electronics: A-D converter LCD drivers
Batteries: 10 each NEDA CR-1220 - shelf life 7 years 2 each Eveready E93, C cell or eq. - 1000 hours
Weight: 26 oz. complete with batteries (.75 kg.)
Shipping Weight: 4 lbs. (1.8 kg.)

Item #	Description
343-049	Digital Cutie Pie, mR/h

RO-20 ION CHAMBER SURVEY METER

Features
- Measures gamma or x-ray exposure rate
- Temperature compensated measurements
- Sliding shield for beta measurements
- Large, backlit display
- 5 ranges up to 50 R/h
- Extended battery life
- Non-mechanical range switching

The Model RO-20 is a portable air ionization chamber instrument, used to detect beta, gamma, and x-radiation, with five linear ranges of operation to measure exposure from background to 50 R/h full scale.

The ionization chamber is vented to atmospheric pressure and is specifically designed to have a flat energy response into the x-ray region. The detector is fully temperature compensated, eliminating any need for temperature correction. Each instrument is factory calibrated to gamma radiation.

A single rotary switch turns the instrument off, checks the batteries, checks the zero setting, and selects the range of operation. An ergonomically located switch illuminates the meter. Internal switching of ranges is accomplished with reed relays, eliminating the mechanical swing arms typically used with portable ion chamber survey instruments.

Detector

The RO-20 detector is an air-filled ionization chamber. It has a diameter of 7.32 cm and a volume of 220 cm^3. The detector has 640 mg/cm^2 phenolic walls inside a 1.6 mm aluminum wall case for a total thickness of approximately 1,000 mg/cm^2. A 7.9 mm thick phenolic sliding beta shield with a positive friction lock is mounted on the bottom of the chamber. The shield thickness is approximately 1,000 mg/cm^2. The chamber window is comprised of two layers (one on the chamber, one on the can) 25 micron (0.001") mylar, approximately 7 mg/cm^2 total.

Energy Response

Photon Response: Reference to ^{137}Cs measured through the bottom with the slide closed, the energy response is:
- ± 30% from 8 keV to 1.3 MeV with the open slide facing the source.
- ± 15% from 33 keV to 1.3 MeV with the closed slide facing the source.
- ± 15% from 55 keV to 1.3 MeV through the side of the instrument

Beta Response: Uranium Slab: 30% of true mrad/h field behind 7 mg/cm^2 window with RO-20 resting on slab, slide open. $^{90}Sr^{90}Y$: Approximately 93% of true mrad/h field at 30 cm with slide open.
Fast Neurton Response (PuBe): Reads approximately 8% in mR/h of true neutron field in mrem/h.
Radiation Detected: Beta, gamma, and x-ray.
Ranges: Five linear ranges: 0-5, 0-50, 0-500 mR/h and 0-5, 0-50 R/h
Meter: Scale length, approx. 7.6 cm (3"), 2% accuracy. Linear markings from 0 to 5 in 50 minor increments. The meter is back-lit
Response Time: 90% of final reading within 5 seconds,
Linearity: Within ± 5% of full scale

Battery Dependence: Reading is independent of battery voltage when the battery check indication is in the green arc.
External Controls: Range switch, including Off, Zero, and Battery checking positions. Zero knob used to set meter to zero when Zero position of range switch is selected or when in no significant radiation field. Light switch, for meter light.
Internal Control: Five calibration controls- one for each range.
Batteries: Main Power: Five "C" cells
Battery Life: "C" cells, widely variable according to RO-20 usage and battery type. Typical ZnC: mR/h ranges, 2900 hrs. All other ranges, 150 hrs. Typical Alkaline: mR/h ranges, 6900 hours. All other positions, 350 hours. Frequent or continuous use of the light will reduce battery life significantly. Thirty volt chamber bias battery life: Totally dependent upon the usage of "Battery 2" position switch. The battery capacity should allow for at least 50,000 five second battery checks. The battery drain is negligible on all other positions of the range switch.
Chamber Bias: Ten 3 volt lithium coin cells, 30 volts
Temperature: Operable from -40 °C to 60 °C (-70 °F to 140 °F) For operation below -18°C (0°F), alkaline or nickel-cadmium "C" cells should be used.
Temperature Compensation: The detector is fully compensated over the operational temperature range for output accuracy within 10% ± 0.5 mR/h
Moisture: Seals used at openings for dust and water resistance. Detector is protected by a silica-gel dryer.
Humidity: Operable from 0 to 95%, non-condensing
Weight: Approximately 3.6 lbs with alkaline C cells
Size: 4.2" W x 7.9" L x 7.7" H
Testing: The RO-20 has been successfully tested to ANSI N42.17A and is CE Certified to European standard EN50082-1 (EN61000-4-2 & EN61000-4-3)

CE

Item #	Description
343-150	RO-20 Survey Meter
343-155	5 Micro Curie Cs-137 Check Source

451B ION CHAMBER SURVEY METER WITH BETA SLIDE

- **High sensitivity measurement of rate and dose simultaneously, with the capability to record peak rate**
- **Auto-ranging and auto-zeroing**
- **RS-232 communications interface with optional Windows-based Excel add-in for data logging**
- **Ergonomic, anti-fatique handle with replaceable grip, wrist strap and tripod mount**
- **Programmable flashing LCD display and audible alarm**
- **Easily-accessible battery door (operated by two 9-volt alkaline batteries) on the outside of the bottom case**

The auto-ranging 451B measures radiation rate and accumulated dose from beta, gamma and x-ray radiation sources. The 451B's site surveying capabilities make it well-suited for a wide range of end users, including: police and fire departments, x-ray manufacturers, government agencies, state inspectors, emergency response and HAZMAT teams, nuclear medicine labs, hospital radiation safety officers, and nuclear power workers. The ion chamber detector allows for a fast response time to radiation from leakage, scatter beams and pinholes. Additionally, the low noise chamber bias supply provides for fast background settling time. A sliding beta shield serves as an equilibrium thickness for photon measurements and enables beta discrimination. The digital display features an analog bar graph, 2.5 digit digital readout, low battery and freeze ("peak hold") mode indicators, and an automatic backlight function. User controls consist of an ON/OFF button and a MODE button. The case is constructed of lightweight, high strength materials and is sealed against moisture. The RS-232 interface can be connected directly to a computer for use with the Excel add-in for Windows (Item 343-460), enhancing the functionality of the instrument. This software allows for data retrieval, user parameter selection and provides a virtual instrument display with audible (requires sound card) and visual alarm indication.

Specifications

Radiation Detected:
Alpha above 7.5 MeV
Beta above 100 keV
Gamma above 7 keV

Operating Ranges- Response Time:
0 to 5 mR/h - 8 seconds
0 to 50 mR/h - 2.5 seconds
0 to 500 mR/h - 2 seconds
0 to 5 R/h - 2 seconds
0 to 50 R/h - 2 seconds

Accuracy: Within 10% of reading between 10% and 100% of full scale indication on any range, exclusive of energy response. Calibration source is ^{137}Cs

Detector
Chamber: 349 cc volume air ionization
Chamber Wall: 246 mg/cm^2 thick phenolic
Chamber Window: 6.6 mg/cm^2 Mylar, protected by steel mesh, 46 cm^2 detection area
Beta Slide: 440 mg/cm^2

Controls: ON/OFF and MODE
Automatic Features: Auto-zeroing, auto-ranging, and auto-back
Power requirements: Two 9 V alkaline, 200 hours operation
Warm-up time: One minute

Modes
Integrate Mode: Operates continuously 30 seconds after the instrument has been turned on. Integration is performed even if the instrument is displaying in mR/h or R/h
Freeze mode: Will place a tick mark on the bar graph display to hold on the peak displayed value. The unit will continue to read and display current radiation values

Display: LCD analog/digital with backlight
Analog: 100 element bar graph 2.5" (6.4 cm) long. Bar graph is divided into 5 major segments, each labeled with the appropriate value for the range of the instrument
Digital: 2.5 digit display is followed by a significant zero digit depending on the operating range of the instrument. The units of measurement are indicated on the display at all times. Digits are 0.25" (6.4 mm) high. Low battery and freeze indicators are also provided on the display

Temperature Range: -4° to +158°F (-20° to +70°C)
Relative humidity: 0 to 100%, @ +60°C
Geotropism: Less than 1%
Size: 4" W x 8" D x 6" H (10 x 20 x 15 cm)
Weight: 2.5 lb (1.11 kg)

CE **Tested.** Meets applicable standards.

Item #	Description
343-451	451B Ion Chamber Survey Meter with Beta Slide, Standard Chamber (R)
343-453	Check Source, ^{238}Uranium 0.064 µCi, Impregnated 2" x 2" Yellow Card
343-458	Single Unit Carrying Case
343-460	451 Assistant for Excel

451P PRESSURIZED µR ION CHAMBER SURVEY METER

- **High sensitivity µR measurements of rate and dose simultaneously, with the capability to record peak rate**
- **Ergonomic, anti-fatigue handle with replaceable grip, wrist strap and tripod mount**
- **Programmable flashing LCD display and audible alarm**
- **Easily-accessible battery door (operated by two 9-volt alkaline batteries) on the outside of the bottom case**
- **RS-232 communications interface with optional Windows-based Excel add-in for data logging**

The auto-ranging 451P features a pressurized ion chamber, providing enhanced sensitivity (µR resolution) and improved energy response to measure radiation rate and dose from x-ray and gamma sources. Originally designed to measure leakage and scatter around diagnostic x-ray and radiation therapy suites, the 451P's site surveying capabilities make it well-suited for a wide range of end users, including: x-ray manufacturers, government agencies, state inspectors, biomedical technicians, and maintenance technicians for airport baggage scanners.
The ion chamber detector allows for a fast response time to radiation from leakage, scatter beams and pinholes. Additionally, the low noise chamber bias supply provides for fast background settling time.

The digital display features an analog bar graph, 2.5 digit digital readout, low battery and freeze ("peak hold") mode indicators, and an automatic backlight function. User controls consist of an ON/OFF button and a MODE button. The case is constructed of lightweight, high strength materials and is sealed against moisture. The RS-232 interface can be connected directly to a computer for use with the Excel add-in for Windows (Item 343-460), enhancing the functionality of the instrument. This software allows for data retrieval, user parameter selection and provides a virtual instrument display with audible (requires sound card) and visual alarm indication.

Specifications

Radiation Detected:
Beta above 1 MeV
Gamma and X-Rays above 25 keV

Operating Ranges - Response Time:
0 to 500 µR/h - 5 seconds
0 to 5 mR/h - 2 seconds
0 to 50 mR/h - 1.8 seconds
0 to 500 mR/h - 1.8 seconds
0 to 5 R/h - 1.8 seconds

Accuracy: Within 10% of reading between 10% and 100% of full-scale indication on any range, exclusive of energy response. Calibration source is ^{137}Cs

Detector
Chamber: 230 cc volume pressurized air ionization chamber to 8 atmospheres or 125 psi

Controls: ON/OFF and MODE

Automatic Features: Auto-zeroing, auto-ranging, and auto-backlight

Response Time: Analog response time from 10% to 90% of reading for a full scale step increase is dependent on operating range. Response time for a step increase in radiation exposure rate from background:

Step to Increase, Background to & Time to Reach 90% of Final Value:
400 µR/h - 4.8 sec
4 mR/h - 3.3 sec
10 mR/h - 4.3 sec
40 mR/h - 4.5 sec
100 mR/h - 2.7 sec
1 R/h - 2 sec
4 R/h - 2.7 sec

Power Requirements: Two 9 V alkaline, 200 hours operation

Warm-up Time: Less than two minutes for initial operation when the instrument is in equilibrium with ambient temperature

Display: LCD analog/digital with backlight
Analog: 100 element bar graph 2.5" (6.4 cm) long. Bar graph is divided into five major segments, each labeled with the appropriate value for the range of the instrument
Digital: 2.5 digit display is followed by a significant zero digit depending on the operating range of the instrument. The units of measurement are indicated on the display at all times. Digits are 0.25" (6.4 mm) high. Low battery and freeze indicators are also provided on the display.

Modes
Integrate Mode: Operates continuously 30 seconds after the instrument has been turned on. Integration is performed even if the instrument is displaying in mR/h or R/h
Freeze Mode: Will place a tick mark on the bar graph display to hold on the peak displayed value. The unit will continue to read and display current radiation values .

Temperature Range: -4° to +122°F (-20° to +50°C)

Relative Humidity: 0 to 100%

Geotropism: Negligible

Size: 4" W x 8" D x 6" H (10 x 20 x 15 cm)

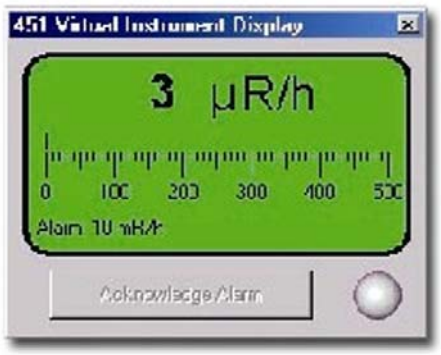
Weight: 2.4 lb (1.07 kg)

CE **Tested.** Meets applicable standards.

Item #	Description
343-455*	451P Pressurized µR Ion Chamber Survey Meter with Standard Chamber (R)
337-141	Check Source, ^{137}Cs, 10µCi, Flat Disc, 1" (2.54 cm) Diameter
343-458	Single Unit Carrying Case
343-460	451 Assistant for Excel

***Due to the pressurized ion chamber, the 451P is considered U.S. Department of Transportation (DOT) Dangerous Goods and must be shipped via IAW DOT special permit DOT-SP 13187.**

451 ASSISTANT FOR EXCEL



- **Real time data logging and uploading of 451 internal data log into protected Excel worksheet**
- **Virtual instrument display with user-defined audible and visual alarm indication**
- **Compatible with Windows® 95, 98, ME®, NT® 4.0, 2000, XP® and Excel 97, 2000**
- **Package includes manual, diskette set, and 25 ft RS-232 cable**

The 451EXL provides remote control for many of the 451B and 451P functions via a Microsoft® Excel-based user interface, including real-time data logging with user defined alarm parameters, upload of the internal data log into Excel worksheet, real-time virtual instrument display, and accumulated dose measurement over a user defined integration period. This information management software is ideal for the facility Radiation Safety Officer or anyone responsible for maintaining a permanent record of spills and accidents for adherence to state and NRC requirements.

The 451EXL's data logging function automatically records realtime measured data into an Excel worksheet. The 451 Assistant provides user configurable audible and visual alarms for the real time logged data, including the color-coding of each data entry for quick identification for radiation levels and alarm acknowledgment status. This 451EXL information management software program is ideal for the facility radiation safety officer or anyone responsible for maintaining a permanent record of spills and accidents for adherence to state and NRC requirements.

Specifications

Controls: The 451 Assistant menu and toolbar provide an interface for the user to remotely control the 451, configure the 451, download the 451's internal data log and start / stop real time data logging and integrated dose measurements

Connect / Disconnect: Connects or disconnects the 451 to the computer's communication port

Start / Stop: Starts and stops computer data logging. When data logging is started, logged data is placed in the active Excel worksheet and the worksheet is protected to provide data security

Logging: Properties Allows the user specify computer data logging parameters. The data logging sample interval (2 seconds to 999 hours), total data logging period (2 seconds to 49 days) and computer data log alarms may be specified through this menu. These parameters are independent of the 451's internal data logging functions

Integrate: Allows the user to select timed integrated dose measurement or user controlled integrated dose measurement. The user may also specify the integration period for timed integration from 1 minute to 999 hours. When timed integrate mode is selected, the 451 Assistant for Excel stops the integrated dose measurement after the specified integration period has expired When timed integrate mode is not selected, the user controls the integration period and the integration time is displayed in real time. The integrated dose and average dose rate are recorded in the active Excel worksheet when integration is complete

Download Log: The 451 is capable of internally logging data at a user defined interval from 1 to 255 seconds with a total capacity of up to 2700 data points. This feature allows the user to download the 451's internal data log into the active Excel worksheet

Options: Allows the user to change many properties of the 451 Assistant for Excel and several of the 451s' properties. The user may configure the various visual and audio alarm features of the 451 Assistant for Excel for each data point that is logged. The 451 Assistant can be configured to use 2 or 4 alarm states. The four alarm states are acknowledged normal (below alarm level), unacknowledged normal, acknowledged alarm and unacknowledged alarm. The user may also select the communication port used by the 451 (default is COM1). The 451's internal data logging parameters and alarm settings may also be changed from the Options menu

System Requirements:

Windows 95, 98, ME, NT 4.0, 2000, or XP
Microsoft Excel 97 or 2000
One serial port (COM1 through COM4)

Item #	Description
343-460	451 Assistant for Excel

MODEL 9DP, PRESSURIZED ION CHAMBER METER

- **0-5 R/hr Range with uR/hr Sensitivity**
- **Sunlight Readable Color Display**
- **Auto Zeroing & Ranging**
- **Rechargeable Batteries**
- **Alarming Capability**
- **Rate, Integrate & Peak Hold Readouts**
- **Data Logging**
- **USB Connectivity**
- **Free Firmware Updates through Internet**

The Model 9DP, pressurized ion chamber meter, provides highly sensitive measurements of exposure and exposure rate. It can simultaneously display the exposure rate, integrated value and highest rate seen by the instrument. The integrated value can be reset (if desired) using one of the four convenient front panel mounted buttons. The stunning 256 color, bit-mapped display provides an optimized presentation of the data and is accompanied with icons informing the user of the active functions and instrument status. All logged data are written in csv format to a plugged-in industry standard USB thumb drive for convenient retrieval by a PC spreadsheet or database program. Alarms are manifested using color changes on the display and an acknowledgable audio output.

This meter is part of the new Dimension series of meters employing state-of-the-art technologies that deliver tremendous capability, user-friendliness, and convenient PC connectivity. Instrument users have access to personal preference type settings by connecting directly to any USB keyboard. An optional Dimension Interface Package is available which facilitates complete setup and calibration programming under administrator controlled password protection.

Item 343-357 Carrying Case
The soft shell design is constructed from air-blown ABS plastic and utilizes a foam insert that provides good protection and a convenient place to store all your equipment

Item 343-358 Stereo Headset
This headset offers comfort and excellent protection against noisy areas whenever it becomes necessary to listen to the audio output from portable survey meters. This headset plugs into any Ludum survey meter equipped with an audio output jack.

Item 343-355 Dimension Interface Package
Dimension Interface Package, Software and special USB cable for interfacing any Dimension series instrument to a PC to perform extensive setup or calibration.

Specifications

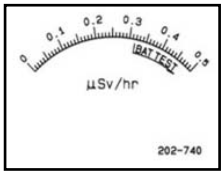
Radiation Detected: Beta above 1 MeV; gamma & X-rays above 25 keV
Operating Ranges: With Sv/h units: 0-5 uSv/h, 0-50 uSv/h, 0-500 uSv/h, 0-5 mSv/h, 0-50 mSv/h; with R/h units: 0-500 uR/h, 0-5 mR/h, 0-50 mR/h, 0-500 mR /h, 0-5 R/h
Chamber Volume: 230 cc pressurized to 125 PSI
Accuracy: ±10%
Response Time: From five seconds in lowest range to under two seconds in highest range when measuring from 10% to 90% of final value
Measurement Readouts: Simultaneous display of dose rate, integrated dose, and highest dose rate (peak hold)
Data Logging: Stored to detachable USB thumb drive in csv format for easy retrieval by PC spreadsheet/database programs. Data points include real-time clock generated date and time with dose rate, integrated dose, and instrument status. Logging time intervals are set by PC interface program
LCD Display: 3.5" (8.9 cm) diagonal, 240 H x 320 W pixels, TFT active matrix, 262 colors, 220 cd/m^2
User Controls: 4 push buttons: instrument on/off, peak rate/integrate mode, audio on/off, alarm acknowledge/meter reset/clearing integrated dose or peak rate
Automatic Functions: Auto ranging, auto zeroing, auto LCD backlighting
Audio Outputs: Built-in unimorph speaker, > 60 dB at 2' (0.6 m), audio jack for connection to optional headset
Alarms: Two levels of radiation alarms available, each are user programmable throughout entire readout range and set through a PC interface program. Other alarms include low battery and various detector failures
Temperature Range: -20 to 50°C (-4 to 122°F)
Power: Eight rechargeable AA NiMH batteries, supplied with wall charger for direct connection to instrument
Battery Life: Approximately 12 to 24 hours between charges depending upon use of backlighting
PC Interface: USB, free PC Windows™ interface program download or a more comprehensive Dimension Interface Package (Item 343-355) that additionally facilitates calibration and administrative control is sold as an option
Construction: Durable plastic accompanied by internal metal support
Size: 8.6" H x 4.6" W x 9.6" L (21.8 x 11.7 x 24.4 cm)
Weight: 3.15 lb (1.43 kg) including batteries

Item 343-357 Carrying Case
Carrying Case Size: 17" L x 13" W x 7.5" H (43.2 x 33.0 x 19.1 cm)

Item #	Description
343-350	Model 9DP, Pressurized Ion Chamber Meter
343-355	Dimension Interface Package
343-357	Carrying Case
343-358	Stereo Headset

SURVEY RATEMETER AND GAMMA DETECTOR PACKAGE

338-001
and
338-002



338-122

338-120

The Survey Ratemeter and Gamma Detector Package includes everything needed to do radiation survey checks of X-ray security scanners. The Survey Ratemeter has a uSv/ h scale with a range of 0 to 0.5 uSv/h. The package also includes a coiled cable that connects the Survey Ratemeter to the Gamma Detector and can stretch up to 48" (122 cm), a 1.0 µCi Check Source inside a Check Source Holder mounted on the side of Survey Ratemeter provides for easy calibration of the Survey Ratemeter and helps prevent losing the Check Source.

Survey Ratemeter and Gamma Detector Package Item 338-000 Includes:
(1) Survey Ratemeter
(1) Gamma Detector
(1) "C" Series Coiled Cable
(1) Check Source
(1) Holder for Check Source

338-001 Survey Ratemeter -Model 3 - with a uSV/h Scale

- Rugged 4 Decade Analog Ratemeter
- Sensitive 1" x 1" (2.54 x 2.54 cm) NaI(Tl) Detector
- Easy to Use
- Easy Reach to Difficult Places
- Greater than 2000 Hour Battery Life

This instrument combines Ludlum's popular Model 3 Analog Survey Meter with a 1" x 1" (2.54 x 2.54 cm) NaI(Tl) gamma scintillator detector, Model 44-2, to create a very sensitive micro-R-meter. The advantage this instrument has over those with the detector housed inside the instrument enclosure is its ability to manipulate the detector into tight or difficult places. It has the additional benefit of keeping the meter conveniently in full view while performing an investigation. The design is very robust with a loud audio signal to facilitate noisy areas. The aluminum cast instrument housing with its separate battery compartment and accompanying metal handle offer an industrial robustness and quality that promote long lasting protection and instrument life. The front panel controls include a rotary switch for selecting the four-decade range, instrument shut-off, battery test, an audio on/off switch, a fast/slow response switch, and a count reset button.

Specifications

338-001 Survey Ratemeter -Model 3 - with a uSV/h Scale
Meter Dial: 0 - 0.5 µSv/h; 0-500 kcpm, BAT TEST
Meter: 2.5" (6.4 cm) arc, 1 mA analog type
Controls:
Rotary Selector: Switches between instrument off, battery check, ranges: x0.1, x1, x10, x100
Response Switch: Toggles between FAST (4 seconds) or SLOW (22 seconds) from 10% to 90% of final reading
Reset Pushbutton: To zero meter
Audio Switch: For audio on/off, built-in unimorph speaker, greater than 60 dB at 2' (0.6 m)
Calibration Controls: Accessible from front of instrument (protective cover provided)
Construction: Cast and drawn aluminum with beige powder coat
Connector: Series "C"
Temperature Range: -4 to 122°F (-20 to 50°C), may be certified for operation from -40 to 150°F (-40 to 65°C)
Power: Two each "D" cell batteries (housed in externally accessible sealed compartment)
Battery Life: Typically greater than 2000 hours with alkaline batteries (battery condition can be checked on meter)
Size: 6.5" H x 3.5" W x 8.5" L (16.5 x 8.9 x 21.6 cm), including handle
Weight: 3.5 lb (1.6 kg), including batteries

Item 338-002 Gamma Detector - Model 44-2
Detector Type: Scintillator, 1" Dia x 1" L (2.54 x 2.54 cm) thick NaI
Sensitivity: Typically 175 cpm/µR/hr (137Cs gamma)
Background: 1900 cpm
Recommended Energy Range: 50 KeV-1.5 MeV
Energy Response: Energy dependent
Photomultiplier Tube: 1.125" (2.86 cm) diameter
Operating Voltage: 500-1200 volts
Connector: Series "C"
Temperature Range: 5 to 122°F (-15 to 50°C), may be certified for -40 to 150°F (-40 to 65°C)
Size: 2" Dia x 7.3" L (5.1 x 18.5 cm)
Weight: 1 lb (0.5 kg)

Item 338-003 Series C Coiled Cable
Connector Type: "C"
Construction: RG58 Shielded Low Noise Coiled Coaxial cable with strain relief
Length: 18" coiled to 48" stretched

Item 338-120 Check Source
Isotope: Cesium-137
Activity: 1.0 µCi
Size: 1" Dia x 0.1" L (2.5 x 0.3 cm)

Item 338-122 Check Source Holder
- Typically Mounted to Side of Instrument
- Holds 1" (2.54 cm) Diameter Check Sources

Item #	Description
338-000	Survey Ratemeter & Gamma Detector Package
338-001	Survey Ratemeter, Model 3
338-002	Gamma Detector/ Scintillator, Model 44-2
338-003	Coiled Cable, "C" Series, 18" to 4' (46 to 122 cm)
338-120	Check Source, Cs-137, 1uCi
338-122	Holder for Check Source 338-120

ISIS QA-1 GEOMETRIC QA PHANTOM

Geometric Accuracy for all QA Steps
- **Room Lasers**
- **Patient Marking Laser**
- **CT Simulator Conventional**
- **Simulator**
- **Treatment Delivery System**

Ensure Data Transfer
- **From Scanned Images**
- **Density Checks**
- **Anatomical Structures**
- **Isocenter + Central Axis**
- **Planned Beams for Patient Marking**

The ISIS QA-1 Phantom provides “Machine to Machine” geometric QA for Treatment Machines, CT Simulator, and Conventional Simulators.

The ISIS QA-1 Phantom was designed to provide an easy low cost approach to the daily, monthly, and annual QA tasks for the Physicist and Therapists . The ISIS QA-1 phantom will aid in verifying the geometric laser position accuracies with multiple laser systems within your department. Further the ISIS QA-1 provides the Physicist and Dosimetrist the ability to verify electron beam density values produced by your CT / CT-Simulator. Your staff scans the four unique density value inserts then transfer this image to the RTP system for verification of the electron density values of the Bone, Water, Inhale and Exhale Lung density inserts. Comparing the individual value for each known density value the user can quickly verify CT image electron density values for treatment planning image QA.

Additionally, the ISIS QA-1 provides an internal known object insert that is scanned with the CT / CT-Simulator. With this multiple image slice set you can create a Treatment Plan / Virtual Simulation plan of the known object for size and location verification though your RTP and Virtual Simulation system. Then the ISIS QA-1 goes one step further to use these known geometric phantom positions for verification of the laser positions as verified with the scanned ISIS QA-1 phantom . This QA process provides a geometric QA of the processed RT Plan for use with IMRT treatment machine lasers and mechanical treatment field setup verifications.

The dose chamber insert provided will provide the physicists the ability to quickly measure single point expected dose values without using additional phantom devices.

CT Simulation RT Field Marking Verification QA
The ISIS QA-1 provides the user the ability to scan, plan, and verify the exported RTP beam designs of the intended treatment field to the lasermarking system for laser point position verification. Additionally this process can be accomplished on the intended treatment machine.

A sample generic QA process is described as follows
Scan the phantom after you have verified the position of the ISIS QA-1 phantom is centered in the X and Y position of the scan plane. This is accomplished by physically moving the ISIS QA-1 phantom and verifying the placement position with the tool set supplied with the scanner. Additionally, verify the tilt of gantry is at a “0” degree tilt in respect to center of the ISIS QA-1 phantom. Once alignment is verified correctly you scan the ISIS QA-1 phantom at 1 mm increments throughout the entire phantom body. Then create three 10 cm x 10 cm RTP / Virtual Simulation plans for export to the laser marking system for laser position verification. You then compare the expected field positions with the actual laser field illuminated positions. These positions are viewed on three of the external sides of the ISIS QA-1 phantom.

Additionally the internal object insert positioned in the exact center axis of the ISIS QA-1 phantom provides laser position RTP field verification. When the ISIS QA-1 is setup on your treatment machine table you can verify lasers / field lights and the expected treatment dose by using an electrometer chamber with the ISIS QA-1 dose chamber insert.

General Benefits of the ISIS QA-1
- Two millimeter wide alignment verification grooves on the surfaces of the ISIS QA-1 provides for easy viewing and quick alignment checks of laser beam positions.
- Multiuse QA machine programs within the therapy department can use the ISIS QA-1 phantom.
- Provides the ability to verify scanned image set position alignment from the radiology department to the radiation therapy department for geometric verifications prior to the laser marking process.
- Precision 10 cm x 10 cm and 5 cm x 5 cm fixed fields on three surfaces of the ISIS QA-1 phantom provide for exact image and beam geometric design QA verification.
- Easy leveling base for setting up an exact level plane for the QA process from machine to machine.
- Single slice check for laser -offset verification with standard CT Scanner and / or CT Simulator. Treatment machine QA for lasers, mechanicals, and beam geometry.

Electron Density Verification Inserts
The four ISIS QA-1 electron density inserts provide the user with the ability to easily verify the electron density values produced on the CT / CT Simulator. This is of particular benefit when determining the consistency of electron density values from week to week. The four inserts are: Bone (+800), H2O (0.0), Inhale Lung (-800), Exhale Lung (-500), and Water (0). This verification is useful in providing a repeatable and dependable QA program for inhouse machine to machine transfer of images. This QA task can be accomplished on a daily, weekly, monthly, and annual by normal radiotherapy staff members.

Item 681-110 ISIS QA-1 Geometric Phantom Package Includes
- Item 681-100 Phantom Cube with Bone, Water, Lung Inhale and Lung Exhale density plugs
- Item 681-159 Leveling Platform with 20 cm Field
- Item 681-150 Alignment Bar
- Item 681-101 2.54 cm Object Insert
- Item 681-112 Tungsten Pins, 20/Pkg
- Item 681-120 50 cm Ruler
- Item 352-234 Magnetic Gantry Level with Light, batteries not included
- Item 681-121 Round Bubble Level
- Item 681-193 Protective Rolling Case

Specifications

Phantom Size: 5.5" L x 5.5" W x 5.5" H (14 x 14 x 14 cm)
Electron Density of Acrylic: 3.847×10^{23}
Phantom Surface Tolerance: .005
Phantom Weight: 8 Lb (3.6 kg)
Rolling Case Size: 32.5" L x 21.5" W x 11.5" D (82.6 x 54.6 x 29.2 cm)
Total Shipping Weight: 45 lb (20.5 kg)

Item #	Description
681-110	ISIS QA-1 Geometric Phantom Package

Specify Ion Chamber: Manufacturer, Model Number and Description

INSERTS FOR ISIS PHANTOM CUBE

- All inserts are 4 cm in diameter and 14 cm long.
- They are made of clear acrylic with a rubber o-ring at one end to keep the insert snug in the phantom cube.
- Each insert is labeled with the item number, description and density.

INSERT, FARMER STYLE CHAMBER

This insert holds a farmer style chamber (without build-up cap) with the center of the collection volume at the center of the phantom cube.

The Farmer Chamber Insert accommodates the following chambers:
PTW: 23333, 30001, 30002, 30004, 30006, 30010, 30011, 30012, 30013
Bicron/NE 2571, 2581, 2505/3 (A or B)
Nuclear Associates 30-351
Capintec PR-06G, PR-06C
Victoreen 580-006
Exradin A19, RMI 448

Item #	Description
681-104	Insert, Farmer Style Chamber

INSERT WITH 2.54 CM DIAMETER TEFLON BALL

This insert has a 2.54 cm Teflon ball centered in the insert. The teflon ball is used as tumor value to verify measurement accuracy on the CT/CT Simulator and treatment planning system.

Specifications

Density: 2.13 - 2.2 g/cm³

Item #	Description
681-101	Insert with 2.54 cm Diameter Teflon Ball

INSERT, PTW 31006 CHAMBER

Item #	Description
681-104-31006	Insert, PTW 31006 Chamber

INSERT, PTW 31016 CHAMBER

Item #	Description
681-104-31016	Insert, PTW 31016 Chamber

INSERT, EXRADIN A12 CHAMBER

Item #	Description
681-104-A12	Insert, Exradin A12 Chamber

Photo Unavailable

INSERT, EXRADIN A12S CHAMBER

Item #	Description
681-104-A12S	Insert, Exradin A12S Chamber

INSERT, EXRADIN A14SL CHAMBER

Item #	Description
681-104-A14SL	Insert, Exradin A14SL Chamber

INSERT, EXRADIN A1SL CHAMBER

Item #	Description
681-104-A1SL	Insert, Exradin A1SL Chamber

INSERT, STEREOTACTIC TUNGSTEN BALL

This insert has a tungsten ball with a diameter of 5.5 mm (7/32") in the center of the insert.

Item #	Description
681-106	Insert, Stereotactic Tungsten Ball

INSERT, MULTI-DENSITY HOLDER

The Multi-Density holder insert accommodates 8 density plugs (2.5 cm diameter x 1.5 cm thick). An acrylic end plug and o-ring on each end of the insert holds the density plugs in place. This insert is custom made. The customer must specify Density Plug material needed and the order of placement in the insert when ordering. **Density plugs are sold separately.**

Item #	Density Plug	Physical Density gm/cm³	Electron Density cc x 10^{23}	Electron Density Relativeto H_2O
681-107	Insert, Multi-Density Holder ONLY			
681-107-6	Lung Inhale	0.195 ± 0.20	0.634	0.190
681-107-7	Lung Exhale	0.495 ± 0.20	1.632	0.489
681-107-8	Bone 800 mg/cc	1.609 ± 0.01	4.862	1.456
681-107-9	Water	1.008 ± 0.01	3.346	1.002
681-107-10	Adipose (Fat)	0.967 ± 0.01	3.170	0.949
681-107-11	Breast (50% Gland / 50% Adipose)	0.991 ± 0.01	3.261	0.976
681-107-12	Muscle	1.062 ± 0.01	3.483	1.043
681-107-13	Liver	1.071 ± 0.01	3.516	1.052
681-107-14	*Trabecular Bone - 200 mg/cc	1.161 ± 0.01	3.730	1.117
681-107-15	*Dense Bone - 1000 mg/cc	1.660 ± 0.01	5.243	1.570
681-107-16	*Dense Bone - 1250 mg/cc	1.830 ± 0.01	5.718	1.712
681-107-17	*Dense Bone - 1500 mg/cc	2.000 ± 0.01	6.209	1.859
681-107-18	*Dense Bone - 1750 mg/cc	2.170 ± 0.01	6.698	2.005
681-107-19	*Coritcal Bone	1.930 ± 0.01	5.956	1.780
681-107-20	**Titanium	4.507 ± 0.01	12.475	3.735
681-107-21	***Aluminum	2.718 ± 0.01	-	-

* All Bone references 10 mm diameter in H_2O density plug.
** Titanium references 6 mm diameter in H_2O density plug.
*** Aluminum references 9.5 mm diameter in H_2O density plug.

INSERT, LIQUID FILLABLE

This insert has a 2.5 cm diameter hollow space in the center of the insert. There are two fill holes drilled at an angle into the hollow space. Each fill hole has an o-ring and screw to hold the liquid in the space The Customer fills the space with a liquid of their choice.

Item #	Description
681-108	Insert, Liquid Fillable

INSERT, HOLDS ISOTOPE PIN IN CENTER

This insert accommodates a holder the NA-22 Isotope is placed into. The holder of the insert keeps the NA-22 in the center of the insert.

Item #	Description
681-109	Insert, Holds Isotope Pin In Center
681-114	Holder for NA-22 Isotope
710-045-3	NA-22 Isotope

INSERT, SEED CALIBRATION

This insert has five (5) aluminum pins which are spaced at different levels laterally and longitudually at specified angles within the insert.

Specifications

Aluminum Pin Size: 1 mm Diameter x 5 mm Long

Item #	Description
681-119	Insert, Seed Calibration

Custom chamber inserts available. Specify the ion chamber manufacturer, model number and description that the insert is to be drilled for.

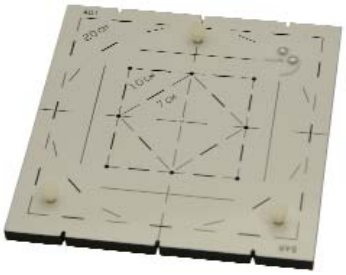
ISIS QA-1 GEOMETRIC PHANTOM ACCESSORIES

ISIS PHANTOM CUBE

This is a 14 cm cube made of clear acrylic with a 10 cm square scribed on three sides of the cube. The scribes are 2 mm wide and painted in white. Four of the six sides of the cube have nine holes per side for use of tungsten pins. One side has a slot to hold the 50 cm ruler. Crosshair markings are on five sides of the cube. A 4 cm wide hole is drilled through the middle of the cube to accommodate the inserts. The cube also has four fixed density inserts. The density inserts are 2.5 cm in diameter x 1.5 cm thick and correspond in density to water, bone, lung inhale and lung exhale. The inserts are labeled with the material and density.

Density Plug	Physical Density	Electron Density Per cc x 10^{23}	Electron Density Relative to H_2O
Lung Inhale	0.20	0.634	0.190
Lung Exhale	0.50	1.632	0.489
Dense Bone 800 mg/cc	1.53	4.862	1.456
Water	1.01	3.346	1.002

Item #	Description
681-100	ISIS Phantom Cube



LEVELING PLATFORM WITH 20CM FIELD

The leveling platform is 1 cm thick black acrylic plate topped with white engraving material and is 22.9 cm wide and 23.2 cm long. The leveling platform has three leveling screws and is engraved with crosshair dashes, a dashed 7 cm square rotated 45° to intersect with a non-rotated dashed 10 cm square, a dashed 20 cm square and a dashed 20 cm diameter circle. The dashes are etched deep and long enough to lay the tungsten pins in the dashes. There is also a 14 cm square for placement of the phantom cube and an adjustable corner guide with two screws at one corner to prevent rotation of the phantom cube. To set corner guide loosen the screws, adjust the corner guide to be snug to the phantom cube when in the correct position then tighten the screws. To connect the leveling platform to the alignment bar or adjustable table centering bar, fit the pin in either bar into a grove on the leveling platform. Two sides of the leveling platform have three alignment grooves, one at center and one on either side at 7 cm from center.

Item #	Description
681-159	Leveling Platform with 20 cm Field

681-150

ALIGNMENT BAR

The Alignment Bar fits on the couchtop for proper alignment of the ISIS Phantom Cube (Item 681-100). The Alignment Bar is white with engraved black dash lines on the top and all four sides for central axis/laser location. Each end has a 1.5 mm diamter x 12.7 mm tungsten pin in the center. There are seven aluminum balls across the top of the bar, one in the center and three on either side at 13, 14 and 15 cm from center. The three balls on each side are 1/32", 1/16", and 3/32" (0.08, 0.16, and 0.24 cm) in diameter with the smallest ball closest to the center. The overall size of the bar is 56.52 cm wide, 4.47 cm long and 2 cm thick. A pin centered on one side of the alignment bar is used to connect the Alignment Bar to the leveling platform (Item 681-159) for center alignment on the couchtop.

Item #	Alignment Bar
681-150	Varian ETR Couch
681-151	Varian ETR and G.E. Discovery Couch
681-152	With Snap-On Ends

TUNGSTEN PINS

The tungsten pins fit into the 9 holes on 4 sides of the phantom cube or they can be placed in the dashes on the leveling platform.

Item #	Tungsten Pins	Quantity
681-112	1/16" Dia. x 1/2" L (0.16 x 1.27 cm)	20
681-113	3/32" Dia. x 1/2" L (0.24 x 1.27 cm)	20

50 CM ALUMINUM RULER

This 50 cm aluminum ruler with mm and cm markings is 3.5 cm wide and 2 mm thick.

Item #	Description
681-120	50 cm Ruler

ISIS QA-1 GEOMETRIC PHANTOM ACCESSORIES

MAGNETIC GANTRY LEVEL WITH LIGHT

Torpedo level with three lighted vials and a magnetic strip. **Batteries not included.**

Item #	Description
352-234	Magnetic Gantry Level with Light

ROUND BUBBLE LEVEL

Item #	Description
681-121	Round Bubble Level

PROTECTIVE ROLLING CASE

This black case has rigid wall construction and reinforced rounded bumper corners. For ease in transport there are two heavy duty urethane wheels and a 7" (17.8 cm) extension handle. The case has seven latches, an o-ring seal and an atmospheric purge valve. The case is airtight, watertight and corrosion proof. The inside has foam padding with cutouts for the components.

Specifications

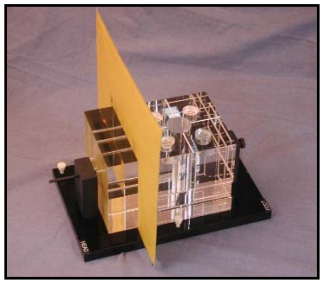
Ouside Dimensions: 32.5" L x 21.5" W x 11.5" D (82.6 x 54.6 x 29.2 cm)
Weight: 30 lb (13.6 kg)

Item #	Description
681-193	Protective Rolling Case with Cut-Outs

HOLDERS FOR MARKUS OR ROOS CHAMBER

This holder allows a Farmer Style, Markus or Roos chamber to be held in place with the nylon thumb screw. Different density plugs are placed on top of the chamber and exposed to radiation. This holder works in conjunction with Item 681-107 Multi-Density Insert.

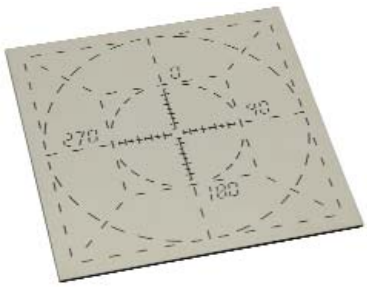
Item #	Description
681-170	Holder, Farmer Chamber / Density
681-171	Holder, Markus Chamber
681-172	Holder, Roos Chamber



FILM PHANTOM ASSEMBLY

The film phantom unit includes a film phantom base, 1.5 cm and 5.0 cm acrylic phantom blocks and a steel marker pin. The phantom cube and the 1.5 cm and 5.0 cm phantom blocks are placed on the film phantom base. A ready pack film is placed between the 1.5 cm and 5.0 cm phantom blocks and the steel marker pin is used to mark film for orientation. Once in the correct position, the film is exposed several times at different gantry angles which produces a star pattern on the film for verification of the machine isocenter.

Item #	Description
681-130	Film Phantom Assembly



ALIGNMENT PATTERN IN TUNGSTEN

Place the alignment pattern over film to check multileaf and field sizes. Circles can be used on simulator tv monitor to set horizontal or vertical adjustments.

Item #	Description
681-158	Alignment Pattern in Tungsten

ISIS QA-1 GEOMETRIC PHANTOM ACCESSORIES

681-162

681-1624

ADJUSTABLE TABLE CENTERING BAR

This bar is used to properly align the ISIS Phantom Cube (681-100) on a table. The bar is adjustable from 37 cm to 68 cm wide. There is a scale on the bar with zero at center. The scale has mm and cm markings on both sides of zero. T-squares at each end of the bar are placed on the side of the couch and adjusted so each side is equal distance from zero on the scale. Knobs at both ends of the bar are loosened and tightened to make adjustments. There is an alignment pin on one side of the bar to connect it to the leveling plate (681-159). An alignment groove on the other side bar is to connect the Alignment Bar (681-150) to the Adjustable Centering Bar.

Item #	Description
681-162	Adjustable Centering Bar for Tables w/Alignment Bumps
681-1624	Centering Bar, Slotted Ends f/ Civco Couch Align Bumps

ADAPTER FOR THE CIVCO LOK-BAR

The Adapter for the CIVCO Lok-Bar is designed to be used on the CIVCO Lok-Bar to allow using the ISIS QA-1 Alignment Bar (681-150) and/or the Leveling Platform (681-159) with the CIVCO Lok-Bar. The Adapter has a circular hole on one side and an oval hole on the other which fit on the Lok-Bar pins. The underside of the Adapter has a cutout groove so it hugs the Lok-Bar which allows the Adapter to sit on the couch top, so it is not just sitting on top of the Lok-Bar. The Adapter has an alignment pin and a pin cutout to allow the Alignment Bar and/or Leveling Platform to fit to the Adapter. The centers of the Adapter's Lok-Bar pin holes are 1" (2.54 cm) from the ends of the Adapter.

Specifications

Adapter Size: 1 5/8" W x 11" L x 3/4" Thick (4.13 x 27.94 x 2 cm)

Item #	Description
681-169	Adapter for the CIVCO Lok-Bar

MINI PHANTOM

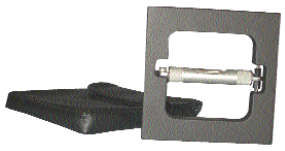
This **Optional** Mini Phantom can be used with the Alignment Bar or the Adjustable Table-Centering Bar to verify the coincidence of the lasers and the crosshairs and to check for gantry sag and optical back pointer position when the gantry is rotated ± 90°. The phantom can be used in the flat or vertical position. It has a "L-shaped" pin groove that sits on the alignment pin on either bar. It is scribed on four sides with 2 mm white painted lines. There are holes for tungsten pins on four sides of the phantom. Four 1.5 mm dia tungsten pins are included.

Specifications:

Material: Clear Acrylic
Dimensions: 15cm x 15cm x 5cm thick

Item #	Description
681-180	Mini Phantom

HIGH PRECISION GANTRY LEVEL



The four-sided Gantry Level is used to check the gantry angle indicators at four locations: 0, 90, 180, and 270 degrees, with accuracy to 1/40 of a degree. Vinyl Case is not included.

Item #	Description
352-200	High Precision Four-Sided Gantry Level
352-201	Vinyl Case for High Precision Gantry Level

MINI PHANTOM

This is an acrylic phantom with a cavity for a PTW 23333 Ion chamber with a build-up cap.

Specifications:

Material: Acrylic
Dimensions: 5.5" L x 5.5" W x 1" T (14 x 14 x 2.54 cm)
Cavity Depth: 1.5 cm from top surface to center of cavity

Item #	Description
681-2002	Phantom, Constancy, PTW N23333 w/Build-up Cap

SELF LEVELING 5 BEAM DOT LASER LEVEL

- **Lock that turns laser off and secures mirrors for handling**
- **Self-leveling laser**
- **Laser projects five self-leveling beams simultaneously**
- **Audible alarms when beyond leveling range**
- **Laser can be rotated 360°**

This 5 Beam Laser Level projects a vertical beam straight up and straight down to easily transfer a point from the floor to the ceiling plus will project 3 horizontal beams, one from left, one from right and one straight on to give you a perfect 90° angle in a room. This level is self-leveling with accuracy of 1/8" at 50 feet, plus has locking compensators so the laser level won't shake or be damaged while not in use.

710-851 Includes

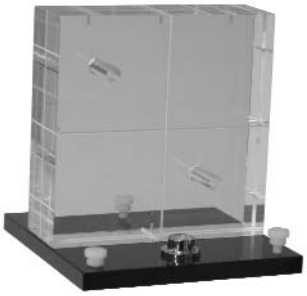
- Multi-functional magnetic base
- 3 "AA" alkaline batteries
- Mounting strap
- Magnetic target
- Tinted glasses
- Instruction manual with warranty card
- Soft-sided carrying case

Specifications

Number of Beams: 5
Leveling Method: Self-Leveling (Pendulum)
Laser Wavelength: 650nm ± 10nm (Red)
Laser Classification: Class IIIa
Maximum Power Output: <=5mW
Accuracy: ± 1/8"/50ft. (± 2mm/10m)
Interior Range: Up to 200ft. (60m) depending on light conditions
Self-Leveling Range: ± 4.5°
Power Supply: 3 "AA" alkaline batteries (included)
Battery Life: Approximately 20 hours with alkaline batteries
Dimensions: 3.15" x 3.858" x 4.0" (80 x 98 x 101.6mm)
Weight: 1.1 lb (0.5 kg)
Working Temperature: 14°F to 113°F (-10°C to +45°C)
Center Screw Thread: 5/8"-11, 1/4"-20
IP Protection Class: 55

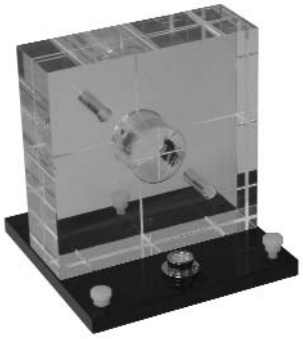
Item	Description
710-851	Self-Leveling Laser Level with 5 Beam Dot Laser

MINI PHANTOM
WITH LEVELING PLATFORM



Mini Phantom
Item 710-186

Tungsten Ball Mini Phantom
Item 710-188



5 Seed Calibration Mini Phantom
Item 710-190

The Mini-Phantom can be used to check the alignment of the internal and external lasers to the radiographic center of CT and PET/CT units and to verify lateral gantry angle. It can also be used with accelerator units to check vertical and lateral gantry angles, laser alignment and vertical table movement.

The Mini-Phantom is made of clear acrylic measuring 15 cm x 15 cm x 5 cm thick. One 15 cm x 15 cm side has centering scribe lines that go all the way across the phantom. All four of the 5 cm x 15cm sides are scribed through the center and two opposite sides are also scribed at 5 cm from center. The scribe lines are 1.3mm wide and white for ease of viewing the lasers. All four 5 cm x 15 cm sides have three pinholes, one at center and two at 5 cm from center. The center pinholes are 1.5 mm dia to hold a tungsten pin and the other pinholes are 1.0 mm. Four 1.5 mm dia tungsten pins are included with the mini-phantom.

The two large holes are 9.5 mm in diameter and are 10.6 cm apart from center to center. Each hole is in the exact center of a quadrant of the phantom.

Tungsten Ball Mini Phantom
(Item 710-188)
The Mini Phantom, for sterotactic collimator verification, has a 5.5mm diameter tungsten ball in the center. The ball is removable for CT applications.

5 Seed Calibration Mini Phantom with Leveling Platform
(Item 710-190)
The Mini Phantom CT 5 Seed Calibration has 5 aluminum seeds 1mm diameter x 5mm with a chart indicating center to center spacing between all seeds.

Leveling Platform for Mini-Phantom
The Leveling Platform for the Mini-Phantom is made of black acrylic that is 15 cm square x 1.0 cm thick. A hole in the center of the Mini-Phantom is for a tungsten pin that goes into the Mini-Phantom. A bubble level and three leveling screws with rubber tips are used to level the platform. The rubber tips help prevent the platform from moving.

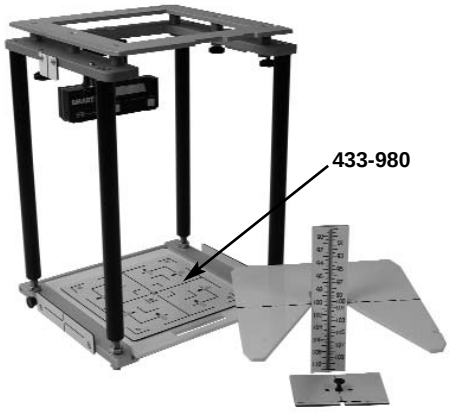
Directions for use in CT or PET/CT
Place the Mini- Phantom on the leveling platform with the pinholes towards the lateral lasers and the 15 cm side with scribe lines towards the foot of the couch. Align the Mini-Phantom to the center of the couch using the sagittal or overhead lasers. Level the platform using the bubble level and three leveling screws. Align the phantom to the CA of the beam by raising or lowering the couch to align the Mini-Phantom with the lateral lasers. A scan through the center of the Mini-Phantom should show the eight 1mm dia pinholes and four 1.5mm dia pinholes. Verify that the CT lasers are on the center scribe line around the phantom. Move the couch out so the lateral and ceiling lasers project onto the phantom. Check the couch movement distance. Verify that the lateral and ceiling lasers are on the center scribe line on the phantom. The movement of the lateral or ceiling lasers can also be checked by raising and lowering the lasers to the scribe lines 5 cm from the center. If present, the sagittal laser should align with the scribe lines on the 15 cm side of the phantom. The couch vertical movement can also be verified by raising and lowering the couch to the 5cm off- center scribe lines on the phantom.

Directions for use in Accelerators or Conventional Simulators
Insert the four tungsten pins into the four 1.5 mm dia holes in the Mini-Phantom. Place the Mini- Phantom on the leveling platform with the pinholes towards the lateral lasers and the 15 cm side with scribe lines towards the foot of the couch. Align the Mini-Phantom to the center of the couch using the sagittal or overhead lasers. Level the platform using the bubble level and three leveling screws. Align the phantom to the CA of the beam by raising or lowering the couch to align the Mini-Phantom with the lateral lasers and by moving the couch in to align with CA crosshairs. To verify vertical and lateral gantry angles take a radiograph with the gantry in the vertical position and in the lateral position. The tungsten pins should be on top of each other on the radiographs. The lateral lasers should align with the center scribe lines and the sagittal laser should align with the scribed line on the 15 cm side of the mini-phantom. To check the overhead laser rotate the gantry so the overhead laser shows upon the mini-phantom. The overhead laser should align with the center scribed line on the top of the mini-phantom. Raising and lowering the couch to the scribes at 5 cm from center and checking the couch vertical movement indicator can check the couch vertical movement. To check lateral couch movements rotate the mini-phantom so a side with the scribes 5 cm off-center is facing up towards the gantry. Then move the couch left and right to align with the scribes that are 5 cm off-center and check the lateral couch movement indicator.

Item #	Description
710-186	Mini Phantom with Leveling Platform
710-188	Tungsten Ball Mini Phantom with Leveling Platform
710-190	5 Seed Calibration Mini Phantom with Leveling Platform

GARD™

Designed to Verify Geometric Accuracy of Linear Accelerators and Simulators



- **Easy to use**
- **Provides quick visual verifications**
- **Helps eliminate errors**

The GARD™ is designed to fit into the shadow tray of the therapy machine, providing a fixed reference point for all measurements. This helps to eliminate errors associated with using independent devices for each geometric parameter.

Gantry and Collimator Angle Indicators
By using a smart tool level, indicators of gantry and collimator angle can be visually verified to 1/16" (0.16 cm) of a degree. The level is mounted so that it can check any gantry or collimator angle.

Optical Distance Indicator and Laser Alignment
An acrylic tray with a distance scale is supplied with the GARD™. Simply slide the tray into the accessory mount of the GARD™ and turn on the machine distance indicator. The distance markers from the machine will be visible on the GARD's™ distance indicator and should coincide. The sides of the GARD™ have white acrylic plates on which black vertical and horizontal lines have been engraved. When aligned, the field lasers should coincide with the etched black lines.

Light and Radiation Field Coincidence
An optional film cassette (8" x 10" or 20.32 x 25.4 cm) is available which fits into the accessory mount of the GARD™. The top is etched with markings of four field sizes. Field size and crosshair position accuracy, as well as light and radiation field coincidence, can be verified.

Specifications

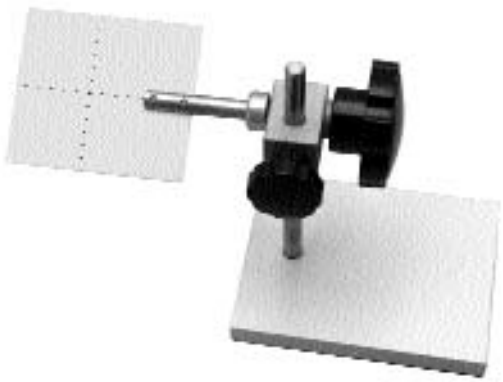
Goniometer Accuracy/Resolution: 0.2°
Optical Distance Indicator Resolution: 1.0 mm
Field Size Indicators: 5 x 5 cm, 10 x 10 cm, 15 x 15 cm, 20 x 20 cm
Size: 13.5" x 13.5" x 14.5" H (34.3 x 34.3 x 36.8 cm)
Weight: 9.5 lb (4.4 kg)

Item	GARD™
433-411	All Siemens with Digital Coding
433-518	Varian II - 65.4cm, with Standard 11 3/4" Tray
433-522	Varian II - 61.6cm, with Standard 11 3/4" Tray
433-535	Varian III-61.6cm, w/Opt. Coded Tray
433-536	Varian III-65.4cm, w/Optical Coded Tray
433-537	Varian III-65.4cm, MLC w/Optical Tray

Item	GARD™
433-700	Elekta Precise 31.9cm
433-753	Elekta Synergy/Infinty 66.59 cm
433-754	Elekta Synergy/Infinty 65.31 cm
433-755	Elekta Precise 56.23 cm
433-756	Elekta Synergy 52.9 cm
433-980	Optional Film Cassette

Please call regarding other manufacturers

ROTATING ALIGNMENT PLATE AND STAND



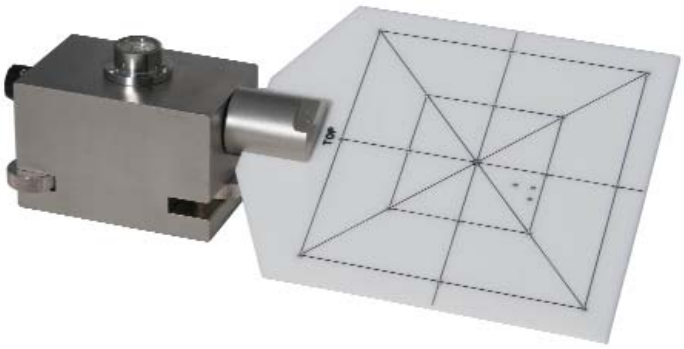
The Rotating Alignment Plate and Stand will allow an easy check of isocenter using the collimator light and lasers. A 1.3 mm diameter tungsten ball located in the center will show up on x-ray or under fluoroscopy.

Specifications

Size
White Acrylic Plate: 2.5" x 3" (6.35 x 7.62 cm)
Steel Base: 4" x 5" x 0.5" (10.16 x 12.7 x 1.27 cm)
Stainless Steel Post: 5.5" (14 cm)
Color: Beige base
Weight: 3.6 lb (1.64 kg)

Item	Description
710-005	Rotating Alignment Plate and Stand

ISOCENTRIC BEAM CHECKER I



- **Radiation and light-field congruence**
- **Collimator isocentricity**
- **Collimator field size accuracy**
- **Compact and easy to carry**
- **Laser alignments**
- **No assembly required**
- **Gantry isocentricity**
- **Rugged construction**

The Isocentric Beam Checker I (IBC I) is used to precisely find the isocenter of any radiation therapy machine. It checks the alignment of side lights or laser beams used for patient set-ups in radiation therapy, conventional tomography and CT scanning.

The Isocentric Beam Checker consists of stainless steel base containing three adjustable rubber-tipped legs and built-in bubble level. Attached to the base is a translucent screen plate which can be rotated 360° in 15° steps. Inscribed on the plate are 3 field sizes; 2 mm x 2 mm, 5 cm x 5 cm and 10 cm x 10 cm. The field sizes are outlined with parallel and diagonal lines. The center of the field and all corners are provided with tungsten markers to project a sharp image of the field on verification films.

Specifications

Material: Stainless Steel and Lucite
Size: 9.5" L x 4.7" W x 2.5" H (24.13 x 11.94 x 6.35 cm)
Weight: 3 lb (1.4 kg)

Item	Description
710-020	Isocentric Beam Checker I

ISOCENTER/LASER ALIGNMENT DEVICE

710-030

352-104

352-108

The Isocenter Alignment Device is a simple quality assurance device for testing alignment of isocentric beams. It allows for adjustments to be made by one person. One set-up will permit alignment of the side, overhead and sagittal lasers. It is usable with dot or line lasers.

Specifications

Size: 2" L x 2.25" W x 2" H (5.08 x 5.72 x 5.08 cm)
Weight: 0.2 lb (.01 kg)

Item	Description
710-030	Isocenter/Laser Alignment Device
352-104	Bulls Eye Circular Level
352-108	6 cm Level

ISOCENTER/LASER ALIGNMENT DEVICE WITH TUNGSTEN BALL

2 mm Tungsten Ball

The Isocenter / Laser Alignment Device with Tungsten Ball is a simple quality assurance device for testing alignment of isocentric beams and room lasers. The addition of the 2 mm Tungsten Ball at central axis is to allow film verification of isocenter with a set orthogonal film exposures. This device allows for laser adjustments to be made by one person. One set-up will permit alignment of the side, overhead and sagittal lasers and isocenter verification on film. It is usable with dot or line lasers.

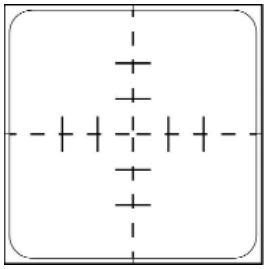
Specifications

Marker: 2 mm Tungsten Ball
Size: 2" L x 2.25" W x 2" H (5.08 x 5.72 x 5.08 cm)
Weight: 0.2 lb (.01 kg)

Item	Description
710-031	Isocenter/Laser Alignment Device with Tungsten Ball

73 mm CUBE

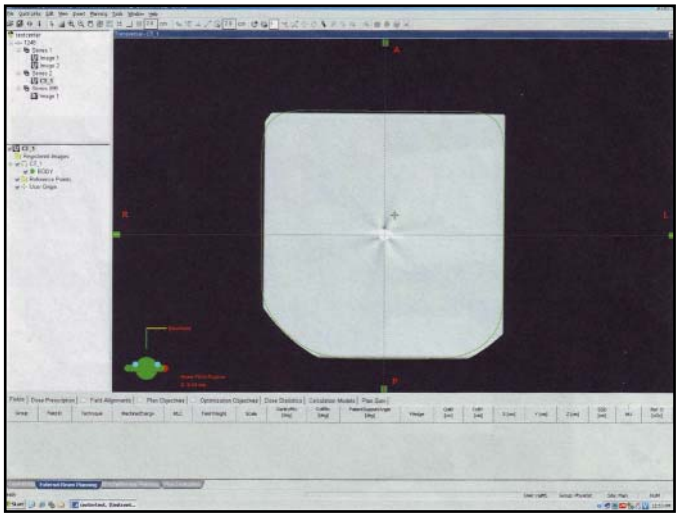
Acrylic Cube with One 2mm Stainless Steel Marker



This Cube can be used to do a modified Winston-Lutz test for IGRT accuracy. The phantom will provide a means to test the isocenter coincidence from CT scan to treatment planning system to treatment delivery.

The accuracy of radiation isocenter relative alignment and couch shift process is of fundamental importance in the accuracy of delivered dose in Image Guided Radiation Therapy (IGRT). Item 710-038, the 73mm Cube, has one (1) Central axis stainless steel marker for the testing and verification of predetermined measurable couch shifts. This phantom can be used to test the accuracy of CBCT alignment and couch shift in a simple and efficient manner. Images can be transferred to the treatment planning system to check coincidence of treatment planning system to couch shifts.

It is, therefore, critical to ensure the coincidence of these two coordinate systems for different clinical needs of image-guided radiation therapy procedures. The QA item "imaging and treatment coordinate coincidence" is aimed to test this coincidence and is applicable for each of the imaging systems considered. In addition, each system performing patient positioning and/or repositioning based on in-room imaging systems, either 2D or 3D, relies upon vendor software that compares and registers on-board images and reference images. Quality assurance of this process could be easily done by a phantom study with known shifts and is recommended for each system used clinically. The accuracy of this process should be tested on the daily basis, especially for SRS/SBRT.



Like the original Winston-Lutz test, the *isocenter coincidence* test is an end-to-end QA procedure in that it must start with the planning imaging process and end with the treatment step. In this case the last step is the use of the treatment beam to both irradiate and image markers using the treatment beam.

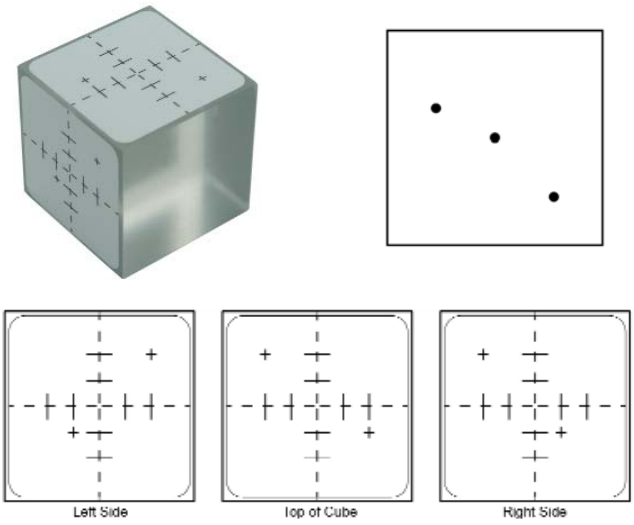
The 73mm Cube is made of Acrylic with three (3) sides each having a white vinyl label with the alignment markings as seen above. The stainless steel marker can be seen on the other three (3) sides.

Specifications
Stainless Steel Marker Location in Cube: at isocenter: X;Y;Z=0
Stainless Steel Marker Diameter: 2mm
Alignment Markings
Central axis: 4mm long dashes
X, Y, and Z: at 1cm and 2cm from central axis, 1cm long dashes
Material: Acrylic, White Vinyl and Stainless Steel
Size: 2.875 x 2.875 x 2.875 cm (73 x 73 x 73 mm)

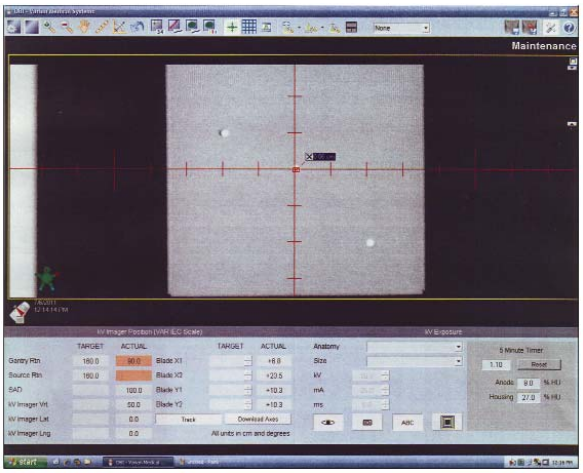
Item	Description
710-038	73 mm Cube, Acrylic w/One 2 mm Stainless Steel Marker

73 mm CUBE

Acrylic Cube with Three 2 mm Tungsten Markers



Alignment Markings



Sample Left Lateral kv Image: Displacement of 1 mm is noted from the crosshair to center of phantom

The accuracy of CBCT alignment and couch shift process is of fundamental importance in the accuracy of delivered dose in Image Guided Radiation Therapy (IGRT). Item 710-039, the 73mm Cube, has one (1) Central axis tungsten marker and two (2) offset tungsten markers for the testing and verification of predetermined measurable couch shifts.This phantom can be used to test the accuracy of CBCT alignment and couch shift in a simple and efficient manner. Images can be transferred to the treatment planning system to check coincidence of treatment planning system to couch shifts.

General Operation for Daily CBCT Shift Verification

Place the phantom cube on the CT couch. Align the phantom utilizing the positioning lasers on the CT machine and the laser alignment markings on the phantom. An axial CT scan of the phantom is acquired. The reference images are imported into the TPS and a simple plan is generated where the tungsten marker is aligned to the isocenter described by the TPS.

Normally one would place the phantom on the Linac couch in a known offset position from isocenter with the use of inscribed markings on the phantom. Then a CBCT scan is acquired in the offset position and the therapist aligns the phantom as one would align the patient using tools on the OBI workstation. The necessary couch shift is applied to move the phantom to the isocenter. After the couch shift is performed, the user can verify the location of the isocenter after the shift and document the deviation from the true isocenter. This test will ensure the CBCT alignment process is performing as intended within the tolerance levels established by the physicist.

Monthly OBI Gantry Rotation and Isocenter Accuracy Test

Place the phantom in the isocenter position (on the center tungsten marker) with the aid of the Linac crosshairs. Then acquire a kv image at the four cardinal angles. Using the OBI graticule tool, the displacement of the tungsten marker from the graticule crosshair can be tabulated as shown in the worksheet below (this process can also be applied to the MV imaging):

The 73mm Cube is made of Acrylic with three (3) sides each having a white vinyl label with the alignment markings as seen above. The tungsten markers can be seen on the other three (3) sides.

Specifications

Tungsten Marker Locations in Cube
- **One (1) at isocenter:** X;Y;Z=0
- **One (1) located from isocenter:** X: -2 cm; Y: -2 cm; Z: +2 cm
- **One (1) located from isocenter:** X: +2 cm; Y: +1 cm; Z: -1 cm

Tungsten Marker Diameter: 2 mm

Alignment Markings
- **Central Axis:** 4 mm long marks
- **X, Y, and Z:** 1 cm and 2 cm from central axis, 1 cm long marks
- **Offset Marker Locations:** Marked with +

Material: Acrylic, White Vinyl and Tungsten

Size: 2.875 x 2.875 x 2.875 cm (73 x 73 x 73 mm)

Item	Description
710-039	73 mm Cube, Acrylic w/Three 2 mm Tungsten Markers

T.A.D. THERAPY ALIGNMENT DEVICE

One simple device can align your Linac, ODI, CT, Lasers and Couch.

Perform the following tests with just one tool:

- Optical Distance Check Over 20 cm Range
- Collimator 90° Rotation Test
- Lasers Test: Side, Overhead and Sagittal
- Couch Height Test Over 20 cm Range
- Couch Vertical Travel Wander
- Couch 90° Left or Right Rotation
- CT Test Cut for Couch Center Alignment and Height
- CT Side Laser Height Check Over 20 cm
- CT Laser Height Test Over 20 cm
- CT Couch Height Vertical Travel
- CT Couch Height, Vertical Travel, CT Cut Stays on Same Spot to Indicate Gantry Vertical
- Gantry 90° Right and Left Test with Radiation and Gantry Vertical Test Using Film or Image Receptor
- Light Field vs. Radiation Field 10 cm x 10 cm and 20 cm x 20 cm with divergent tungsten pins
- CT Distance Alignment Check Over 0 cm, 8 cm, 13 cm and 21 cm Viewing 0.75 mm Aluminum Balls (Inside Balls 5 cm apart and Outisde Balls 21 cm apart)

Therapy Alignment Device Specifications

Leveling Plate Base
- 8.5" x 8.5" x 3/4" thick (21.6 x 21.6 x 1.9 cm) black acrylic with a 1/16" (0.16 cm) white engraving material top
- Three leveling screws with rubber tips to prevent movement
- One bubble level attached to top with screws
- Two half-moon side plates, scribed with black dashes that align to top of leveling plate and center markings on leveling plate

Scribing on Leveling Plate
- Central axis to 20 cm
- 10 cm x 10 cm field
- 20 cm x 20 cm field

Accelerator Markers in Leveling Plate
- Eight 1.6 mm diameter x 12.5 mm tungsten pins mounted divergently at the four corners of the 10 cm and 20 cm fields
- One removable tungsten pin in the center
- Two 1.6 mm diameter tungsten pins are horizontally half-way embedded in the scribe lines 3 mm from the side plates

CT Markers in Leveling Plate
- Four 1/32" (0.08 cm) diameter aluminum balls imbedded flush with surface at 2.5 cm and 10.5 cm from central axis in one plane
  Note: Tungsten pin must not be in the center hole for CT

ODI Scale Specifications

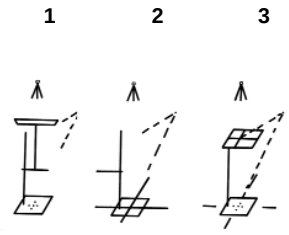
Base
- 2" x 2" x 0.875" thick (5.08 x 5.08 x 2.22 cm) black acrylic base
- 2" W x 8.125" H x 1/8" thick (5.08 x 20.64 x 0.32 cm) white/black/white engraving material attached to base

Scribing on ODI Scale
- Vertical dashed line
- Horizontal lines at 5.0 cm, 10.0 cm. 15.0 cm and 20.0 cm from bottom of scale

Item #	Description
710-040	T.A.D. Therapy Alignment Deivice

OPTICAL DISTANCE VERIFICATION AND ALIGNMENT TOOL

With Isocentric Ball Pointer



This system will calibrate optical distance indicators on accelerators, cobalt units and simulators. The ball pointer is used to determine the rotational isocenter of the treatment machine collimator head and gantry. The ball pointer is also visible in fluoroscopy on simulators.

Instructions

Step 1

Determine the most useful range (40 cm or less) of the Optical Distance Indicator (ie. 80 cm to 120 cm range with a 100 cm isocenter). Figure 1 - set the white plastic tray five steps (20 cm) down from the top. Use an Accurate Mechanical Distance Rod adjusted for 100 cm isocenter and adjust the couch height until the distance rod just touches the white plastic tray.

Step 2

Figure 2 - rotate the white plastic tray around 180º out of the field and adjust the alignment tool so crosshairs align with the black dots on the base plate.

Step 3

Figure 3 - raise the white plastic tray up 20 cm. This tray would show field light crosshairs intersecting with 80 cm. The black dots on the base represents the crosshairs and will intersect with 120 cm.

Step 4

Adjust the Optical Distance Indicator so that 80 cm and 120 cm are obtained at the same time. When both points are precisely on, linearity can be checked in 5 cm steps by moving the plastic tray down the rod.

Specifications

Optical Distances: 5 cm steps to 40 cm
Material: White plastic w/mat finish and black dots
Ball Pointer: 1/16” dia. ball on 12” long rod
Rod Clamp
Base: 10 cm W x 13 cm L x 1/2” T zinc plated steel w/rubber feet
Height: 43 cm
Weight: 4 lbs

Item #	Description
710-000	Optical Distance Verification and Alignment Tool

MAGNETIC FRONT POINTER

The Magnetic Front Pointer provides a mechanical SSD Check, and verification of the Optical Distance Indicator (ODI).

The tray for the magnetic front pointer slides into the block tray slot. The rod is held to the tray by a magnet. Each rod has a 10 cm range with an engraved scale in 2 mm increments. The scale on the Magnetic Front Pointer has an adjustment range of 3.8 mm.

One rod of the customers choice is included with the magnetic front pointer.

When ordering please specify manufacturer and model of machine, tray size, and rod to be included.

Item	Magnetic Front Pointer
701-401	for Varian Clinac 4/80
701-402	for Varian Type II Accessory Mount
701-403	for Varian Type III Accessory Mount
701-407	for Siemens with Coding By-Pass
701-408	for Siemens with Screw Coding
701-409	for Siemens with Digital Coding Plug
701-410	for Siemens with MLC - Digital Coding
701-411	for Siemens Primus with MLC, 56.6 cm
701-420	for Philips SL25
701-426	for GE Saturne 40, 41, 42 or 43
701-428	for ACEL Theratron 780C
701-429	for AECL Theratron Elite 80
701-430	for MDS Nordion / BEST
701-431	for Mitsubishi ML-6M, ML 20M
701-432	for Mitsubishi
701-433	for Siddharth 6MeV Linear Accelerator

Item	Rods
701-400-30	70 to 80 cm
701-400-31	80 to 90 cm
701-400-32	90 to 100 cm
701-400-33	100 to 110 cm
701-400-34	110 to 120 cm

X-LITE

QA Tool for Light Field Alignment Checks

Correct alignment of the light field with the radiation field is essential for reliable treatment set-up. According to national and international recommendations this alignment should be checked at least once a week and should correspond to within ±2mm at SSD 100cm.

The X-Lite with a fluorescent plate helps you align the accelerator radiation fields on the treatment table quickly and directly. The plate is activated by ionizing radiation, producing a green fluorescence which is clearly visible for a few minutes after the radiation is switched off. The 5x5, 10x10, 15x15 and 20x20 cm^2 active areas are permanently marked with field scales in centimeters.

A protective red filter prevents activation of the phosphor by the light field from the gantry head or by ambient light. Irradiation photons and electrons penetrate the filter to activate the plate.

Using X-Lite is easy and alignment checks can be part of the daily routine. With the filter in place, align the light field according to the scale on X-Lite. Put any required build-up material on the plate and irradiate. Remove the filter from X-Lite and check the radiation field alignment.

It is not necessary to wait for the afterglow to fade between irradiations, since the contrast is high as long as the following irradiation uses the same dose or higher

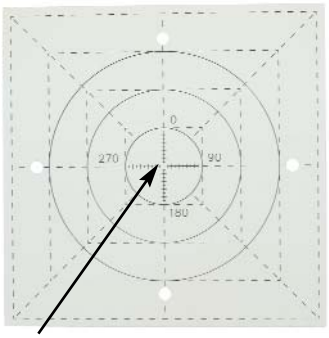
Specifications

Active Area: 23 x 23 cm
Field Scale: 5 x 5 cm, 10 x 10 cm, 15 x 15 cm, 20 x 20 cm
Deviation Scale: ±5 mm in steps of 1 mm from each field scale.
Scale Accuracy: ±1 mm
Maximum Dose: 6 Gy/exposure
Radiation Type: Photons, electrons
Daylight Filter: Red, removable
Material: Plexiglass / polycarbonate
Operating Temperature: 59° - 113°F (15° - 45°C)
Dimensions: 10.87" W x 12.6" L x 0.55" H (32 x 27.6 x 1.4 cm)
Weight: 3.1 lb (1.4 kg)

Item	Description
710-705	X-Lite

TUNGSTEN ALIGNMENT PATTERN PLATE

For Accelerators and Simulators



4 Posterior Crosshair Line Viewers

Film Verification of light field to radiation field is accomplished by placing a Ready Pack film under the tungsten pattern plate. Tests include the following: collimator zero and rotation verification, field size, gantry sag, collimator filament sag, light field to radiation field with film or image tube, fluoroscopy horizontal and vertical linearity check.

Specifications

Sizes: 10, 20, 30, and 40 cm squares and circles
Overall Size: 16 5/8" sq. x 1/8" T (42.38 x 0.32 cm)

Item	Description
710-713	Tungsten Alignment Pattern Plate

PLUMB BOB

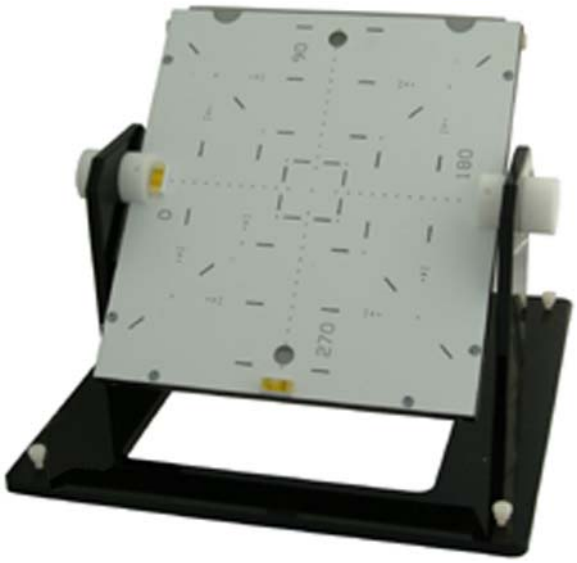
Nickel-Plated

The Plumb Bob can be used to align gantries, couches, laser lights and more. Gantry vertical alignment can be accomplished by marking the cross hair projection spot on the ceiling and floor, then dropping the Plumb Bob line from the ceiling spot to the floor spot. The machine alignment is vertical when the Plumb Bob line intersects with the ceiling and floor spots.

Item	Description
352-120	Plumb Bob, Nickel-Plated

TUNGSTEN ROTATING ALIGNMENT PATTERN DEVICE

For Ready Pack Film For Accelerators and Simulators



Checks the following mechanical and geometrical parameters of accelerators and simulators easily and accurately:

- **Radiation / field-light congruence**
- **Collimator field size accuracy**
- **Isocenter rotation accuracy**
- **Collimator, gantry, and table isocentricity**
- **ODI accuracy**
- **Laser alignment**
- **Uses 10"x12" Ready-Pack Film**

The Tungsten Rotating Alignment Pattern (TRAP) is an easy to use multi-purpose QA test tool for daily, weekly, monthly, or annual checks of the mechanical and geometric parameters of linear accelerators and simulators.

The TRAP has a 40.5 cm wide x 40.5 cm long black acrylic base with a 25 cm wide x 30 cm long cutout. The base cutout allows for viewing of the central axis on the plate with the gantry at 0°. The base has 5 rubber-tipped leveling screws (3 leveling screws and 2 stabilization screws).

The vertical supports are black acrylic with 1 3/4" (4.46 cm) diameter knobs for rotating the plate. The knobs have indents every 45° for accurate positioning when rotating the plate. The rotating plate consists of two white plates that allow a 10" x 12" ready pack film to be inserted between and secured by a clamp. Two half-moon cutouts on the plates make it easy to grasp the film and pull it out.

On one plate there are 1.6 mm diameter tungsten balls and 1.6 mm diameter x 12.7 mm long tungsten rods embedded with gray epoxy which give a sharper film image. The dark markings allow for easy viewing of the field-light and central axis on the plate surface. The 5 cm^2, 10 cm^2 and 20 cm^2 fields are defined by tungsten balls and rods. The tungsten balls are used to form arrows so film orientation is easily seen and no film pricking is necessary. Tungsten balls are also placed at central axis and every cm from 2 cm to 13 cm and again at 15 cm. Device orientation is accomplished with 0, 90, 180 and 270 markings on the plate. Two bubble levels on this plate ensure level accuracy of the rotating plate.

On the other plate dashed lines are used to correspond to central axis. This allows for verification of lasers to central axis.

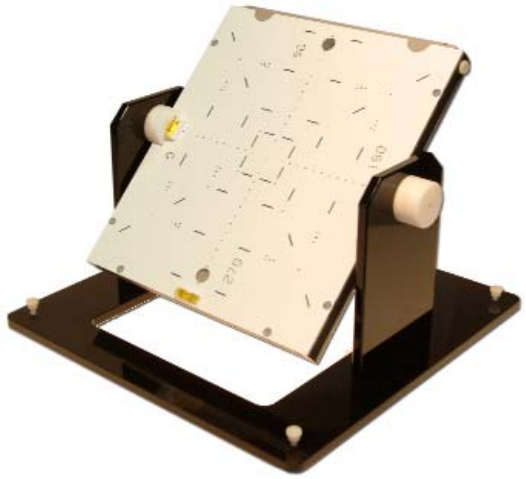
Specifications

Field Sizes: 5 x 5 cm, 10 x 10 cm and 20 x 20 cm
Rotation: 360° in 45° increments
Positioning: Self-seating indents
Markers: 1.6 mm Dia. tungsten balls
1.6 mm Dia. x 12.7 mm L tungsten rods
Leveling: 3-point with 2 bubble levels
Maximum Size: 40.5 W x 40.5 L x 36.7 H cm
Screen Size: 33.7 W x 30.5 L cm
Material: Black acrylic; White and clear engraving material
Weight: 9 lb (4.09 kg)

Item	Description
710-720	Tungsten Rotating Alignment Pattern Device for Ready Pack Film

TUNGSTEN ROTATING ALIGNMENT PATTERN DEVICE

For CR Cassette For Accelerators and Simulators



Checks the following mechanical and geometrical parameters of accelerators and simulators easily and accurately:

- **Radiation / field-light congruence**
- **Collimator field size accuracy**
- **Isocenter rotation accuracy**
- **Collimator, gantry, and table isocentricity**
- **ODI accuracy**
- **Laser alignment**
- **Uses a Standard CR Cassette**

The Tungsten Rotating Alignment Pattern (TRAP) is an easy to use multi-purpose QA test tool for daily, weekly, monthly, or annual checks of the mechanical and geometric parameters of linear accelerators and simulators.

The TRAP has a 40.5 cm wide x 40.5 cm long black acrylic base with a 25 cm wide x 30 cm long cutout. The base cutout allows for viewing of the central axis on the plate with the gantry at 0°. The base has 5 rubber-tipped leveling screws (3 leveling screws and 2 stabilization screws).

The vertical supports are black acrylic with 1 3/4" (4.46 cm) diameter knobs for rotating the plate. The knobs have indents every 45° for accurate positioning when rotating the plate. The rotating plate consists of two white plates that allow a standard CR Cassette to be inserted between and secured by thumb screws. Two half-moon cutouts on the plates make it easy to grasp the cassette and pull it out.

On one plate there are 1.6 mm diameter tungsten balls and 1.6 mm diameter x 12.7 mm long tungsten rods embedded with gray epoxy which give a sharper film image. The dark markings allow for easy viewing of the field-light and central axis on the plate surface. The 5 cm^2, 10 cm^2 and 20 cm^2 fields are defined by tungsten balls and rods. The tungsten balls are used to form arrows so film orientation is easily seen. Tungsten balls are also placed at central axis and every cm from 2 cm to 13 cm and at 15 cm. Device orientation is accomplished with 0, 90, 180 and 270 markings on the plate. Two bubble levels on this plate ensure level accuracy of the rotating plate.

On the other plate dashed lines are used to correspond to central axis. This allows for verification of lasers to central axis.

Specifications

Field Sizes: 5 x 5 cm, 10 x 10 cm and 20 x 20 cm
Rotation: 360° in 45° increments
Positioning: Self-seating indents
Markers: 1.6 mm Dia. tungsten balls
1.6 mm Dia. x 12.7 mm L tungsten rods
Leveling: 3-point with 2 bubble levels
Maximum Size: 40.5 W x 40.5 L x 36.7 H cm
Screen Size: 33.7 W x 30.5 L cm
Material: Black acrylic; White and clear engraving material
Weight: 14 lb (6.36 kg)

Item	Description
710-721	Tungsten Rotating Alignment Pattern Device for CR Cassette

ISOCENTRIC BEAM CHECKER II

- **Radiation / light-field congruence**
- **Collimator isocentricity**
- **Collimator field size accuracy**
- **Isocenter rotational stability**
- **Accepts 10" x 12" Ready Pack Films**
- **Laser alignments**
- **ODI accuracy**
- **Gantry isocentricity**
- **Table isocentricity**

The IBC II, a “multi-purpose” precision quality assurance tool, is an easy to use test device for daily, weekly or monthly quality assessments of all mechanical and geometrical treatment parameters of linear accelerators or teletherapy units.

The Multifunctional Isocentric Beam Checker, IBC II, consists of a large opaque acrylic screen backed by a secondary plate, both supported by two lateral uprights. The screen is inscribed with lines precisely defining corners, edges and center of the screen’s 2 mm square, 5 cm square, l0 cm square, l5 cm square and 20 cm square fields. Intersecting center lines are inscribed with short lines spaced 1 cm apart. The screen can rotate about its axis in increments of 45°.

Tungsten markers of 2 mm diameter are embedded in the center and corners of the fields. A l0" x 12" ready-pack film can be sandwiched between the two plates. When exposed, the tungsten markers project a sharp image on the film. The necessity of pricking holes into the film is therefore eliminated.

Caution: Although provided with non-slip rubber-tipped adjustment thumb screws, care must be taken not to displace the IBC during rotation of the screen plate. The screen plate can be rotated in 45° increments. To rotate the screen plate it is best to grab both left and right knobs together while turning them simultaneously. When turned 45°, the screen seats itself accurately and automatically thus repositioning is accomplished easily and quickly.

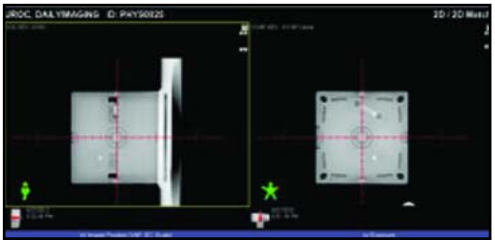
Specifications

Field Sizes: 2 mm, 5 cm, 10 cm, 15 cm and 20 cm
Rotation: 360° in 45° increments
Positioning: Self-Seating
Markers: All intersecting corners: 2 mm O.D. dia. tungsten balls
Leveling: 3-point w/bubble level
Size: 20.3 W x 45.7 L x 33 H cm
Screen Size: 30.5 x 30.5 cm
Materials: White and clear plexi and tungsten
Weight: 6.1 lb (2.8 kg)
Shipping: Fully assembled

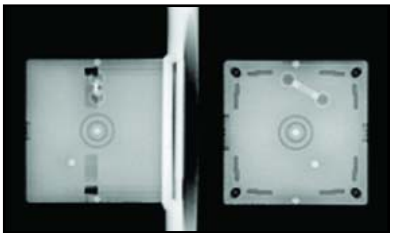
Item #	Description
710-730	Isocentric Beam Checker II

ISO CUBE™ DAILY QA PHANTOM

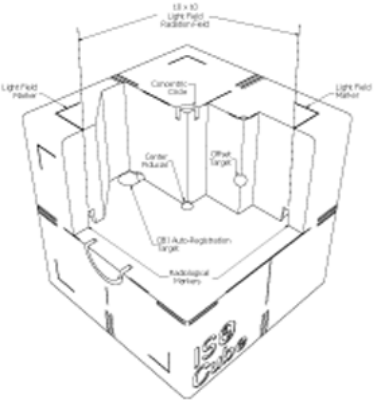
ISO Cube™ with ISO Base



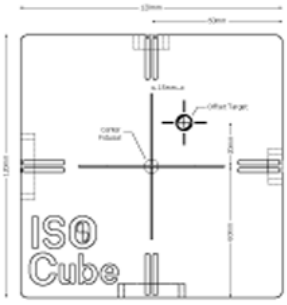
2D/2D match of kV and DRR



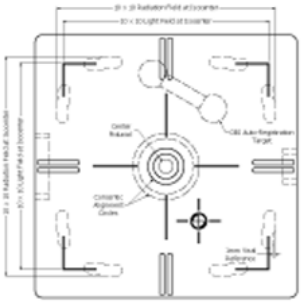
Concentric circles verify accurate alignment of ISO Cube and establish true position of the kV radiation isocenter



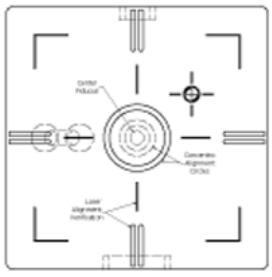
Internal View



Inferior / Superior View



Anterior / Posterior View



Lateral View

- **Fast and easy to use**
- **Unique shell fiducials produce sharp clear images in EPID, kV and CBCT imaging**
- **Offset fiducial to check accuracy of couch corrections**
- **Check**
  - **Laser alignment**
  - **Light field size verification**
  - **kV and MV imager coincidence**
  - **CBCT process accuracy**
  - **ODI accuracy**
  - **Table height accuracy**
  - **Radiation field/light field alignment**

Target positioning through imaging localization is critical for the accurate delivery of radiation treatment. Verifying that all of the imaging, localization and targeting systems are aligned with the true radiation isocenter is crucial. The ISO Cube™ provides a cost-effective, quick and accurate means of testing radiation isocenter coincidence with the isocenters of the image guidance systems.

The ISO Cube™ was designed specifically for daily system checks. The lasers and light field can be tuned to the true radiation isocenter using the engraved markings on the exterior of the ISO Cube™. The light field and radiation field alignment can be checked using integral radiographic markers. More importantly the isocenters of both the ODI and the EPID can be checked for true spacial alignment and coincidence with that of the treatment beam.

ISO Analyze™ Image Analysis Software integrates with the ISO Cube™ Daily QA Phantom and ISO Base™ Alignment Platform, enabling user-friendly quality control of the isocenter of a LINAC by analyzing DICOM images acquired with the EPID detector. Controls are run automatically, analyzing the image of the ISO Cube™ and quantifying a large number of evaluation parameters. It allows users to easily generate a report for each preceding control.

Item 710-323 ISO Cube Daily QA Phantom Includes

- ISO Cube™ Daily QA Phantom
- User Guide
- 48 month Warranty

Specifications

Material: Plastic Water®
Size: 4.75" x 4.75" x 4.75" (12 x 12 x 12 cm)
Weight: 3.9 lb (1.7 kg)

Item	Description
710-323	ISO Cube™ Daily QA Phantom

Item	Accessories
710-325	ISO Cube™ Stereotactic Target Frame Adapter
710-327	ISO Align Altazimuth Alignment Platform
710-328	ISO Analyze Image Analysis Software Pkg
710-329	ISO Base Alignment Platform

ISO CUBE™ DAILY QA PACKAGE

Affordable "TurnKey" Solution for daily machine QA

Target positioning through imaging guidance is critical for the accurate delivery of radiation treatment. Verifying that all of the imaging, localization and targeting systems are aligned with the true radiation isocenter is crucial. The ISO Cube™ Daily QA Package provides a cost-effective, fast and accurate means of testing radiation isocenter coincidence with the isocenters of the image guidance systems.

The package includes ISO Cube™ Daily QA Phantom, ISO Base™ Platform and ISO Analyze™ Image Analysis Software.

ISO Analyze™ integrates with the ISO Cube™ and ISO Base™, enabling user-friendly quality control of the isocenter of a LINAC by analyzing DICOM images acquired with the EPID detector. Controls are run automatically, analyzing images of the phantom and quantifying a large number of evaluation parameters. The software allows users to easily generate, save and print a report for each preceding control.

The ISO Base™ is used to position and level the ISO Cube™ on the treatment couch. It contains integrated pixel calibration targets for use with ISO Analyze™.

The phantom, base and software were designed specifically for daily system checks. LINAC laser and light fields can be “tuned” to true radiation isocenter using the engraved markings on the exterior of the phantom. The light field and radiation field alignment can be checked using the phantom’s integral radiographic markers. More importantly the isocenters of both the OBI and the EPID can be checked for true special alignment and coincidence with that of the treatment beam.

The ISO Cube contains a center point target and an offset target. The center point target imaged in concert with the external concentric engraved circles provides greater accuracy localizing the center of the phantom with respect to the center of the radiation field. The off-set target is used to insure the table offset coordinates generated by kV/MV imaging are accurate.

Item 710-330 ISO Cube™ Daily QA Package Includes

- ISO Cube™ Daily QA Phantom
- ISO Base™ Alignment Platform
- ISO Analyze™ Image Analysis Software Package
- User Guide
- 48 month Warranty

Optional Items

Item 710-325 ISO Cube™ Stereotactic Target Frame Adapter

Specifications - ISO Cube™

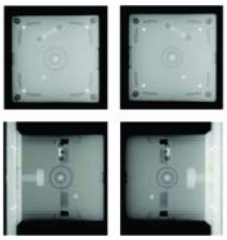
Material: Plastic Water®
Size: 4.75" x 4.75" x 4.75" (12 x 12 x 12 cm)
Weight: 3.9 lb (1.7 kg)

Item	Description
710-330	ISO Cube™ Daily QA Package
710-325	ISO Cube™ Stereotactic Target Frame Adapter

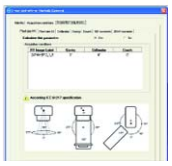
Integrated Data Analysis in 5 Easy Steps

Acquire
Use pre-established ISO Cube's treatment plan to acquire all necessary images for analysis of parameters

ISO Analyze™ Software provides suggested image sequences for each parameter



Define
One time setup for each LINAC requires:
- LINAC Identity
- Acquisition Conditions
- Acquisition Sequences



Select
Select pre-acquired DICOM images to use in each parameter calculation

Select images are highlighted for each parameter.

Why use ISO Cube™?

1. The stereo-triangulation approach employed with ISO Cube is similar to that of highly accurate GPS Systems. The calculation accuracy of the isocenters is based on projections of targets distributed in a 3D space contained within the 3D space found at the convergence of the treatment beams.

2. ISO Cube allows for comprehensive and thorough testing of LINAC specific centers of rotation.

3. ISO Cube allows for quick, daily QA of OBI and CBCT isocenters.

4. ISO Cube shows the impact of postioning a 3D object on the couch using LINAC specific positioning lights and lasers.

5. ISO Cube offers an opportunity to assess the orthogonality of LINAC specific positioning lights and lasers.

6. ISO Cube allows calculation of the planar deviation between the center of the radiation field and the projection of the LINAC mechanical ISO center on the image plane for each gantry and collimator position. This eases troubleshooting of clear outliers.

7. ISO Cube's internal features permit assessment of misalignment between light field and radiation field.

Calculate
ISOAnalyze™quickly calculates parameters and displays detailed results

Report
Detailed results can be manipulated for in-depth analysis

Summary report is displayed and PDF document may be printed and saved

O

BEAM SENTRY 2 DAILY OUTPUT CONSTANCY MONITOR

Model 105 A

- **Sealed ion chamber - no air density correction necessary**
- **Reversible detector - dual entrance windows, 6 & 18 MV**
- **Electrometer protected from radiation**
- **Remote operation using a standard triax extension cable**
- **Powered by a single 9V battery - no bias batteries to replace**
- **Electronic bias - full and half voltage**

Beam Sentry 2 provides a convenient and economical means of performing daily radiation output constancy checks. It is a light-weight, portable unit with remote readout featuring the accuracy of a digital display. The unique design, featuring a separate ion chamber, eliminates radiation damage to the electronics while allowing both the dosimeter and the ion chamber to be used independently for other purposes.

Beam Sentry 2 is easy to use. Simply connect the electrometer to the ion chamber assembly, place the electrometer at the foot of the treatment table, collimate the beam to the 10 cm field markings on the ion chamber, make the exposure and collect the reading.

The electrometer offers high accuracy, precision and repeatability, and is suitable as a stand-by or a back-up dosimeter. The connectors are triaxial BNC, permitting use with a standard triaxial extension cable for reading successive doses from outside of the treatment room and providing interchangeability with other dosimetry ion chambers and electrometers.

The detector assembly contains a sealed plane-parallel plate ion chamber, requiring no corrections for barometric pressure and temperature changes. The detector assembly is reversible, having two entrance windows, each with a 10 cm field markings. One entrance window has a buildup optimized for 6MV and electron beams, and the opposite entrance window has a buildup optimized for 18MV.

Specifications

Electrometer
Display: 3 1/2 digit LCD
Range: 19.99 and 199.9
Units: Factory set: R, cGy, or nC
Accuracy: ±0.1% of reading + 1 digit
Linearity: ±0.1%, +1 digit or precision of reading, whichever is greater
Leakage: <60 fA
Temperature Stability: 20ppm/°C
Input Connector: BNC-F triax w/cap and chain
Bias Supply: Static, 300V, 100%, 50% off
Power: 9V battery, NEDA 1604A
Size: 6" x 6" x 3.5" (15.24 x 15.24 x 8.89 cm)
Weight: 2 lb (1 kg)

505A Ion Chamber Assembly
Chamber Type: Plane-parallel
Sensitive Volume: 2cc, nominal
Collector: 31 mm diameter
Electrode Spacing: 2.6 mm
Sensitivity: 0.7 nC/cGy, nominal
Top Buildup: 1.4 g/cm^2 (4-10 MV, 5-12 MeV)
Bottom Buildup: 2.6 g/cm^2 (10-25 MV, 12-25 MeV)
Cable: 6.5' (2 m) integral
Connector: Triaxial BNC (TNC optional)
Size: 6" x 6" x 1.5" (15 x 15 x 3.8 cm)
Weight: 2.4 lb (1.1 kg)

Optional Acrylic Build-Up Plate Set Includes
(1) 15 cm^2 x 0.63 cm (1/4")
(1) 15 cm^2 x 1.27 cm (1/2")
(1) 15 cm^2 x 1.90 cm (3/4")

Item #	Description
321-031	Beam Sentry 2 Daily Output Constancy Monitor
321-041	Acrylic Build-Up Plate Set
323-1303	10 Meter Triax Cable BNC-F to BNC-M

THERAPRO DAILY OUTPUT AND SYMMETRY MONITOR

- **Consistency, flatness, symmetry and energy monitoring**
- **Five ion chamber array with sixth chamber for energy constancy**
- **Automatically corrects for temperature and pressure**
- **No electronics near beam**
- **Controller runs on Windows®**
- **Touchscreen display (with optional mouse and keyboard included)**
- **32 MB internal flash memory**
- **Includes 64 MB CompactFlash™ card and USB CompactFlash card reader for exporting data**
- **Flexible data transfer to any Windows application for charting, reporting, etc.**
- **Expandable to a five-channel diode dose monitor**

The TheraPro is designed for daily output/symmetry/flatness/energy checks of radiation therapy treatment machines. High quality, ease-of-use and versatility are the prime objectives in the TheraPro design.

A Windows®-based control panel digitally controls the instrument. The TheraPro guides the user through setup, measurement and data management. The user proceeds through measurement sequences easily by using either the touchscreen interface or by clicking the mouse. The TheraPro stores a virtually-unlimited number of calibrations and measurements. Years of measurements can be stored on multiple machines using the internal 32 MB flash memory. Stored beam information includes date, time, machine name, energy, chamber readings, flatness and symmetry. Data files can be transferred via the supplied 64 MB CompactFlash™ card and USB card reader to standard spreadsheet or word processor applications.

When compared to similar devices, the TheraPro is unique because it is expandable. With the optional Diode Dosimetry Software, diode input module and diode detectors, the TheraPro can be economically upgraded to perform as a five-channel diode dosimeter, with the same data collection and storage power as mentioned above. As such, the TheraPro does not sit idle after the daily beam output checks are done.

Components

Chamber Array
The chamber array contains six ion chambers that are automatically corrected for temperature and pressure. One chamber is located in the center of the 20 cm x 20 cm field and four chambers are each located 8 cm off the central axis on the X and Y axes. The signals are sent through a custom made, molded-jacket, shielded multi-coax cable to the Data Acquisition Module located inside the treatment room. The sixth ion chamber, in a separate location, provides energy constancy information.

Data Acquisition Module
The data acquisition module contains a six-channel electrometer that sends data to the controller located outside the treatment room via inexpensive, readily available 49' (15 m) cable. Longer cable lengths are available on request.

Controller
The controller provides control and data storage for the TheraPro. This controller runs the TheraPro software under Windows® using either touchscreen or keyboard & mouse for operation. Data can be exported to standard spreadsheet and word processing programs for more extensive plotting, charting, and reporting of data.

Diode Dosimetry Software (optional)
The TheraPro can be used as a one-to-five channel dose verification monitor by using optional software and simply replacing the ion chamber array with a diode input module that accepts up to five diode detectors of either polarity.

Equidose® II Diode Detector
Items 322-862 to 322-879. Sold Separately.

Item 347-950 TheraPro Daily Output and Symmetry Monitor Includes:
Chamber Array
Data Acquisition Module
Controller
64 MB CompactFlash™ Card
USB CompactFlash™ Card Reader
Mouse
Keyboard
Acrylic Buildup Plates
Gantry Mounting Bracket
Interconnecting Cables

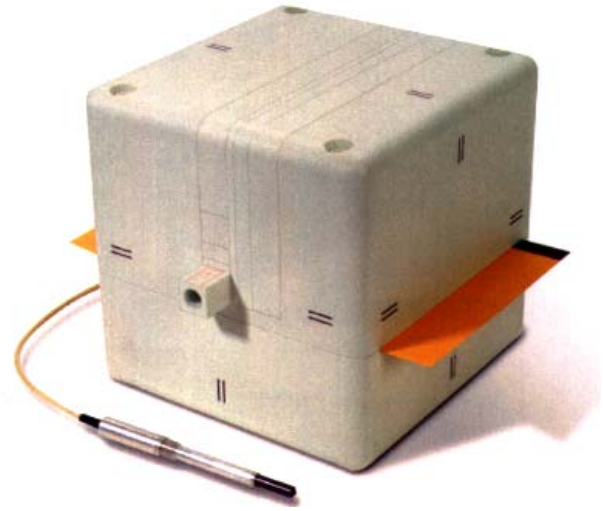
Specifications

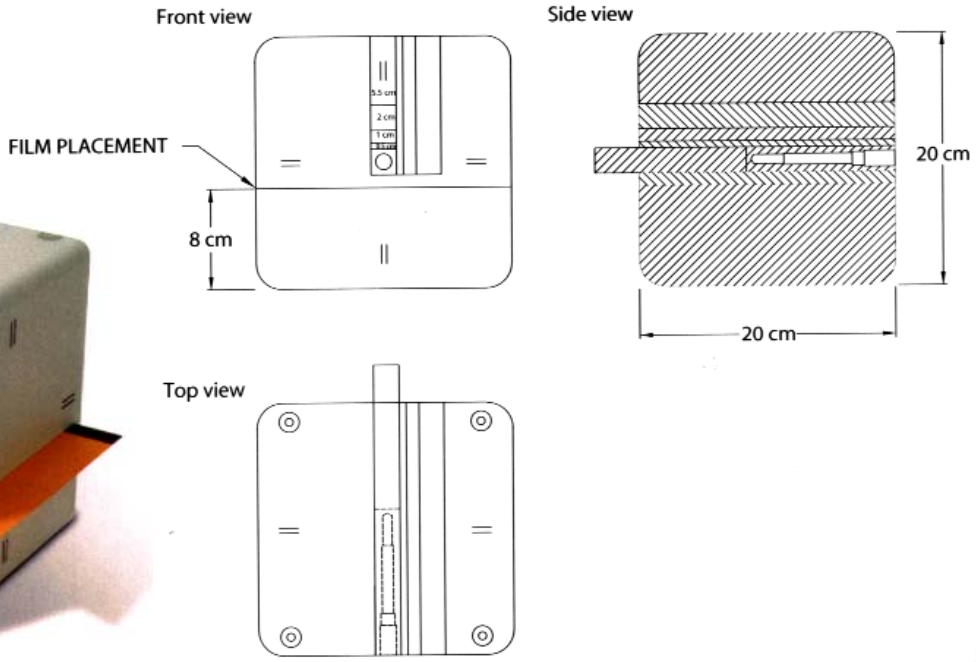
Repeatability: Within 0.5% of reading
Detectors: Six ion chambers, one on central axis, four chambers spaced at ±8cm off central axis on X-Y axes, one energy check chamber
Chamber size: ~ 0.6 cc, 1.2 cm diameter
Buildup: 0.60 g/cm^2 (0.481 acrylic + 0.084 polystyrene + 0.035 Mylar®)
Range: ~ 500 cGy (6 MV photons)
Rate Limitation: 1000 cGy/min
Deviation Limit: User selected low and high alarm
Data Link: 15 m cable transmits data from the Data Acquisition Module to the controller
Data Storage: 32 MB internal flash memory. 64 MB CompactFlash™ and USB CompactFlash™ card reader for exporting data included.
Temp. Accuracy: ±1°C
Pressure Accuracy: ±1.5 mmHg
Power: 100-240 AC, 50-60 Hz, 2 A fuse
Dim./weight:
Chamber Array Size: 9.1" x 11.2" x 1.2" (23.1 x 28.5 x 3.0 cm)
Chamber Array Weight: 3.75 lb (1.7 kg)
Data Acquisition Module Size: 10" x 5.3" x 3.7" (25.4 x 13.5 x 9.5 cm)
Data Acquisition Module Weight: 3.1 lb (1.4 kg)
Controller Size: 8.2" x 8.2" x 5.8" (20.8 x 20.7 x 14.8 cm)
Controller Weight: 4 lb (1.8 kg)

Item #	Description
347-950	TheraPro Daily Output and Symmetry Monitor
347-952	TheraPro Dose Verification Software and Diode Input Module

CUBE 20 PHANTOM

The most convenient device for routine QA and IMRT applications





Features

- Routine patient QA
- Beam constancy checks
- MLC QA
- User friendly set-up and positioning
- Suitable for head/neck and torso treatments
- Mimics water within 1%

The Cube 20 Phantom was designed for routine QA in RT and IMRT applications where ease of use and quick set-up are important. The Cube 20 phantom is manufactured from Plastic Water® DT which faithfully mimics water within 1% from 50 keV to 25 MeV. This enables complete QA from CT image acquisitions to therapy dose verifications. The 20 cm cubic dimension was chosen as a suitable approximation for both head/neck and torso treatments. All the edges are rounded to avoid CT artifacts.

Chamber, diode or MOSFET detectors are easily positioned at isocenter of the cube and laser alignment marks on all sides facilitate precise positioning of the phantom. Detector position can be adjusted in 1mm increments longitudinally and 5mm increments for lateral and elevational adjustments.

Ready-Pac film can be inserted in the cube. By rotating the cube, the film is easily set in sagittal, coronal or transverse orientations. Stainless steel fiducial points are clearly resolvable on CT images and leave small indentations on the film for precise film to plan registration.

Specifications

Size: 20 cm x 20 cm x 20 cm
Lateral Spacers: 0.5 cm, 1 cm, 2 cm
Elevational Spacers: 0.5 cm, 1 cm, 2 cm
Please specify chamber to be used

Item #	Description
682-400	Cube 20 Phantom

VERIDOSE PDMQC SYSTEM

Two Systems In One

Use VeriDose PDMQC as a patient dose monitor and when needed, just simply plug in the Veridose QC Module and VeriDose PDMQC is transformed into a precision linear accelerator quality control device.

VeriDose PDMQC is actually two radiation oncology products in one. It's a linear accelerator quality control device (it measures beam constancy, which includes flatness and symmetry). It's a five-channel patient dose monitoring system that records patient dose verification data from actual radiation measurements made on the patient during treatment.

Accuracy

• Measurements and updates are provided in real time, accurate to within 1% or better

• Automatically adjusts the proper offset voltage for each detector, resulting in up to ten times less drift than other products

Time-Savings

VeriDose PDMQC stores up to 25 separate calibration sets. A calibration set can be created for up to 5 diodes at a time. As a result, the frequency of calibrations you do is significantly reduced. Setup time and error potential are also dramatically reduced, leaving more time for patient treatment.

Documentation

• When interfaced with a standard printer, you can print:

1. Patient treatment dose reports
2. Date and time of procedure
3. Diode detector group and serial number

• In vivo measurements with VeriDose PDMQC as a patient dose monitor are reimbursable under CPT-4 Section 77331 Special Dosimetry

Specifications

VeriDose PDMQC Electrometer

Input Circuitry: Five electrometer channels with digital zeroing and gain control; bi-polar
Rate Range: 1.0 cGy/minute to 1000 cGy/minute
Dose Range: 0.1 cGy to 1000 cGy
Sensitivity Adjustment: 0.1 nC/cGy to 10 nC/cGy
Display: 240 x 64 dot LCD; 8 lines x 40 characters, with CCF backlight
Clock: Real time clock, battery operated, USA or European format
Alarm: User-selectable level for each channel
User Controls: On-Off switch, 5-column select soft-keys for control functions, scroll-up, scroll-down, and enter key for data entry
User Setup Parameters: Stored in non-volatile, battery-backup RAM
Computer Interface: RS-232C, 19.2 K BAUD, 8, N, 1; data format: standard decimal points or Euro-commas
Printer Interface: Parallel, selectable drivers for: LaserJet, Label printer; ASCII Format only.
Storage Temperature: 0° C to 70° C
Operating Temperature: 10° C to 30° C
Relative Humidity: 5% to 95% non-condensing
Connector: BNC-F Coax
Power: 120 VAC, 60 Hz or 230 VAC, 50 Hz to 12VDC @ 1A; AC adapter, UL, CSA, CE
Dimensions: 9" W x 8.5" D x 2.5" H (EMI shielded)
Weight: 2.5 lbs

VeriDose PDMQC Phantom Module

Detector: Five diode detectors
Energy Range: Photon: 4 MV to 25 MV
Electron: 5 MeV to 25 MeV
Sensitive Volume: 0.25 mm^3
Sensitivity: 1.5 nC/cGy
Diode Polarity: Negative
Rad Damage at 10 kGy: <15%
Detector Configuration:
Flatness/Symmetry: One central axis
Four orthogonally-positioned at 8 cm off central axis in the transverse and radial dimensions off-axis detectors are positioned at 80% of field size for flatness and symmetry measurements
Energy Constancy: Detector Depth Positions: 4.5, 12.5, 20.5 cm
Interface Cable: 15 meters (50 feet)
Build-up: 1.9 cm acrylic (2.3 g/cm^2)
Dimensions: 9.85" sq. x 1.5" H
Weight: 5.25 lbs

VeriDose PDMQC System Includes: Electrometer, Windows® Excel software, and Phantom Module.
Item 322-908 - Add-in software is needed for additional machines.
Note: Recommend negative polarity diodes with VeriDose PDMQC System

Item #	Description
322-902	VeriDose PDMQC System
322-902-1	VeriDose V Electrometer ONLY
322-908	VeriDose Excel Add-in Software

DIODE HOLDER

Diodes Sold Separately

Item #	Description
322-930	Diode Holder with Five Slots

VERIDOSE GANTRY HOLDER

The gantry holder secures the VeriDose PDMQC Phantom Module at 100 cm (to the chambers) with four nylon thumb screws. Acrylic build-up plates are made to fit around the support posts and secured in place with two locking rings that are mounted on the support posts. When ordering please give contact person, phone number, accelerator model and target to bottom of treatment tray slot, photon and/or electron measurement and tray coding.

Item #	Machine Description
322-970-_ _	VeriDose Gantry Holder
322-980	1/32” (0.8 mm) Acrylic Build-up Plate
322-981	1/16” (1.6 mm) Acrylic Build-up Plate
322-982	1/8” (3.2 mm) Acrylic Build-up Plate
322-983	1/4” (6.4 mm) Acrylic Build-up Plate
322-984	3/8” (9.5 mm) Acrylic Build-up Plate
322-985	1/2” (12.7 mm) Acrylic Build-up Plate
322-986	1” (25.4 mm) Acrylic Build-up Plate

VERIDOSE SOLID-STATE DIODE DETECTORS

Using the VeriDose PDMQC in conjunction with VeriDose Diode Detectors, you can verify the given dose quickly and accurately during treatment, thus avoiding potential misadministration of radiation.

VeriDose Diode Detectors are solid-state silicon-based radiation detectors that utilize a p-n junction. These rugged diodes are encased within a biocompatible polystyrene material. A low noise coaxial cable is used to connect the diode to an electrometer. When attached to an electrometer, these diodes provide enhanced sensitivity and instantaneous response time.

- Designed to provide superior response, reliability, and performance
- Long-lifetime diodes. Tested 2 x 10^6 cGy in high-energy electron beam, the most damaging radiation
- Very low dose rate and temperature dependence
- Hemispherical shape improves isotropic response and reduces angular and field-size dependencies

Features

- Waterproof design with appropriate build-up for all clinical photon and electron energies
- Flat bottom permits secure, easy placement on the patient
- Color-coded for ease of identification
- Dose rate independent
- Responds to photons and electrons
- Responds to dose rates of 1.0 cGy/min to 1000 cGy/min
- Can be used on continuous (^{60}CO) X-ray beams, pulsed (linear-accelerator) X-ray beams, and electron beams
- Optimized for use with Patient Dose Monitors and high-quality medical-grade ionization chamber electrometers
- All diodes are supplied with a non-crimp repairable cable with BNC connector

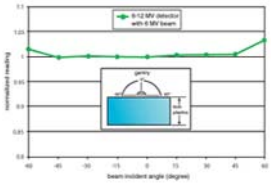
Specifications

Photon and Electron Diode Detectors
Nominal Sensitivity: 1.5nC/cGy
Sensitivity Volume: 0.25 mm³
Output Polarity: Positive/Negative
Linearity: <.1% for dose ranges from 0.01 Gy to 10 Gy
<.1% for dose rates 3 to 5 Gy/min
Reproducibility: 0.2%
Angular Dependence: <2% ± 60° for lower energy diodes (Item 322-913). <2% ± 10°; <5% ± 60° for higher energy photon diodes and electron diodes.
Sensitivity Loss at 10 kGy: <15%
Cable Length: 3 meters
Connector: Coaxial BNC-M
Dimensions: 8 mm ∅
Weight: 42 gm

Item #	Description	Range	Polarity/Color	Build-Up Type	Build-up (g/cm²)
322-912	Photon Diode Detector	1-4 MV	Negative/Blue	Cu	0.732
322-913	Photon Diode Detector	5-11 MV	Positive/Yellow	Cu	1.359
322-914	Photon Diode Detector	5-11 MV	Negative/Yellow	Cu	1.359
322-915	Photon Diode Detector	12-17 MV	Positive/Red	Tu	2.606
322-916	Photon Diode Detector	12-17 MV	Negative/Red	Tu	2.606
322-917	Photon Diode Detector	18-25 MV	Positive/Green	Tu	3.574
322-918	Photon Diode Detector	18-25 MV	Negative/Green	Tu	3.574
322-919	Electron Diode Detector	5-25 MeV	Positive/Gray	-	0.284
322-920	Electron Diode Detector	5-25 MeV	Negative/Gray	-	0.284
322-928	9 Meter (30 Foot) Diode Extension Cable BNC-M to BNC-F				

QED™ DIODE DETECTORS

- **Radiation hardened silicon diode**
- **Active dimension of 0.8 x 0.8mm**
- **32 nC/Gy sensitivity**
- **Flat design allows for easy and reliable placement on patient skin surface**
- **Advanced p-type die design is accurate and responsive**
- **Compatibility with any diode based dosimetry system**
- **Long lifetime if handled properly**

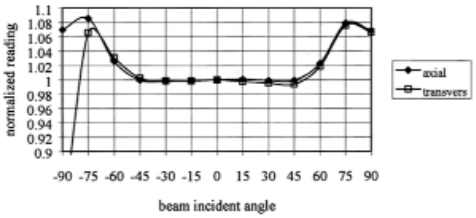


The QED™ features a flat design for easy patient placement. It is ideal for treatments where diode placement is normal to the beam. QED's are available in three photon energy ranges, and a single range for all electron energies.

QED™ Applications
QED™ diode detectors should be used in situations where the beam is normal or close to normal to the patient skin surface.

Accuracy
The QED™ offers exceptional accuracy for a flat diode detector. When tested on top of 6 cm of virtual water, variation in directional response is ± 0.5% for 30°, and ± 1.0% for 45° for 6MV beams.

Angular dependence for 6 MV:



QED™ detectors offer three different buildup configurations (just as the ISORAD™) for each of the low, medium and high photon energy ranges. There is also a skin (scatter) QED™ detector which has no buildup. The QED™ is ideal for treatments where diode placement is relatively normal to the beam.

Clinical Characteristics
Superior Radiation Resistance - The radiation degradation rate is 1.5% per kGy at 10 MeV and < 0.5% per kGy at 6 MV.

Minimized Instantaneous Dose Rate Dependence - Normalized to 100cm SSD, the diode response variation is less than ± 1.5% for both 6 and 18 MV beams from 80 cm to 130 cm.

Reproducible - QED reproducibility error is less than 0.5% for measurements > 1cGy.

Specifications

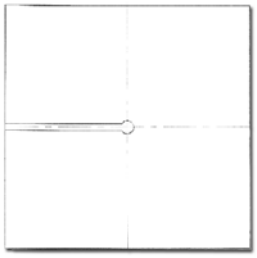
Cable Diameter: 0.1" (2.5 mm)
Cable Length: 9.75' (3 m)
Cable Connector: Lemo

QED	Item 322-112 Item 322-122	Item 322-113 Item 322-123	Item 322-114 Item 322-124	Item 322-115 Item 322-125	Item 322-116 Item 322-126
Color	GREY	BLACK	BLUE	YELLOW	RED
Voltage Range	ELECTRON	SKIN	1-4 MV	6-12 MV	15-25 MV
Buildup Material	Acrylic	None	Aluminum	Brass	Brass
Buildup (g/cm²)	0.36	0.11	1.09	1.91	3.10
Energy Used for Directional Response	6 MeV	Co-60	Co-60	6 MV	18 MV
Response (30°)	104.0%	101.5%	99.50%	100.5%	98.50%
Response (45°)	-	103.5%	99.50%	101.5%	97.50%
Response (60°)	-	-	100.0%	103.5%	97.00%
Detector Area (mm²)	0.64				
Active Dimension (mm)	0.8 x 0.8				
Dose Rate Dependence	± 1%, 75 - 250 cm SSD				
Detector Sensitivity (nC/Gy)	27.0				
Detector Stability	0.5% / kGy at 6 MV				
Negative Output Item #	322-112	322-113	322-114	322-115	322-116
Positive Output Item #	322-122	322-123	322-124	322-125	322-126

Item #	Accessories
322-884	Connector Adaptor Lemo- F to BNC- M
322-886	Coax Cable Extension w/Lemo-F to BNC-M Connector 10 m
322-888	Coax Cable Extension w/Lemo-F to BNC-M Connector 15 m
322-890	Coax Cable Extension w/Lemo-F to BNC-M Connector 20 m

Item #	Accessories
322-891	Coax Cable, Diode, BNC-F to BNC-M, 32' (10 m)
322-892	Coax Cable, Diode, BNC-F to BNC-M, 49' (15 m)
322-893	Coax Cable, Diode, BNC-F to BNC-M, 65' (20 m)

EQUIDOSE II DIODE PHANTOM



Specifications

Material: Polystyrene
Size: 9.8" x 9.8" x 1" (25 x 25 x 2.54 cm)

This phantom is also available in other materials. Call RPDinc for more information.

Item #	Description
638-000	Equidose II Diode Phantom

IBA DOSIMETRY DIODE DETECTORS

322-610
322-605
322-600
322-615

- **Waterproof**
- **Have a proven dose rate and energy independence**
- **Have a high uniform spatial resolution in the beam plane and precise definition of the measurement depth (accurately shaped penumbras in the whole beam plane using the same detector orientation)**
- **Independent of bias, pressure and moisture, very robust, always reliable, no "warm-up" time**
- **High durability: 3 year warranty - low lifetime costs**

Applications
The IBA Dosimetry Diode Detectors are designed for depth dose and profile measurements in water and in air and for output factor measurements in small photon beams.

The IBA Dosimetry Diode Detectors are an excellent choice in relative field analysis as well as output factor measurements. They are based on the 3rd generation of pSi semiconductors. The high doped p-type silicon detector chips, specifically designed for radiation therapy applications, have since their introduction in 1992 been the natural choice for measurements where high spatial resolution is required. The accuracy and lifetime of the diode detectors is unsurpassed in the field of radiation therapy today.

Item 300-605 EFD^{3G} Electron Diode and Item 300-615 SFD Stereotactic Diode provides direct electron depth dose, no need for ionization to dose conversion.

Diode	Item 322-600	Item 322-605	Item 322-610	Item 322-615
Effective Measurement Point	< 0.9 mm	< 0.9 mm	NA	< 0.9 mm
Chip Size (Side / Thickness)	2.5 / 0.5 mm	2.5 / 0.5 mm	2.5 / 0.5 mm	0.95 / 0.5 mm
Geometric Form of Active Area	Circled	Circled	Circled	Circled
Diameter of Active Area	2 mm	2 mm	2 mm	0.6 mm
Thickness of Active Volume	0.06 mm	0.06 mm	0.06 mm	0.06 mm

Item #	Description
322-600	PFD^{3G} Photon Diode Detector
322-605	EFD^{3G} Electron Diode Detector
322-610	RFD^{3G} Reference Diode Detector
322-615	SFD Stereotactic Diode Detector

ISORAD™ DETECTORS

- **ISORAD is the only available diode with Cylindrical Symmetry, angular corrections are not required**
- **Compatibility with any diode based dosimetry system**
- **Very good reproducibility (= 1% for measurements >1 cGy)**
- **Long lifetime when handled properly**

P

ISORAD™ is the only available cylindrical (isotropic) diode detector. The ISORAD's™ cylindrical design allows it to have nearly zero angular dependence along the axial axis, this makes it an ideal choice for tangential treatment cases where it is difficult to predict angle of incidence. ISORAD's™ are available in three photon energy ranges. Each energy range uses a different buildup material designed to give a reading at dmax, therefore, no additional buildup is required. ISORAD™ - Angular Independent Dose Monitoring.

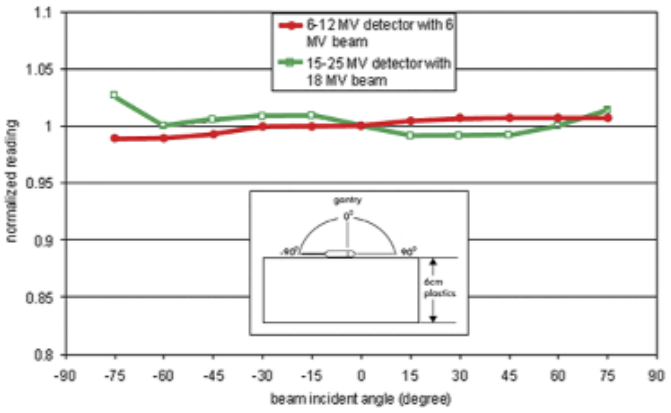
ISORAD™ Applications

- A situation where a surface mounted diode is needed to verify patient dose.
- Tangential treatments where the angle of incidence is difficult or impossible to predict.
- Can be used in conjunction with some solid phantoms and the IVD to verify complex treatment plans.

Accuracy

The ISORAD™ offers exceptional accuracy for a flat diode detector. When tested on top of 6 cm of virtual water, variation in directional response is ± 0.5% for 30°, and ± 1.0% for 45° for 6MV beams.

Axial Directional Response on Phantom:



IsoRad	Item 322-162 Item 322-166	Item 322-163 Item 322-167	Item 322-164 Item 322-168
Color	BLUE	YELLOW	RED
Voltage Range	1-4 MV	6-12 MV	15-25 MV
Buildup Material	Brass	Molybolenum	Tungsten
Buildup (g/cm²)	1.4	1.6	2.6
Energy Used for Directional Response	Co-60	6 MV	18 MV
***Axial Angular Response 1 (0° ~ 360°)**	99.5% ~ 100.5%	99.5% ~ 100.5%	99.5% ~ 100.5%
****Axial Angular Response 1 (-60° ~ +60°)**	99.5% ~ 101.0%	100.0% ~ 101.0%	99.5% ~ 100.0%
****Transverse Angular Response (-30° ~ +30°)**	97.5% ~ 102.0%	99.0% ~ 100.5%	99.5% ~ 104.0%
Detector Area (mm²)	0.97		
Active Dimension (mm)	1.4 diameter		
Dose Rate Dependence	± 1%, 75 - 250 cm SSD		
Detector Sensitivity (nC/Gy)	27.0		
Detector Stability	0.5% / kGy at 6 MV		
Negative Output Item #	322-162	322-163	322-164
Positive Output Item #	322-166	322-167	322-168

*Tested in air
**Tested on a 6 cm plastic phantom

22D DUAL DIODE DOSIMETER

- **Dual digital display**
- **Two calibrations per channel**
- **Accepts a wide variety of positive or negative diode detectors**
- **Slanted front panel for easy reading and control**

The Dual Diode Dosimeter is a compact, economical, battery-operated, dual channel diode detector monitor designed for simplicity of operation without compromising accuracy and reliability.

The user-friendliness is immediately apparent by its sloping control panel that allows operation from a convenient angle. Collected exposure data from both channels is read simultaneously on two large, easy-to-read liquid crystal displays without switching. Two independent calibration potentiometers for each channel allow individual custom calibration settings for up to two sets of diode detectors or two beams. Operation is simple, only four switches are needed to select the calibration factors, dose or dose rate and to reset display to zero. It is powered by a single, easily accessible 9 volt battery. An input jack is provided for the UL-listed wall-mount transformer in case AC line operation is desired.

A special inherent feature of the Dual Diode Dosimeter is its compatibility with both negative and positive current output diode detectors: EquiDose™, Isorad, QED, or VeriDose. This flexibility allows utilization of existing diode detectors and future standardization. When using with diode detectors that have a 2 or 3 meter cable, one extension cable of suitable length is needed per each channel.

When using with EquiDose™ diode detectors, an extension cable with Lemo and BNC-M connectors will be needed.

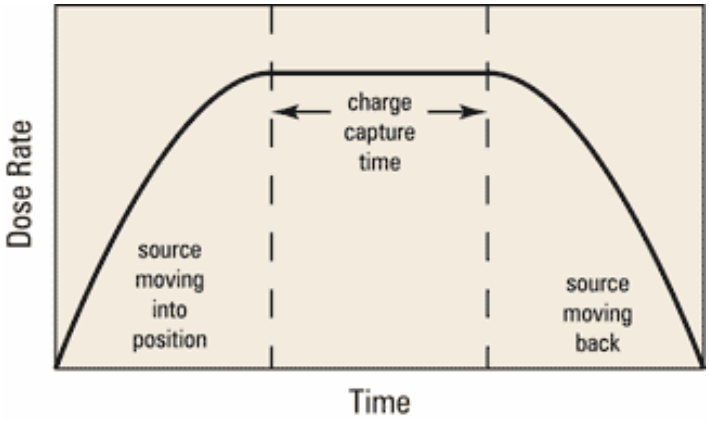
Specifications

Display: Two displays, one per each channel, 1/2" LCD 3 1/2 digit
Range: 0-1999 cGy and 0-1999 cGy/min
Accuracy: ±1% dose and dose rate
Zero Drift: <0.1 cGy/min
Linearity: ±0.1% + 1 digit
Input Connector: Coaxial BNC-F
Power: One 9 V alkaline battery, NEDA 1604, External UL-Listed 115VAC wall-mount transformer
Battery Life: Approx. 50 hrs. continuous, 100 hrs. intermittent
Size: 10" x 8" x 4.1"
Weight: 1.75 lbs

Item #	Description
348-022	22D Dual Diode Dosimeter
348-024	115 Vac Wall-Mount Transformer, Replacement

For Diodes - See Equidose II, Isorad, QED and Veridose

CDX 2000B ELECTROMETER



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Versatile, Affordable
The compact, stable, lightweight and easily transported CDX 2000B has wide amp and coulomb ranges for both external beam dosimetry measurements and precise HDR brachytherapy calibrations.

Exceptional Range for Many Applications

The CDX 2000B's wide range make it an excellent instrument for absolute dosimetry measurements with standard Farmer-type ion chambers and parallel plate ion chambers. It is extremely reliable and precise for HDR brachytherapy calibrations.

Wide range for both external beam and brachytherapy measurements.

Low Noise and Stable Repeatability

A powerful digital microprocessor provides 0.1% repeatability and exceptionally low leakage of less than 5 fA. The digital filter nearly eliminates the effects of noise, resulting in extremely stable readings.

Easy to use pressure sensitive buttons control the operations. With user activated zeroing, just press the button and it is ready to measure. The rechargeable battery operation, with percent of battery charge displayed on the screen, provides conveinient use.

Unique Timing Capabilities
The unique timing feature is ideally suited for HDR brachytherapy calibration measurements. The CDX 2000B can capture charge for a selected amount of time during an exposure, thereby eliminating end effects or other variable portions of an exposure.

This application is very useful during the measurement of high dose rate brachytherapy sources allowing the measurement of charge only during the time the source is in place and the rate is constant.

Specifications

Rate Mode: 0.01 nA - 195.00 nA
Charge Mode : 0.01 nC - 999,999 nC
Combined: Accumulated charge and current are displayed simultaneously
Timed: User set duration (Range: 0-600 sec; Increment: 15 sec; **Resolution:** 1 sec)
Max Run: Unlimited duration with manual stop
Short Term Repeatability: ± 0.1% ± 1 count
Long Term Repeatability: ±0.2% (maximum change over two years)
Signal Setting Time (typical): 1 sec
Linearity: ±0.06% typical
Zero Drift: < 5 fA @ STP
5 User Bias Settings: -300, -150, 0; 150, 300 (VDC)
Bias Accuracy: ±0.3 volt
Display: LCD, 2 x 20 with 5/16" characters
Input: BNC-F two lug, triaxial connector
Bias Voltage: Nominal ± 300 volt bias.
Power: UL listed and CE marked wall-mounted power supply, 110 or 220 VAC input, 9VDC@300 mA output. Internal battery: 10 hrs/charge
Zeroing: Automatic zero function, user activated.
Output: Isolated RS-232, bi-directional, 19,200 baud rate, 8 data bits, no parity, 1 stop bit
Dimensions: 8.24" W x 9" L x 2.75" H
Weight: 3 lbs

CE **CE$_{0413}$,** Externally certified IEC 60601-1, IEC 60601-1-2, Designed to meet IEC 60731

Item #	Description
321-450	CDX 2000B Electrometer
321-405	Carrying Case for CDX2000B Electrometer

MAX 4000 ELECTROMETER

Versatile and Accurate: Reference grade instrument for use in a wide range of radiation therapy applications, including external beam, low dose, high dose, intravascular brachytherapy, diagnostic x-ray, and mammographic x-ray

Automatic Threshold Detection: Already one of the easiest and most widely used electrometers, threshold detecting trigger mode makes the MAX 4000 even more versatile. The MAX 4000 automatically detects the start and stop of radiation exposure by measuring the current crossing predetermined limit thresholds. This allows you to take sequential measurements without the need to manually reset the electrometer.

Low Noise and Stable Repeatability: A powerful digital microprocessor provides 0.1% repeatability and exceptionally low leakage of less than 1 fA. The built-in digital filter nearly eliminates the effects of noise, resulting in stable and exact measurements.

Powerful Data Management: Connect the MAX 4000 to a PC and use the included MAX COMM™ Software for fast, comprehensive control of dose and dose rate measurements, chamber libraries, remote operations, data logging, and many other advanced features.

New! Wide Range, Superior Sensitivity
0.001 pA to 500.00 nA range
0.01 pC to 999,999 nC range

Features and Benefits

Powerful Measurement Capabilities

- Triggered collection with automatic start, stop and reset of charge collection based on specific threshold detection levels for flexibility needed in clinical and research applications
- Timed collection from 0-600 seconds and continuous mode provide additional charge collection options
- Built-in digital filter virtually eliminates the effect of noise, resulting in stable and exact measurements

Simple, Intuitive Interface

- NEW! Large, easy to read backlit LCD display is visible from a distance and in low light
- Simultaneous display of amp, coulomb, and collection time minimizes the need to switch screens
- User activated, automatic zeroing function

Measure with Confidence

- Designed to exceed AAPM, ADCL and reference grade instrument specifications
- Designed to meet or exceed requirements of IEC 60731 for reference grade instruments

MAX COMM Software

- NEW! Automatic acquisition of a series of timed charge collections
- NEW! Continuous collection of rate measurement points over a user defined interval with a choice of two frequencies
— Useful for basic beam profiling
- Chamber library allows a chamber or system factor to be applied, facilitating calculation & read out of integrated dose and dose rate in Gy, Sv, R, Gy/min, Sv/hr, R/min, or Gym2/hr
- Apply temperature and pressure correction to measurements
- Export data in a Microsoft® Excel compatible format

Applications

- NEW! Extended bias settings of ± 0-450 VDC for TG-51 and 1/3 ratio IAEA TRS-398 measurements
- External Beam IMRT – Quick measurements of even the smallest volume ion chambers, such as those used in IMRT or stereotactic radiosurgery.
- LDR or HDR Brachytherapy – Exceptional sensitivity and a wide range make the MAX 4000 the electrometer of choice for brachytherapy measurements. It provides quick measurements of low activity isotopes. A 0.27 mCi iodine seed, measured in the HDR 1000 Plus Well Chamber, gives a typical signal of 1.458 pA. The MAX 4000 also measures 10 Ci and higher iridium sources
- Other Applications – Ideally suited for ion chambers typically used for data acquisition in water phantoms and with chambers used for quality assurance tests. Works exceptionally well with mammographic, conventional radiology, and CT scanning applications

Specifications

Height: 7 cm (2.75 in)
Width: 22.2 cm (8.24 in)
Length: 23 cm (9 in)
Weight: 1.4 kg (3.0 lbs)
Three Modes:
RATE: Low Range 0.001 pA – 1000.00 pA, 1 fA resolution
High Range 0.001 nA – 500.00 nA, 1 pA resolution
CHARGE: Low Range 0.01 pC – 999,999 nC, 10 fC resolution
High Range 0.01 nC – 999,999 nC, 10 pC resolution
COMBINED: Accumulated charge and the current readings are displayed simultaneously
Charge Collections:
TRIGGER: Automatic start, stop, and reset based on user defined thresholds (Start: 0.02 – 9.99 pA; Stop: 0.01 – 9.98 pA)
TIMED: User set duration (Range: 0 – 600 sec; Increment: 15 sec; Resolution: 1 sec)
MAX RUN: Unlimited duration with manual stop
Range Switching: User selectable - High or Low
Repeatability:
SHORT TERM: ± 0.1% ± 1 count
LONG TERM: ± 0.2% (maximum change over two years)
SIGNAL SETTLING TIME (typical): Low Range: 12 sec; High Range: 3 sec
Linearity: ± 0.06% typical for all rate and charge settings
Zero Drift: < 1 fA @ STP
Display: Backlit LCD, 2 x 20 with 5/16" characters
Input: BNC two lug, triaxial connector
Bias Voltage: Nominal ± 450 volt bias
5 USER BIAS SETTINGS:
-450, - 300, - 150, 0; 150, 300, 450 (VDC)
ACCURACY: ± 0.3 volt
Zeroing: Automatic zero function, user activated
Output: Isolated RS-232; bidirectional 19,200 baud rate; 8 data bits; no parity; 1 stop bit; compatible with Argus QC4 software
Power: 100-240 VAC, 0.5 A max, 50/60 Hz input to external power supply, 9 VDC, 1.7 A power supply output to electrometer input, UL/TUL listed power supply; internal battery: 8 hrs/charge

CE 93/42/EEC

Item #	Description
321-400	MAX 4000 Electrometer
321-405	Carrying Case for MAX 4001 Electrometer

35040 ADVANCED THERAPY DOSIMETER

- **Now with timer function and wider dynamic range**
- **Ultra long-term stability error of approximately 0.1% per five years.**
- **Virtually removes effects of system leakage during measurement. Uncorrected leakage <10 fA over temperature range**
- **Eleven user-defined bias settings from -500 V to +500 V**
- **Read out in C, A, R, Gy, Sv, Bq, and more**

The 35040 Advanced Therapy Dosimeter is a reference grade instrument used to measure the charge and current from ion chambers in Radiation Therapy, and provides bias voltage for all commonly used chambers. The ATD large clear display offers direct readings of charge, current, time and radiation units over a wide range. The user can customize the display for basic use or for specialized applications such as brachytherapy. The 35040 Advanced Therapy Dosimeter exceeds the recommendations of calibration laboratories for leakage, linearity, and stability by a wide margin.

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The 35040 Advanced Therapy Dosimeter, provides the long-term stability and accuracy demanded for calibrations, quality assurance programs, and protocols in Radiation Therapy.

The 35040 Advanced Therapy Dosimeter is fully stable within five minutes. In battery operation or using AC Line, the ATD measures dose and effective exposure time in a single exposure, thus eliminating the need for multiple exposures for Cobalt 60 and brachytherapy measurements. Front panel controls select ion chamber calibration factors, facilitate entry of temperature and pressure values for air density correction, allow bias voltage selection, threshold level, timer control, and choice of display screens. The user-customized display screens can simultaneously show dose, exposure time, dose rate, effective exposure time, average current/rate, accumulated charge/dose, bias voltage, leakage, and other important information that ensures the validity of the instrument.

The customization software allows design of 16 screens that display conditions, parameters, values and text. Up to 32 chambers factors, 11 bias voltages can be programmed. It is PC compatible and connects via a RS-232 cable.

Features

- Wide measurement range, up to 1,000 µA and 19.999 mC for HDR Brachytherapy applications
- Automatic reset and hold of measured valued between exposures
- Front panel adjustment of exposure threshold and user disable of threshold to permit manual operation
- Thirty-two ion chamber calibration factors
- Automatic power-down after user-specified time period, when operating from battery supply
- Annunciators warn of low battery, low bias, and operational errors
- Large capacity battery provides eight hours of continuous operation; fast recharge in less than three hours, even during operation
- AC line operation over the range 100 to 240 VAC and 47 to 63 Hz without operator intervention
- Charge and current calibration factors entered by calibration laboratories at user's option
- Front and rear panel ion chamber connections

Specifications

Dose and Rate Display

Charge Full Scale	Charge Sensitivity	Current * Full Scale	Current * Sensitivity
200.00 pC	0.01 pC	200.0 pA	0.1 pA
2.0000 nC	0.0001 nC	2.000 nA	0.001 nA
20.000 nC	0.001 nC	20.00 nA	0.01 nA
200.00 nC	0.01 nC	200.0 nA	0.1 nA
2.0000 µC	0.0001 µC	1.000 µA	0.001µA
20.000 µC	0.001 µC		
200.00 µC	0.01 µC		
2.0000 mC	0.0001 mC		
20.000 mC	0.001 mC		
* Average current is displayed with ten times greater resolution			

Effective Exposure Time Ranges

Full Scale Range	Display Resolution
59.99 s	0.01 s
5 hrs 33 min 19.9 s	0.1 s

Stability: Designed for ultra long-term stability error of approximately 0.1% per five years.
Leakage: Virtually removes effects of total system leakage during measurement. Uncorrected leakage <10 fA over temperature range.
Linearity: Maximum non-linearity variation from straight line of 0.1% of all charge and current ranges.
Resolution: 0.005% of range (4.5 digits) for charge, dose, average rate and average current; 0.05% of range (3.5 digits) for current and rate.
Warm-up: Fully meets specifications within five minutes of applying power.
Measurement Accuracy: 18° C to 28° C (64° to 82° F)
Charge ± (0.20% readings plus two counts)
Current ± (0.20% reading plus two counts)
Bias: Eleven (11) user-programmable steps from -500 V to +500 V in 0.1 volt increments. Accuracy ±0.3 volt for loads <0.2 mA. Front panel selectable.
Ion Chamber Calibration Factors: Thirty-two (32) user-programmable calibration factors. Front panel selectable.
Display Unit: All practical radiation and electrical units.
RS-232 Computer Configuration: For customizing and data transfer.
Physical Dimensions: 9.4" W x 10" D x 4.0" H
Weight: 10 lbs.
Power: Internal Lead Acid Battery; Integral Charger Operates 100 to 240 Vac (47 - 63 Hz)
Connectors: Triax BNC-F front/rear or Triax TNC-F/M front/rear

Item #	Description
321-005	35040 Advanced Therapy Dosimeter -BNC-F
321-006	35040 Advanced Therapy Dosimeter - TNC-F/M

PTW UNIDOS® E
Universal Dosemeter

Easy to use reference class or field class dosemeter for routine dosimetry.

Features

• An economical high quality dosemeter for universal use in radiation therapy and diagnostic radiology
• Complies with the following standards:
IEC 60731 as a field class dosemeter
IEC 60731 as a reference class dosemeter (option)
IPEM guidelines on dosimetry transfer instruments as a secondary standard dosemeter (option)
IEC 61674 as a diagnostic dosemeter
• High accuracy, excellent resolution (1 fA) and wide dynamic measuring ranges
• HV power supply (0...±400) V in increments of ±50 V
• Measures integrated dose (or charge) and dose rate (or current) simultaneously
• RS232 interface for device control and data output

The lightweight and compact UNIDOS E is an easy to use dosemeter, mainly used for daily routine dosimetry in radiation therapy. Ion chambers and solid-state detectors can be connected. A chamber library makes it possible to store calibration data. Air density corrections are done by keying in air pressure and temperature. UNIDOS E displays the measured values of dose and dose rate in Gy, R, Gy/min, R/min or Gy•m. The electrical values charge and current are measured in C and A. The large, high-contrast LC display is easy to read. The device includes automatic leakage compensation and an RS232 interface. The high voltage between the ion chamber electrodes is checked automatically. UNIDOS E features both mains and battery operation.

Specifications

Resolution for current measurements: 1• 10^{-15} A
Resolution for charge measurements: 1 • 10^{-14} C
Measuring range for current measurements: (2 • 10^{-13} to 1 • 10^{-5}) A
Measuring range for charge measurements: (2 • 10^{-12} to 6.5 • 10^{-2}) C
Measuring range with 0.5% resolution (with Farmer Ionization Chamber Type 30001 (Item 322-001):
Dose Rate: 0.6 mGy/min to 3000 Gy/min
Dose: 0.1 mGy to 3.0 MGy
Long Term Stability: <± 0.5% according to IEC
Non-linearity: <±0.5 % acc. to IEC for dose measurements <± 1.0 % acc. to IEC for dose rate measurements
Internal Adjustment Time: <1.5 s
Accuracy of Current and Charge Measurement:
<± (0.5% ± 1 count)
Interval Time: 1 - 9999's
Nominal Useful range:
Temperature Range: 10º - 40º C
Air Pressure Range: 700 - 1060 mbar
Humidity Range: 10 - 75% rel. humidity; 20 g/m³ max.
Leakage Current (Zero Drift): <± 10^{-15} A
Zeroing of the Amplifier: Automatically in approx. 50 s
Warming-Up Period: 15 minutes
Chamber Voltage: 0 - ± 400 V in 50 V-increments
Power Supply: Main Power 115-230 V; 50/60 Hz or from rechargeable NiCd batteries, operating time: 3 - 4 hrs.
Time Constant for Current and Dose Rate Measurements: Low: 350 ms, Medium: 200 ms, High: 200 ms
Weight: Approximately 1.5 lbs
Outer Dimensions: 9.8" W x 6.3" D x 3.9" H
Connectors: Triax BNC-F or Triax TNC-F/M

Item #	Description
321-021-10	Unidos® E - BNC-F Connector (Standard)
321-021-9	Unidos® E - TNC F/M Connector
321-022	Reference Class Certificate
321-023	Carrying Case

MODEL K602 ELECTROMETER

Modified Keithley 602

The Keithley Model 602 is a high quality, general purpose electrometer capable of measuring low currents, low voltage levels and high resistances. It is best known in the industry for its stability and extremely low input offset current on the order of less than 5 fA.

This electrometer is modified to make is expressly suited for medical dosimetry applications. The modifications include:

- Installation of a 150/300 volt electronic bias supply with reversible polarity
- Replacement of the analog meter with a 4 1/2 digit LCD
- Installation of a single 12V rechargeable battery with wall-mount
- UL listed transformer/charger
- Installation of circuitry to allow bias voltage and battery condition to be read on the display
- Installation of a metal connector cap with retaining chain
- Color-coding of switch positions for ease of use
- Coulomb scale calibration to ±0.1% and complete QA at checkout

Range	Current		Charge	
	2V	10V	2V	10V
10^{-11}	19.999 pA	120.00 pA	- - - - -	- - - - -
10^{-10}	199.99 pA	1.2000 nA	199.99 pC	1.2000 nC
10^{-9}	1.9999 nA	12.000 nA	1.9999 nC	12.000 nC
10^{-8}	19.999 nA	120.00 nA	19.999 nC	120.00 nC*
10^{-7}	199.99 nA	1.2000 µA	199.99 nC	1200.0 nC
10^{-6}	1.9999 µA	12.000 µA	- - - - -	- - - - -
10^{-5}	19.999 µA	120.00 µA	- - - - -	- - - - -
10^{-4}	199.99 µA	1.2000 mA	- - - - -	- - - - -
10^{-3}	1.9999 mA	12.000 mA	- - - - -	- - - - -
10^{-2}	19.999 mA	120.00 mA	- - - - -	- - - - -
10^{-1}	199.99 mA	1200.0 mA	- - - - -	- - - - -

*** Normal range for use with a 0.6cc Farmer-Type Ion Chamber**

Specifications

Display: LCD, 4 1/2 digit, 0.48" high
Range: Charge: .0001x10^{-10} to 12.000x10^{-7}C
Current: .0001x10^{-11} to 12.000x10^{-1}A
Overrange: Indicated by 1 followed by blanks
Accuracy: ±0.1% of reading + 1 digit
Linearity: ±0.1% + 1 digit or precision of reading
Leakage: <5x10^{-15}A
Calibration: coulomb scale to ±0.1%
Input Impedance: >1x10^{14} ohm
Temp. Coefficient: 0.2%/EC
Bias: internal electronic bias supply; -150V, -300V, OFF, +300V, +150V, selectable on front panel, bias voltage may be read on display
External Bias: Binding posts for banana plugs
Input: Triaxial BNC-F with cap & chain
Power: rechargeable 12V 1.2 AH gel-cell battery, voltage may be read on display, low battery indicator, 120VAC UL listed wall-mount charger provided (240VAC optional)
Current Drain: 57mA
Dimensions: 7" Wide x 10.75" High x 11.5" Deep
Weight: 14.5 lbs

Item #	Description
321-602	Model K602 Electrometer

MODEL 206 DOSIMETRY ELECTROMETER

Electrometer Features
- External feedback module interface
- 2,000 hour operation on “D” cell batteries
- Less than 3 fA leakage current
- 4 1/2 digit custom LCD
- Internal electronic bias (±300V / ±150V)
- A/D voltage reference - band gap diode
- Analog electrometer output
- Auto-ranging
- Instant on - no stabilization period

Removable Feedback Module
User selectable feedback element:
- Provides probe calibration
- Sets measurement range
- Defines input (floating or grounded)
- Selects appropriate display units
- Triax BNC-F input
- Calibration adjustment
- Charge, rate or both

The Model 206 Dosimetry Electrometer maintains the simplicity of classic electrometer styling while utilizing contemporary design and state-of-the-art electronics. It is simple to operate. All controls are located on the front panel. The value is displayed in easy-to-read 0.7” digits. A tilt bail is provided for optional viewing angles. The Model 206 Electrometer has a broad range of operation and can accommodate any size ion chamber utilizing any type of connector.

The versatility of the Model 206 Electrometer stems from it’s innovative modular design. The amplifier feedback element is contained in an external module. This module is removable and can be exchanged with any number of modules. Each module changes the measurement features of the electrometer. In this way, a single electrometer can be configured to satisfy a wide range of applications. By pairing an ion chamber with a specific module, full calibration, of all chambers, on a single electrometer can be achieved.

The Model 206 Electrometer is designed for long term reliability. Leakage currents as low as 1 fA are achieved due to the selection of special components and the implementation of proprietary production techniques. All feedback elements are extensively evaluated to insure long-term stability.

Removable feedback modules
One 200nC (*206-110) feedback module with a triaxial BNC-F connector, optimized for beam calibrations with a 0.6cc Farmer type ionization chamber, is supplied with each Model 206 Electrometer. This feedback module may be substituted at no additional cost, or additional feedback modules may be purchased to suit multiple applications. Feedback module connection is a triaxial BNC-F.

Specifications

Display: 0.7”, 4 1/2 digit custom LCD with floating decimal point, display hold and low battery indications
Display Update: 1 sec.
Accuracy: ±0.2% of full scale
Repeatability: ±0.03% of full scale
Linearity: ±0.05% of full scale
Stability: long term (1 year) ±0.1% of full scale
Units: feedback module selected
Electrometry Units: pA, nA µA, pC, nC
Dosimetry Units: R or Gy with µ, m, c, prefix
Rate Units: in s, min, h
Input Leakage Current: Less than 3 fA
Preamp Output: 2V, banana jack (back panel) 10kΩ
Internal Bias: Electronic, ±300V and ±150V, ±300V and ±100V optional
External Bias: Via banana jacks (back panel)
Ranges: Three decade autoranging, unit powers up in high range with manual increase in sensitivity
Electrometer Range: With appropriate module selection capable of:
Current: 0.001pA to 1999.9µA
Charge: 0.0001pC to 19999nC
Standard Range: 200nC module - 0.0001 to 199.99nC
Exposure/Dose: Determined by multiplying the above by the chamber calibration factor
Module Storage: Rear panel compartment holds up to three accessory feedback modules
Input: Triax BNC-F
Power: Six “D” cell batteries, 2000 hours of continuous operation (access panel on bottom)
Size: 5.2” W x 8.4” H x 7.9” D
Weight: 10 lbs

Item #	Description		
321-008	Model 206 Dosimetry Electrometer w/One Feedback Module		
	Optional Feedback Modules		
Item #	**Nominal Range**	**Min. - Max. Reading**	**Chamber Size**
	Charge		
206-108	20,000 nC	00.01 - 19,999 nC	Any
206-109	2,000 nC	0.001 - 1,999.9 nC	Any
* 206-110	200 nC	.0001 - 199.99 nC	Any
206-111	20,000 pC	00.01 - 19,999 pC	Any
206-112	2,000 pC	0.001 - 1,999.9 pC	Any
206-113	200 pC	.0001 - 199.99 pC	Any
	Current		
206-120	2,000 pA	0.001 - 1,999.9 pA	Any
206-121	20,000 pA	00.01 - 19,999 pA	Any
206-126	200 nA	.0001 - 199.99 nA	Any
206-127	2,000 nA	0.001 - 1,999.9 nA	Any

DOSE-1 ELECTROMETER

The DOSE 1 is a portable, single channel, high-precision reference class electrometer that significantly exceeds the recommendations of the IEC 60731 and the AAPM ADCL. It combines superior accuracy with an excellent resolution in a wide dynamic range. The electrometer can be used with ionization chambers, semiconductor detectors and diamond probes for measurements of absorbed dose. In combination with radioactive check sources the response stability of the ionization chambers is verified and the cross calibration performed.

Hardware

- Large and high contrast graphic electro luminescent display with a wide viewing angle (160°) for complete and comprehensive display of all measured values, chamber and correction factors
- Ergonomic design of the operator interface, intuitive easy to use soft keys, pop-up menus
- Dose, dose rate, average dose rate, charge, current and dose per monitor unit measurements are displayed simultaneously
- For verification of instrument, connecting cable and proper sensor operation, an electrical check source as well as leakage and bias voltage testing are included as standard built-in features
- Possibility to store up to 40 different sensors, same number of correction factors and up to 10 radioactive check sources

Software

- Separate measurement or performance of a whole queue of batches (Batch measurement consists of doing several measurements, and to compute the average)
- Automatic starting and stopping function when running a batch measurement
- Fully automated calculation of average and normalization to a reference value (e.g. automated output factor determination)
- Visibility of old results due to saving of measurements in a database or file
- Results are collected and sent from the electrometer to the PC continuously
- Results can be presented on the screen as tables or graphics
- The communication between the DOSE 1 and the PC is realized via RS-232 serial interface
- Result of individual measurements as well as batch summaries can be adapted and saved in text and XML formats for data import, e.g. into Excel for further analysis
- The administration software allows the management of detectors, correction factors and radioactive check sources with PC

Specifications

Bias Voltage: ±500 V, programmable in steps of 1 V
Sensor Connector Types
Standard Option: Triaxial TNC (threaded) in combination with triaxial BNC (bayonet)
Alternative "Convertible Option": M-Type, BNC/Banana and triaxial TNC, triaxial BNC
Temperature Range: 15 - 35°
Relative Humidity: 10 - 80% rel. humidity
Absolute Humidity: Max. 20 g/m^3
Power Supply (Mains): 100 - 240 V, 50/60 Hz
PC Interface: Bidirectional RS-232, configuration and measurement software
Outer Dimensions: 10.2" W x 10.2" L x 6.5" H (259 x 259 x 165 mm)
Weight: 7.7 lb (3.5 kg)

Measuring Modes/Range
Charge (Dose): 40pC to 1.0C at 0.1pC resolution
Current (Dose Rate): 40pA to 1000nA at 0.1pA resolution

Measuring Quantities and Units
Electrical: charge (C), Current (A)
Integrate: Gy, Sv, R, rad, rem
Time Base for Rate: Second, minute, hour
Interval Time Range: 1 to 9999 sec
Accuracy/Repeatability: ±0.2%
Leakage Current: ≤±10fA, typically 1fA
Linearity: <±0.25% in whole range
Stability: <±0.25% per year
Display: Graphic electro luminescent, 160° viewing angle
Zero: Automatic, within 60 sec.
Memory: All setup and detector parameters stored in EEPROM
Background Compensation: On/off mode with memory

Computer Requirements
Operating System: Windows® XP Pro, Windows® 2000
Interface to Dose1: RS232

CE 0124

Item	Description
321-100	DOSE-1 Electrometer

MOSFET DOSIMETERS

- **One calibration factor for all photon and electron modalities in the radiotherapy energy range**
- **Isotropic (± 3% or better for 360°)**
- **Active region of 0.2 x 0.2 mm**
- **Permits pinpoint measurement without patient shielding**
- **Dose-rate and temperature independent**
- **Unobtrusive in procedures**
- **Lightweight and flexible**
- **Multiple dosimeter capability with one reader**

Reinforced MOSFET Dosimeter - Now Standard
Reinforcing the MOSFET dosimeter increases its durability during procedures that may cause high stress to the dosimeter, A thin layer of protective plastic coating is added to the tip of the dosimeter, which hardens, strengthens and protects the sensor.

High Sensitivity MOSFET Dosimeter
The high sensitivity MOSFETs are three times as sensitive as the standard MOSFETs and help to maintain reproducibility at low doses. The high sensitivity MOSFETs are ideal for scatter doses to regions at risk, or radiology dose measurements.

MicroMOSFET Dosimeter
With a width of 1.0 mm and an extra long 375 mm flex, the microMOSFET dosimeter is small enough and long enough for use inside a 6 Fr catheter.

Radio-opaque Marker for Visualization
A tiny tungsten radio-opaque marker is added to the tip of the MOSFET dosimeter for localizing the dosimeter with OBI, or other imaging procedures. Additionally, these dosimeters are fully coated with a special plastic material that makes them more durable for repeated insertions inside a catheter.

Plain MOSFET Dosimeter
The plain MOSFET dosimeter does not have the protective plastic coating. Customers using phantoms with tight tolerances may require the plain dosimeter otherwise the reinforced dosimeter is recommended.

Linear 5ive Array
The Linear 5ive Array incorporates five (5) sensors separated 20 mm, center to center, on one 460 mm flex with a tungsten radio-opaque marker at the tip. The length of the dosimeter flex is fully coated with a special plastic material for greater durability during catheter insertions.

MOSFET DOSIMETERS

Flex Dimensions*	Standard MOSFETs	microMOSFETs	Linear 5ive Arrays
Width of Flex	2.5 mm	1.0 mm	1.8 mm
Thickness of Flex (flat part of flex)	0.3 mm	0.3 mm	0.6 mm
Length of Flex (from end of gray cable)	200 mm	375 mm	460 mm
Thickness of Bulb	1.3 mm	1.0 mm	1.4 mm
Length of Bulb	8.0 mm	3.5 mm	5.0 mm
Distance to Center of Chip (from end of bulb)	4.0 mm	1.75 mm	2.5 mm
Common Uses	Dose verification during radiotherapy treatments; beam QA	Fits down a 6Fr catheter for dose verification during HDR procedures	Measurement of urethral dose during prostate brachytherapy

*Measurements listed above are average values and are meant to serve as a guide for the use of MOSFET dosimeters.
For phantom use and tolerances, please contact Best Medical Canada directly for more detailed information.

Radiotherapy Applications**

Typical Applications	Radiotherapy Dose	Recommended Dosimeter	Recommended Bias Supply
Scatter Dose / Research	1 to 20 cGy	High Sensitivity Dosimeter	High Setting
Central / Scatter Doses	20 to 100 cGy	Standard Dosimeter	High Setting
TBI / Central Dose	> 100 cGy	Standard Dosimeter	Standard Setting
HDR Brachytherapy	> 20 cGy	Standard Linear 5ive Array	Standard Setting
LDR Brachytherapy	1 to 20 cGy	High/Extreme Sensitivity Linear 5ive Array	High Setting

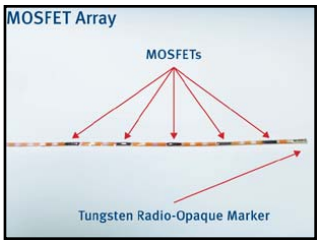
** Pertains to the standard MOSFET dosimeter, the microMOSFET dosimeter, and the Linear 5ive Array Dosimeter

Item #	MOSFET Dosimeter	Quantity
322-320	Plain	2
322-321	Plain	5
322-322	Reinforced	2
322-323	Reinforced	5
322-324	Reinforced with Radio-opaque Marker	2
322-325	Reinforced with Radio-opaque Marker	5
322-326	Plain High Sensitivity	2
322-327	Plain High Sensitivity	5
322-328	Reinforced High Sensitivity	2
322-329	Reinforced High Sensitivity	5
322-330	Reinforced High Sensitivity with Radio-opaque Marker	2
322-331	Reinforced High Sensitivity with Radio-opaque Marker	5

Item #	MicroMOSFET Dosimeter	Quantity
322-335	Plain	2
322-336	Plain	5
322-337	Reinforced	2
322-338	Reinforced	5
322-339	Reinforced with Radio-opaque Marker	2
322-340	Reinforced with Radio-opaque Marker	5
322-342	Plain High Sensitivity	2
322-342	Plain High Sensitivity	5
322-343	Reinforced High Sensitivity	2
322-344	Reinforced High Sensitivity	5
322-345	Reinforced High Sensitivity with Radio-opaque Marker	2
322-346	Reinforced High Sensitivity with Radio-opaque Marker	5

MOSFET Dosimeters are available with a 10' (3 m) cable upon request.

LINEAR 5IVE MOSFET ARRAY™



The Linear 5ive MOSFET Array is ideal for LDR/HDR Brachytherapy and IMRT QA.

- **Suitable for in-vivo dosimetry and beam QA**
- **For use in both electron and photon modalities**
- **Isotropic response for 360° gantry angles**
- **Dose rate and energy independent**
- **Visible under CT or Fluoroscopy imaging**
- **Waterproof, resistant to body fluids and liquid sterilization**
- **Small, lightweight, flexible, and rugged for extensive handling**

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The Array contains five isotropic, energy independent MOSFET dosimeters, at 2cm intervals. The MOSFETs on the array can be read simultaneously, facilitating multiple dose measurements at several spatial points. The radio-opaque marker, located at the tip of the array, enables visualization under X-Ray imaging (CT, Fluoroscopy), allowing for five dosimetry points to be accurately located and easily compared to target doses.

Applications
The isotropic Linear 5ive Array, with excellent reproducibility and linearity, is the tool of choice for a variety of radiotherapy applications such as in-vivo dosimetry and Beam Quality Assurance.

LDR Implant/ HDR Brachytherapy - The array can be used effectively for direct measurement of intra-cavitary dose profiles. For example, during gynecological and prostate procedures, five dose points can be read directly from a computer, displaying the dose profile of the organ at risk in real-time. This is then compared to the planned target dose, allowing for immediate assessments of post-implant base and apex dose, as well as the dose to the organs at risk (eg. urethra, rectum, or bladder).

Beam Quality Assurance - Two arrays crossing at the isocenter of a beam will provide quick 2D dose profiling with 10 simultaneous dose point readings for the X and Y-axes. Since arrays are isotropic, multiple beams at different gantry angles, as in IMRT, can be accurately and quickly checked.

Dynamic Dose Measurements for Brachytherapy Dosimetry
The Linear 5ive MOSFET Array™, when used in combination with the mobileMOSFET™, is the first and only commercially available combination that allows for real-time quality assurance of all brachytherapy procedures, without a significant investment in extra time.

Real-time dose profiling is provided by the in-vivo use of a mobileMOSFET Wireless Dosimetry System. the Linear Array is used for various HDR applications such as prostate and gynecological brachytherapy using Item 322-360.

When placed on the surface of the breast, the array can also validate Mammosite™ treatments. Implant and LDR dosimetry is performed using the higher sensitivity model, Item 322-362.

When inserted directly into a urethral catheter, the dose results provide immediate assessment of post-implant base and apex dose coverage, as well as the dose to organs at risk such as the urethra, rectum or bladder. This real-time dose feedback allows assessing the quality of the seed implant program in LDR and HDR brachytherapy. Absolute dose measurements or dose rate measurements are obtained in real-time. This helps to validate the quality of the treatment, and ultimately the quality of life for the patient.

Compatibility
- mobileMOSFET Dose Verification System
- AutoSense Dose Verification System & Dual Bias Supply for Linear 5ive MOSFET Array
- Not compatible with MOSFET 20 Dose Verification System

Radiation Characteristics
- 20,000 mV lifetime (~20,000 cGy on standard sensitivity setting)
- Five active detection points (0.04 mm^2 each)
- Suitable for photon and electron modalities
- Isotropic response (± 3% for 360°)
- Temperature independent
- Visible under CT or Fluoroscopy with a radio-opaque tungsten marker at the tip

Additional Applications
- IMRT IGRT, IORT, QA and In vivo
- Rectal Dose Measurements
- Skin Dosimetry
- Beam Profiling
- Fluoroscopy / CT Dose Verification
- External beam radiotherapy / TBI

Dimensions
1.5 mm W x 46 cm L x 1.3 mm T
2 cm Inter-MOSFET Spacing

Three linear arrays with different sensitivities are offered to accommodate all clinical and research applications

Linear 5ive Array	Common Use	Standard Sensitivity Bias	High Sensitivity Bias
322-360	HDR brachytherapy, MammoSite	0.98 mV/cGy (for ^{192}Ir)	1.38 mV/cGy (for ^{192}Ir)
322-362	LDR brachytherapy	11.1 mV/cGy (for ^{125}I)	15.2 mV/cGy (for ^{125}I)
322-364	LDR brachytherapy, diagnostic x-rays	25.8 mV/cGy (for ^{125}I)	37.2 mV/cGy (for ^{125}I)

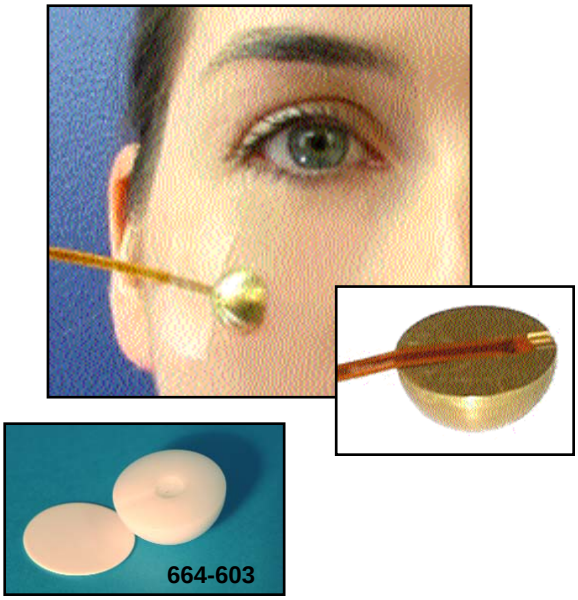
Note: sensitivities noted above are under full build-up (^{60}Co)

All of these arrays continue to yield dose reproducibility at standard sensitivity bias at 1σ

Linear 5ive Array	20 cGy	200 cGy
322-360	< 2%	< 1.0%
322-362	< 2%	< 1.5%
322-364	< 2%	< 1.5%

Item #	Description
322-360	Linear 5ive MOSFET Array, Standard Sensitivity
322-362	Linear 5ive MOSFET Array, High Sensitivity
322-364	Linear 5ive MOSFET Array, Extreme Sensitivity

WIDE ENERGY HEMISPHERICAL BUILD-UP CAPS FOR MOSFET DOSIMETERS



Hemispherical Build-up Caps
MOSFET dosimeters have only 0.8 mm inherent build-up, which allows for flexibility in measuring surface dose as well as dose at Dmax. In order to measure dose at Dmax, build-up is required. This custom designed Build-up Cap for use with MOSFET Dosimeters allows for depth dose measurements over a wide range of energies.

Full Photon Range & 15 MeV - 18 MeV Electrons
Brass Build-up Caps - 0.635 cm Radius
In order to maintain the isotropic characteristics of the MOSFET dosimeter (± 2% for 360°) and allow for one calibration factor for all energies and modalities, it is recommended that a hemispherical build-up cap be used. This small brass hemisphere is specially grooved for precise placement of the MOSFET and maintains the characteristics which distinguish these devices from other types of dosimeters.

The brass build-up cap is very lightweight (only 4g) and small (radius: 0.635 cm), which makes it ideal for placement on patients.

This build-up cap may be affixed to the MOSFET for the duration of its life, i.e. 200 doses. Using just one build-up cap for all Photons and some Electron energies makes the dosimeters easier to use.

Why Brass? Brass is a metal alloy containing mainly copper and zinc compounds. Due to its high density (8.5g/cm^3) and to its high Z number (Z~30), it provides the minimal amount of metal needed to achieve full build-up at Dmax for a range of photon energies (4, 6, 10 and 18MV) and some electron energies (15-18MeV)* at a very practical size.

*Note: For low electron energies, it is suggested that no build-up is used. However, if desired, one can use the 1.5 cm radius tissue equivalent build-up cap.

MOSFET Correction Factors (CR) Under Brass Build-Up Caps
To directly correct for dose readings at Dmax, the system's software allows for Correction Factor (CR) values to be entered which then convert MOSFET response to dose.

These CRs vary between 0.8 and 1.1 and are Linac and calibration set-up dependent. They must be determined for any new MOSFET/Cap combination. These CRs may be stored in the system's software dose measurement template.

For example, two sets of CRs were obtained with a Siemens Mevatron Linac at 6 and 18MV photon energies, with a nominal dose of 200 cGy at Dmax in water and 10 x 10 cm^2 field size (100 cm Source Axis Distance):*See Below*

Typical Correction Factors for Brass Build-up Caps:
- 6 MV Energy - Correction Factor "CR": 1.10
- 18 MV Energy - Correction Factor "CR": 0.84

Note: The Correction Factor "CR" is the value used in the system software, along with the Calibration Factor "CF" to convert MOSFET response to dose. (Please refer to Operators' Manuals for further details).

Tissue Equivalent Hemispherical Build-up Cap
These plastic water build-up caps come in sizes of 1.0 cm, 1.5 cm and 2.0 cm for various energies. The build-up caps have grooves specifically made for MOSFET dosimeters, allowing accurate measurements. A 3.0 cm build-up cap made of polystyrene is also available.

Handling and Cleaning
Brass build-up caps are easily attached to the MOSFET. Circular adhesive patches are provided with the caps to fasten the MOSFET dosimeter to the build-up cap for the duration of the lifetime of the dosimeter. The cap/MOSFET is then adhered to the patient's skin using paper tape.

Cleaning - use rubbing alcohol or alcohol swabs.

Custom Build-Up Caps
Build-up caps for MOSFET dosimeters can also be custom made per customers specifications.

Item #	Description
322-375	Brass Build-up Cap
322-377	1 cm Tissue Equivalent Build-up Cap
322-379	1.5 cm Tissue Equivalent Build-up Cap
322-381	2.0 cm Tissue Equivalent Build-up Cap
322-383	Set of 3 Tissue Equivalent Build-up Caps: 1, 1.5 & 2 cm
664-603	3.0 cm Tissue Equivalent Build-up Cap

MOSFET CALIBRATION JIG

Calibration jig shown with mobileMOSFET

- **Quick and easy calibration**
- **Consistent positioning**
- **Reproducible calibrations**
- **Quick verification of beam flatness and symmetry**
- **Better degree of accuracy in high field gradients (IMRT)**
- **Allows for customization of build-up**
- **Surface entrance dose and radiology applications**

The MOSFET Calibration Jig is designed for consistent and reproducible MOSFET calibration with a simple set-up configuration. The jig reference lines can be easily aligned with the positioning lasers and linear accelerator light fields for 10 x 10 cm, 20 x 20 cm, and 30 x 30 cm fields. The use of the jig promotes easy and consistent positioning at the beam isocenter and, thereby, reproducible calibrations.

The MOSFET placement indentations not only aid positioning, but also prevent accidentally damaging the MOSFETs with build-up material during calibration. The staggered positioning reduces the influence of scatter from adjacent MOSFETs and the symmetrical design allows comparison of opposing MOSFETs to each other, and quick verification of beam flatness and symmetry.

The relatively thin 1 cm thickness of the MOSFET Calibration Jig provides a moderate amount of backscatter, but is thin enough to permit customized irradiation set-up with additional backscatter and build-up materials.

Calibration with the mobileMOSFET Calibration Module Software
Calibration becomes even easier when the MOSFET Calibration Jig is combined with the mobileMOSFET Dose Verification System. The mobileMOSFET is completely software driven and contains a Calibration Module. The Calibration Module collects the calibration dose repetitions in a viewable pool of data. The software automatically calculates the Calibration Factor (CF), the average CF and the percent standard deviation for each MOSFET
dosimeter. The CF data file can also be printed, saved, loaded, and edited.

Other Applications
In addition to calibration, the simplicity of the calibration jig lends itself to customized use in phantom-based measurements. The MOSFET arrangement can be used for dose measurement as a two-dimensional array that provides an inexpensive and quick validation of dose distribution. Due to the small active volume of the MOSFET (2 x 10^{-5} mm^3), there is limited dose averaging and therefore a better degree of accuracy in high field gradients. The standardized set-up geometry provides simple entry of positional data to treatment planning software, which can be compared to absolute MOSFET dosimeter measurements. The MOSFET dosimeters are also isotropic (± 2% for 360°) and have negligible energy dependence, which makes them an ideal dosimeter for IMRT validation.

Typically calibration measurements are done at D_{max}, but the MOSFET Calibration Jig places the dosimeters on the surface of the jig to allow for customization of build-up. With no build-up applied, the Calibration Jig can be used for entrance CF estimation during surface dose measurements in radiotherapy or radiology applications.

Specifications:

Material: Acrylic (PMMA)
Size: 11.8" x 11.8" x 0.4" (30 cm x 30 cm x 1 cm)
Field Sizes: 10 x 10 cm; 20 x 20 cm; 30 x 30 cm
MOSFET grooves: 5
Weight: 2.4 lb (1.07 kg)

Item #	Description
322-301	MOSFET Calibration Jig

MOSFET XWU-IMRT PHANTOM

Phantom for MOSFET Dosimeters & Superimposed Film / Ion Chamber

The XWU-IMRT Phantom is ideal for obtaining qualitative dose measurements for film and MOSFET dosimetry. This 20 x 20 cm block phantom houses film and a minimum of nine MOSFET dosimeters on two orthogonal planes. One of the planes, containing five MOSFET detection points, is the dividing plane of the two sub-phantoms where a film is housed. Five absolute MOSFET dose points on the plane of the film provide dose verification. Easy to use cassettes come with pre-manufactured slots for the dosimeters and allow for greater versatility.

Advanced Applications: IMRT
Reliable and efficient MOSFETs are well suited for Quality Assurance in IMRT programs because they provide quantitative dose measurements. Due to their small size and excellent isotropic response, MOSFETs can be positioned in the XWU-IMRT Phantom for treatment planning QA of IMRT procedures. This can be done with single dosimeters or with the Linear 5ive Array, both in the phantom and on the patient.

Item #	Description
322-303	MOSFET XWU-IMRT Phantom

PORTABLE DOSIMETER FOR MOSFET DOSIMETERS

- **Stand-alone reader with LCD**
- **Portable and compact**
- **Quick set-up time**
- **Simple menu operation**
- **Supports two MOSFET dosimeters**
- **Supports all single MOSFETs**
- **Optional data export via USB and PortableDose Connect software**
- **Calibration factor library**
- **Long rechargeable battery life**
- **Manual measurement mode, or Automatic Sequential mode**
- **No software or computer necessary**

Applications

Radiotherapy
- In vivo dose – photon or electron
- Skin entrance and exit dose (TBI)
- D_{max} dose measurements
- IMRT and Tomotherapy
- Brachytherapy

Radiology
- Pediatric CT dose
- Fluoroscopy dose

The Portable Dosimeter is an economical, compact, stand-alone system for radiation dose measurement. Patient dosimetry measurements are available at the touch of a button and display on the integrated LCD, without the need for software or a computer. Additionally, the rechargeable battery powered dosimeter allows easy transportation from room-to-room, or hospital-to-hospital.

The Portable Dosimeter supports up to two simultaneous dose points with any of the single MOSFETs on standard or high bias setting for optimal dose reproducibility. An automatic mode is available to continuously sample dose data at a fixed time interval during a session.

After every measurement the dosimetry data is automatically stored to memory for later viewing and can be downloaded to a computer via a USB connection and the PortableDose Connect software. A simple, menu driven interface allows customization of calibration factors, dose units and operational settings directly on the Portable Dosimeter. To save you time, a library of default calibration factors is stored in the memory, but the user also has the choice of entering their customized calibration factors.

For one-to-two dose points, the Portable dosimeter is a fast, simple solution for patient dosimetry that can be used for a wide range of applications in radiotherapy and radiology.

Supported MOSFET Dosimeters
All single MOSFETs* are supported by the Portable Dosimeter including, Standard and High Sensitivities, microMOSFETs, Heat shrink Reinforced, and Radio-opaque Marker dosimeters.
*Linear 5 Array is not supported.

Note: It is recommended that a Brass Build-up Cap (322-375) be included with this dosimeter. Order 322-375 Separately.

Item 322-370 Portable Dosimeter for MOSFET Dosimeters Includes
- Portable Dosimeter Reader Module
- PortableDose Connect Software
- USB Cable (PC-to-Reader connection)
- Medical Universal Power Adapter (to recharge Reader Module)
- (2) Standard Sensitivity Reinforced MOSFET Dosimeters
- (1) Brass Build-Up Cap
- Carrying Case

Specifications

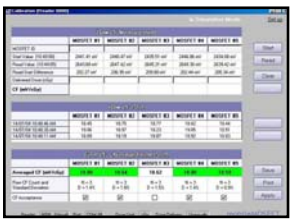
Units: Gy, cGy, mGy, rad, mV
Internal clock: Time and date in 24 hour format
Bias settings: High and Standard for customized sensitivity
Batteries: Two AA batteries. Estimated battery life of more than 1 month
Rechargeable: Integrated recharging circuit for NiMH AA batteries
Software: PortableDose Connect software provides data download support with Windows 2000/XP/Vista
Resolution: 0.1 mV over an accumulated total of 20,000 mV
Linearity: ± 1 mV for the total 20,000 mV
Dose Range: Typically 20,000 cGy for standard sensitivity and 7,000 cGy for high sensitivity

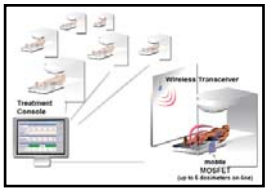
Dose Reproducibility (^{60}Co, 1 σ)

Dose	Bias Setting	
	High	Standard
200 cGy	<1%	<2%
20 cGy	<1%	<3%

Item	Description
322-370	Portable Dosimeter for MOSFET Dosimeters
322-375	Brass Build-Up Cap for MOSFET Diode

mobileMOSFET WIRELESS DOSE VERIFICATION SYSTEM





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On-line Wireless Dosimetry

The mobileMOSFET Dose Verification System takes MOSFET Dosimetry to the next level. The mobileMOSFET is an easy to use, seamlessly integrated system, that minimizes dosimetry and QA time.

This wireless system is entirely software driven, allowing for complete control of one or more systems from a remote PC. The system consists of Remote Monitoring Dose Verification Software, wall-mounted Bluetooth™ Wireless Transceiver and a small Reader Module acting as a channel between the MOSFET and software. Up to five MOSFETs or one Linear 5ive Array can be plugged into one module. This provides easy mobility within the treatment room. The PC is on-line with the Reader Module and dose is obtained in real-time.

Applications

- Routine In-vivo Dosimetry
- 1-2 Fields / Patient starts
- First Dose; Treatment Plan Verification
- IMRT QA and Phantom Work
- Brachytherapy
- IGRT / Tomotherapy
- Radiology
- Intracavitary Measurement

Dose Points

- 1 - 5 on-line
  (Up to 40 on-line with additional Reader Modules and transceivers)

Software Features

- Interactive, 2-way on-line communication between a PC and the Reader Module
- Dose obtained in real-time
- Performs all dose data measurements with a few mouse clicks
- Calibration feature enables quick and easy calibration of the MOSFETs
- Capability to assign Calibration Factors, Correction Factors and Target Dose to each MOSFET. Final dose and percent deviation from target are automatically calculated
- Export to Excel™
- Set interval read times to sample multiple doses during treatment (automatic or manual control)
- With multiple systems and transceivers, one PC can read MOSFETs in multiple treatment rooms simultaneously
- Patient records can be saved, imported, and/or printed and are password checked

The MOSFET Dosimeter

- One dosimeter/calibration factor for all photon/electron modalities
- Isotropic (± 2% for 360°)
- Active region of 0.2 x 0.2 mm
- Permits pinpoint measurement without patient shielding
- Dose-rate and temperature independent
- Lighweight and flexible
- Multiple dosimeter capability with one Reader
- Standard MOSFET is 2.5 mm wide
- microMOSFET is 1 mm wide
- Linear 5ive Array - 5 dose points on one flex

Wireless Room Expansion Package

Your mobileMOSFET system with Bluetooth™ can easily be used in multiple rooms with the installation of Wireless Room Expansion Packages. The package is also compatible with previously installed mobileMOSFET wireless dosimetry systems.

Hardware Features

- Bluetooth™ transceiver (wall mounted)
- Reader Module (17.8 cm x 15.9 cm x 4.2 cm)
- Wireless (up to 10 meters), portable and mobile
- Contains reader, Bluetooth™ transceiver, dual bias supply settings (high and standard), ports for 5 MOSFETs and a port for 1 Linear 5ive Array
- One Reader Module can be used for 1-5 MOSFETs or one Linear 5ive Array
- Battery Operated (Rechargeable; >20 hours of typical use)
- Built-in smart charger (<3 hours)
- Software supports up to 8 readers and 40 MOSFETs simultaneously
- Portability between multiple treatment rooms

MOSFET Sensitivity

Under Full Build-Up: 1 mV/cGy on standard bias
2.7 mV/cGy on high sensitivity bias

Under X-Ray Energies: 9 mV/R on high sensitivity bias

Dose	BIAS SUPPLY	
	Standard	High
200 cGy	<2%	<0.8%
100 cGy	<3%	<1.2%
20 cGy	<8%	<3%

System Dose-to-Dose Reproducibility at 1 σ

Item #	mobileMOSFET	Software	Dose Points	Reader Modules	Bluetooth™ Connection
322-350	Wireless	*	5	1	*
322-351	X Wireless	*	10	2	*
322-352	XX Wireless	*	20	4	*

mobileMOSFET Component Details

Item 322-350 mobileMOSFET Wireless Dosimetry System (5 Dose Points, 1 Reader Module)
A wireless Bluetooth™ connection allows for complete control of the system from a remote PC outside the treatment room and eliminates cables running across the floor. Additional Bluetooth™ transceivers expand the use of the system to more treatment rooms.

System Components Include:
- mobileMOSFET Remote Monitoring Dose Verification Software - Includes: two (2) years of software support/upgrades, one (1) license (additional licenses available) and one (1) USB-to-Serial Converter
- Reader Module (wireless transceiver, bias, battery, 5 ports for single MOSFETs dosimeters and one port for the Linear 5ive Array, 5 dose points.)
- 50' (15 m) RS-232 Extension Cable (Transceiver extension, PC to Reader connection)
- Universal power adapter for recharging the Reader Module
- (5) Standard Sensitivity Reinforced MOSFET Dosimeters
- Bluetooth™ wireless transceiver (external/wall mounted) and a 6' (2 m) cable
- Carrying Case
- Calibration Jig (acrylic, 30cm x 30cm x 1cm, MOSFET grooves)
- (2) Hemispherical brass build-up caps (0.63cm radius, photons)

Item 322-351 mobileMOSFET X Wireless Dosimetry System (10 Dose Points, 2 Reader Modules)
The standard mobileMOSFET system is expanded to ten dose points by the addition of a second Reader module. Both Readers are controlled from the same PC through a single Bluetooth™ wireless transceiver. Additional Bluetooth™ transceivers expand the use of the system to more treatment rooms.

System Components Include:
- mobileMOSFET Remote Monitoring Dose Verification Software - Includes: two (2) years of software support/upgrades, one (1) license (additional licenses available) and one (1) USB-to-Serial Converter
- (2) Reader Modules (wireless transceiver, bias, battery, 5 ports for single MOSFETs dosimeters and one port for the Linear 5ive Array, 5 dose points.)
- 50' (15 m) RS-232 Extension Cable (Transceiver extension, PC to Reader connection)
- (2) Universal power adapters for recharging the Reader Module
- (10) Standard Sensitivity Reinforced MOSFET Dosimeters
- Bluetooth™ wireless transceiver (external/wall mounted) and a 6' (2 m) cable
- Calibration Jig (acrylic, 30cm x 30cm x 1cm, MOSFET grooves)
- (2) Hemispherical brass build-up caps (0.63cm radius, photons)

Item 322-352 mobileMOSFET XX Wireless Dosimetry System (20 Dose Points, Four Reader Modules)
The standard mobileMOSFET system is expanded to twenty dose points by the addition of more Reader Modules. All four Readers are controlled from the same PC through a single Bluetooth™ transceiver. The system can accommodate up to eight (8) Reader Modules simultaneously for a total of forty (40) dose points.

System Components Include:
- mobileMOSFET Remote Monitoring Dose Verification Software - Includes: two (2) years of software support/upgrades, one (1) license (additional licenses available) and one (1) USB-to-Serial Converter
- (4) Reader Modules (wireless transceiver, bias, battery, 5 ports for single MOSFETs dosimeters and one port for the Linear 5ive Array, 5 dose points.)
- 50' (15 m) RS-232 Extension Cable (Transceiver extension, PC to Reader connection)
- (4) Universal power adapters for recharging the Reader Modules
- (20) Standard Sensitivity Reinforced MOSFET Dosimeters
- Bluetooth™ wireless transceiver (external/wall mounted) and 6' (2 m) cable
- Calibration Jig (acrylic, 30cm x 30cm x 1cm, MOSFET grooves)
- (2) Hemispherical brass build-up caps (0.63cm radius, photons)

Wireless Room Expansion Packages
- **Item 322-353 One Additional Room**
- **Item 322-354 Two Additional Rooms**
- **Item 322-355 Three Additional Rooms**

The mobileMOSFET Reader Module can easily be shared with an additional room by the installation of a wireless room expansion package.

Package Components Include:
- Bluetooth™ wireless transceiver (external/wall mounted) and 6' (2 m) cable
- 50' (15 m) RS-232 Extension Cable (Transceiver cable extension, PC to Reader connection)
- Additional single user software license

Item 322-356 Additional Cable
- 50' (15 m) RS-232 Extension Cable (PC to Reader connection)

Item 322-357 Single User mobileMOSFET Software License
- Includes two years of software support and upgrades

Item 322-358 mobileMOSFET Software License for 2-9 Users
- License for software installation on 2 to 9 PC workstations

Item 322-359 mobileMOSFET Software License for 10+ Users
- License for software installation on 10 or more PC workstations

Item 322-365 Carrying Case
- Padded, cloth, laptop style carrying case for transporting your equipment (Black)

Item 322-366 Additional Reader Module
Includes a universal power adapter.

Item 322-367 Additional USB-to-Serial Converter
one (1) included with system.

Item 322-384 Optional mobileMOSFET Extended Warranty
The extended warranty is available for all new system purchases. Price is per year, per Reader module and is available for up to two (2) extra years (total of three years coverage). Terms and conditions are as per the original warranty, excluding dosimeters and batteries.

Item 322-385 Optional mobileMOSFET Service Contract
The service contract is under the same terms as the warranty, with the additional option to return the system once a year for annual maintenance. The service contract is available up to five (5) years from the time of purchase and covers parts and labor as per the original warranty, excluding dosimeters and batteries. Volume discounts for multiple Reader Modules are available.

Item #	mobileMOSFET
322-350	Wireless Dosimetry System, 5 dose points
322-351	X Wireless Dosimetry System, 10 dose pts
322-352	XX Wireless Dosimetry System, 20 dose pts
322-353	Wireless Room Expansion Pkg, 1 Add'l Rm
322-354	Wireless Room Expansion Pkg, 2 Add'l Rms
322-355	Wireless Room Expansion Pkg, 3 Add'l Rms
322-356	50' (15 m) RS-232 Extension Cable

Item #	mobileMOSFET
322-357	Additional Software License, Single user
322-358	Additional Software License, 2 to 9 users
322-359	Additional Software License, 10+ users
322-365	Carrying Case, Black
322-366	Additional Reader Module
322-367	Additional USB-to-Serial-Converter
322-384	Extended Warranty (Per Year)
322-385	Service Contract (Per Year)

UNIDOSE webline UNIVERSAL DOSIMETER

The ethernet interface based on the TCP/IP protocol allows to integrate the UNIDOS webline in a LAN for remote access and e-mail capability. Its big, user-configurable TFT display guaranties visibility from wide angles. A comprehensive chamber library makes it possible to store the calibration data of the chambers. Air density corrections are done by keying in air pressure and temperature, ir by means of radioactive check devices. The check device data are stored in a database. An internal clock calculates the decay of the isotope radioactivity. It features both means and battery operation. The delivery includes a manual in English.

The new UNIDOS webline differs from previously known dosimeters with its completely new operating concept and network capability.

The simple and clear user-prompting with help texts and a navigation button make operating instructions almost superfluous. Every function can be set quickly and easily, and every setting option is explained by help texts. Menu-prompting is in the selected language. The measurement values are also clearly readable at greater distances. In addition to simultaneous display of dose and dose rate, all selected detector settings are shown. The bright color display can be configured according to user requirements.

UNIDOS webline has a relay output, an RS-232 interface and a TCP/IP interface. The dosimeter can be integrated into a network via the TCP/IP interface. UNIDOS webline can be operated remotely from any PC in a network using a VNC client. The complete user interface is displayed on the networked PC. As a result, measurements can be started, measurement results retrieved and settings changed conveniently from a workstation. The dosimeter can send an alarm via e-mails if the set dose or dose rate threshold is exceeded. In addition, comprehensive status and service functions can be queried per e-mail. This makes remote maintenance possible.

UNIDOS webline exceeds the requirements for a reference class dosimeter according to IEC 60731 as well as the requirements according to the IPEM Secondary Standard. The resolution for 1 fA / 10 fC.

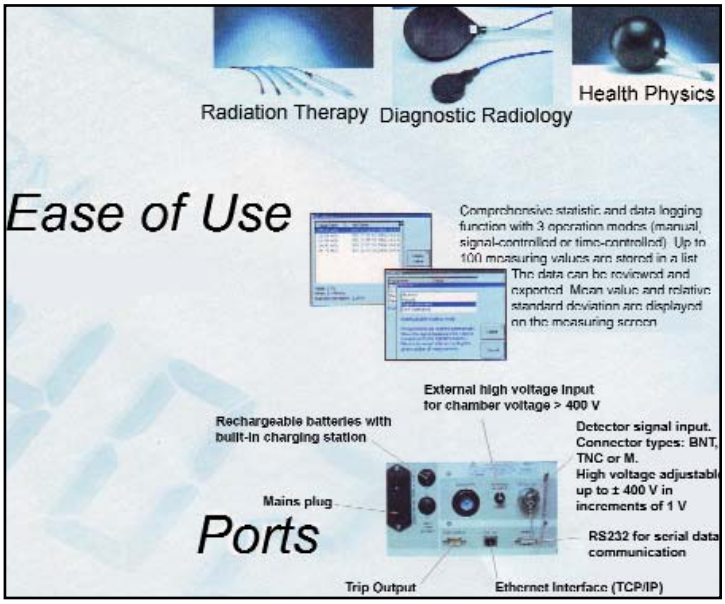
Classification

Highest classification in all applications (radiation therapy, diagnostic radiology, health physics).

Surpasses the requirements for reference class dosemeters according to IEC 60731, the IPEM secondary standard dosemeter guidelines, IEC 61674 for diagnostic radiology and IEC 60846 for health physics.

High performance secondary standard and reference class dosemeter/electrometer with integrated network features.

- High quality reference class dosemeter for radiation therapy, diagnostic radiology and radiation protection.
- Integration in a LAN with the internet standard TCP/IP
- Remote access functionality
- E-mail capability, eg. to initiate self tests and to send a status report
- Active, configurable TFT display with wide viewing angles
- Easy and fast menu-driven handling with navigation knob and help system



Specifications:

Type of Product: High precision dosemeter according to IEC 60731, IEC 61674 and IEC 60846

Application: Dose and dose rate measurements (charge and current measurements) in radiation therapy, X-ray diagnostics and radiation protection/

Measuring Quantities/Units: Absorbed dose to water (Gy), Air Kerma (Gy), Photon equivalent dose (Sv), Ambient dose equivalent H*(10), Exposure (R), Dose length product (Gy-cm), Activity (Bq), (Ci), Corresponding rates of before mentioned-Charge (C), Current (A).

Measuring Ranges:

Charge: 2 pC...8.991 C
Current: 200 fA...2.5µA

Resolution:

Charge: 10 fC
Current: 1 fA

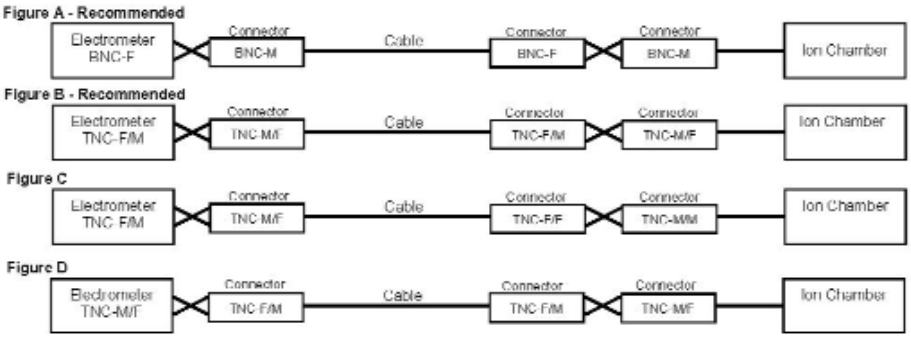
Long-term Stability: < ± 0.1 % p.a.
Non-linearity: < ± 0.25 % according to IEC
Interval Time: (1...9999) s
Temperature Range: (10...40)°C, (50...104)°F
Relative Humidity: (20...80)%, max 20 g/m
Leakage Current: < ± 1 fA
Amplifier Zeroing: automatically within approx. 75 s
Chamber Voltage: (0...± 400) V in 1 V increments
Interfaces: IEEE802 (TCP/IP), RS232
Power Supply: (85...265) VAC, (50...60) Hz resp. rechargeable batteries AA (NiMH)
Dimensions: 152 mm x 257 mm x 262 mm
(H xW xD) 5.98 in x 10.12 in x 10.31 in
Weight: Approx. 5.9 kg, 13.0 lbs

Item #	Description
321-015	UNIDOS webline Universal Dosemeter
321-024	Carrying Case for UNIDOS webline

REFERENCE GUIDE FOR ELECTROMETER - CABLE - CHAMBER CONNECTIONS

Capintec Electrometer uses TNC-F/M or BNC-F . . . . . (Figure A or C)
Capintec Triax Cable uses TNC-M/F and TNC-F/F. . . . . (Figure C)
Capintec Chamber uses TNC-M/M or BNC-M . . . . . (Figure A or C)
Wellhofer Electrometer uses TNC-F/M . . . . . (Figure C)
Wellhofer Triax Cable uses TNC-M/F and TNC-F/F . . . . . (Figure C)
Wellhofer Chamber uses TNC-M/M. . . . . (Figure C)
N.E. Electrometer uses TNC-F/M . . . . . (Figure B)
N.E. Chambers w/Triax Cable uses TNC-M/F or BNC-M . (Figure B)
Victoreen Electrometer uses TNC-M/F . . . . . (Figure D)
Victoreen Chamber with Triax Cable uses TNC-M/F . . . . (Figure D)
Keithley Electrometer uses BNC-F . . . . . (Figure A)
Keithley Chamber with Triax Cable uses BNC-M . . . . . (Figure A)
PTW Chamber with 1 Meter Triax Cable uses BNC-M. . . (Figure A or B)
PTW Chamber with 10 Meters Triax Cable uses BNC-M . (Figure A)
PTW Extensions Triax Cable uses BNC-M and BNC-F . . (Figure A)
PTW Electrometer uses M, TNC-F/M or BNC-F . . . . . (Figure A)
Standard Imaging Electrometer uses BNC-F . . . . . (Figure A)
CNMC Electrometer uses BNC-F . . . . . (Figure A)

DIAGRAM FOR REFERENCE GUIDE CONNECTIONS



CONNECTIONS ADAPTERS

323-324

323-329

323-341

323-342

323-343

Item	Triax Adapters
323-320	Triax BNC-M and Triax TNC-F/M Connectors
323-323	Triax BNC-M and Triax TNC-F/F Connectors
323-324	Triax BNC-F and Triax TNC-M/F Connectors
323-328	Triax BNC-F and Triax BNC-F Connectors
323-329	Triax BNC-M and Triax BNC-M Connectors
323-334	Triax BNC-M and Triax BNC-F Connectors
323-336	Triax PTW Type M-F to Triax BNC-M Connector with 1 Meter Cable

Item	Coax to Triax Adapters
323-339	Coax BNC-M and Triax BNC-F Connectors with 1 Meter Cable
323-340	Coax BNC-F and Triax BNC-M Connectors Diode to Electrometer Connector

Item	Coax Adapters
323-341	Coax BNC-F and BNC-F Connectors
323-342	Coax BNC-F and BNC-F Panel Mount Connectors
323-343	Coax BNC-M and BNC-M Connectors

Item	Custom Connector Adapter
323-350	Custom Adapters - Specify Connectors with 1 Meter Cable between connectors - Specify Length if another length is needed

See Connector Example Page

Item 323-320 is able to modify the BNC-F Keithley Electrometer to the TNC M/F Capintec, Wellhofer or Nuclear Enterprises Triax Cable.

Item 323-323 is able to modify the BNC-F Triax Cable to the TNC-F/M Wellhofer, Capintec and Nuclear Enterprises Electrometer.

Item 323-324 is able to modify the BNC-M Chamber to the TNC-F/M Wellhofer, Capintec and Nuclear Enterprises Electrometer.

CABLE CONNECTOR REFERENCE

A. Triax BNC Plug
(M/F) [2-Lug]

B. Triax BNC Jack
(F/M) [2-Lug]

C. Triax TNC Plug
(M/F)

D. Triax TNC Jack
(F/M)

E. Triax TNC Jack
(M/M)

F. Triax TNC Plug
(F/F)

G. Coax BNC Plug
(M/F) [2-Lug]

H. Coax BNC Jack
(F/M) [2-Lug]

I. Coax SHV Plug
(F/F) [2-Lug]

J. Coax MHV Plug
(M/F) [2-Lug]

K. Triax Type M
(M/M)

L. Triax Type M
(F/F)

M. Triax BNC Plug
(M/F) [3-Lug]

N. Banana Plug

O. Banana Jack

P. Triax LEMO Plug
(F/M)

Q. Triax LEMO Plug
(M/F)

Naming Standard: Connector Type (Center Pin Gender / Outer Housing Gender).
Letters are for reference only.

CONNECTOR DUST CAPS

323-360 323-361

323-362 323-363

The Dust Caps with chains prevent dirt and dust from accumulating in the connectors. Dust and dirt accumulations will cause high leakage currents.

Item	Description
323-360	Male Dust Cap for BNC-F and Female Center Pin
323-361	Female Dust Cap for BNC-M and Male Center Pin
323-362	Male Dust Cap for TNC-F/M or TNC-M/M Connectors
323-363	Female Dust Cap for TNC-M/F or TNC-F/F Connector

TRIAX EXTENSION CABLES

Q

The triaxial cable assemblies are made of Microdot flexible white, 3 mm diameter, shielded, low-noise, high impendance, radiation resistant cable, designed to carry the extremely small currents generated by ion chambers without signal degradation.

A standard extension cable has a male connector on one end to mate with the electrometer and a female connector on the other end to mate with the output connector of the ion chamber.

See reference guide and cable connector reference pages to determine correct connectors for triax cables.

For Keithly or PTW

Item	BNC Triax Cable with Dust Caps	Length
323-1303	BNC-F and BNC-M Connectors	33' (10 Meters)
323-1304	BNC-F and BNC-M Connectors	40' (12 Meters)
323-1305	BNC-F and BNC-M Connectors	50' (15 Meters)
323-1306	BNC-F and BNC-M Connectors	60' (18.5 Meters)

For NE America (Nuclear Enterprise)

Item	TNC Triax Cable	Length
323-1313	TNC-M/F and TNC-F/M Connector	33' (10 Meters)
323-1314	TNC-M/F and TNC-F/M Connector	40' (12 Meters)
323-1315	TNC-M/F and TNC-F/M Connector	50' (15 Meters)
323-1316	TNC-M/F and TNC-F/M Connector	60' (18.5 Meters)

Dust Caps Must Be Purchased Separately

For Capintec or Wellhofer

Item	TNC Triax Cable	Length
323-1323	TNC-M/F and TNC-F/F Connector	33' (10 Meters)
323-1324	TNC-M/F and TNC-F/F Connector	40' (12 Meters)
323-1325	TNC-M/F and TNC-F/F Connector	50' (15 Meters)
323-1326	TNC-M/F and TNC-F/F Connector	60' (18.5 Meters)

Dust Caps Must Be Purchased Separately

CUSTOM TRIAX EXTENSION CABLES

These cables are made to order, no exchanges or refunds are available. When ordering, please specify the following:

- Connection 1 and Connection 2
- Length of the Cable in Meters
- Cable Type - 3mm Diameter White (Standard) or 5.3mm Diameter Suhner Swiss Gray (Heavy Duty)
- Cable on Reel - if Yes, Specify the Connection at the Hub

Item	Description
323-1300	Custom Cable

COAX EXTENSION CABLES

Item	Description
322-891	32' (10M) Coax Cable, Diode, BNC-F to BNC-M
322-892	49' (15M) Coax Cable, Diode, BNC-F to BNC-M
322-893	65' (20M) Coax Cable, Diode, BNC-F to BNC-M

TRIAX EXTENSION CABLE ON SMALL REEL

Cable reel assemblies offer a great convenience in winding and storage of extension cables. A cable reel will extend the life of a cable significantly by eliminating kinks and providing protection during storage. Reel out only as much cable as needed. The extended end is where the cable reels out . The hub end has 18" (45.7 cm) of fixed triax cable. Connector type and location is determined by where the reel will be used, inside or outside of room.

The reel can be purchased without a cable. The small reel can be used with cables 50' (15 meters) or less in length. This reel can not be used for cable lengths getter than 50' (15 meters).

See reference guide and cable connector reference pages to determine correct connectors for triax cable on reel.

Item	Description
323-2400	Small Cable Reel without Cable

For Keithly or PTW Connector Ends WILL Mate

Item	BNC Triax Cable Reel w/Dust Caps	Length
323-2402	Hub End - BNC-F Connector Extended End - BNC-M Connector	40' (12 Meters)
323-2403	Hub End - BNC-F Connector Extended End - BNC-M Connector	50' (15 Meters)
323-2412	Hub End - BNC-M Connector Extended End - BNC-F Connector	40' (12 Meters)
323-2413	Hub End - BNC-M Connector Extended End - BNC-F Connector	50' (15 Meters)

For NE America (Nuclear Enterprise) and (New) Wellhofer Connector Ends WILL Mate

Item	TNC Triax Cable Reel	Length
323-2424	Hub End - TNC-M/F Connector Extended End - TNC-F/M Connector	40' (12 Meters)
323-2423	Hub End - TNC-M/F Connector Extended End - TNC-F/M Connector	50' (15 Meters)
323-2432	Hub End - TNC-F/M Connector Extended End - TNC-M/F Connector	40' (12 Meters)
323-2433	Hub End - TNC-F/M Connector Extended End - TNC-M/F Connector	50' (15 Meters)

Dust Caps Must Be Purchased Separately

For Capintec and (Old) Wellhofer Connector Ends WILL NOT Mate

Item	TNC Triax Cable Reel	Length
323-2444	Hub End - TNC-M/F Connector Extended End - TNC-F/F Connector	40' (12 Meters)
323-2443	Hub End - TNC-M/F Connector Extended End - TNC-F/F Connector	50' (15 Meters)
323-2454	Hub End - TNC-F/F Connector Extended End - TNC-M/F Connector	40' (12 Meters)
323-2453	Hub End - TNC-F/F Connector Extended End - TNC-M/F Connector	50' (15 Meters)

Dust Caps Must Be Purchased Separately

WALL PLATES FOR TRIAX CABLE CONNECTOR

These wall plates grip a standard BNC or TNC triax cable connector. The wall plates are made to replace a standard single or double electrical wall plate. There is an adjustable collar in the opening that can be tightened to the connector to prevent movement. An allen wrench for the collar adjustment is included with each wall plate.

Specifications

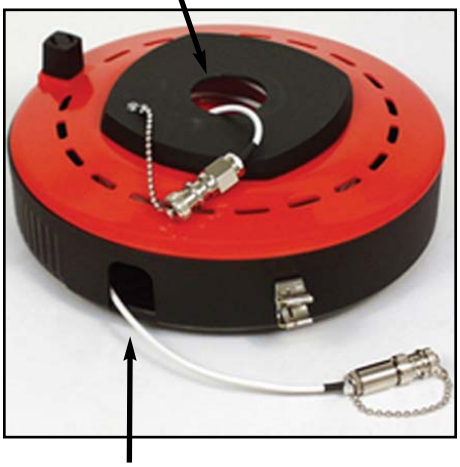
Material: Stainless Steel

Item	Description
323-380	Wall Plate, Single for Triax Cable Connector
323-381	Wall Plate, Double for Triax Cable Connector

TRIAX EXTENSION CABLE ON LARGE REEL

Hub End (Electrometer Connection)

Normally connected to Electrometer outside of treatment room.



Extended End (Ion Chamber Connection)

Cable reel assemblies offer a great convenience in winding and storage of extension cables. A cable reel will extend the life of a cable significantly by eliminating kinks and providing protection during storage. Reel out only as much cable as needed. The extended end is where the cable reels out . The hub end has 18" (45.7 cm) of fixed triax cable. Connector type and location is determined by where the reel will be used, inside or outside of room.

The reel can be purchased without a cable. The large reel can be used with cables 50' (15 meters) or more in length. This reel can not be used for cable lengths less than 50' (15 meters).

See reference guide and cable connector reference pages to determine correct connectors for triax cable on reel.

Item	Description
323-2401	Large Cable Reel without Cable

For Keithly or PTW
Connector Ends WILL Mate

Item	BNC Triax Cable Reel w/Dust Caps	Length
323-2404	Hub End - BNC-F Connector Extended End - BNC-M Connector	40' (12 Meters)
323-2405	Hub End - BNC-F Connector Extended End - BNC-M Connector	50' (15 Meters)
323-2406	Hub End - BNC-F Connector Extended End - BNC-M Connector	65' (20 Meters)
323-2414	Hub End - BNC-M Connector Extended End - BNC-F Connector	40' (12 Meters)
323-2415	Hub End - BNC-M Connector Extended End - BNC-F Connector	50' (15 Meters)
323-2416	Hub End - BNC-M Connector Extended End - BNC-F Connector	65' (20 Meters)

For NE America (Nuclear Enterprise) and (New) Wellhofer
Connector Ends WILL Mate

Item	TNC Triax Cable Reel	Length
323-2422	Hub End - TNC-M/F Connector Extended End - TNC-F/M Connector	40' (12 Meters)
323-2425	Hub End - TNC-M/F Connector Extended End - TNC-F/M Connector	50' (15 Meters)
323-2426	Hub End - TNC-M/F Connector Extended End - TNC-F/M Connector	65' (20 Meters)
323-2434	Hub End - TNC-F/M Connector Extended End - TNC-M/F Connector	40' (12 Meters)
323-2435	Hub End - TNC-F/M Connector Extended End - TNC-M/F Connector	50' (15 Meters)
323-2436	Hub End - TNC-F/M Connector Extended End - TNC-M/F Connector	65' (20 Meters)

Dust Caps Must Be Purchased Separately

For Capintec and (Old) Wellhofer
Connector Ends WILL NOT Mate

Item	TNC Triax Cable Reel	Length
323-2442	Hub End - TNC-M/F Connector Extended End - TNC-F/F Connector	40' (12 Meters)
323-2445	Hub End - TNC-M/F Connector Extended End - TNC-F/F Connector	50' (15 Meters)
323-2446	Hub End - TNC-M/F Connector Extended End - TNC-F/F Connector	65' (20 Meters)
323-2452	Hub End - TNC-F/F Connector Extended End - TNC-M/F Connector	40' (12 Meters)
323-2455	Hub End - TNC-F/F Connector Extended End - TNC-M/F Connector	50' (15 Meters)
323-2456	Hub End - TNC-F/F Connector Extended End - TNC-M/F Connector	65' (20 Meters)

Dust Caps Must Be Purchased Separately

PTW FARMER® IONIZATION CHAMBERS

Thimble chambers for measuring high-energy photon and electron radiation in air or in phantom material

- **Fully guarded chamber**
- **Vented sensitive columes of 0.6 cm³**
- **Suitable as therapy chambers for use in solid phantoms**
- **Flat energy response**
- **Correction factors needed to determine absorbed dose to water or air kerma are published in the pertinent dosimetry protocols**
- **The chambers are designed for the use in solid state phantoms and are not waterproof**

The 0.6 cm³ PTW Farmer chambers are designed for absolute photon and electron dosimetry with therapy dosemeters. Three chamber types for measurements in air or in solid state phantom material are available.

Item 300-640: The 30010 is a Classical therapy chamber. The 30010 Farmer chamber is a wide spread ionization chamber for absolute dose measurements in radiation therapy. The acrylic chamber wall ensures the ruggedness of the chamber. The wall material is graphite with a protective acrylic cover, and the electrode is made of Al. The nominal photon energy range is from 30 kV to 50 MV.

Item 300-645: The 30011 is a pure graphite therapy chamber. The 30011 all graphite Farmer chamber is used for absolute dose measurements in radiation therapy in cases where a minimum of different materials in the radiation field is desired. Due to the sole use of graphite the energy response of the chamber at energies below ^{60}Co varies stronger than that of chambers with an aluminum electrode. The 30011 is used for therapy dosimetry, where a completely graphite-built chamber is required. The nominal photon energy range is from 140 kV to 50 MV.

Item 300-650: The 30012 is a Farmer chamber with graphite wall. The 30012 Farmer chamber is intended for absolute dose measurements in radiation therapy. The graphite wall makes the chamber almost water-equivalent, the aluminum central electrode improves the energy response at energies below ^{60}Co. used for therapy dosimetry. The 30012 is used where a chamber with graphite wall and Al electrode is required. The nominal photon energy range is from 60 kV to 50 MV.

The electron energy range of all chambers is from 10 MeV to 45 MeV. The chambers type 30011 and 30012 with their graphite caps are of delicate construction and should be handled with extreme care. The guard rings of all chamber types are designed up to the measuring volume. An acrylic build-up cap for in-air measurement in ^{60}Co beams is included with each chamber, as well as a calibration certificate.

Item	Description
300-640	PTW 30010, 0.6cc Farmer® Chamber
300-645	PTW 30011, 0.6cc Graphite Farmer® Chamber
300-650	PTW 30012, 0.6cc C/A1 Farmer® Chamber

Specify Connection

WATERPROOF PTW FARMER® IONIZATION CHAMBER

Waterproof therapy chamber for absolute dosimetry in high-energy photon, electron and proton beams

- **Waterproof, fully guarded chamber**
- **Vented sensitive columes of 0.6 cm³**
- **Suitable as therapy chamber for use in water**
- **Flat energy response**
- **Correction factors needed to determine absorbed dose to water or air kerma are published in the pertinent dosimetry protocols**
- **The chamber is waterproof and can be used in water or solid state phantoms**

Item 300-655 has a nominal photon energy range from 30 kV to 50 MV, the electron energy range is from 10 MeV to 45 MeV. This chamber type is of rugged construction, since the wall material is graphite with a protective acrylic cover and the electrode is made of aluminum. The guard ring is designed up to the measuring volume. A calibration certificate for calibration in absorbed dose to water or air kerma is included with each chamber. Air density correction is required for each measurement

Item	Description
300-655	PTW 30013, 0.6cc Waterproof Farmer® Chamber

Specify Connection

PTW FARMER® IONIZATION CHAMBERS

Specifications	Item 300-640	Item 300-645	Item 300-650	Item 300-655 (Waterproof)
PTW Model	30010	30011	30012	30013
Type of Product	vented cylindrical ionization chamber acc. IEC 60731	vented cylindrical ionization chamber acc. IEC 60731	vented cylindrical ionization chamber acc. IEC 60731	vented cylindrical ionization chamber acc. IEC 60731
Application	absolute dosimetry in radiotherapy beams	absolute therapy dosimetry in solid state phantoms and air	absolute therapy dosimetry in solid state phantoms and air	absolute therapy dosimetry in water,
Measuring Quantities	absorbed dose to water, air kerma, exposure	absorbed dose to water, air kerma, exposure	absorbed dose to water, air kerma, exposure	absorbed dose to water, air kerma, exposure
Reference Radiation Quality	^{60}Co	^{60}Co	^{60}Co	^{60}Co
Nominal Sensitive Volume	0.6 cm^3	0.6 cm^3	0.6 cm^3	0.6 cm^3
Design	NOT waterproof, vented fully guarded	NOT waterproof, vented fully guarded	NOT waterproof, vented fully guarded	Waterproof, vented fully guarded
Reference Point	on chamber axis, 13mm from tip	on chamber axis, 13mm from tip	on chamber axis, 13mm from tip	on chamber axis, 13mm from tip
Direction of Incidence	radial	radial	radial	radial
Nominal Response	20 nC/Gy	20 nC/Gy	20 nC/Gy	20 nC/Gy
Long-term Stability	≤ 0.5 % per year	≤ 0.5 % per year	≤ 0.5 % per year	≤ 0.5 % per year
Chamber Voltage	400 V nominal ± 500 V maximal	400 V nominal ± 500 V maximal	400 V nominal ± 500 V maximal	400 V nominal ± 500 V maximal
Polarity Effect at ^{60}Co	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Photon Energy Response	≤ ± 2% (70 kV to 280 kV) ≤ ± 4% (200 kV to ^{60}Co)	≤ ± 2% (70 kV to 280 kV) ≤ ± 4% (200 kV to ^{60}Co)	≤ ± 2% (70 kV to 280 kV) ≤ ± 4% (200 kV to ^{60}Co)	≤ ± 2% (70 kV to 280 kV) ≤ ± 4% (200 kV to ^{60}Co)
Directional Response in Solid State Phantom	≤ ± 0.5% for rotation around the chamber axis and for tilting of the axis up to ± 5°	≤ ± 0.5% for rotation around the chamber axis and for tilting of the axis up to ± 5°	≤ ± 0.5% for rotation around the chamber axis and for tilting of the axis up to ± 5°	
Directional Response in Water				≤ ± 0.5% for rotation around the chamber axis and for tilting of the axis up to ± 5°
Leakage Current	≤ ± 4 fA	≤ ± 4 fA	≤ ± 4 fA	≤ ± 4 fA
Cable Leakage	≤ 1 pC/(Gy·cm)	≤ 1 pC/(Gy·cm)	≤ 1 pC/(Gy·cm)	≤ 1 pC/(Gy·cm)
Materials and Measures				
Wall of Sensitive Volume	0.335 mm PMMA, 1.19 g/cm^3 0.09 mm graphite, 1.85 g/cm^3	0.425 mm graphite, 1.85 g/cm^3	0.425 mm graphite, 1.85 g/cm^3	0.335 mm PMMA, 1.19 g/cm^3 0.09 mm graphite, 1.85 g/cm^3
Total Wall Area Density	56.5 mg/cm^2	79 mg/cm^2	79 mg/cm^2	56.5 mg/cm^2
Dimension of Sensitve Volume	radius 3.05 mm length 23.0 mm	radius 3.05 mm length 23.0 mm	radius 3.05 mm length 23.0 mm	radius 3.05 mm length 23.0 mm
Central Electrode	Al 99.98, diameter 1.1 mm	Graphite, diameter 1.0 mm	Al 99.98, diameter 1.1 mm	Al 99.98, diameter 1.1 mm
Build-up Cap	PMMA, thickness 4.55 mm	PMMA, thickness 4.55 mm	PMMA, thickness 4.55 mm	PMMA, thickness 4.55 mm
Ion Collection Efficiency at Nominal Voltage				
Ion collection time	140µs	140µs	140µs	140µs
Max. dose rate for > 99.5 % saturation > 99.0 % saturation	5 Gy/s 10 Gy/s	5 Gy/s 10 Gy/s	5 Gy/s 10 Gy/s	5 Gy/s 10 Gy/s
Useful ranges				
Chamber voltage	± 100 to 400 V	± 100 to 400 V	± 100 to 400 V	
Radiation quality	30 kV to 50 MV photons (10 to 45) MeV electrons (50 to 270) MeV protons	140 kV to 50 MV photons (10 to 45) MeV electrons (50 to 270) MeV protons	60 kV to 50 MV photons (10 to 45) MeV electrons (50 to 270) MeV protons	30 kV to 50 MV photons (10 to 45) MeV electrons (50 to 270) MeV protons
Field size	(5 x 5) cm^2 to (40 x 40) cm^2	(5 x 5) cm^2 to (40 x 40) cm^2	(5 x 5) cm^2 to (40 x 40) cm^2	(5 x 5) cm^2 to (40 x 40) cm^2
Temperature	50°-104°F (10°-40°C)	50°-104°F (10°-40°C)	50°-104°F (10°-40°C)	50°-104°F (10°-40°C)
Humidity	10 - 80%, max 20 g/m^3	10 - 80%, max 20 g/m^3	10 - 80%, max 20 g/m^3	10 - 80%, max 20 g/m^3
Air pressure	700 - 1060 hPa	700 - 1060 hPa	700 - 1060 hPa	700 - 1060 hPa

PTW SEMIFLEX® IONIZATION CHAMBERS

Waterproof thimble chambers for measuring high-energy photon and electron radiation

- **Vented sensitive volumes of 0.125 cm3 and 0.3 cm3**
- **Suitable for use in water phantoms**
- **Flat energy response within a wide energy range**

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The semiflex chambers are designed for therapy dosimetry, mainly for dose distribution measurements in motorized water phantoms. They have a short stem for mounting and a flexible connection cable. The nominal useful energy range is from 30 kV to 50 MV photons and 6 MeV to 50 MeV electrons. The wall material is graphite with a protective acrylic cover. The guard rings are designed up to the measuring volume. An acrylic build-up cap for inair measurement in ^{60}Co beams is included with each chamber, as well as a calibration certificate for calibration in absorbed dose to water or in air kerma. Air density correction is required for each measurement. Both chambers are shaped cylindrically with an inner diameter of 5.5 mm; they differ only in the length of the measuring volume.

Item 300-660: The Model 31010, 0.125 cm^3 chamber is ideal for 3D dosimetry in a water phantom, since the measuring volume is approximately spherical resulting in a flat angular response over an angle of ± 160° and a uniform spatial resolution along all three axes of a water phantom. This chamber has a 31 mm rigid stem for mounting.

Item 300-662: The Model 31013, 0.3 cm^3 chamber is used as an alternative for the 31010 chamber in cases where increased signal levels are required and spatial resolution along the axis of the chamber can be compromised.

Item 300-665: The Model 31011 is a 0.125 cm^3 chamber and has shorter rigid stem length of 17.8 mm as compared to 31 mm rigid stem length of the Item 300-660.

Item	Description
300-660	PTW 31010, 0.125cc Semiflex® Chamber
300-665	PTW 31011, 0.125cc Short Stem Semiflex® Chamber
300-662	PTW 31013, 0.3cc Semiflex® Chamber

Specify Connection

Specifications	Item 300-660	Item 300-665	Item 300-662
PTW Model	31010	31011	31013
Type of Product	vented cylindrical ionization chamber	vented cylindrical ionization chamber	vented cylindrical ionization chamber
Application	absolute dosimetry in radiotherapy beams	absolute dosimetry in radiotherapy beams	absolute dosimetry in radiotherapy beams
Measuring Quantities	absorbed dose to water, air kerma, exposure	absorbed dose to water, air kerma, exposure	absorbed dose to water, air kerma, exposure
Reference Radiation Quality	^{60}Co	^{60}Co	^{60}Co
Nominal Sensitive Volume	0.125 cm^3	0.125 cm^3	0.3 cm^3
Design	Waterproof, vented fully guarded	Waterproof, vented fully guarded	Waterproof, vented fully guarded
Reference Point	on chamber axis, 4.5mm from chamber tip	on chamber axis, 4.5mm from chamber tip	on chamber axis, 9.5mm from chamber tip
Direction of Incidence	radial	radial	radial
Nominal Response	3.3 nC/Gy	3.3 nC/Gy	10 nC/Gy
Long-term Stability	≤ 1% per year	≤ 1% per year	≤ 1% per year
Chamber Voltage	400 V nominal ± 500 V maximal	400 V nominal ± 500 V maximal	400 V nominal ± 500 V maximal
Polarity Effect at ^{60}Co	< 1%	< 1%	< 1%
Photon Energy Response	≤ ± 2% (140 kV to 280 kV) ≤ ± 4% (140 kV to ^{60}Co)	≤ ± 2% (140 kV to 280 kV) ≤ ± 4% (140 kV to ^{60}Co)	≤ ± 2% (140 kV to 280 kV) ≤ ± 4% (100 kV to ^{60}Co)
Directional Response in Water	≤ ± 0.5% for rotation around the chamber axis and for tilting of the axis up to ± 10°	≤ ± 0.5% for rotation around the chamber axis and for tilting of the axis up to ± 10°	≤ ± 0.5% for rotation around the chamber axis and for tilting of the axis up to ± 10°
Leakage Current	≤ ± 4 fA	≤ ± 4 fA	≤ ± 4 fA
Cable Leakage	≤ 1 pC/(Gy·cm)	≤ 1 pC/(Gy·cm)	≤ 1 pC/(Gy·cm)
Materials and Measures			
Wall of Sensitive Volume	0.55 mm PMMA, 1.19 g/cm^3 0.15 mm graphite, 0.82 g/cm^3	0.55 mm PMMA, 1.19 g/cm^3 0.15 mm graphite, 0.82 g/cm^3	0.55 mm PMMA, 1.19 g/cm^3 0.15 mm graphite, 0.82 g/cm^3
Total Wall Area Density	78 mg/cm^2	78 mg/cm^2	78 mg/cm^2
Dimension of Sensitve Volume	radius 2.75 mm length 6.5 mm	radius 2.75 mm length 6.5 mm	radius 2.75 mm length 16.25 mm
Central Electrode	Al 99.98, diameter 1.1 mm	Al 99.98, diameter 1.1 mm	Al 99.98, diameter 0.9 mm
Build-up Cap	PMMA, thickness 3mm	PMMA, thickness 3mm	PMMA, thickness 3mm
Ion Collection Efficiency at Nominal Voltage			
Ion collection time	100µs	100µs	80µs
Max. dose rate for **> 99.5 % saturation** **> 99.0 % saturation**	6 Gy/s 12 Gy/s	6 Gy/s 12 Gy/s	14 Gy/s 28 Gy/s
Max. dose per pulse for **> 99.5 % saturation** **> 99.0 % saturation**	0.5 mGy 1.0 mGy	0.5 mGy 1.0 mGy	0.8 mGy 1.5 mGy
Useful ranges			
Chamber voltage	± 100 to 400 V	± 100 to 400 V	± 100 to 400 V
Radiation quality	140 kV to 50 MV photons (10 to 45) MeV electrons (50 to 270) MeV protons	140 kV to 50 MV photons (10 to 45) MeV electrons (50 to 270) MeV protons	100 kV to 50 MV photons (10 to 45) MeV electrons (50 to 270) MeV protons
Field size	(3 x 3) cm^2 to (40 x 40) cm^2	(3 x 3) cm^2 to (40 x 40) cm^2	(4 x 4) cm^2 to (40 x 40) cm^2
Temperature	50°-104°F (10°-40°C)	50°-104°F (10°-40°C)	50°-104°F (10°-40°C)
Humidity	10 - 80%, max 20 g/m^3	10 - 80%, max 20 g/m^3	10 - 80%, max 20 g/m^3
Air pressure	700 - 1060 hPa	700 - 1060 hPa	700 - 1060 hPa

PTW PINPOINT® IONIZATION CHAMBERS

Ultra small-sized therapy chambers for dosimetry in high-energy photon beams

300-672 300-673

- **Small-sized cylindrical ion chambers with vented sensitive volumes of only 0.015cm³/0.03cm³ and 2mm/2.9mm in diameter**
- **Ideal for dose measurements in small fields as e.g. in IORT, IMRT and stereotactic beams**
- **Very high spatial resolution when used for scans perpendicular to the chamber axis**
- **Suitable for field sizes from 2x2cm to 30x30cm**
- **Aluminum central electrode**

The PinPoint chambers are ideal for dose measurements in small fields as encountered e.g. in IORT, IMRT and stereotactic beams. Relative dose distributions can be measured with very high spatial resolution when the chambers are moved perpendicular to the chamber axis. The waterproof, fully guarded chambers can be used in air, solid state phantoms and in water.

Item	Description
300-672	PTW 31014, 0.015 cc Waterproof PinPoint Chamber
300-673	PTW 31015, 0.03 cc Waterproof PinPoint Chamber

Specify Connection

PTW PINPOINT® IONIZATION 3D CHAMBER

Ultra small-sized therapy chamber with 3D characteristics for dosimetry in high-energy photon beams

- **Small-sized sensitive volume 0.016 cm3 , vented to air**
- **Minimized directional response**
- **Aluminum central electrode**

The 3D PinPoint chamber is ideal for dose measurements in small fields as encountered e.g. in IORT, IMRT and stereotactic beams. Relative dose distributions can be measured with high spatial resolution in any direction. The waterproof, fully guarded chamber can be used in air, solid state phantoms and in water.

Item	Description
300-674	PTW 31016, 0.016 cc Waterproof PinPoint Chamber

Specify Connection

Specifications	Item 300-672	Item 300-673	Item 300-674
PTW Model	31014	31015	31016
Type of Product	vented cylindrical ionization chamber	vented cylindrical ionization chamber	vented cylindrical ionization chamber
Application	dosimetry in high-energy photon beams with high spatial resolution	dosimetry in high-energy photon beams with high spatial resolution	dosimetry in high-energy photon beams
Measuring Quantities	absorbed dose to water, air kerma, exposure	absorbed dose to water, air kerma, exposure	absorbed dose to water, air kerma, exposure
Reference Radiation Quality	^{60}Co	^{60}Co	^{60}Co
Nominal Sensitive Volume	0.015 cm^3	0.03 cm^3	0.016 cm^3
Design	Waterproof, vented fully guarded	Waterproof, vented fully guarded	Waterproof, vented fully guarded
Reference Point	on chamber axis, 3.4mm from chamber tip	on chamber axis, 3.4mm from chamber tip	on chamber axis, 2.4mm from chamber tip
Direction of Incidence	radial, axial	radial	radial
Pre-Irradiation Dose	2Gy	2Gy	2Gy
Nominal Response	400 pC/Gy	800 pC/Gy	400 pC/Gy
Long-term Stability	≤ 1% per year	≤ 1% per year	≤ 1% per year
Chamber Voltage	400 V nominal ± 500 V maximal	400 V nominal ± 500 V maximal	400 V nominal ± 500 V maximal
Polarity Effect at ^{60}Co	< ± 2%	< ± 2%	< ± 2%
Directional Response in Water	≤ ± 0.5% for rotation around the chamber axis ≤ ± 1% for tilting of the axis up to ± 20° (radial incidence) ± 15° (axial incidence)	≤ ± 0.5% for rotation around the chamber axis ≤ ± 1% for tilting of the axis up to ± 20° (radial incidence)	≤ ± 0.5% for rotation around the chamber axis ≤ ± 1% for tilting of the axis up to ± 110°
Leakage Current	≤ ± 4 fA	≤ ± 4 fA	≤ ± 4 fA
Cable Leakage	≤ 1 pC/(Gy·cm)	≤ 1 pC/(Gy·cm)	≤ 1 pC/(Gy·cm)
Materials and Measures			
Wall of Sensitive Volume	0.57 mm PMMA, 1.19 g/cm^3 0.09 mm graphite, 1.85 g/cm^3	0.57 mm PMMA, 1.19 g/cm^3 0.09 mm graphite, 1.85 g/cm^3	0.57 mm PMMA, 1.19 g/cm^3 0.09 mm graphite, 1.85 g/cm^3
Total Wall Area Density	85 mg/cm^2	85 mg/cm^2	85 mg/cm^2
Dimension of Sensitve Volume	radius 1 mm length 5 mm	radius 1.45 mm length 5 mm	radius 1.45 mm length 2.9 mm
Central Electrode	Al 99.98, diameter 0.3 mm	Al 99.98, diameter 0.3 mm	Al 99.98, diameter 0.3 mm
Build-up Cap	PMMA, thickness 3mm	PMMA, thickness 3mm	PMMA, thickness 3mm
Ion Collection Efficiency at Nominal Voltage			
Ion collection time	20µs	50µs	60µs
Max. dose rate for			
> 99.5 % saturation	265 Gy/s	29 Gy/s	19 Gy/s
> 99.0 % saturation	580 Gy/s	55 Gy/s	38 Gy/s
Max. dose per pulse for			
> 99.5 % saturation	3.5 mGy	1.2 mGy	1.0 mGy
> 99.0 % saturation	7.0 mGy	2.3 mGy	1.9 mGy
Useful ranges			
Chamber voltage	± 100 to 400 V	± 100 to 400 V	± 100 to 400 V
Radiation quality	^{60}Co - 50 MV photons	^{60}Co - 50 MV photons	^{60}Co - 50 MV photons
Field size	2x2 cm^2 to 30x30 cm^2	2x2 cm^2 to 30x30 cm^2	2x2 cm^2 to 30x30 cm^2
Temperature	50°-104°F (10°-40°C)	50°-104°F (10°-40°C)	50°-104°F (10°-40°C)
Humidity	10 - 80%, max 20 g/m^3	10 - 80%, max 20 g/m^3	10 - 80%, max 20 g/m^3
Air pressure	700 - 1060 hPa	700 - 1060 hPa	700 - 1060 hPa

MARKUS® ELECTRON CHAMBER

Classic plane parallel chamber for absolute dosimetry in high-energy electron beams

- **Thin entrance window and waterproof protection cap**
- **Small-sized for high spatial resolution**
- **Sensitive volume 0.055 cm³, vented to air**

The 23343 Markus chamber is manufactured in the original famous Markus design. Absorbed dose to water can be measured by applying correction factors for perturbation effects as published in pertinent dosimetry protocols. The thin entrance window allows measurements in solid state phantoms up to the surface. The protection cap makes the chamber waterproof for measurements in water phantoms.

Item	Description
300-625	PTW 23343 - Markus (0.055cc) Chamber

Specify Connection

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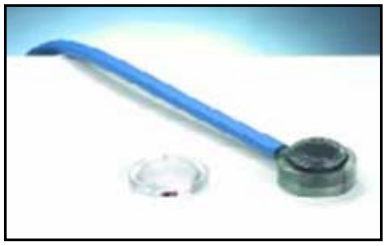
ADVANCED MARKUS® ELECTRON CHAMBER

Perturbation-free version of the famous classic Markus chamber for absolute dosimetry in high-energy electron beams



- **Perturbation-free electron chamber**
- **Thin entrance window and waterproof protection cap**
- **Small-sized for high spatial resolution**
- **Sensitive volume 0.02 cm³, vented to air**
- **Suitable for relative and absolute electron dosimetry**

The Advanced Markus features a wide guard ring design to avoid perturbation effects by reducing the influence of scattered radiation from the housing. Since the outer shape is identical with the Markus chamber, all existing Markus chamber phantom plates and adapters can be used with the Advanced Markus chamber. The small sensitive volume makes the chamber ideal for dose distribution measurements in a water phantom, giving a good spatial resolution. The chamber features a flat energy response within the nominal energy range from 2 MeV to 45 MeV. With the very thin membrane of only 0.03 mm polyethylene, the chamber is suitable for use in solid state phantoms. The chamber comes with a protective acrylic cover of 0.87 mm thickness (1 mm water equivalence) for use in water. A calibration certificate with a 60Co calibration factor given in absorbed dose to water is included. Air density correction is required for each measurement. The chamber cable length is 1.05 m.

Item	Description
300-626	PTW 34045 - Advanced Markus Electron Chamber

Specify Connection

MARKUS® ELECTRON CHAMBER

PTW 23343

Plane-parallel ion chamber with thin membrane for high-energy electron measurements in water and solid state phantoms

Features
- Suitable for use in solid state and water phantoms
- Vented measuring volume
- Fully guarded up to measuring volume
- Touchable parts free of high voltage.
- Chamber is **waterproof when used with protective cap**.

The Markus chamber is the first chamber specifically designed for electron dosimetry. A PMMA waterproofing cap, equivalent to 1 mm of water, and an annulus, for solid state phantom measurements, are included. The chamber's small measuring volume makes it ideal for electron measurements when very high spatial resolution is required. The diaphragm front allows measurements in the build-up region of electron fields to a depth of virtually zero.

Nominal Useful Range: 2 MeV to 45 MeV
Cable Length: 1.05 m
Standard Connection: BNC-M Triax
If non standard connection is needed - specify connection.

Specifications

Volume: 0.055 cm^3
Response: $2 \cdot 10^{-9}$ C/Gy
Leakage: $\pm 2 \cdot 10^{-16}$ A
Polarizing Voltage: 300 V recommended, 400 V maximum
Cable Leakage: $3.5 \cdot 10^{-12}$ C/(Gy · cm)
Wall Material: Polyethylene CH2
Membrane Thickness: 0.03 mm
Area Thickness: 2.5 mg/cm^2
Electrode: Acrylic, graphite coated, 5.3 mm∅
Range of Temperature: 10° C to 40° C
Range of Relative Humidity: 10% to 80%
Ion Collection Time:
150 V: 0.20 ms
300 V: 0.09 ms
400 V: 0.07 ms

Specs. - Info. - MSDS: Visit www.rpdinc.com or call.

A calibration certificate with a ^{60}Co calibration factor given in absorbed dose to water is included. Air density correction is required for each measurement.

Item #	Description
300-625	Markus Ion Chamber - PTW 23343

ADVANCED MARKUS® ELECTRON CHAMBER

PTW 34045

Plane-parallel chamber for high-energy electron measurements in water and solid state phantoms.

Features
- Vented sensitive volume of 0.02 cm^3
- Same outer dimensions as the Markus chamber
- Suitable for relative and absolute electron dosimetry
- Wide guard ring design
- The chamber is **waterproof when used with protective cap**

The Advanced Markus chamber[1] is a further development of the Markus chamber, featuring a wide guard ring design to avoid perturbation effects by reducing the influence of scattered radiation from the housing. Since the outer shape is identical to the Markus chamber, all existing Markus chamber phantom plates and adapters can be used with the Advanced Markus chamber.

The small sensitive volume makes the chamber ideal for dose distribution measurements in a water phantom, giving a good spatial resolution. The chamber features a flat energy response within the nominal energy range. The membrane material is polyethylene of 0.03 mm thickness. The Advanced Markus chamber comes with a protective acrylic cover of 0.87 mm thickness (1 mm water equivalence) for use in water.

[1]The Advanced Markus chamber was developed in cooperation with Prof. Rosenow, Göttingen University, Germany.

Nominal Useful Range: 2 MeV to 45 MeV
Cable Length: 1.05 m
Standard Connection: BNC-M Triax
If non standard connection is needed - specify connection.

Specs. - Info. - MSDS: Visit www.rpdinc.com or call.

A calibration certificate with a ^{60}Co calibration factor given in absorbed dose to water is included. Air density correction is required for each measurement.

Item #	Description
300-626	Advanced Markus® Electron Chamber - PTW 34045

ROOS® ELECTRON CHAMBER

PTW 34001

Precision plane-parallel chamber for absolute dosimetry of high-energy electron radiation in water and solid state phantoms.

Features
- Vented sensitive volume of 0.35 cm^3
- Reference chamber for precise absolute electron dosimetry
- **Completely Waterproof**.
- Suitable for use in water and in solid state phantoms
- Perturbation free design and minimal polarity effect

The Roos electron chamber[1] is used as a reference electron chamber. It is recommended by the IAEA[2] for high precision electron dosimetry in radiation therapy.

The chamber has a 4 mm wide guard ring to exclude any perturbation effect even at low electron energies. The polarity effect is negligible (< 0.5% at 10 MeV). The energy response is only influenced by the stopping power ratios water/air. The acrylic entrance window has a thickness of 1 mm.

[1]The Roos Electron chamber was developed in cooperation with Dr. Roos, PTB-Braunschweig, German Federal Institutes of Physics and Metrology (National Laboratory of Germany).

[2]Technical Report No. TRS-381. The use of Plane Parallel Ionization Chambers in High Energy Electron and Photon Beams. IAEA (International Atomic Energy Agency), Vienna 1997.

Nominal Useful Energy Range: 2 MeV to 45 MeV
Cable Length: 1.08 m
Standard Connection: BNC-M Triax
If non standard connection is needed - specify connection.

Specifications

Volume: 0.35 cm^3
Response: $1 \cdot 10^{-8}$ C/Gy
Leakage: $\pm 4 \cdot 10^{-15}$A
Polarizing Voltage: 100 V recommended, maximum 400 V
Cable Leakage: $3.5 \cdot 10^{-12}$ C/(GY · cm)
Wall Material: Acrylic, ($C_5H_8O_2$)

Wall Density: 1.19 g/cm^3
Wall Thickness: 1.0 mm
Area Density: 119 mg/cm^2
Electrode: Acrylic, graphite coated; 15 mm ∅
Guard Ring: 4 mm wide
Range of Temperature: 10° C to 40° C
Range of Relative Humidity: 10% to 80%
Ion Collection Time:
100 V: 0.37 ms
200 V: 0.13 ms
300 V: 0.07 ms

Specs. - Info. - MSDS: Visit www.rpdinc.com or call.

A calibration certificate with a ^{60}Co calibration factor given in absorbed dose to water is included. Air density correction is required for each measurement.

Item #	Description
300-675	Roos Ion Chamber - PTW 34001

PTW 23323 SEALED MICRO CHAMBER

Therapy chamber for in-vivo measurements

Features:
- Sealed ionization chamber for in-vivo measurements
- Waterproof, flexible design for intracavitary use
- Sensitive volume 0.1 cm^3, fully guarded

The 23323 micro chamber is used for patient in-vivo measurements in conjunction with an electrometer classified for this purpose. Applications are external beam and brachytherapy dose measurements on the patient's surface or in body cavities such as the rectum. for the use in body cavities the chamber should ne protected by a rubber sleeve. The micro chamber is to be used with a radioactive check device and features a stable response even if the chamber temperature changes.

Specifications

Outer diameter: 7 mm
Measuring quantities: absorbed dose to water
Reference radiation quality: ^{60}Co
Nominal sensitive volume: 0.1 cm^3
Design: waterproof, fully guarded
Reference point: on chamber axis, 8 mm from chamber tip
Direction of incidence: radial
Nominal response: 3.8 nC/Gy
Long-tern stability: ≤ 1% per year
Chamber voltage: 400 V nominal, ± 500 V maximal
Photon energy response: ≤ ± 2% (140 kV ... ^{60}Co)
Directional response in water: < ± 0.5% for rotation around the chamber axis and for tilting of the axis up to ± 30° (280 kV)
Temperature dependence: ≤ ± 5% within the useful range

Temperature equilibrium time: (2 ... 3) min/°C
Leakage current: ≤ ± 4 fA
Cable leakage: ≤ 1 pC/(Gy·cm)
Wall of sensitive volume:
0.61 mm PMMA,
1.19 g/cm^3
0.13 mm graphite,
0.82 g/cm^3
rubber
Total wall area density: 197 mg/cm^2
Dimension of sensitive volume: radius 1.625 mm, length 11.875 mm
Central electrode: Al 99.5, diameter 0.8 mm
Build-up cap: PMMA, thickness 3 mm

Ion collection efficiency at nominal voltage
Ion collection time: 28 µs
Max dose rate for
≥ 99.5% saturation: 107 Gy/s
≥ 99.0% saturation: 213 Gy/s
Max dose per pulse for
≥ 99.5% saturation: 2.1 mGy
≥ 99.0% saturation: 4.2 mGy

Useful ranges:
Chamber voltage: ± (100 ... 400) V
Radiation quality: 66 keV ... 50 MV photons
Field size: (4 x 4)cm^2 ... (40 x 40)cm^2
Temperature: (10 ... 40)°C, (50 ... 104)°F
Humidity: (20 ... 75)%, max 20 g/m^3
Air pressure: (700 ... 1060) hPa
Note: A calibration certificate is included with each chamber.

Item #	Description
300-605-BNC-M	Micro Chamber 0.1 cm^3 - PTW 23323

PTW SEMIFLEX IONIZATION CHAMBERS

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PTW CROSS REFERENCE FROM OLD TO NEW MODEL NUMBERS

PTW#S OLD TO NEW	CHAMBER DESCRIPTION
233642 / 31002 / 31010	0.125 cc Semiflex
23332 / 233641 / 31003 / 31013	0.3 cc Semiflex
233643 / 31005 / 31011	0.125 cc Short Stem Semiflex

Waterproof thimble chambers for measuring high-energy photon and electron radiation in air, water and phantom material.

Item 300-660 Semiflex™ 0.125 cm^3 ion chamber
Designed for measurements in the useful beam of high energy photon and electron fields in a water phantom, this chamber can also be used for IMRT measurements.

Item 300-662 Semiflex™ 0.3cm^3 ion chamber
This chamber is mainly used for relative measurements in a water phantom of high energy photon and electron beams.

Features
- Vented sensitive volumes of 0.125 cm^3 and 0.3 cm^3
- Suitable for use in water phantoms
- Flat energy response within a wide energy range

The semiflex chambers are designed for therapy dosimetry, mainly for dose distribution measurements in motorized water phantoms. They have a short stem for mounting and a flexible connection cable.

The guard ring borders the measuring volume. An acrylic build-up cap for in-air measurement in ^{60}Co beams is included with each chamber.

All Semiflex chambers are shaped cylindrically with an inner diameter of 5.5 mm; they differ only in the length of the measuring volume. The 0.125 cm^3 chamber is ideal for a 3D dosimetry in a water phantom, since the measuring volume is approximately spherical resulting in a flat angular response over an angle of ±160° and a uniform spatial resolution along all three axes of a water phantom.

Nominal useful range: 30 Kev to 50 MeV photons.
Standard Connection: BNC-M Triax
If non standard connection is needed - specify connection

Specs. - Info. - MSDS: Visit www.rpdinc.com or call.

A calibration certificate for calibration in absorbed dose to water or in air kerma is included. Air density correction is required for each measurement.

Specifications - Item 300-660 (PTW 31002 / 31010) - 0.125 cm^3 Chamber - 36 mm Rigid Stem

Cable Length: 1.3 m
Volume: 0.125 cm^3
Response: $4 \cdot 10^{-9}$ C/Gy
Leakage: $\pm 4 \cdot 10^{-15}$A
Polarizing Voltage: Max 500 V
Cable Leakage: $1 \cdot 10^{-12}$ C/(Gy · cm)
Wall Material: PMMA $(C_5H_8O_2)_n$
Wall Density: 1.18 g/cm^3
Wall Thickness: 0.7 mm
Area Density: 82.6 mg/cm^2
Electrode: Aluminum; 1 mm Ø, 5 mm long
Range of Temperature: 10° C to 40° C
Range of Relative Humidity: 20% to 75%
Ion Collection Time:
300 V: 0.15 ms
400 V: 0.10 ms
500 V: 0.08 ms

Item #	Description
300-660	0.125 cm^3 Semiflex Chamber - 31002 / 31010 - BNC-M

Specifications - Item 300-662 (PTW 31003 / 31013) - 0.3 cm^3 Chamber

Cable Length: 1.3 m
Volume: 0.3 cm^3
Response: $1 \cdot 10^{-8}$ C/Gy
Leakage: $\pm 4 \cdot 10^{-15}$A
Polarizing Voltage: Max 500 V
Cable Leakage: $1 \cdot 10^{-12}$ C/(Gy · cm)
Wall Material: PMMA $(C_5H_8O_2)_n$
Wall Density: 1.18 g/cm^3
Wall Thickness: 0.7 mm
Area Density: 82.6 mg/cm^2
Electrode: Aluminum, graphite coated; 1.5 mm Ø; 14.25 mm long
Range of Temperature: 10° C to 40° C
Range of Relative Humidity: 20% to 75%
Ion Collection Time:
300 V: 0.10 ms
400 V: 0.08 ms
500 V: 0.06 ms

Item #	Description
300-662	0.3 cm^3 Semiflex Chamber - 31003 / 31013 - BNC-M

Specifications - Item 300-665 (PTW 31005 / 31011) - 0.125cm^3 Short Stem - 18.75 mm Rigid Stem

Cable Length: 1.3 m
Volume: 0.125 cm^3
Sensitivity: 0.04 nC/R
Sensitive Length: 6.5 mm
Electrode Dimensions: 1 mm Ø x 5 mm
Aluminum Stem Length: 19 mm
Electrode Material: Aluminum graphite coated
Outside Diameter: 6.9 mm thimble, 7 mm stem
Wall Thickness: 0.7 mm, 82.6 mg/cm^2, acrylic/graphite
Leakage: $4x10^{-15}$ A
Polarizing Voltage: Max 500 V

Item #	Description
300-665	0.125 cm^3 Short Stem Semiflex - 31005 / 31011 - BNC-M

PTW RIGID STEM IONIZATION CHAMBERS

300-615

300-610

PTW CROSS REFERENCE FROM OLD TO NEW MODEL NUMBERS

PTW#S OLD TO NEW	CHAMBER DESCRIPTION
23332 / 30016	0.3 cc Rigid Stem
23331 / 30015	1.0 cc Rigid Stem

Thimble chambers for measuring high-energy photon and electron radiation in air and in phantom material.

Features
- Very flat energy response within a wide range
- Guard ring up to measuring volume
- Suitable as reference chambers for use in solid state phantoms
- Guard ring at potential of the collecting electrode. Touchable parts free of high voltage
- Open measuring volume, without check device air density correction is necessary
- High voltage to be connected only with active current-limiting device (I_{max} < 0.5mA)

These Rigid Stem Chambers are designed as reference chambers for absolute dosimetry to be used in radiation therapy or by secondary standard dosimetry laboratories. These chambers have very small variations of response with radiation quality from low X-ray energies up to high-energy photon and electron radiation. Both chambers are constructed with a 25 cm long rigid stem for easy mounting in the radiation field.

Item 300-615 the 0.3cm^3 chamber has a smaller volume in comparison to **Item 300-610** the 1 cm^3 chamber which makes this chamber more suitable for use with pulsed radiation because of its better saturation.

Each chamber includes an acrylic build-up cap for measurement in ^{60}Co beams and a calibration certificate for calibration in absorbed dose to water or in air karma. Air density correction is required for each measurement.

Nominal Useful Energy Range: 30 keV to 50 MeV.
Standard Connection: BNC-M Triax
If non standard connection is needed - specify connection.

Specs. - Info. - MSDS: Visit www.rpdinc.com or call.

Specifications - Item 300-615 (PTW 23332 / 30016) 0.3 cm^3 Chamber

Volume: 0.3 cm^3
Response: $1 \cdot 10^{-8}$ C/Gy
Leakage: $\pm 4 \cdot 10^{-15}$ A
Polarizing Voltage: max 500 V
Cable Leakage: $1 \cdot 10^{-12}$ C/(Gy · cm)
Wall Material: PMMA $(C_5H_8O_2)_n$
Wall Density: 1.18 g/cm^3
Wall Thickness: 0.5 mm
Area Density: 59 mg/cm^2
Electrode: Aluminum, graphite coated; 2 mm Ø; 16.5 mm long
Range of Temperature: 10° C to 40° C
Range of Relative Humidity: 20% to 75%
Ion Collection Time:
300 V: 0.05 ms
400 V: 0.04 ms
500 V: 0.03 ms

Item #	Description
300-615	Ionization Chamber, Rigid Stem 0.3 cm^3

Specifications - Item 300-610 (PTW 23331 / 30015) - 1 cm^2 Chamber

Volume: 1 cm^3
Response: $3.3 \cdot 10^{-8}$ CGy
Leakage: $\pm 4 \cdot 10^{-15}$ A
Polarizing Voltage: max 500 V
Cable Leakage: $1 \cdot 10^{-12}$ C/(Gy · cm)
Wall Material: PMMA $(C_5H_8O_2)_n$
Wall Density: 1.18 g/cm^3
Wall Thickness: 0.55 mm
Area Density: 64.9 mg/cm^2
Electrode: Aluminum, graphite coated; 1.5 mm Ø; 20 mm long
Range of Temperature: 10° C to 40° C
Range of Relative Humidity: 20% to 75%
Ion Collection Time:
300 V: 0.3 ms
400 V: 0.2 ms
500 V: 0.2 ms

Item #	Description
300-610	Ionization Chamber, Rigid Stem 1 cm^3

PTW 60016 DOSIMETRY DIODE P - PHOTONS

Waterproof Silicon Detector for Dosimetry in High-Energy Photon Beams Up to Field Size 40cm x 40cm

- **Useful for measurements in small and large photon fields**
- **Excellent spatial resolution**
- **Minimized energy response for field size independent measurements up to 40 cm x 40 cm**

The Dosimetry Diode P is ideal for dose measurements in small photon fields as encountered in IORT, IMRT and stereotactic beams. The excellent spatial resolution makes it possible to measure very precisely beam profiles even in the penumbra region of small fields. The superior energy response enables the user to perform accurate percentage depth dose measurements which are field size independent up to field sizes of (40 x 40) cm^2. The waterproof detector can be used in air, solid state phantoms and in water.

Useful Ranges

Radiation Quality: ^{60}Co ... 25 MV photons
Field Size: 1 x 1 cm^2 ... 40 x 40 cm^2
Temperature: 50 ... 104 °F (10 ... 40 °C)
Humidity: 10 ... 80 %, max 20 g/m^3

Specifications

Type of Product: p-type silicon diode
Application: Dosimetry in radiotherapy beams
Measuring Quantity: Absorbed dose to water
Reference Radiation Quality: ^{60}Co
Nominal Sensitive Volume: 0.03 mm^3
Design: Waterproof, disk-shaped sensitive volume perpendicular to detector axis
Reference Point: On detector axis, 2 mm from detector tip
Direction of Incidence: Axial
Nominal Response: 9 nC/Gy
Dose Stability: </= 0.5 %/kGy at 6 MV; </= 1 %/10 kGy at 15 MV
Temperature Response: </= 0.4 %/K
Energy Response: At higher depths than d_{max}, the percentage depth dose curves match curves measured with ionization chambers within ± 0.5 %
Detector Bias Voltage: 0 V
Signal Polarity: Negative
Directional Response in Water: </= ± 0.5% for rotation around the chamber axis, </= ± 1% for tilting </= ± 20°
Leakage Current: </= 100 fA
Cable Leakage: </= 1 pC/(Gy·cm)

Materials and Measures

Entrance Window: 1 mm RW3, 1.045 g/cm^3, 1 mm epoxy
Total Window Area Density: 221 mg/cm^2
Water-Equivalent Window Thickness: 2.2 mm
Sensitive Volume: 1 mm^2 circular; 30 µm thick
Outer Dimensions: 7 mm diameter x 47 mm length

Item	Description
300-681	PTW 60016 - Dosimetry Diode P - Photons

PTW 60017 DOSIMETRY DIODE E - PHOTON / ELECTRON

Waterproof Silicon Detector for Dosimetry in High-Energy Electron and Photon Beams

- **Useful for measurements in all electron fields and for small photon fields**
- **Excellent spatial resolution**
- **Minimized energy response**
- **Thin entrance window for measurements in the vicinity of surfaces and interfaces**

The Dosimetry Diode E is ideal for dose measurements in small electron and photon fields as encountered in IORT, IMRT and stereotactic beams. The excellent spatial resolution makes it possible to measure very precisely beam profiles even in the penumbra region of small fields. The superior energy response enables the user to perform accurate percentage depth dose measurements which are field size independent up to field sizes of 40 x 40 cm^2. The waterproof detector can be used in air, solid state phantoms and in water.

Useful Ranges

Radiation Quality: 6...25 MeV electrons; ^{60}Co...25 MV photons
Field Size: 1 x 1 cm^2...40 x 40 cm^2 for electrons;
1 x 1 cm^2...10 x 10 cm^2 for photons
Temperature: 50...104 °F (10...40 °C)
Humidity: 10...80%, max 20 g/m^3

Specifications

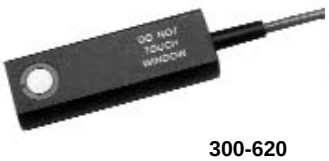
Type of Product: p-type silicon diode
Application: Dosimetry in radiotherapy beams
Measuring Quantity: Absorbed dose to water
Reference Radiation Quality: ^{60}Co
Nominal Sensitive Volume: 0.03 mm^3
Design: Waterproof, disk-shaped sensitive volume perpendicular to detector axis
Reference Point: On detector axis, 0.77 mm from detector tip
Direction of Incidence: Axial
Nominal Response: 9 nC/Gy
Dose Stability: </= 0.5%/kGy at 6 MV; </= 1%/kGy at 15 MV; </= 0.5%/kGy at 5 MeV; </= 4%/kGy at 21 MeV
Temperature Response: </= 0.4 %/K
Energy Response: At higher depths than d_{max}, the percentage depth dose curves match curves measured with ionization chambers within ± 0.5 %
Detector Bias Voltage: 0 V
Signal Polarity: Negative
Directional Response in Water: </= ± 0.5% for rotation around the chamber axis, </= ± 1% for tilting </= ± 20°
Leakage Current: </= ± 50 fA
Cable Leakage: </= 1 pC/(Gy·cm)

Materials and Measures

Entrance Window: 0.3 mm RW3, 1.045 g/cm^3, 0.4 mm epoxy
Total Window Area Density: 140 mg/cm^2
Water-Equivalent Window Thickness: 1.33 mm
Sensitive Volume: 1 mm^2 circular; 30 µm thick
Outer Dimensions: 7 mm diameter x 45.5 mm length

Item	Description
300-682	PTW 60017 - Dosimetry Diode E - Photon/Electron

SOFT X-RAY IONIZATION CHAMBERS



300-620

300-630

300-632

Plane-parallel chambers with thin membranes for measuring therapeutic x-rays in air and solid state phantoms.

Features
- Guard ring up to measuring volume
- Suitable for use in solid state phantoms and in air
- Guard ring at the potential of the inner electrode. All touchable parts free of high voltage
- Open measuring volume, without check device air density correction is necessary
- Very thin flat entrance windows for dose measurements of low energy x-ray beams
- High voltage to be connected only with active current-limiting device (I_{max}< 0.5 mA)

Item 300-620 the Small 0.02 cm^3 soft X-ray chamber is the standard chamber for dose measurements in superficial radiation therapy.
Item 300-630 the Big 0.20 cm^3 soft X-ray chamber is an alternative chamber for dose measurements in superficial radiation therapy or mammography, where a higher response is necessary.

The usual calibration of both chambers is done at 15 kV to 70 kV. The chambers have a very flat energy response in the range from 10 kV to 100 kV
Item 300-632 the 0.0053 cm^3 soft X-ray chamber has an extremely small design that allows measurements in very small fields or with steep dose gradients. The typical calibration is at 15 to 50 KV, and the energy response within this range is ±2%.

All chambers include a calibration certificate. Air density correction is required for each measurement.

Cable Length: 0.7 m
Standard Connection: BNC-M Triax
If non standard connection is needed - specify connection.

Specs. - Info. - MSDS: Visit www.rpdinc.com or call.

Specifications - Item 300-620 (PTW 23342) - Small 0.02 cm^3 Chamber

Volume: 0.02 cm^3
Response: 3 □ 10^{-10} C/Gy
Leakage: ± 1 □ 10^{-14} A
Polarizing Voltage: Max 300 V
Cable Leakage: 1 □ 10^{-12} C/(Gy □ cm)
Wall Material: PE $(CH_2)_n$
Membrane Thickness: 0.03 mm
Area Density: 2.5 mg/cm^2
Electrode: Graphite; 3 mm Ø
Range of Temperature: 10° C to 40° C
Range of Relative Humidity: 20% to 75%
Ion Collection Time: 150 V: 0.05 ms; 300 V: 0.03 m

Item #	Description
300-620	Small 0.02 cm^3 Soft X-Ray Chamber - PTW 23342

Specifications - Item 300-630 (PTW 23344) - Big 0.2 cm^3 Chamber

Volume: 0.20 cm^3
Response: 7 □ 10^{-10} C/Gy
Leakage: ± 1 □ 10^{-14} A
Polarizing Voltage: Max 500 V
Cable Leakage: 1 □ 10^{-12} C/(Gy □ cm)
Wall Material: PE $(CH_2)_n$
Membrane Thickness: 0.03 mm
Area Density: 2.5 mg/cm^2
Electrode: Graphite with amber, graphite coated; 13 mm Ø
Range of Temperature: 10° C to 40° C
Range of Relative Humidity: 20% to 75%
Ion Collection Time: 300 V: 0.05 ms; 400 V: 0.04 ms; 500 V: 0.03 ms

Item #	Description
300-630	Big 0.2 cm^3 Soft X-Ray Chamber - PTW 23344

Specifications - Item 300-632 (PTW 34013) - Soft X-Ray Chamber 0.0053 cm^3

Volume: 0.0053 cm^3
Response: 2 □ 10^{-10} C/Gy
Leakage: ± 1 □ 10^{-14} A
Polarizing Voltage: Max 400 V
Cable Leakage: 1 □ 10^{-12} C/(Gy □ cm)
Wall Material: PE $(CH_2)_n$
Membrane Thickness: 0.025 mm
Area Density: 2.3 mg/cm^2
Electrode: Graphite; 1.7 mm Ø
Range of Temperature: 10° C to 40° C
Range of Relative Humidity: 10% to 80% (max. 20g /m^3)
Ion Collection Time: 400 V: 0,009 ms
Directional Dependence: £ ± 5% at £ ± 10°

Item #	Description
300-632	0.0053 cm^3 Soft X-Ray Chamber - PTW 34013

3.2 cc CT ION CHAMBER

Specifications

Detector Type: Vented air ion chamber
Volume: 3.2 cc
Sensitive Length: 10.0 cm
Chamber Material: Polystyrene
Chamber Inside Diameter: 6.4 mm
Chamber Wall Thickness: 54 mg/cm^2
Electrode Material: Aluminum
Sensitivity: 10 R•cm/nC (nominal)
Standard Calibration: 100 kVCP, 5.5 mm Al HVL (NIST Tech. M100)

Response Uniformity Along Axis: ± 3% over central 90% of active length
Beam Orientation: Normal to chamber axis
Phantom Adapter OD: 1.27 ± 0.04 cm (0.50 ± 0.015 in)
Leakage Current (300 V collection potential): Less than 1013 A at 10 min polarization time, less than 1014 A at 2 hr polarization time
Intensity Limits: Continuous beam: 4.86 kR/min (1% recombination loss)
Pulsed Beam: 51.5 mR/pulse (1% recombination loss)
Maximum Pulse Repetition Rate: 3.3 kHz
Cable Length: 3' (0.9 m)
Operating Voltage: -300V

Item #	Description
300-505	CT Ion Chamber, 3.2 cc, with triax BNC: used with the 35040 (ATD), TRIAD™ and TRIAD™ TnT
300-515	CT Ion Chamber, 3.2 cc, with coax BNC for signal and banana plug for bias: used with the 4000, 8000 and RAD-CHECK® PLUS Dosimeter

10 cc CT ION CHAMBER

Specifications

Detector Type: Vented air ion chamber
Volume: 10.1 cc
Sensitive Length: 10.0 cm
Chamber Material: Acrylic (PMMA)
Chamber Outside Diameter: 0.5 in ± 0.015 in (12.7 mm ± 0.4 mm)
Chamber Inside Diameter: 0.45 in (11.4 mm)
Chamber Wall Thickness: 77 mg/cm^2

Electrode Material: Aluminum, 1100
Sensitivity: 3.2 R•cm/nC (nominal) or 0.3/n
Standard Calibration: 100 kVCP, 5.5 mm Al HVL (NIST Tech. M100)
Response Uniformity Along Axis: ± 3% over central 90% of active length
Beam Orientation: Normal to chamber axis
Leakage Current: (300 V collection potential) Less than 10^{-14}A at 10 min polarization time
Intensity Limits: Continuous beam: 31.6 R/Sec, (1% recombination loss)
Pulsed Beam: 15.8 mR/pulse (1% recombination loss)
Collection Time: 0.478 mSec
Cable Length: 3' (0.9 m)
Operating Voltage: -300 V

Item #	Description
300-510	CT Ion Chamber High Sensitivity, 10 cc for multislice CT, with triax BNC: used with the 35040 ATD and other electrometer/dosimeters, including TRIAD™ and TRIAD™ TnT

EXRADIN FARMER-TYPE CHAMBERS

Model A12 , A12S, and A19

For absolute dosimetry calibrations in water, air or other phantom material

Model A12

Model A12S

Model A19

Features

- Proven guard design yields stable, precise measurements and minimizes settling time by creating uniform field lines
- Shell, collector, and guard are made of durable, long lasting Shonka conductive plastic
- Use of homogeneous material throughout the chamber minimizes perturbation of the beam due to the presence of the chamber and optimizes measurements
- Axially symmetric design of the chamber provides an uniform, isotropic response
- Inherent waterproof construction eliminates need for additional protective coverings
- A matching 2.8 mm thick 60Co build-up cap of C552 Shonka air-equivalent plastic is provided for air calibrations and measurements
- Additional build-up caps of Delrin and brass are available
- Ionization collection efficiency is 99.9% or better

Waterproof construction and two piece removable stem makes it ideal for use in water phantoms. The chamber vents through a flexible tube that surrounds the triaxial cable, ensuring the collecting volume is in pressure equilibrium with the surroundings. The design assures there are no stem or voltage soakage effects, providing precise and reliable measurements.

Farmer-type Chambers are constructed of rugged C552 Shonka air-equivalent plastic, providing excellent conductivity and years of reliable use. Rigorous one meter drop test proves ruggedness and reliability.

Model A12

For absolute dosimetry calibrations in water, air, or other phantom material. The Model A12 is completely characterized in TG 51 and TRS 398. Two separate stem pieces of 5.1 cm and 12.7 cm can be coupled together for ease of use. Collecting volume is 0.65 cc.

Model A12S

The Model A12S thimble chamber is a modified Farmer-Type Chamber Model A12. The collector length of the Model A12S is approximately one-third the size of the Model A12, which confines its collecting volume to more of the tip of the chamber. Collecting volume is 0.25 cc.

Model A19

The Classic Farmer-type Chamber is fully guarded in the Exradin tradition of quality design to eliminate perturbation and minimize settling times and provides precise absolute dosimetry calibrations in water, air, or other phantom material. The Classic Farmer-type Chamber fits existing plastic phantom cavities and build-up caps. Collection volume is 0.63 cc.

CE CE0413, Designed to meet IEC 60601-1, IEC 60731

Item #	Description
300-240-A12	Exradin A12 Farmer Type Chamber, 0.65 cc
300-240-A12S	Exradin A12S Farmer Type Chamber, 0.25 cc
300-240-A19	Exradin A19 Farmer Type Chamber, 0.63 cc

EXRADIN IONIZATION CHAMBERS MATERIAL CODES:

A = C552 Shonka Air Equivalent Plastic **T = A150 Shonka Tissue Equivalent Plastic**
P = D400 Polystyrene Equivalent Plastic **M = Magnesium**

Specifications	Item 300-240-A12	Item 300-240-A12S	Item 300-240-A19
Exradin	Model 12	Model 12S	Model 19
Collecting Volume:	0.65 cm^3	0.25 cm^3	0.63 cm^3
Nominal Calibration Factor:	5 R/nC	14 R/nC	5 R/nC
Centroid of Collecting Volume:	12.9 mm from chamber tip	5.8 mm from chamber tip	12.8 mm from chamber tip
Collector Diameter:	1.0 mm	1.0 mm	1.0 mm
Outside Diameter Sensitive Region:	7.1 mm	7.1 mm	7.0 mm
Wall Thickness:	0.5 mm	0.5 mm	0.5 mm
Stem:	1.3 cm OD black phenolic, two piece w/ 5.1 & 12.7 cm segments	1.3 cm OD black phenolic, two piece w/ 5.1 & 12.7 cm segments	Non-removable 1.3 cm OD x 4.6 cm long black annodized aluminum
Wall, Collector and Guard Material:	A	A	A
Maximum Polarizing Potential:	1000 V		
Inherent Leakage Currents:	10^{-15} A		
Cable:	50 Ohms, 29 pF/ft, 1.5 m long		
Signal Connector:	Triax BNC-M		
High Voltage Connector:	Integral with triaxial connector		
Venting:	Vented to the Ambient via the flexible vent tube surrounding the triaxial cable		
Included 60CO Build-up Cap:	Wall thickness of 2.8 mm; constructed of C552		
Nominal Collection Efficiency:	1.000		
Waterproof:	Yes		

EXRADIN PARALLEL PLATE CHAMBERS

Model A10, Model 11 and Model 11TW

For use in routine electron beam measurements and for depth-dose studies in electron, photon, proton, and neutron beams.

- The TG-51 Protocol requires a parallel plate chamber for electron energies ≤ 6 MeV.
- The **Model 11** is **inherently waterproof** without any additional cap or covering. The **11TW** and the **A10 require waterproof caps** due to their Kapton film windows. Both chambers include a water proofing cover for TG-51.
- Fully guarded for extremely uniform field lines and negligible variation of polarizing potential, thus polarity corrections are not needed.
- Exceptionally wide 4.14 mm guard rings exceed the benefits described in TG-39 for 3 mm rings. This allows for no perturbation in field line, even at low electron energies, ensuring precision in depth-dose measurements.
- Strong, reliable construction with homogenous conductive plastic construction allows for little to no scatter when compared to other similar type chambers.
- Long rigid stem allows accurate positioning of the chamber. No stem effects are present.
- Energy dependence is only influenced by the stopping power correction, a type dependent correcting is not necessary.
- The chamber vents through a flexible tube that surrounds the triaxial cable. This vent tube is sealed to the chamber body and open near the connector.
- The **Model 11's** larger volume is ideally suited for routine electron field measurements in a water phantom. A Cobalt-60 buildup cap is available.
- **Model A10's** small measuring volume allows for excellent spatial resolution. It is ideally suited for smaller electron field measurements in a water phantom for absolute electron dosimetry calibration.
- **Model A10** is capable of measuring in zero depth in the buildup region of an electron field.

Item #	Description
300-225-A10	Exradin A10 Planar Electron, Markus Type, 0.05 cc
300-230-A11	Exradin A11 Spokas, Parallel Plate Chamber, 0.62 cc
300-230-P11	Exradin P11 Spokas, Parallel Plate Chamber, 0.62 cc
300-230-T11	Exradin T11 Spokas, Parallel Plate Chamber, 0.62 cc
300-232-A11TW	Exradin A11TW Thin Window Parallel Plate, 0.94 cc
300-232-P11TW	Exradin P11TW Thin Window Parallel Plate, 0.94 cc
300-232-T11TW	Exradin T11TW Thin Window Parallel Plate, 0.94 cc

EXRADIN IONIZATION CHAMBERS MATERIAL CODES:

A = C552 Shonka Air Equivalent Plastic
P = D400 Polystyrene Equivalent Plastic
T = A150 Shonka Tissue Equivalent Plastic
M = Magnesium

Specifications	Item 300-225-A10	Item 300-230-A11, P11, T11	Item 300-232-A11TW, P11TW, T11TW
Exradin	Model 10	Model 11	Model 11TW
Collecting Volume:	0.05 cm^3	0.6 cm^3	0.94 cm^3
Nominal Calibration Factor:	60 R/nC (TG-21) 527.4 Gy/µc (Air Kerma)	5.5 R/nC (TG-21) 48.3 Gy/µC (Air Kerma)	3.4 R/nC (TG-21) 29.9 Gy/µC (Air Kerma)
Centroid of Collecting Volume:	1.0 mm from window surface	2.0 mm from window surface	1.5 mm from window surface
Collector Diameter:	5.4 mm	20.0 mm	20.0 mm
Window-Collector Gap:	2.0 mm	2.0 mm	3.0 mm
Window:	Conductive Kapton Film, 3.86 mg/cm^2	1.0 mm thick	Conductive Kapton Film, 3.86 mg/cm^2
Body, Collector and Guard Material:	A	A, P or T	A, P or T
Maximum Polarizing Potential:	< 1000 volts	< 1000 volts	< 1000 volts
Inherent Leakage Currents:	<10^{-15} amps	<10^{-15} amps	<10^{-15} amps
Cable:	50 Ohms, 29 pF/F, 1.5 m Long	50 Ohms, 29 pF/F, 1.5 m Long	50 Ohms, 29 pF/F, 1.5 m Long
Stem:	8.9 mm O.D. Black Delrin 1 piece 7.6 cm L; not removable	11.1mm OD Black Phenolic, 2 piece 10.0 + 12.7 cm L.; removable	11.1mm OD Black Phenolic 2 piece(10.0 + 12.7 cm L. ; removable
Signal Connector:	Triaxial BNC-M		
High Voltage Connector:	Integral with Triaxial Connectors		
Venting:	Vented to the ambient via the flexible vent tube surrounding the triaxial cable		

EXRADIN THIMBLE CHAMBERS

Model 1, Model A1S, Model 2, and Model A18

For relative dosimetry scanning and measuring points in water, air or other phantom material.

A1, T1 A1SL A2, P2, T2 A18

Exradin Thimble Chambers

- Proven guard design yields stable, precise measurements and minimizes settling time by creating uniform field lines
- Shell, collector, and guard are all made of durable, long lasting Shonka conductive plastic
- Use of homogeneous material throughout the chamber minimizes perturbation of the beam due to the presence of the chamber and optimizes measurements
- Axially symmetric design of the chamber provides a uniform, isotropic response
- Inherent waterproof construction eliminates need for additional protective coverings
- Ionization collection efficiency is always 99.9% or better

The chambers vent through a flexible tube that surrounds the triaxial cable, ensuring the collecting volume is in pressure equilibrium with the surroundings. The designs assure there are no stem or voltage soakage effects, providing precise and reliable measurements.

Model 1

The Exradin Miniature Shonka Thimble Chamber provides a perfect balance between fast scanning and point dose measurements within 1 cm in water, air, or other phantom material. Model A1 is completely characterized in TG 51 and TRS 398. The chamber features exceptional spatial resolution for relative dosimetry scanning and is capable of measuring small field sizes of 6 mm by 8 mm for accurate point dose measurements. Its waterproof construction and two piece removable stem makes it ideal for use in water phantoms. Two separate stem pieces of 5.1 cm and 12.7 cm can be coupled together for ease of use.

EXRADIN CHAMBER MATERIAL CODES:

A = C552 Shonka Air Equivalent Plastic
T = A150 Shonka Tissue Equivalent Plastic
P = D400 Polystyrene Equivalent Plastic

Model A1SL

The Model A1SL Thimble Chamber is the Slim-Line version of Model A1. It has the exact same internal dimensions and collecting volume as the Model A1, yet the entire chamber has the uniform diameter of 6.4 mm (0.250"), ideal when using a small phantom. Non-removable one piece stem for easy, precise positioning. Small collection volume allows for optimal spatial resolution and exact characterization of a small area of the beam in depth-dose measurements.

Model A2

The Spokas Thimble Chamber permits the precise measurement of exposure and air kerma in photon beams and of absorbed dose in photon, electron, proton, neutron, and mixed photon-neutron beams. Waterproof construction and two piece removable stem makes it ideal for use in wtare phantoms. Two separate stem pieces of 5.1 cm and 12.7 cm can be coupled together for ease of use.

Model A18

Features exceptional spatial resolution for relative dosimetry scanning and is capable of measuring small field sizes of 6.9 mm by 8.3 mm for accurate point dose measurements. Waterproof construction. Non-removable one piece stem for easy, precise positioning. A matching 2.0 mm thick Cobalt-60 build-up cap of C552 Shonka air-equivalent plastic is provided for air calibrations and measurements. ^{60}Co Build-up cap is included with wall thickness of 2.0 mm, constructed of C552 Shonka air equivalent plastic.

CE *CE0413, Designed to meet IEC 60601-1, IEC 60731*

Item #	Description
300-205-A1	Exradin A1 Miniature Shonka, 0.056 cc
300-205-T1	Exradin T1 Miniature Shonka, 0.056 cc
300-205-A1SL	Exradin A1SL Slim-Line Miniature Shonka, 0.056 cc
300-210-A2	Exradin A2 Spokas Thimble Chamber, 0.5 cc
300-210-P2	Exradin P2 Spokas Thimble Chamber, 0.5 cc
300-210-T2	Exradin T2 Spokas Thimble Chamber, 0.5 cc
300-205-A18	Exradin A18 Shonka Thimble Chamber, 0.125 cc

Specifications	Item 300-205-A1, and T1	Item 300-205-A1SL	Item 300-210-A2, P2 and T2	Item 300-205-A18
Exradin	Model 1	Model A1SL	Model 2	Model A18
Collecting Volume:	0.057 cm^3	0.057 cm^3	0.54 cm^3	0.125 cm^3
Nominal Calibration Factor:	60 R/nC	60 R/nC	6 R/nC	25 R/nC
Centroid of Collecting Volume:	4.0 mm from tip of chamber	4.1 mm from tip of the chamber	7.0 mm from tip of chamber	4.9 mm from tip of chamber
Collector Diameter:	1.0 mm	1.0 mm	4.6 mm	1.0 mm
Outside Diameter Sensitive Region:	6.0 mm	6.35 mm	11.4 mm	6.9 mm
Wall Thickness:	1.0 mm	1.1 mm	1.0 mm	1.0 mm
Wall, Collector and Guard Material:	A or T	A	A, P or T	A
Maximum Polarizing Potential:	1000 volts	1000 volts	1000 volts	1000 volts
Inherent Leakage Currents:	10^{-15} Amps	10^{-15} Amps	10^{-15} Amps	10^{-15} Amps
Cable:	50 Ohms, 29 pF/f, 1.5 m long	50 Ohms, 29 pF/f, 1.5 m long	50 Ohms, 29 pF/f, 1.5 m long	50 Ohms, 29 pF/f, 1.5 m long
Signal Connector:	Triaxial BNC-M	Triaxial BNC-M	Triaxial BNC-M	Triaxial BNC-M
High Voltage Connector:	Integral w/triaxial connectors	Integral w/triaxial connectors	Integral w/triaxial connectors	Integral w/triaxial connectors
Stem:	1.3 cm OD Black phenolic two piece with 5.1 & 12.7 cm segments	Non-removable 0.64 cm OD x 5.6 cm L, black anodized aluminum	1.3 cm OD Black phenolic two piece with 5.1 & 12.7 cm segments	Non-removable 0.69 cm OD x 5.5 cm L, black anodized aluminum
Waterproof:	Yes	Yes	Yes	Yes
Vented to the ambient via the flexible vent tube surrounding the triaxial cable				

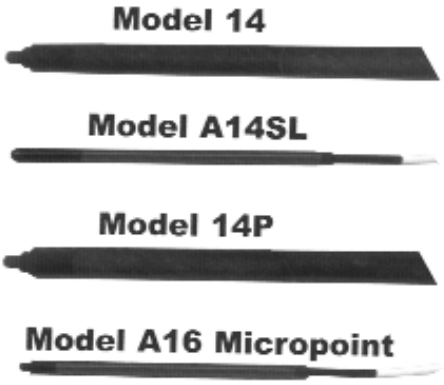
EXRADIN MICROCHAMBERS

Model 14, Model 14P, Model A14SL and Model A16

For assessing pinpoint radiation fields for orthovoltage, x-rays and stereotactic, and superficial skin therapy.

- Axially symmetric design, homogenous construction, and complete guarding for uniform field lines.
- Extremely small volumes allow for exceptional spatial resolution and exact pinpoint characterization of a small area of the beam and beam profile measurements in a water phantom or water equivalent material.
- **Inherently waterproof** construction.
- Uniform isotropic response on cylindrical axis measuring volume.
- Two separate stem pieces of 10.1 cm and 12.7 cm can be coupled together for easy mounting.
- The **Model A14SL** stem keeps the entire chamber with stem only 0.64 cm in diameter.
- The chamber vents through a flexible tube that surrounds the triaxial cable. This vent tube is sealed to the chamber body and open near the connector.
- Extremely small field sizes of 4 x 6 mm for **Model 14** and **A14SL** and 4 x 4 mm for **Model A16** allow for accurate measurements without partial volume effects.

A16 Micropoint chamber is designed primarily for applications like IMRT and stereotactic surgery, which use Cobalt and higher energy beams. A typical calibration factor for air kerma in a cobalt beam is 3.5 x 10^9 Gy/C.



CE

Item #	Description
300-250-A14	Exradin A14 Microchamber, 0.009 cc
300-250-T14	Exradin T14 Microchamber, 0.009 cc
300-250-A14SL	Exradin A14ASL Microchamber, 0.009 cc
300-252-A14P	Exradin A14P Planar Microchamber, 0.002 cc
300-252-T14P	Exradin T14P Planar Microchamber, 0.002 cc
300-253-A16	Exradin A16 Micropoint, 0.007 cc

EXRADIN IONIZATION CHAMBERS MATERIAL CODES:

A = C552 Shonka Air Equivalent Plastic
IP = D400 Polystyrene Equivalent Plastic
T = A150 Shonka Tissue Equivalent Plastic
M = Magnesium

Specifications	Item 300-250-A14, T14	Item 300-250-A14SL	Item 300-252-A14P, T14P	Item 300-253-A16
Exradin	Model 14	Model 14SL	Model 14P	Model 16
Collecting Volume:	0.009 cm^3	0.009 cm^3	0.002 cm^3	0.007 cm^3
Nominal Calibration Factor:	365 R/nC (TG-21) 3.2 Gy/nc (Air Kerma)	365 R/nC(TG-21) 3.2 Gy/nc (Air Kerma)	1430 R/nC(TG-21) 12.6 Gy/nc (Air Kerma)	400 R/nC (TG-21), 3.5 Gy/nC (Air Kerma)
Centroid of Collecting Volume:	2.0 mm from tip of shell	2 mm from tip of shell	1.5 mm from tip of shell	1.7 mm from tip of Shell
Collector Diameter / Length:	1.5 mm x 0 Length	1.5 mm x 0 Length	1.5 mm x 0 Length	0.3 mm x 1.3 mm Long
Outside Diameter Sensitive Region:	6.0 mm	6.25 mm	6.0 mm	3.4 mm
Wall Thickness:	1.0 mm	1.1 mm	1.0 mm	0.5 mm
Wall, Collector and Guard Material:	A or T	A	A or T	A
Maximum Polarizing Potential:	< 1000 volts			
Inherent Leakage Currents:	-10^{-15} Amps			
Cable:	50 Ohms, 29 pF/f, 1.5 m			
Signal Connector:	Triaxial BNC-M			
High Voltage Connector:	Integral with Triaxial Connectors			
Venting:	Vented to ambient via the flexible vent tube surrounding the triaxial cable			
Stem:	12.7 mm OD Black Phenolic, two piece 10.1 and 12.7 cm L. ; removable.			6.4 O.D. aluminum, one piece 10.1 cm L, not removable

SCANDATRONIX / WELLHOFER FARMER TYPE CHAMBERS

- **Waterproof**
- **Air ionization chamber**
- **Vented through waterproof sleeve**
- **Fully guarded**
- **Includes Build-up Cap, with individual factory calibration certificate and user's guide**

Item #	Description
300-720	Farmer Type Chamber FC65-P

- **Waterproof**
- **Air ionization chamber**
- **Vented through waterproof sleeve**
- **Fully guarded**
- **Includes Build-up Cap, with individual factory calibration certificate and user's guide**

Item #	Description
300-722	Farmer Type Chamber FC65-G

- **Waterproof**
- **Air ionization chamber**
- **Vented through waterproof sleeve**
- **Fully guarded**
- **Includes Build-up Cap, with individual factory calibration certificate and user's guide**

Item #	Description
300-725	Farmer Type Chamber FC23-C

Specifications	Item 300-720	Item 300-722	Item 300-725
Scanditronix / Wellhofer	FC65-P	FC65-G	FC23-C
Volume (Nominal)	0.65 cm^3	0.65 cm^3	0.23 cm^3
Total Active Length	23.1 mm	23.1 mm	8.8 mm
Wall Thickness	0.4 mm	0.4 mm	0.4 mm
Central Electrode Material	Aluminum	Aluminum	C552
Diameter of Inner Electrode	1.0 mm	1.0 mm	1.0 mm
Wall Thickness of Build-Up Cap for ^{60}Co	3.9 mm	3.9 mm	3.9 mm
Connector	BNC-M	BNC-M	BNC-M
Cable	1.4 m	1.4 m	1.4 m

SCANDATRONIX / WELLHOFER PARALLEL PLATE CHAMBERS

- **Waterproof**
- **Air ionization chamber**
- **High spatial resolution**
- **Fully guarded**
- **Vented through waterproof sleeve**
- **Suitable for phantoms and holders designed for Markus chamber**
- **Supplied with individual factory calibration certificate and user's guide**

Item #	Description
300-735	Parallel Plate Chamber PPC05

- **Waterproof**
- **Air ionization chamber**
- **Vented through waterproof sleeve**
- **Fully guarded**
- **Superior physics characteristics:**
  - **stabilization time after polarity change approx. 30 s**
  - **polarity effect < 1% for all usable energies, field sizes and depths at linear accelerators**
- **Supplied with individual factory calibration certificate and user's guide**

Item #	Description
300-740	Parallel Plate Chamber PPC40

- **Waterproof**
- **Air-vented**
- **Fully guarded**
- **Low polarity effect**
- **Thin front wall minimizes contamination of the beam and allows measurements at shallow depth**
- **High accuracy even at low electron energies (perturbation factor very close to unity due to large guard ring)**
- **Supplied with an individual factory calibration certificate and scientific papers**
- **Specify BNC or TNC connector**

Item #	Description
300-745	Parallel Plate Chamber NACP

Specifications	Item 300-735	Item 300-740	Item 300-745
Scanditronix / Wellhofer	PPC05	PPC40	NACP
Volume (Nominal)	0.05 cm^3	0.4 cm^3	0.16 cm^3
Cylinder Height	0.6 mm	2.0 mm	2.0 mm
Front Window Thickness	1.0 mm	1.0 mm	-
Graphite	-	-	0.5 mm
Mylar Foil	-	-	0.1 mm
Diameter of Inner Electrode	9.9 mm	16.0 mm	10.0 mm
Guard Ring Width	3.5 mm	4.0 mm	3.0 mm
Polarity Effect	-	-	0.5%
Connector	BNC-M	BNC-M	BNC-M
Cable	1.4 m	1.4 m	2.0 m

SCANDATRONIX / WELLHOFER COMPACT CHAMBERS

- **Waterproof**
- **Air ionization chamber**
- **High uniform spatial resolution**
- **Vented through waterproof sleeve**
- **Fully guarded**
- **Supplied with individual factory calibration certificate and user's guide**

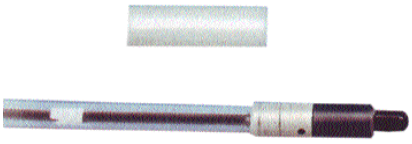
Item #	Description
300-750	Compact Chamber CC01

- **Waterproof**
- **Air ionization chamber**
- **High uniform spatial resolution**
- **Vented through waterproof sleeve**
- **Fully guarded**
- **Supplied with individual factory calibration certificate and user's guide**

Item #	Description
300-755	Compact Chamber CC04

- **Waterproof**
- **Air ionization chamber**
- **Vented through waterproof sleeve**
- **Fully guarded**
- **Supplied with individual factory calibration certificate and user's guide**
- **Designed for axial beam entrance**
- **Sphere-symmetrically designed to obtain resolution for all beam directions. (axial and radial, according to ICRU)**

Item #	Description
300-760	Compact Chamber CC08



- **Waterproof**
- **Air ionization chamber**
- **Vented through waterproof sleeve**
- **Fully guarded**
- **Used for radial and axial beam incidence**

Item #	Description
300-767	Compact Chamber CC13-S
300-768	CC13-S Holder for RFA Phantoms

- **Waterproof**
- **Air ionization chamber**
- **Vented through waterproof sleeve**
- **Fully guarded**
- **PTB approved [15.101 / 97.01]**
- **Used for radial and axial beam incidence**
- **Supplied with individual factory calibration certificate and user's guide**

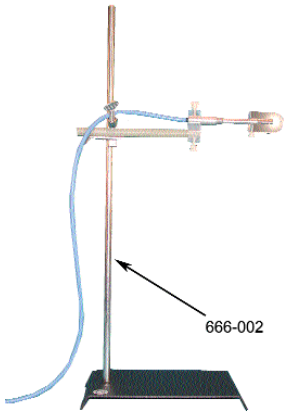
Item #	Description
300-765	Compact Chamber CC13

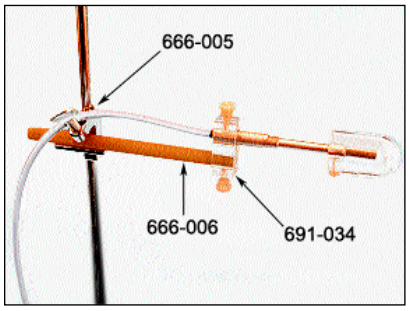
- **Waterproof**
- **Air ionization chamber**
- **Vented through waterproof sleeve**
- **Fully guarded**
- **PTB approved [15.101 / 98.01]**
- **Supplied with individual factory calibration certificate and user's guide**

Item #	Description
300-770	Compact Chamber CC25

Specifications	Item 300-750	Item 300-755	Item 300-760	Item 300-767	Item 300-765	Item 300-770
Scanditronix / Wellhofer	CC01	CC004	CC08	CC13-S	CC13	CC25
Volume (Nominal)	0.01 cm^3	0.04 cm^3	0.08 cm^3	0.13 cm^3	0.13 cm^3	0.25 cm^3
Total Active Length	3.6 mm	3.6 mm	4.0 mm	5.8 mm	5.8 mm	10.0 mm
Wall Thickness	0.5 mm	0.4 mm	0.4 mm	0.88mm	0.4 mm	0.4 mm
Diameter of Inner Electrode	0.35 mm	1.0 mm	1.0 mm	1 mm	1.0 mm	1.0 mm
Connector	BNC-M	BNC-M	BNC-M	BNC-Banana Plug	BNC-M	BNC-M
Cable	1.4 m	1.4 m	1.4 m	1.4 m	1.4 m	1.4 m

CHAMBER SUPPORT STAND





The steel chamber support stand will hold an ion chamber for "in air" measurements. The base of the stand is 6" x 9" (15.24 x 22.86 cm) and the vertical post is 24" (61 cm). The support stand includes a 90° clamp which holds a 15 cm rod. A farmer style chamber holder is also included and attaches to the 15 cm fiberglass rod.

Item 666-000 Chamber Support Stand Includes

- Item 666-002 Support Base and Post
- Item 666-005 90° Clamp
- Item 666-006 Rod for Chamber Support
- Item 691-034 Farmer Style Chamber Holder

Item	Description
666-000	Chamber Support Stand

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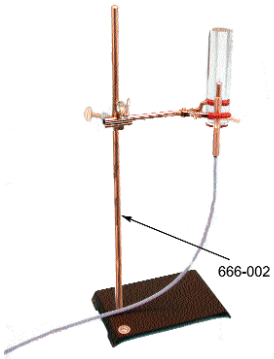
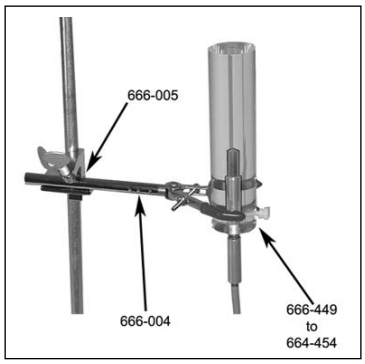
CYLINDRICAL SCATTER PHANTOMS AND STAND





The Cylindrical Scatter Phantom is used vertically to check the collimator scatter.

The steel Cylindrical Scatter Phantom Support Stand will hold a Cylindrical Scatter Phantom vertically. The base of the stand is 6" x 9" (15.24 x 22.86 cm) and the vertical post is 24" (61 cm). The support stand includes a three prong adjustable clamp that attaches to the vertical post using a 90° clamp.

Item 664-448 Cylindrical Scatter Phantom Support Stand Includes

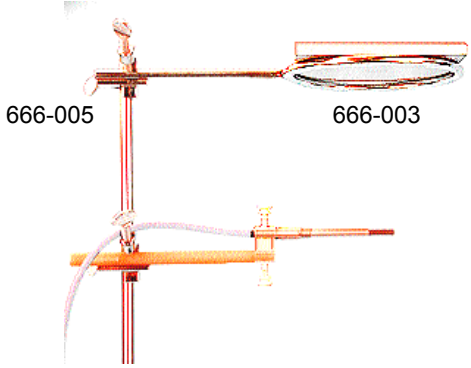
- Item 666-002 Support Base and Post
- Item 666-005 90° Clamp
- Item 666-004 Three Prong Adjustable Clamp

Item	Description
664-448	Cylindrical Scatter Phantom Support Stand

Item	Cylindrical Scatter Phantom	Material
664-449	for PTW 31002 / 31010	Acrylic
664-450	for PTW Farmer Chamber	Acrylic
664-451	for Exradin A-12 Chamber	Polystyrene
664-452	for Exradin A-2 Chamber	Acrylic
664-454	for Exradin A-14 Chamber	Acrylic

Items are Custom Made and Nonreturnable

EXTENSION RING



The steel extension ring has a 6" (15.24 cm) inside diameter and an overall length of 13.75" (35 cm). It attaches to the support stand using a 90° clamp.

Item	Description
666-003	Extension Ring, 6" (15.24 cm) ID
666-0034	Extension Ring, 4" (10.16 cm) ID
666-005	90° Clamp, Three-Prong Adjustable

PROBE HOLDER

NASA Space Shuttle engineering assures smooth and effortless operation. Performs like a robot arm in zero gravity. Fingertip control raises, lowers, and pivots (360°) the perfectly balanced holder wherever desired. Moves in all directions and the arm articulates at three points. Weighted die-cast metal base and spring counterbalance permit fluid movement with superior stability.

Item 666-010 Probe Holder Includes

- 21" (53.34 cm) Metal Arm
- 8" (20.32 cm) Diameter Metal Base
- Probe Holder

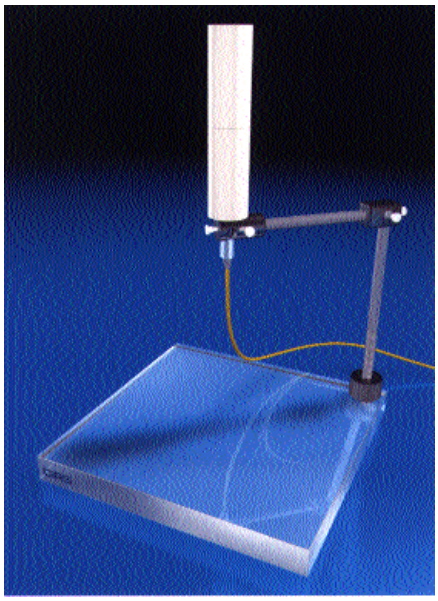
Specifications

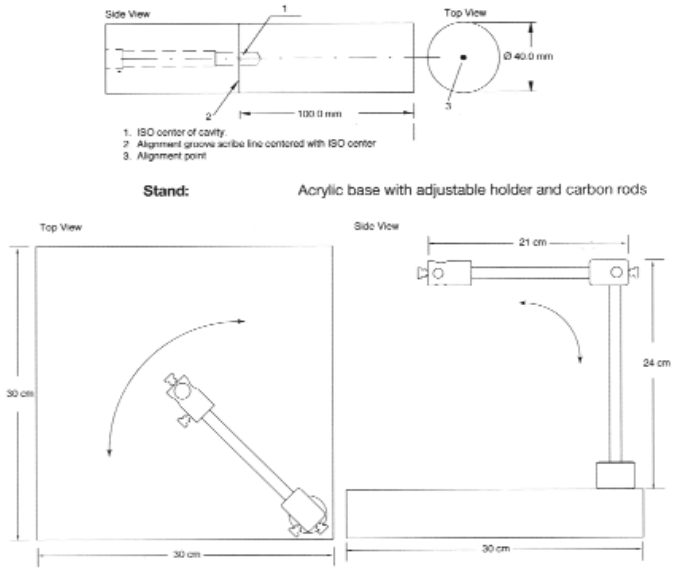
Metal Arm: 21" (53.34 cm)
Metal Base: 8" (20.32 cm) Diameter
Diameter: 10 mm and 14 mm
Weight: 6 lb (2.8 kg)

Item	Description
666-010	Probe Holder

WATER EQUIVALENT MINI PHANTOM

Permits Precise Evaluation of Scatter





The Water Equivalent Mini Phantom for Radiotherapy eliminates scatter radiation and X-Ray beam electron contamination during the ion chamber measurements at a reference depth of 10 cm. Phantom material is Plastic Water® and precise machining improves the dosimetric accuracy and reliability of LINAC beam MU calibrations.

The phantom satisfies the requirements of ESTRO Booklet 3 “Monitor unit calculation for high energy photon beams” for Output, Volume-Scatter and Scatter Primary Ratio measurements.

The Mini Phantom provides an excellent tissue simulation and opportunity of true dose comparison with the 30 x 30 cm Plastic Water® slab phantom. By positioning the ion chamber at a reference depth of 10 cm, the Mini Phantom allows the physicist to isolate and investigate the influence of scatter radiation on a reference dose measured in a slab phantom.

The Mini Phantom stand allows for vertical or horizontal positioning of a 0.6 cc Farmer and smaller diameter chambers. Precise three axis rotation improves measurement accuracy.

Specifications

Characteristics: Water-Equivalent for photon beams 150 keV - 100 MeV
Composition: Plastic Water®
Shape: Cylindrical
Dimensions: As per drawing
Standard Cavity: Farmer 0.6 cc Ion Chamber
Optional Cavities: By request

Item #	Description
664-500	Water Equivalent Mini Phantom
664-502	Stand for Mini Phantom

S_c BRASS MINI PHANTOM

S_c for Multivoltage Photon Beams

Item	Description
664-475	Sc Brass Mini Phantom

Specify Chamber and Dimensions

Task Group 74

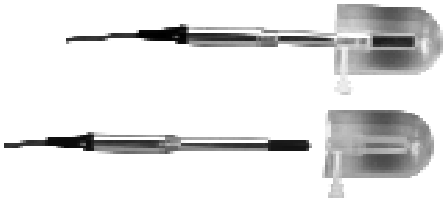
In-Air output ratio (S_c) is defined as the ratio of primary collision water kerma in free-space, K_p, per monitor unit between an arbitrary collimator setting and the reference collimator setting at the same location. Mini phantoms with sufficient lateral and longitudinal thickness to eliminate electron contamination and maintain transient electron equilibrium are recommended for the measurement of S_c. Mini phantoms made of high-Z material are used to measure S_c for small fields (e.g. IMRT or sterotactic radiosurgery).

Reference: Report of AAPM Therapy Physics Committee Task Group 74: In-air output ratio, S_c, for megavoltage photon beams - Timothy C Zhu[a)] - University of Pennsylvania, Philadelphia, PA; Andres Ahnesjö - Uppsala University, 751 85 Uppsala, Sweden and Nucletron AB, Box 1704, 751 47 Uppsala, Sweden; Kwok Leung Lam - University Michigan, Ann Arbor, MI 48109; X. Allen Li - Medical College of Wisconsin, Milwaukee, WI 53226; Chang-Ming Charlie Ma - Fox Chase Cancer Center, Philadelphia, PA 19111; Jatinder R. Palta - University of Florida, Gainsville, FL 32610; Michael B. Sharpe - Princess Margret Hospital, Toronto, ON M5G 2M9, Canada; Bruce Thomadsen - University of Wisconsin, Madison, WI 53705; Ramesh C. Tailor - RPD, UT MD Anderson Cancer Center, Houston, TX 77030 - Med. Phys. 36 (11), November 2009.

BUILD-UP CAPS FOR 'IN AIR' MEASUREMENTS

Custom Caps Available

Acrylic | Aluminum | Brass | Lead | Plastic Water



Build-up Caps for the **Capintec PR-06C or G, 0.6cm³ Farmer Style Chamber** with a 0.28 mm wall thickness of air equivalent plastic and a density of 1.785 g/cm³.

These build-up caps **fit over the Cobalt 60 polystyrene** (density 1.04 g/cm³) build-up cap that has a wall thickness of 5.2 mm and a **17.5 mm outside diameter**.

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		Acrylic Density 1.185 g/cm³		Aluminum Density 2.718 g/cm³		Polystyrene Density 1.05 g/cm³		Brass Density 8.515 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	660-104	4.30 mm	660-404	1.87 mm	660-604	4.85 mm	660-704	0.60 mm
15 mm	6MV	660-106	7.7 mm	660-406	3.40 mm	660-606	8.74 mm	660-706	1.07 mm
24 mm	10MV	660-110	15.3 mm	660-410	6.70 mm	660-610	17.4 mm	660-710	2.12 mm
27 mm	15MV	660-115	17.8 mm	660-415	7.80 mm	660-615	20.28 mm	660-715	2.48 mm
30 mm	18MV	660-118	20.3 mm	660-418	8.90 mm	660-618	23.17 mm	660-718	2.83 mm
35 mm	20MV	660-120	24.6 mm	660-420	10.70 mm	660-620	27.97 mm	660-720	3.42 mm

		Lead Density 11.35 g/cm³		Copper Density 8.90 g/cm³		Plastic Water Density 1.02 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	660-1404	0.45 mm	660-1504	0.57 mm	660-1704	4.99 mm
15 mm	6MV	660-1406	0.80 mm	660-1506	1.02 mm	660-1706	8.91 mm
24 mm	10MV	660-1410	1.59 mm	660-1510	2.03 mm	660-1710	17.74 mm
27 mm	15MV	660-1415	1.86 mm	660-1515	2.37 mm	660-1715	20.68 mm
30 mm	18MV	660-1418	2.12 mm	660-1518	2.71 mm	660-1718	23.62 mm
35 mm	20MV	660-1420	2.56 mm	660-1520	3.27 mm	660-1720	28.52 mm

These build-up caps fit over the Cobalt 60 acrylic build-up cap with a 16.4 mm outside diameter.

Build-up caps for the following 0.6 cm³ Farmer Style Chambers:
PTW 23333 / 233633, PTW 30001 / 30010, PTW 30002 / 30011, PTW 30004 / 30012, PTW 30006 / 30013, NEL 2505/3 (A or B), Victoreen 580-006 or Victoreen 0.6 cm³ Farmer Style Chamber With 0.5 mm Acrylic Wall

		Acrylic Density 1.85 g/cm³		Aluminum Density 2.718 g/cm³		Brass Density 8.515 g/cm³		Polystyrene Density 1.05 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	660-004	4.2 mm	660-304	1.8 mm	660-804	0.6 mm	660-904	4.8 mm
15 mm	6MV	660-006	7.6 mm	660-306	3.3 mm	660-806	1.1 mm	660-906	8.6 mm
20 mm	8MV	660-008	11.8 mm	660-308	5.2 mm	660-808	1.7 mm	660-908	13.4 mm
24 mm	10MV	660-010	15.2 mm	660-310	6.6 mm	660-810	2.1 mm	660-910	17.2 mm
27 mm	15MV	660-015	17.7 mm	660-315	7.7 mm	660-815	2.5 mm	660-915	20.0 mm
30 mm	18MV	660-018	20.3 mm	660-318	8.8 mm	660-818	2.8 mm	660-918	22.9 mm
35 mm	20MV	660-020	24.5 mm	660-320	10.7 mm	660-820	3.4 mm	660-920	27.6 mm
40 mm	24MV	660-024	28.7 mm	660-324	12.5 mm	660-824	4.0 mm	660-924	32.4 mm
50 mm	26MV	660-026	37.1 mm	660-326	16.2 mm	660-826	5.2 mm	660-926	41.9 mm

Note: At energies above 10 MV metal Build-Up Caps may become slightly activated, please check and take appropriate precautions.

BUILD-UP CAPS FOR 'IN AIR' MEASUREMENTS

The Following Build-Up Caps fit over the **0.6 cm³ Farmer Style Chambers *Without Build-up Cap:***
PTW 23333 / 233633 / 30001 / 30010, PTW 30002 / 30011, PTW 30004 / 30012, PTW 30006 / 30013, NEL 2505/3 (A or B), NE 2571 (A), NE 2581 (A), Exradin A-19, RMI 448, Nuclear Associates 30-351, Capintec PR06-G, Victoreen 580-006
There is no compensation for chamber wall thickness.

		Copper Density 8.9 g/cm³		Aluminum Density 2.718 g/cm³		Brass Density 8.515 g/cm³		Lead Density 11.35 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	661-004	1.2 mm	661-104	4.0 mm	661-204	1.3 mm	661-304	1.0 mm
15 mm	6MV	661-006	1.7 mm	661-106	5.5 mm	661-206	1.8 mm	661-306	1.3 mm
20 mm	8MV	661-008	2.3 mm	661-108	7.4 mm	661-208	2.3 mm	661-308	1.8 mm
24 mm	10MV	661-010	2.7 mm	661-110	8.8 mm	661-210	2.8 mm	661-310	2.1 mm
27 mm	15MV	661-015	3.0 mm	661-115	9.9 mm	661-215	3.2 mm	661-315	2.4 mm
30 mm	18MV	661-018	3.4 mm	661-118	11.0 mm	661-218	3.5 mm	661-318	2.6 mm
35 mm	20MV	661-020	3.9 mm	661-120	12.9 mm	661-220	4.1 mm	661-320	3.1 mm
40 mm	24MV	661-024	4.5 mm	661-124	14.7 mm	661-224	4.7 mm	661-324	3.5 mm
50 mm	26MV	661-026	5.6 mm	661-126	18.4 mm	661-226	5.9 mm	661-326	4.4 mm

		Acrylic Density 1.185 g/cm³		Polystyrene Density 1.05 g/cm³		Solid Water Density 1.03 g/cm³		Plastic Water Density 1.02 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	661-404	9.3 mm	661-504	10.78 mm	661-604	10.84 mm	661-704	10.8 mm
15 mm	6MV	661-406	12.7 mm	661-506	14.71 mm	661-606	14.78 mm	661-706	14.7 mm
20 mm	8MV	661-408	16.9 mm	661-508	19.61 mm	661-608	19.70 mm	661-708	19.6 mm
24 mm	10MV	661-410	20.3 mm	661-510	23.53 mm	661-610	23.65 mm	661-710	23.5 mm
27 mm	15MV	661-415	22.8 mm	661-515	26.47 mm	661-615	26.60 mm	661-715	26.5 mm
30 mm	18MV	661-418	25.3 mm	661-518	29.41 mm	661-618	29.56 mm	661-718	29.4 mm
35 mm	20MV	661-420	29.5 mm	661-520	34.31 mm	661-620	34.48 mm	661-720	34.3 mm
40 mm	24MV	661-424	33.8 mm	661-524	29.22 mm	661-624	39.41 mm	661-724	39.2 mm
50 mm	26MV	661-426	42.2 mm	661-526	49.02 mm	661-626	49.26 mm	661-726	49.0 mm

The Following Build-Up Caps fit over a **0.015cc Pinpoint Chamber PTW 31006 / 31014**

		Aluminum Density 2.718 g/cm³		Brass Density 8.515 g/cm³		Lead Density 11.35 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	662-31006-04-2	3.80 mm	662-31006-04-3	1.21 mm	662-31006-04-4	0.91 mm
15 mm	6MV	662-31006-06-2	5.27 mm	662-31006-06-3	1.68 mm	662-31006-06-4	1.26 mm
24 mm	10MV	662-31006-10-2	8.59 mm	662-31006-10-3	2.74 mm	662-31006-10-4	2.06 mm
27 mm	15MV	662-31006-15-2	9.69 mm	662-31006-15-3	3.09 mm	662-31006-15-4	2.32 mm
30 mm	18MV	662-31006-18-2	10.79 mm	662-31006-18-3	3.45 mm	662-31006-18-4	2.58 mm
35 mm	20MV	662-31006-20-2	12.63 mm	662-31006-20-3	4.03 mm	662-31006-20-4	3.03 mm

The Following Build-Up Caps fit over a **0.016cc Pinpoint Chamber PTW 31016**

		Brass Density 8.515 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness
11 mm	4MV	662-31016-04-3	
15 mm	6MV	662-31016-06-3	1.66 mm
20 mm	8MV	662-31016-08-3	
24 mm	10MV	662-31016-10-3	
27 mm	15MV	662-31016-15-3	
30 mm	18MV	662-31016-18-3	3.42 mm

Note: At energies above 10 MV metal Build-Up Caps may become slightly activated, please check and take appropriate precautions.

BUILD-UP CAPS FOR 'IN AIR' MEASUREMENTS

The following build-up caps fit over the **0.3 cm³ semiflex chamber** with an acrylic wall thickness of 0.75 mm.
Caps fit on the following chambers: **PTW 23332 / 233641 / 31003 / 31013, Nuclear Associates 30-316 and 30-317**

		Acrylic Density 1.185 g/cm³		Aluminum Density 2.718 g/cm³		Brass Density 8.515 g/cm³		Lead Density 11.35 g/cm³		Polystyrene Density 1.05 g/cm³		Solid Water Density g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
5.0 mm	1.25MV Co-60	662-001	3.5 mm	662-101		662-201		662-301					
11 mm	4MV	662-004	8.5 mm	662-104	3.72 mm	662-204	1.19 mm	662-304	0.89 mm	662-604	9.63 mm	662-804	
15 mm	6MV	662-006	11.9 mm	662-106	5.19 mm	662-206	1.66 mm	662-306	1.21 mm	662-606	13.44 mm	662-806	
20 mm	8MV	662-008	16.1 mm	662-108	7.03 mm	662-208	2.24 mm	662-308	1.68 mm	662-608	18.20 mm	662-808	
24 mm	10MV	662-010	19.5 mm	662-110	8.50 mm	662-210	2.71 mm	662-310	2.04 mm	662-610	22.01 mm	662-810	
27 mm	15MV	662-015	22.0 mm	662-115	9.61 mm	662-215	3.07 mm	662-315	2.30 mm	662-615	24.87 mm	662-815	
30 mm	18MV	662-018	24.6 mm	662-118	10.71 mm	662-218	3.42 mm	662-318	2.56 mm	662-618	27.72 mm	662-818	
35 mm	20MV	662-020	28.8 mm	662-120	12.55 mm	662-220	4.01 mm	662-320	3.01 mm	662-620	32.49 mm	662-820	
40 mm	24MV	662-024	33.0 mm	662-124	14.39 mm	662-224	4.59 mm	662-324	3.45 mm	662-624	37.25 mm	662-824	

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The following build-up caps fit over the **0.125 cm³ semiflex chamber** with a wall thickness of 0.75 mm and short stem.
Caps fit on the following chambers: **PTW 233642 / 31002 / 31010, PTW 233643 / 31005 / 31011**

		Acrylic Density 1.185 g/cm³		Aluminum Density 2.718 g/cm³		Brass Density 8.515 g/cm³		Lead Density 11.35 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	662-2004	8.53 mm	662-2104	3.72 mm	662-2204	1.19 mm	662-2404	0.89 mm
15 mm	6MV	662-2006	11.91 mm	662-2106	5.19 mm	662-2206	1.66 mm	662-2406	1.24 mm
24 mm	10MV	662-2010	19.50 mm	662-2110	8.50 mm	662-2210	2.71 mm	662-2410	2.04 mm
30 mm	18MV	662-2018	24.57 mm	662-2118	10.71 mm	662-2218	3.42 mm	662-2418	2.56 mm
35 mm	20MV	662-2020	28.79 mm	662-2120	12.55 mm	662-2220	4.01 mm	662-2420	3.01 mm
40 mm	24MV	662-2024	33.01 mm	662-2124	4.59 mm	662-2224	4.59 mm	662-2424	3.45 mm

		Copper Density 8.90 g/cm³		Polystyrene Density 1.05 g/cm³		Plastic Water Density 1.02 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	662-2504	1.14 mm	662-2604	9.63 mm	662-2804	9.91 mm
15 mm	6MV	662-2506	1.59 mm	662-2606	13.44 mm	662-2806	13.83 mm
24 mm	10MV	662-2510	2.60 mm	662-2610	22.01 mm	662-2810	22.66 mm
27 mm	15MV	662-2515	2.93 mm	662-2615	24.87 mm	662-2815	25.60 mm
30 mm	18MV	662-2518	3.27 mm	662-2618	27.72 mm	662-2818	28.54 mm
35 mm	20MV	662-2520	3.83 mm	662-2620	32.49 mm	662-2820	33.44 mm

MARKUS CHAMBER BUILD-UP DISK

664-320

664-401

The Markus Chamber (PTW 23343) Build-up Disk is made of acrylic and available in 2 styles.

Item 664-320 is a Cobalt 60 Disk that is placed over the chamber's acrylic screw on cap. The disk has a 2.99 cm diameter and is 3.2 mm thick.

Item 664-401 is a Cobalt 60 disk with a shoulder placed over the chamber's mylar window. It has a 3.2 cm diameter and is 4 mm thick.

Item #	Description	Thickness
664-320	Cobalt 60 Disk	3.2 mm
664-401	Cobalt 60 w/Shoulder	4.01 mm

Note: At energies above 10 MV metal Build-Up Caps may become slightly activated, please check and take appropriate precautions.

BUILD-UP CAPS FOR "IN AIR" MEASUREMENTS

The following build-up caps fit on the **Exradin Model A2 0.5cm³ Spokas Thimble Chamber** with a wall thickness of 1.0 mm.
Material: Shonka air equivalent plastic C552**. Density:** 1.76 g/cm³

		Acrylic Density 1.185 g/cm³		Polystyrene Density 1.05 g/cm³		Aluminum Density 2.718 g/cm³		Brass Density 8.515 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	659-2-04-1	7.80 mm	659-2-04-6	8.80 mm	659-2-04-2	3.40 mm	659-2-04-3	1.09 mm
15 mm	6MV	659-2-06-1	11.17 mm	659-2-06-6	12.61 mm	659-2-06-2	4.87 mm	659-2-06-3	1.55 mm
20 mm	8MV	659-2-08-1	15.39 mm	659-2-08-6	17.37 mm	659-2-08-2	6.71 mm	659-2-08-3	2.14 mm
24 mm	10MV	659-2-10-1	18.77 mm	659-2-10-6	21.18 mm	659-2-10-2	8.18 mm	659-2-10-3	2.61 mm
27 mm	15MV	659-2-15-1	21.30 mm	659-2-15-6	24.04 mm	659-2-15-2	9.29 mm	659-2-15-3	2.96 mm
30 mm	18MV	659-2-18-1	23.83 mm	659-2-18-6	26.90 mm	659-2-18-2	10.39 mm	659-2-18-3	3.32 mm
35 mm	20MV	659-2-20-1	28.05 mm	659-2-20-6	31.66 mm	659-2-20-2	12.23 mm	659-2-20-3	3.90 mm
40 mm	24MV	659-2-24-1	32.27 mm	659-2-24-6	36.42 mm	659-2-24-2	14.07 mm	659-2-24-3	4.49 mm
50 mm	26MV	659-2-26-1	40.71 mm	659-2-26-6	45.94 mm	659-2-26-2	17.75 mm	659-2-26-3	5.67 mm

The following build-up caps fit over the **Exradin Model A12 Farmer type chamber** with a wall thickness of 0.5 mm.
Material: Shonka Air-Equivalent Plastic C552 **Density:** 1.76 g/cm³

		Acrylic Density 1.185 g/cm³		Polystyrene Density 1.05 g/cm³		Aluminum Density 2.718 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	659-12-04-1	8.54 mm	659-12-04-6	9.64 mm	659-12-04-2	3.72 mm
15 mm	6MV	659-12-06-1	11.92 mm	659-12-06-6	13.45 mm	659-12-06-2	5.19 mm
20 mm	8MV	659-12-08-1	16.14 mm	659-12-08-6	18.21 mm	659-12-08-2	7.03 mm
24 mm	10MV	659-12-10-1	19.51 mm	659-12-10-6	22.02 mm	659-12-10-2	8.51 mm
27 mm	15MV	659-12-15-1	22.04 mm	659-12-15-6	24.88 mm	659-12-15-2	9.61 mm
30 mm	18MV	659-12-18-1	24.57 mm	659-12-18-6	27.73 mm	659-12-18-2	10.71 mm
35 mm	20MV	659-12-20-1	28.79 mm	659-12-20-6	32.50 mm	659-12-20-2	12.55 mm
40 mm	24MV	659-12-24-1	33.01 mm	659-12-24-6	37.26 mm	659-12-24-2	14.39 mm
50 mm	26MV	659-12-26-1	41.45 mm	659-12-26-6	46.78 mm	659-12-26-2	18.07 mm

		Brass Density 8.515 g/cm³		Lead Density 11.35 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	659-12-04-3	1.19 mm	659-12-04-4	1.14 mm
15 mm	6MV	659-12-06-3	1.66 mm	659-12-06-4	1.59 mm
20 mm	8MV	659-12-08-3	2.25 mm	659-12-08-4	2.15 mm
24 mm	10MV	659-12-10-3	2.72 mm	659-12-10-4	2.60 mm
27 mm	15MV	659-12-15-3	3.07 mm	659-12-15-4	2.93 mm
30 mm	18MV	659-12-18-3	3.42 mm	659-12-18-4	3.27 mm
35 mm	20MV	659-12-20-3	4.01 mm	659-12-20-4	3.83 mm
40 mm	24MV	659-12-24-3	4.59 mm	659-12-24-4	4.40 mm
50 mm	26MV	659-12-26-3	5.77 mm	659-12-26-4	5.52 mm

We Manufacture Build-Up Caps for All Ionization Chambers - Please Call for More Information

Note: At energies above 10 MV metal Build-Up Caps may become slightly activated, please check and take appropriate precautions.

BUILD-UP CAPS FOR "IN AIR" MEASUREMENTS

Build-up caps for the **NE 2571**, **0.6cm³ Farmer Style Chamber** with a 0.36 mm graphite (density 1.857 g/cm³) wall thickness.

These build-up caps **fit over the Cobalt 60 delrin (density 1.415 g/cm³) build-up cap** that has a wall thickness of 4.13 mm and an **outside diameter of 15.14 mm**.

		Acrylic Density 1.185 g/cm³		Aluminum Density 2.718 g/cm³		Brass Density 8.515 g/cm³		Lead Density 11.35 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	660-204	4.08 mm	660-504	1.78 mm	660-5304	0.57 mm	660-5404	0.43 mm
15 mm	6MV	660-206	7.2 mm	660-506	3.1 mm	660-5306	1.04 mm	660-5406	0.78 mm
24 mm	10MV	660-210	14.8 mm	660-510	6.4 mm	660-5310	2.09 mm	660-5410	1.57 mm
27 mm	15MV	660-215	17.3 mm	660-515	7.5 mm	660-5315	2.45 mm	660-5415	1.84 mm
30 mm	18MV	660-218	19.8 mm	660-518	8.6 mm	660-5318	2.80 mm	660-5418	2.10 mm

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		Copper Density 8.90 g/cm³		Polystyrene Density 1.05 g/cm³		Plastic Water Density 1.02 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	660-5504	0.54 mm	660-5604	4.60 mm	660-5704	4.74 mm
15 mm	6MV	660-5506	0.99 mm	660-5606	8.41 mm	660-5706	8.66 mm
20 mm	8MV	660-5508	1.55 mm	660-5608	13.17 mm	660-5708	13.56 mm
24 mm	10MV	660-5510	2.00 mm	660-5610	16.98 mm	660-5710	17.48 mm
27 mm	15MV	660-5515	2.34 mm	660-5615	19.84 mm	660-5715	20.42 mm
30 mm	18MV	660-5518	2.68 mm	660-5618	22.70 mm	660-5718	23.37 mm
35 mm	20MV	660-5520	3.24 mm	660-5620	27.46 mm	660-5720	28.27 mm
40 mm	24MV	660-5524	3.80 mm	660-5624	32.22 mm	660-5724	33.17 mm

The following build-up caps fit on the **IBA (Scanditronix/Wellhofer) CC13, IC-15, and IC-10 Chamber**

		Acrylic Density 1.185 g/cm³		Aluminum Density 2.718 g/cm³		Brass Density 8.515 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	663-901-04	8.69 mm	663-902-04	3.79 mm	663-903-04	1.21 mm
15 mm	6MV	663-901-06	12.07 mm	663-902-06	5.26 mm	663-903-06	1.68 mm
20 mm	8MV	663-901-08	16.29 mm	663-902-08	7.10 mm	663-903-08	2.27 mm
24 mm	10MV	663-901-10	19.66 mm	663-902-10	8.57 mm	663-903-10	2.74 mm
27 mm	15MV	663-901-15	22.19 mm	663-902-15	9.68 mm	663-903-15	3.09 mm
30 mm	18MV	663-901-18	24.73 mm	663-902-18	10.78 mm	663-903-18	3.44 mm
35 mm	20MV	663-901-20	28.95 mm	663-902-20	12.62 mm	663-903-20	4.03 mm
40 mm	24MV	663-901-24	33.16 mm	663-902-24	14.46 mm	663-903-24	4.62 mm
50 mm	26MV	663-901-26	41.60 mm	663-902-26	18.14 mm	663-903-26	5.79 mm

		Polystyrene Density 1.05 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness
11 mm	4MV	663-906-04	9.81 mm
15 mm	6MV	663-906-06	13.62 mm
20 mm	8MV	663-906-08	18.38 mm
24 mm	10MV	663-906-10	22.19 mm
27 mm	15MV	663-906-15	25.05 mm
30 mm	18MV	663-906-18	27.90 mm
35 mm	20MV	663-906-20	32.67 mm
40 mm	24MV	663-906-24	37.43 mm
50 mm	26MV	663-906-26	46.95 mm

Note: At energies above 10 MV metal Build-Up Caps may become slightly activated, please check and take appropriate precautions.

BUILD-UP CAPS FOR "IN AIR" MEASUREMENTS

The following build-up caps fit on the **Exradin A16**

		Aluminum Density 2.718 g/cm³		Lead Density 11.35 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	659-A16-04-2	3.72 mm	659-A16-04-4	0.89 mm
15 mm	6MV	659-A16-06-2	5.19 mm	659-A16-06-4	1.24 mm
20 mm	8MV	659-A16-08-2	7.03 mm	659-A16-08-4	1.68 mm
24 mm	10MV	659-A16-10-2	8.51 mm	659-A16-10-4	2.04 mm
27 mm	15MV	659-A16-15-2	9.61 mm	659-A16-15-4	2.30 mm
30 mm	18MV	659-A16-18-2	10.71 mm	659-A16-18-4	2.57 mm
35 mm	20MV	659-A16-20-2	12.55 mm	659-A16-20-4	3.01 mm
40 mm	24MV	659-A16-24-2	14.39 mm	659-A16-24-4	3.45 mm
50 mm	26MV	659-A16-26-2	18.07 mm	659-A16-26-4	4.33 mm

The following build-up caps fit on the **Exradin A14**

		Acrylic Density 1.185 g/cm³		Aluminum Density 2.718 g/cm³		Brass Density 8.515 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	659-A14-04-1	7.80 mm	659-A14-04-2	3.40 mm	659-A14-04-3	1.09 mm
15 mm	6MV	659-A14-06-1	11.17 mm	659-A14-06-2	4.87 mm	659-A14-06-3	1.55 mm
20 mm	8MV	659-A14-08-1	15.39 mm	659-A14-08-2	6.71 mm	659-A14-08-3	2.14 mm
24 mm	10MV	659-A14-10-1	18.77 mm	659-A14-10-2	8.18 mm	659-A14-10-3	2.61 mm
27 mm	15MV	659-A14-15-1	21.30 mm	659-A14-15-2	9.29 mm	659-A14-15-3	2.96 mm
30 mm	18MV	659-A14-18-1	23.83 mm	659-A14-18-2	10.39 mm	659-A14-18-3	3.32 mm
35 mm	20MV	659-A14-20-1	28.05 mm	659-A14-20-2	12.23 mm	659-A14-20-3	3.90 mm
40 mm	24MV	659-A14-24-1	32.27 mm	659-A14-24-2	14.07 mm	659-A14-24-3	4.49 mm

The following build-up caps fit on the **Exradin A14SL**

		Brass Density 8.515 g/cm³		Lead Density 11.35 g/cm³	
D-Max In Water	Nominal Energy	Item #	Wall Thickness	Item #	Wall Thickness
11 mm	4MV	659-A14SL-04-3	1.06 mm	659-A14SL-04-4	0.80 mm
15 mm	6MV	659-A14SL-06-3	1.53 mm	659-A14SL-06-4	1.15 mm
20 mm	8MV	659-A14SL-08-3	2.12 mm	659-A14SL-08-4	1.59 mm
24 mm	10MV	659-A14SL-10-3	2.59 mm	659-A14SL-10-4	1.94 mm
27 mm	15MV	659-A14SL-15-3	2.94 mm	659-A14SL-15-4	2.21 mm
30 mm	18MV	659-A14SL-18-3	3.30 mm	659-A14SL-18-4	2.47 mm
35 mm	20MV	659-A14SL-20-3	3.88 mm	659-A14SL-20-4	2.91 mm
40 mm	24MV	659-A14SL-24-3	4.47 mm	659-A14SL-24-4	3.35 mm

Note: At energies above 10 MV metal Build-Up Caps may become slightly activated, please check and take appropriate precautions.

WATER PHANTOM MOTOR DRIVE SYSTEM

Motor Control Box

- **Rugged construction**
- **Precision ground shaft**
- **Variable speed control**
- **All metal motor drive**
- **No lost counts of travel**
- **No jitter counting**
- **Quadrature X1 counting mode**
- **Two sizes of water tanks are available**
- **Meets AAPM-51 and IAEA TRS-398 dosimetry protocol requirements**

Motor Drive System
The main feature of this motor drive system is that no travel movement counts are lost if jogging up or down when setting the chamber depth position. This is due to an output shaft encoder producing 100 counts per millimeter in travel and a quadrature X 1 counting mode. This mode requires two identical square wave signals with one of the (QUAD) shifted 90° relative to other (COUNT). These two signals are processed by a dual counter. Counter accuracy becomes 0.01 mm with no lost counts.

The all metal motor drive system adds convenience and saves time by allowing the user to set the ion chamber position from outside of the treatment room.

The motor control box has a 5 digit 1/2" (1.27 cm) LCD (liquid crystal display) which reads to 0.01 mm resolution, and has a reset button below the display. A downward chamber movement is indicated by a (-) on the LCD. A knob for the motor speed control sets the speed of travel based on the % of maximum motor speed. When pushed, the drive thumb switch gives continuous motion in the up (p / +) or down (q / -) direction of travel. A lighted power switch indicates when the unit is on. The motor control box is fused through a 6' (1.8 m) long hospital grade cord that attaches to the motor control box through an isolation transformer. A fuse holder is located on the back of the motor control box for easy service and accessibility.

A 50’ (15.25 m) fully shielded cable connects the motor control box to the motor drive unit. Individual cables (Item 691-080) can be installed in each treatment room.

The motor drive unit sits on the side of the water phantom and is manually positioned in the X or Y axis using the scales on the side of the phantom. The motor drive unit is held in place using the two tightening screws. The momentary toggle switch on the side of the motor drive unit also controls the up/down direction of travel. The speed of travel is set at the motor control box. The vertical position is displayed in millimeters at the motor control box or can be read on the 30 cm scale attached to the motor drive unit. The maximum vertical travel is 30 cm.

For safety the maximum power supply to the motor is 24 volts D.C. All components of the motor control box and motor drive unit are UL approved.

Water Phantom
The water phantom has 1/4" (0.635 cm) thick clear acrylic sides, a 3/8" (0.953 cm) thick white acrylic bottom, and a clear acrylic support rim at the top of the phantom. The white bottom allows for easy viewing of the chamber and cross hair shadows. The water phantom has a tank plug and a drain valve assembly. A 5' (1.5 m) drain hose is also included. Two sides of the water phantom have ±16 cm scales with millimeter markings. The water phantom is available in two sizes: large and small.

A 46 cm aluminum depth scale with millimeter markings is included with the water phantom. The depth scale has a half-round cutout at the base which allows positioning on the active area of a RPD waterproofing tip (Item 691-030 and 691-032) for a Farmer style chamber. When using the 46 cm aluminum depth scale on the active chamber area of a **waterproof** Farmer style chamber (all manufacturers) to measure water depth, **subtract 1 mm** from depth reading.

Items 691-010 Small Water Phantom and 691-015 Large Water Phantom Includes

- Motor control box
- 50’ (15.25 m) cable
- Motor drive unit
- 46 cm aluminum depth scale (Item 692-000-50)
- Chamber support rod w/scribing, 1/2" (1.27 cm) diameter delrin (Item 691-036 or Item 691-037)
- Acrylic holder for a Farmer Style Chamber (Item 691-034)
- Drain valve assembly (Item 691-000-56)
- Pipe plug (Item 14-310)
- 5' (1.5 m) drain hose with hose connection (Item 691-090)

Specifications

Motor Drive System
Power: 115 Vac, 50/60 Hz
Optional Power: 230 Vac, 50/60 Hz
Display: 5 Digit LCD
Accuracy: 0.01 mm
Travel: 30 cm
Cable: 50' (15.25 m) Fully shielded
Motor: Variable speed, reversible, 24 VDC

Item 691-010 Small Water Phantom
Inside Dimensions: 35 cm x 40 cm x 38 cm D
Gallons: 13
Weight: 15 lb (6.8 kg)
Weight When Full: Approximately 104 lb (47.3 kg)

Item 691-015 Large Water Phantom
Inside Dimensions: 40 cm x 45 cm x 38 cm D
Gallons: 16.5
Weight: 16.5 lb (7.5 kg)
Weight When Full: Approximately 132 lb (60 kg)

Item	Description
691-010	Small Water Phantom with Motor Drive System
691-015	Large Water Phantom with Motor Drive System
691-080	Cable, Fully Shielded, 50' (15.25 m)
692-000-50	46 cm Depth Scale

WATER PHANTOM MANUAL DRIVE SYSTEM

- **Rugged construction**
- **Precision ground shaft**
- **Quadrature X1 counting mode**
- **Two sizes of water tanks are available**
- **Meets AAPM-51 and IAEA TRS-398 dosimetry protocol requirements**

Manual Drive Unit
When using the manual drive unit the chamber is manually positioned in the X or Y axis using the scale on the side of the water phantom. The manual drive unit is held in place by two tightening screws. The chamber is adjusted on the Z axis using the manual drive. The maximum vertical travel is 30 cm. A precision 2:1 gear box allows for quick vertical motion. The large handwheel provides ease of motion and a 0.1 mm mechanical increment counter provides an accurate readout of the vertical position of the chamber. One turn of the handwheel is equal to 3.0 mm of travel. The mechanical counter can be reset to zero at any position by turning the reset knob (located on the side of the counter) counter clockwise.

Water Phantom
The water phantom has 1/4" (0.635 cm) thick clear acrylic sides, a 3/8" (0.953 cm) thick white acrylic bottom, and a clear acrylic support rim at the top of the phantom. The white bottom allows for easy viewing of the chamber and cross hair shadows. The water phantom has a tank plug and a drain valve assembly. A 5' (1.5 m) drain hose is also included. Two sides of the water phantom have ±16 cm scales with millimeter markings. The water phantom is available in two sizes: large and small.

A 46 cm aluminum depth scale with millimeter markings is included with the water phantom. The depth scale has a half-round cutout at the base which allows positioning on the active area of a RPD waterproofing tip (Item 691-030 and 691-032) for a Farmer style chamber. When using the 46 cm aluminum depth scale on the active chamber area of a **waterproof** Farmer style chamber (all manufacturers) to measure water depth, **subtract 1 mm** from depth reading.

Items 691-001 Small Water Phantom and 691-005 Large Water Phantom Includes

- 46 cm aluminum depth scale (Item 692-000-50)
- Chamber support rod w/scribing, 1/2" (1.27 cm) diameter delrin (Item 691-036 or Item 691-037)
- Acrylic holder for a Farmer Style Chamber (Item 691-034)
- Drain valve assembly (Item 691-000-56)
- Pipe plug (Item 14-310)
- 5' (1.5 m) drain hose with hose connection (Item 691-090)

Specifications

Manual Drive Unit
Counter: Mechanical
Accuracy: 0.1 mm
Travel: 30 cm

Item 691-001 Small Water Phantom
Inside Dimensions: 35 cm x 40 cm x 38 cm D
Gallons: 13
Weight: 15 lb (6.8 kg)
Weight When Full: Approximately 104 lb (47.3 kg)

Item 691-005 Large Water Phantom
Inside Dimensions: 40 cm x 45 cm x 38 cm D
Gallons: 16.5
Weight: 16.5 lb (7.5 kg)
Weight When Full: Approximately 132 lb (60 kg)

Item	Description
691-001	Small Water Phantom with Manual Drive Unit
691-005	Large Water Phantom with Manual Drive Unit

CHAMBER HOLDERS FOR WATER PHANTOM

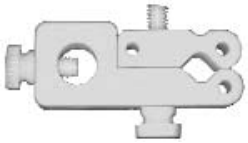
Items 691-034 and 691-036 or 691-037 are included with water tank

691-034

691-041, 691-042 or 691-043

691-036

691-040



691-050

The Markus (Item 691-041) or Roos (Item 691-042) chamber holders will hold the chamber parallel with the water surface. A thumb screw secures the chamber in place.

Item	Description
691-034	Farmer Style Chamber Holder, Additional or Replacement
691-036	Chamber Support Rod for Small Water Phantom
691-037	Chamber Support Rod for Large Water Phantom
691-040	Chamber Holder for PTW 0.1cc, 0.125cc, and 0.3cc Chambers
691-041	Chamber Holder - Acrylic for PTW Markus/Exradin A10/Wellhoffer NACP
691-042	Chamber Holder - Acrylic for PTW Roos/Wellhoffer PPC40/PPC 035
691-043	Chamber Holder - Acrylic for Exradin Model 11
691-050	Universal Chamber Holder Sizes 5.8mm to 17.7mm Dia.

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CHAMBER WATERPROOFING ACCESSORIES

691-030

691-030 Shown with a Farmer Style Chamber Holder

691-033

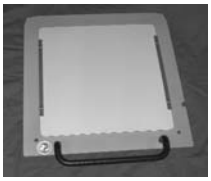
A Farmer Style Chamber can be housed in a watertight tip made of polystyrene (Item 693-030) or acrylic (Item 693-032) with a tip wall thickness of 1 mm. A 60 cm long rubber sheath is connected to the tip with an O-Ring. The shealth is long enough to extend out of the water phantom. Atmospheric air pressure is provided through the rubber sheath to the chamber tip.

Item	Description
691-030	Waterproof Poly Farmer Style Chamber Tip with Tubing
691-032	Waterproof Acrylic Farmer Style Chamber Tip with Tubing
691-033	Kit - Sheath and O-ring

Will NOT Fit Exradin A12 Chamber

LEAD FOIL OR LEAD FOIL TRAY FOR TG-51

691-175



691-176

691-177

691-184

Lead Thickness: ± 10% of 1 mm

Item #	Description
691-175	1 mm Thick x 25 cm Sq. Lead Foil
691-176	1 mm Pb Foil on Varian Type III Tray - Wedge Slot
691-177	1 mm Pb Foil on Varian Type III Tray - Block Slot
691-178	1 mm Pb Foil on Varian Type II Tray - Wedge Slot
691-180	1 mm Pb Foil on Siemens Screw Coded Tray - Block Slot
691-184	1 mm Pb Foil on Siemens Tray w/ Code By-pass - Block Slot
691-185	1 mm Pb Foil on Siemens Tray w/ Code Plug* - Block Slot
691-190	1 mm Pb Foil on Philips/ Elekta Acrylic Tray - Block Slot

* Coding Plug is extra, use Item 1884-10-5

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CASE & TRANSPORT CART FOR WATER PHANTOM

691-055

691-056

An optional foam lined storage case (Item 691-055) for the motor drive provides safe transport/storage. Also available is a collapsible transport cart (Item 691-056) with bungee straps that will hold the storage case, water phantom and accessories to provide easy transport.

Item #	Optional Waterproofing Accessories
691-055	Case for Motor Drive and Control
691-056	Foldable Transport Cart

PTW WATER TANK CHAMBER HOLDERS FOR EXRADIN ION CHAMBERS

696-018

696-020

Holders for holding Ion Chamber in Horizontalposition.

Item	PTW Water Tank Chamber Holder
696-018	For Exradin A14SL and A16
696-019	For Exradin Models 1, 2, 12 and 14 (Exradin A1, A2, A12, A12S, A14, A14P, M1, M2, P2, T1, T2, T14 and T14P)
696-020	For Exradin A10
696-021	For PTW T31002 (0.125cc Semifliex)

Holders for holding Ion Chamber in Vertical position.

Item	PTW Water Tank Chamber Holder
696-022	For Exradin A10
696-024	For Exradin 11 and 13 (Exradin A11, A11TW, A13, P11, P11TW, P13, T11 and T11TW)

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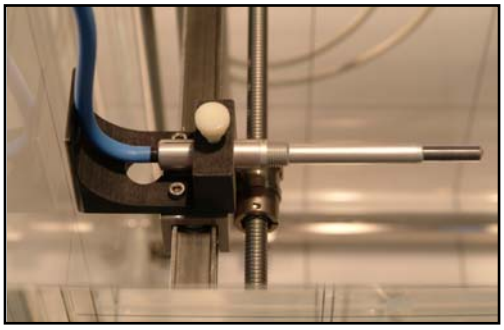
FARMER CHAMBER HOLDER FOR PTW MP3-XS 3D WATER PHANTOM

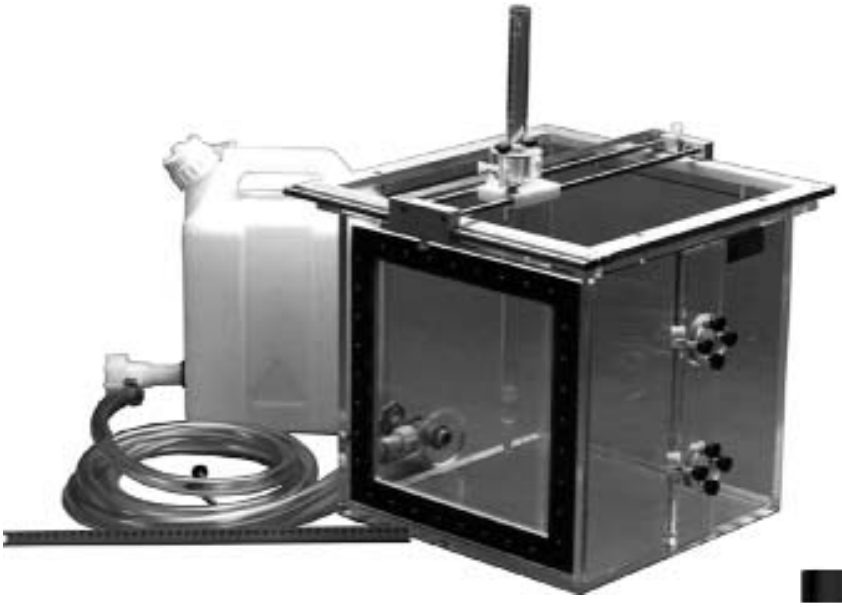


This chamber holder will hold any 1/2. (12.7mm) diameter waterproof Farmer chamber horizontal in the PTW MP3-XS 3D Water Phantom.

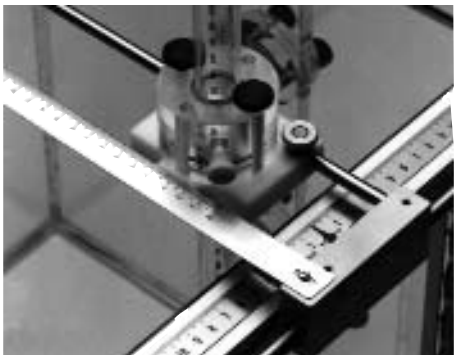
This chamber holder allows the triax cable to be guided vertically and smoothly over the top of the tank. There is no side wall pressure against the triax cable. A plastic “C” channel stop is provided to prevent crashing of the chamber against the side wall.

Item	PTW Water Tank Chamber Holder
696-025	Holder for 1/2" (12.7mm) Dia Waterproof Farmer Chamber

MYLAR WINDOW WATER PHANTOM



692-000-60



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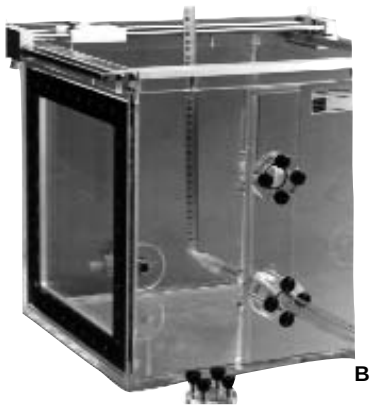


B

Mylar Window
The window is made of 0.010" thick Mylar. It is mounted in an 27 cm square aluminum frame. The outside of the water phantom is 18.7 cm from the bottom to the center of the mylar window.

Two Water-Tight Side Openings
The side openings for the chamber holder are located 10 cm and 25 cm from the bottom of the phantom. The chamber holder has a single axis of motion.

Drain
The Water Phantom drain valve can be connected with a vinyl hose to a 2 1/2" gallon reservoir tank with valve. Place the reservoir tank above the water phantom and open the valves to raise the water level. Place the reservoir tank below the water phantom to lower the water level.

Depth Scale
A 46 cm aluminum depth scale with millimeter markings is included with the water phantom. The depth scale has a half-round cutout at the base which allows positioning on the active area of a RPD waterproofing tip (Item 691-030 and 691-032) for a Farmer style chamber.

When using the 46 cm aluminum depth scale on the active chamber area of a **waterproof** Farmer style chamber (all manufacturers) to measure water depth, **subtract 1 mm** from depth reading.

Chamber Holder
The chamber holder comes with an 18" L x 7/8" or 5/8" diameter acrylic tube with a polystyrene or acrylic tip that has a 1 mm thick wall for a Farmer Style Chambers (Figure B). A millimeter scale is silk screened on the outside of the 7/8" diameter tube only. Optional chamber holders are also available.

Chamber Carriage
A welded aluminum frame is secured to the phantom. It can be rotated 90º. X-axis delrin bearings slide on a stainless steel rod with two scales and locks. A Y-axis delrin chamber holder slides on stainless steel rods with a lock and is adjustable (Figure A). An adjustable scale allows for accurate setting of the chamber tip to the mylar window distance. A Z-axis acrylic chamber holder slides on o-rings with a lock.

Service
Lubricate o-rings with vaseline so the acrylic chamber tube slides easily.

Specifications

Size: 35 cm x 37 cm H
Weight (empty): 42 lbs
Weight with Water: 94 lbs. (35 cm³)
Material: Acrylic reinforced top and corners (sides measure 1/4" thick and bottom measures 3/8" thick)
Shipping Weight: 42 lbs.

Included with Mylar Window Water Phantom:
Hose w/drain connection
2 1/2 gallon reservoir tank
46 cm depth scale
3 cm calibrator from Farmer Chamber tube
1 chamber holder of your choice

Item #	Description
692-000	Mylar Window Water Phantom
	Replacement Accessories
692-000-50	46 cm Depth Scale
692-000-60	Farmer Chamber Tube 3 cm Calibrator
692-011	Hose with Drain Connection

CHAMBER HOLDERS FOR MYLAR WINDOW PHANTOM

- **Waterproof**
- **Included o-ring assembly**
- **Scaled acrylic tube**

The chamber holders are watertight acrylic tubes that have a 1 mm thick polystyrene or acrylic tip for Farmer-style Ion Chambers. A 50 cm scale is printed on the tube. No further waterproofing is necessary.

Item 692-600 and 692-610 Options A and B
Fit Capintec PR-06C or G with TNC connector.

Item 692-620 and 692-630 Options C and D
Fit all Farmer-style chambers except Capintec PR-06C or G with TNC connector.

Item #	Chamber Holder	Tube Diameter	Tip Material
692-600	Option A	0.875" (2.22 cm)	Polystyrene
692-610	Option B	0.875" (2.22 cm)	Acrylic
692-620	Option C	0.625" (1.59 cm)	Polystyrene
692-630	Option D	0.625" (1.59 cm)	Acrylic
692-635	Exradin A12	0.875" (2.22 cm)	Polystyrene

R

OPTION "N" COMBINATION CHAMBER HOLDER

The Option "N" Chamber Holder has a 5/8" (1.59 cm) O.D. tube and is a combination holder. It can be used for the Markus chamber, and the 0.3 cm^3 or 0.1 cm^3 chambers. This holder can be used both horizontally or vertically.

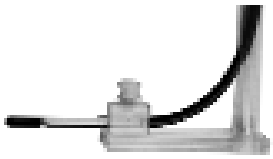
Item	Description
692-652	Option "N"Combination Chamber Holder

OPTION "H" CHAMBER HOLDER

The Option "H" Chamber Holder is a 5/8 O.D. acrylic tube used with the PTW 23332/233641/31003/31013 waterproof chamber.

Item	Description
692-640	Option "H" Chamber Holder

OPTION "L" CHAMBER HOLDER



The Option "L" Chamber Holder has a 5/8" O.D. acrylic tube and holds a PTW 23332/233641/31003/31013 chamber parallel to the water surface.

Item	Description
692-641	Option "L" Chamber Holder

OPTION "M", "O", & "Q" HOLDERS

The Option "M", "O", and "Q" Chamber Holders have a 7/8" O.D. Tube and are used to hold a Markus (PTW 23343), Roos (PTW 34001) or Exradin Model 11 Chamber parallel to the water surface.

Item	Description
692-651	Option "M" Chamber Holder
692-653	Option "O" Roos Chamber Holder
692-655	Option "Q" Exradin Model 11 Chamber Holder

OPTION "K", "P", "R" & "S" HOLDERS

The Option "K", "P", "R" and "S" Chamber Holders are used to hold a Markus (PTW 23343), Roos (PTW 34001), Exradin Model 11 or Exradin Model 10 Chamber parallel to the mylar window.

Item	Description
692-650	Option "K" Markus Chamber Holder
692-654	Option "P" Roos Chamber Holder
692-656	Option "R" Exradin Model 11 Chamber Holder
692-658	Option "S" Exradin Model A10 Chamber Holder

HYDRAULIC-SCISSORS LIFT TABLE

The Hydraulic-Scissors Lift Table is ideally suited to hold a water phantom. A white platform top allows for easy viewing of the crosshairs through a water phantom with a clear bottom.

The lift table has three holes drilled in the platform to accommodate the corresponding leveling plate (see below).

The Hydraulic-Scissors Lift Table utilizes a jack pedal to raise the platform. A mechanical height lock will hold the platform at the desired height. To lower the platform use the lowering lever.

Use the parking brake to hold the hydraulic-scissors lift table in place. Four heavy duty leveling legs are used to make sure the platform is level when being used. For more precise leveling, use the leveling plate which is compatible with lift table. The hydraulic-scissors lift table is easily moved by the four 5” diameter casters. Item 693-037 accommodates a large Wellhofer water tank.

Specifications

Platform Height Adjustment: 11.8” to 36.6”
Handle Height: 37.8”,
Front Casters: 5” diameter rigid rubber
Rear Casters: 5” diameter, swivel rigid rubber
Capacity: 1,100 lbs.
Finish: White platform - blue enamel frame
Shipping Weight: 265 lbs. - 300 lbs.

Item	Description	Table Top Size
693-036	Hydraulic-Scissors Lift Table	23.75" x 36" (60.54 x 91.76 cm)
693-037	Hydraulic-Scissors Lift Table	27.75" x 36" (70.73 x 91.76 cm)

LEVELING PLATE

For Hydraulic-Scissors Lift Table

The aluminum leveling plate utilizes three point leveling. Three location pads fit into the pre-drilled holes on the platform of the hydraulic-scissors lift table. The three hand adjustable threaded leveling legs go through the holes in the leveling plate and rest inside the location pads.

For added stabilization a pair of rubber feet are included. These feet will go through the tapped holes on either side of the third leg of the leveling plate.

Specifications

Height Adjustment: 1/2" to 3 3/4"
Plate Size: 35 7/8" L x 1/2" T
Finish: White polyurethane enamel

Item	Description	Use With Hydraulic-Scissors Lift Table	Weight
693-3624	Leveling Plate - 24" (61.18 cm) W	Item 693-036	50 lb (22.73 kg)
693-3627	Leveling Plate - 27" (68.82 cm) W	Item 693-037	60 lb (27.27 kg)

ELECTRIC LIFT TABLE

- **Large Platform size accommodates all Water Tanks on the market**
- **Instantaneous start and stop movement - no drift**
- **Removable handle with cord wrap hooks**
- **Hanger on all four (4) sides for control pendant**

The Electric Lift Table is ideally suited to hold any water tank currently on the market. A white platform top allows for easy viewing of the crosshairs through a water phantom with a clear bottom.

The table platform has a vertical travel distance of 15.75" (40.0 cm). In the lowest position the top of the platform is 24.75" (62.8 cm) from the floor. In the highest position the top of the platform is at 40.5" (102.8 cm) from the floor. The telescoping pillar provides a smooth up and down movement of the platform. The control pendant has push buttons for up and down movement with instantaneous starting and stopping without any drift. The table platform has a 0.25" (0.64 cm) high raised lip on all four sides to prevent a water tank or an adjustable base from sliding off the platform.

For user convenience there is a control pendant hanger on each of the four sides of the platform. The handle of the lift table has cord wrap hooks for easy storage of the power cord. The handle is also removable with a quick release pin on each side of the handle.

The electric lift table has four (4) 6" (15.2 cm) diameter swivel locking casters for ease of moving and locking in position. Four (4) heavy duty screw leveling legs are used to make sure the platform is level when being used.

Specifications

Capacity: 900 lb (408 kg)
Platform Size: 31.75" x 31.75" (80.65 x 80.65 cm)
Platform Lowered Height: 24.75" (62.8 cm)
Platform Raised Height: 40.5" (102.8 cm)
Vertical Travel: 15.75" (40.0 cm)
Handle Height: 34" (86.3 cm)
Casters: Four (4) - 6" (15.2 cm) swivel locking, rubber
Material: Steel and Aluminum
Platform Color: Bright White
Frame Color: Precision Tan
Power: 120 VAC, 50/60 Hz or 220VAC, 50/60 Hz

Item	Description
693-040	Electric Lift Table - 120VAC, 50/60 Hz
693-042	Electric Lift Table - 220VAC, 50/60 Hz.

THREE POINT LEVELING PLATE

For Water Phantom Tank

The Three Point Leveling Plate is used with the Water Phantoms (Items 691-001, 691-005, 691-010, 691-011, 691-015, 691-016 or 692-000). The aluminum plate is 18" x 24" x 0.5" (45.7 x 60.9 x 0.13 cm). A wood support panel on the bottom is 0.75" (1.9 cm) thick.

Item	Description
693-080	Three Point Leveling Plate for Water Phantom

LEVELING PLATE

For Water Phantoms on Treatment Table

R

The three hand adjustable threaded leveling legs go through the holes in the leveling plate and secured to anti-skid feet.

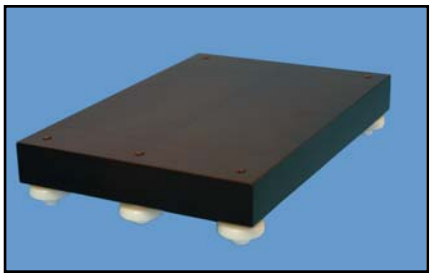
For added stabilization a pair of rubber feet are included. These feet will go through the tapped holes on either side of the third leg of the leveling plate.

Material: Aluminum
Finish: White polyurethane enamel
Feet: Anti-skid

Item #	Description
693-083	Leveling Plate with 3 Anti-Skid Feet Size: 18” W x 24” L x 1/2” T
693-085	Leveling Plate with 3 Anti-Skid Feet Size: 24” W x 35 7/8” x 1/2” T

LEVELING PLATE

For Slab Phantoms



The leveling plate for slab phantoms has five leveling legs, is made from ABS Plastic, and has threaded nylon knobs.

Specifications:

Capacity: 60 lbs
Dimensions: 30 cm x 44 cm x 2 cm thick

Item #	Description
657-400	Leveling Plate with 5 Leveling Legs

WATER TRANSFER TANK AND PUMP

The 60 gallon Water Transfer Tank is molded of polyethylene in one piece to eliminate seams and stress areas. The 1/4" (0.64 cm) wall thickness will bow slightly when filled with water. The water level will show through the tank wall. A mark can be made on the outside of the tank for the fill capacity of your Water Phantom. A steel frame supports the transfer tank with four 5" (12.7 cm) diameter swivel casters to allow easy movement.

The removable top is made of 1/2" thick (1.27 cm) polyethylene with two holes. A copper pipe inserted through the stand-off hole touches the bottom of tank. This pipe is attached to one end of a 45 gallon/8 minute pump and the other end is attached to 10' (3 m) of clear vinyl tubing. The tubing is put into the Water Transfer Tank from the top for filling. To pump the water from the water phantom back into the Water Transfer Tank, simply reverse the water connections on the pump. A faucet adapter is included for initial filling of the transfer tank, using the vinyl tubing.

Specifications

Item 695-000 Water Transfer Tank with Pump
Tank Dimension: 24" x 24" x 24" (61 x 61 x 61 cm)
Overall Dimension: 26" x 26" x 43" (66 x 66 x 109 cm)
Pump: 115V VAC, 1.6 Amps, thermal protection
Shipping Weight: 83 lb (38 kg)

Item 695-020 Pump Repair Kit
Includes: Impeller and cover gasket

Item #	Description
695-000	Water Transfer Tank with Pump
695-010	Water Transfer Tank Only**,** NO PUMP
695-015	Pump, HI/LOW Temp, 115 VAC
695-020	Impeller Repair Kit for 695-015 Pump

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15-GALLON WATER TANK WITH HAND PUMP OR MOTORIZED PUMP

695-100

695-200

- **Easy to Use**
- **Lightweight**
- **Mobile**

The Water Tank is a 15 gallon drum constructed of one piece of low density polyethylene. It has a removable slide lever lock lid and two bung openings. For mobility the water tank sits on a polyethylene dollie with four swivel casters.

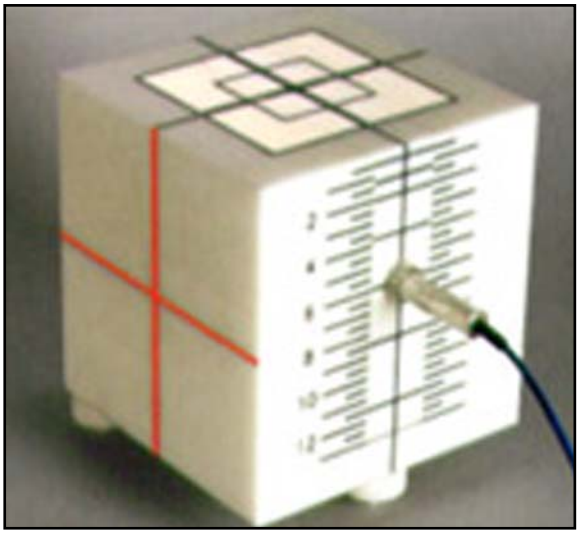
Item 695-100 Water Tank w/ Hand Pump
The Hand Pump is a reversible crank style and will pump 6 gallons of water with 50 revolutions. Turning the crank clockwise will pump water into a water phantom and turning counter clockwise will pump water out of the water phantom. A 5 foot hose is attached to the pump.

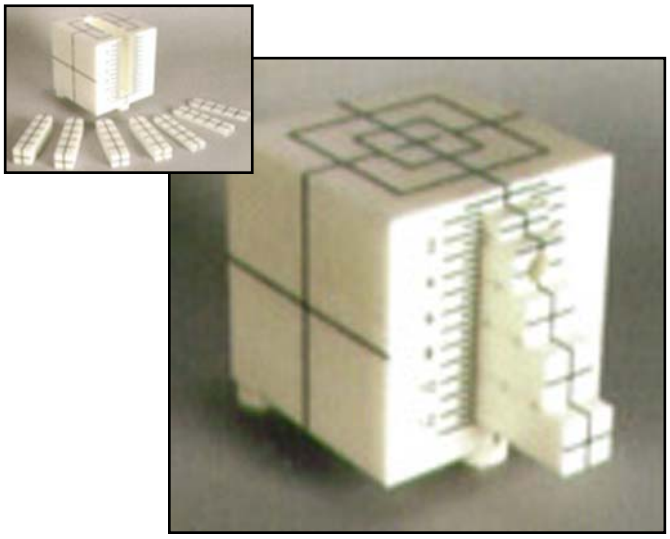
Item 695-200 Water Tank w/ Motorized Pump
The electric pump is 115V VAC, 1.6 Amps, with thermal protection. The pump the water from the water phantom back into the tank, simply reverse the water connections on the pump.

Specifications:
Drum Size: 16” Dia. X 22 3/4” H
Dollie Size: 17” Dia. X 7” H (includes casters)
Shipping Weight: Approximately 20 lbs.

Item #	Description
695-100	Water Tank with Reversible Hand Pump- 15 Gallon
695-200	Water Tank with Motorized Pump- 15 Gallon
695-020	Pump Repair Kit

REINSTEIN EZ - CUBE PHANTOM





- **Output constancy measurements for photon and electron beams**
- **Depth dose constancy measurements for photon and electron beams**
- **Superior phantom alignment stability and Ion chamber positioning reproducibility**
- **Rapid, precise and reproducible Ion chamber depth changes (from 1cm to 12cm depth at 0.5cm intervals) while maintaining constant TSD.**
- **Easily readable and unambiguous Ion chamber depth scale.**
- **Output plus depth dose constancy measurements at 90°, 180°, 270° gantry angles.**
- **One phantom setup for all output and energy constancy measurement depths.**
- **Reduction of total setup and measuring times by as much as 75%.**
- **Includes adjustable support leveling legs and a bubble level.**

The Reinstein EZ-Cube Phantom Provides a Means for Quickly and Accurately Changing Ion Chamber Depth Without the Need for Realignment Between Measurements!

The Reinstein EZ -Cube Phantom is a radiation oncology QA phantom that provides rapid and reproducible Ion chamber positioning from 1cm to 12cm depth at 0.5cm intervals. Its unique design allows placement of the Ion chamber through a range of depths, without ever having to readjust the phantom position with respect to the central axis or its TSD. Conventional solid "slab" phantoms often require realignment of the slabs for each change in Ion chamber depth. This can waste substantial amounts of time and lead to misalignment, especially during monthly QA (as recommended by AAPM TG-40) of a dual-photon, multiple-electron beam accelerator.

The Reinstein EZ-Cube phantom is designed to simplify testing of beam output plus energy constancy at three gantry angles: 90°, 180°, 270°, as described in "Comprehensive QA for Radiation Oncology: Report of AAPM Radiation Therapy Committee Task Group 40."

ADVANTAGES

- Simplifies testing of output versus gantry angel, which is difficult to accomplish by other phantoms.
- Provides rapid and reproducible Ion chamber positioning at 0.5cm steps, without the annoying need for repeated readjustment of phantom position.
- Eliminates the need to periodically recalibrate or balance detectors, a significant hidden expense with multiple detector systems.
- Is a multipurpose, cost-saving QA and calibration phantom that makes use of your own Ion chamber and electrometer.
- Verifies every constancy measurement for photon and electron beams.

Item 682-450 Reinstein EZ - Cube Phantom Includes

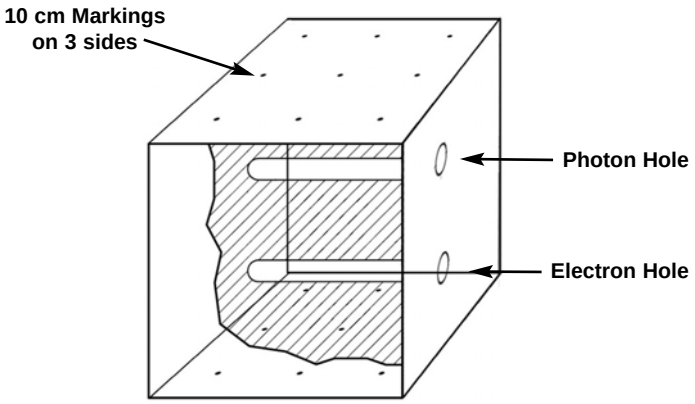
(1) EZ - Cube Phantom with the following positioning inserts:
(2) 3.0 cm thick
(1) 2.5 cm thick
(1) 2.0 cm thick
(2) 1.0 cm thick
(1) 0.5 cm thick

Specifications

Material: UHMW
Overall Weight: 8 lb (3.7 kg)
Size: 6" x 6" x 6" (15 x 15 x 15 cm)
Adjustable: Leveling feet and Bubble Level

Item	Description
682-450	Reinstein EZ-Cube Phantom

15 CM CUBE CONSTANCY PHANTOMS



- **Photon measurements at 5 and 10 cm depth**
- **Electron measurements at 1 cm or 1.5 cm depth**
- **Compact and economical**

The constancy phantoms are solid 15 cm cubes. The photon hole is placed 5 cm from one side and therefore is 10 cm from the other side. Three sides of the cube contain 9 black dots which define a 10 cm² field

The phantom cubes can be custom drilled to meet customers specifications. Please provide name and phone number of contact person.

Specifications

Acrylic Density: 1.185g/cm³
Plastic Water Density: 1.02g/cm³

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PLASTIC WATER PHANTOMS

Item #	Chamber	Compatible Chamber Model #'s	Photon Chamber Hole	Electron Chamber Hole
665-510	0.6 cc Farmer Style Chamber	PTW 0.6cc Farmer Chambers, NE2505/3	With Build-up Cap	1.0 cm Depth, No Build-up Cap
665-512	0.6 cc Farmer Style Chamber	PTW 0.6cc Farmer Chambers, NE2505/3	With Build-up Cap	1.5 cm Depth, With Build-up Cap
665-513	0.6 cc Farmer Style Chamber	PTW 0.6cc Farmer Chambers, NE2505/3	No Build-up Cap	1.5 cm Depth, No Build-up Cap
665-514	0.6 cc Farmer Style Chamber	**ALL** - PTW / Nuclear Associates / Bicron NE / Capintec / RMI / Exradin A19	No Build-up Cap	1.0 cm Depth, No Build-up Cap
665-518	Exradin A12		No Build-up Cap	1.5 cm Depth, No Build-up Cap

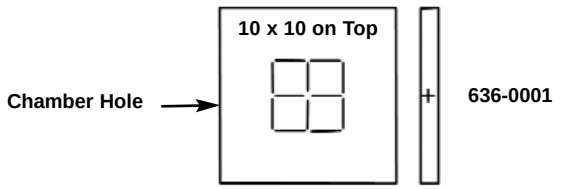
ACRYLIC PHANTOMS

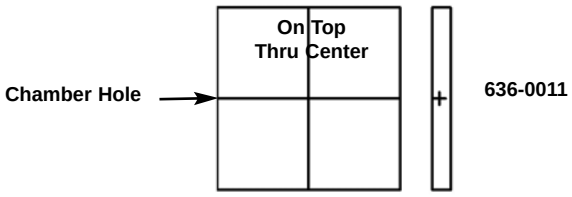
Item #	Chamber	Compatible Chamber Model #'s	Photon Chamber Hole	Electron Chamber Hole
665-601	0.6 cc Farmer Style Chamber	PTW 0.6cc Farmer Chambers, NE2505/3	With Build-up Cap	1.0 cm Depth, No Build-up Cap
665-602	0.3 cc Waterproof Chamber	PTW 23332 / 233641 / 31003 / 31013, Nuclear Associates 30-316, 30-317	No Build-up Cap	1.0 cm Depth, No Build-up Cap
665-6025	0.3 cc Waterproof Chamber	PTW 23332 / 233641 / 31003 / 31013, Nuclear Associates 30-316, 30-317	No Build-up Cap	1.5 cm Depth, No Build-up Cap
665-603	0.6 cc Farmer Style Chamber	NE2581	With Build-up Cap	1.5 cm Depth, No Build-up Cap
665-605	0.125 cc Chamber	PTW 233642 / 31002 / 31010, Nuclear Associates 30-344	No Build-up Cap	1.0 cm Depth, No Build-up Cap
665-622	0.6 cc Farmer Style Chamber	Capintec PR-06C, PR-06G	With Build-up Cap	1.5 cm Depth, No Build-up Cap
665-642	0.1 cc Chamber	PTW N23323 and Nuclear Associates 30-350	No Build-up Cap	1.0 cm Depth, No Build-up Cap
665-702	0.6 cc Farmer Style Chamber	PTW 0.6cc Farmer Chambers, NE 2505/3, Nuclear Associates 30-351, 30-352	With Build-up Cap	1.5 cm Depth, With Build-up Cap
665-704	0.6 cc Farmer Style Chamber	PTW 0.6cc Farmer Chambers, NE 2505/3, Nuclear Associates 30-351, 30-352	With Build-up Cap	1.5 cm Depth, No Build-up Cap
665-705	0.125 cc Chamber 0.50" Dia.	PTW: 233642 / 31002 / 31010, Nuclear Associates 30-344	No Build-up Cap	1.5 cm Depth, No Build-up Cap
665-712	0.6 cc Farmer Style Chamber	NE2571	With Build-up Cap	1.5 cm Depth, With Build-up Cap
665-722	0.6 cc Farmer Style Chamber	Capintec PR-06C and PR-06G	With Build-up Cap	1.5 cm Depth, With Build-up Cap
665-732	0.6 cc Farmer Style Chamber	NE 2581	With Build-up Cap	1.5 cm Depth, With Build-up Cap
665-750	Exradin Model A-12		No Build-up Cap	1.5 cm Depth, No Build-up Cap
665-751	Exradin Model A-12		With Build-up Cap	1.5 cm Depth, With Build-up Cap
665-752	Exradin Model A1SL		No Build-up Cap	1.5 cm Depth, No Build-up Cap
665-753	Exradin Model A-16		No Build-up Cap	1.5 cm Depth, No Build-up Cap
665-760	0.6 cc Farmer Style Chamber	**ALL** - PTW / Nuclear Associates / FLUKE / Bicron NE / Capintec / RMI / Exradin A19 Farmer Style Chambers	No Build-up Cap	1.5 cm Depth, No Build-up Cap
665-761	0.6 cc Farmer Style Chamber	**ALL** - PTW / Nuclear Associates / Bicron NE / Capintec / RMI / Exradin A19	No Build-up Cap	1.0 cm Depth, No Build-up Cap
665-770	0.6 cc Farmer Style Chamber	Exradin A19	With Build-up Cap	1.0 cm Depth, No Build-up Cap
665-771	0.6 cc Farmer Style Chamber	Exradin A19	With Build-up Cap	1.5 cm Depth, With Build-up Cap
665-780	Scanditronix / Wellhofer FC65-G		No Build-up Cap	1.5 cm Depth, No Build-up Cap

PLUG INSERT

Item #	Chamber	Compatible Chamber Model #'s	Photon Chamber Hole	Electron Chamber Hole
665-6011	0.6 cc Farmer Style Chamber	Acrylic Plug Insert for PTW N23333	With Build-up Cap	

SCRIBING ON CHAMBER PHANTOMS





1 side: + scribe is opposite chamber hole.
2 sides: + scribes are on sides perpendicular to the chamber.
3 sides: + scribes are on the sides without chamber hole.
4 sides: + scribes are on all four sides.

Item #	Scribing
636-0000	10 x 10 cm on Top
636-0001	10 cm x 10 cm on Top, + 1 Side
636-0002	10 cm x 10 cm on Top, + 2 Sides
636-0003	10 cm x 10 cm on Top, + 3 Sides
636-0004	10 cm x 10 cm on Top, + 4 Sides
636-0005	10 cm x 10 cm on Top and Bottom
636-0006	10 cm x 10 cm on Top and Bottom + 1 Side
636-0007	10 cm x 10 cm on Top and Bottom + 2 Sides
636-0008	10 cm x 10 cm on Top and Bottom + 3 Sides
636-0009	10 cm x 10 cm on Top and Bottom + 4 Sides
636-0010	Top Thru Center
636-0011	Top Thru Center, + 1 Side
636-0012	Top Thru Center, + 2 Sides
636-0013	Top Thru Center, + 3 Sides
636-0014	Top Thru Center, + 4 Sides

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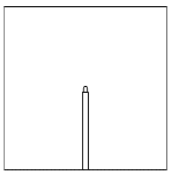
PHANTOMS FOR SCANDITRONIX / WELLHOFFER IONIZATION CHAMBERS

SCANDATRONIX/WELLHOFFER IC 15, CC13

0.13 cm³ Chamber without Build-Up Cap

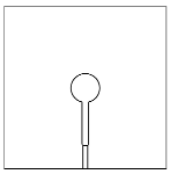


Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-736	Polystyrene	25 cm sq. x 2.5 cm T
636-737	Acrylic	25 cm sq. x 2.5 cm T

WELLHOFFER PPC 035 AND PPC40

0.05 cm³ Chamber



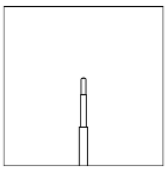
Chamber is flush with surface.

Item #	Phantom Material	Size
636-731	Polystyrene	25 cm sq. x 2.5 cm T
636-732	Acrylic	25 cm sq. x 2.5 cm T

PHANTOMS FOR PTW IONIZATION CHAMBERS

PTW 23333, 30001, 30002, 30004, 30006, 30010, 30011, 30012, 30013

0.6 cm³ Farmer Style Chamber without Build-Up Cap



Most Common

Chamber Hole Depth:
1 cm from top to center of hole.

Item #	Phantom Material	Size
636-001	Polystyrene	25 cm sq. x 2.5 cm T
636-002	Acrylic	25 cm sq. x 2.5 cm T

PHANTOMS FOR PTW IONIZATION CHAMBERS

PTW 23333, 30001, 30002, 30004, 30006, 30010, 30011, 30012, 30013

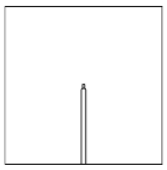
0.6 cm³ Farmer Style Chamber with Build-Up Cap

Chamber Hole Depth:
1.2 cm from top to center of hole, and has a diameter of 1.65 cm.

Item #	Phantom Material	Size
636-101	Polystyrene	25 cm sq. x 2.5 cm T
636-102	Acrylic	25 cm sq. x 2.5 cm T
636-104	Plastic Water	30 cm sq. x 3 cm T

PTW 31006, 31014, 31015, 31016

0.015 cm³ Pin Point Chamber without Build-Up Cap



Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-526	Polystyrene	25 cm sq. x 2.5 cm T
636-527	Acrylic	25 cm sq. x 2.5 cm T

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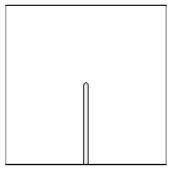
PTW 233642, 31002, 31010, 233643, 31005, 31011

0.125 cm³ Chamber without Build-Up Cap

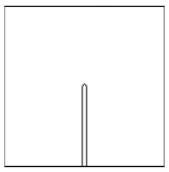


Chamber Hole Depth:
1 cm from top to center of hole.

Item #	Phantom Material	Size
636-511	Polystyrene	25 cm sq. x 2.5 cm T
636-512	Acrylic	25 cm sq. x 2.5 cm T

PTW 23332, 233641, 31003, 31013

0.3 cm³ Chamber without Build-Up Cap



Chamber Hole Depth:
0.7 cm from top to center of hole.

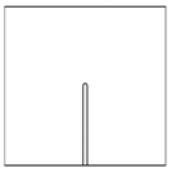
Item #	Phantom Material	Size
636-301	Polystyrene	25 cm sq. x 2.5 cm T
636-302	Acrylic	25 cm sq. x 2.5 cm T

Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-311	Polystyrene	25 cm sq. x 2.5 cm T
636-312	Acrylic	25 cm sq. x 2.5 cm T

PTW 23323, 2332

0.1 cm³ Chamber without Build-Up Cap



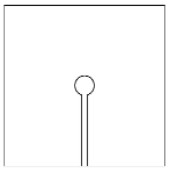
Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-501	Polystyrene	25 cm sq. x 2.5 cm T
636-502	Acrylic	25 cm sq. x 2.5 cm T

PHANTOMS FOR PTW IONIZATION CHAMBERS

PTW 23343, 34045

0.055 cm³ Markus and 0.02 cm³ Advanced Markus Chamber

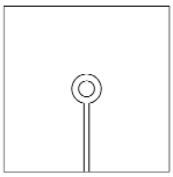


Chamber is flush with surface.

Item #	Phantom Material	Size
636-701	Polystyrene with Cable Cover	25 cm sq. x 2.5 cm T
636-702	Acrylic with Cable Cover	25 cm sq. x 2.5 cm T
636-704-2	Plastic Water Cable Cover	

PTW 34001

0.35 cm³ Roos Chamber

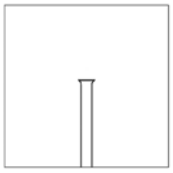


Chamber is flush with surface.

Item #	Phantom Material	Size
636-721	Polystyrene	25 cm sq. x 2.5 cm T
636-722	Acrylic	25 cm sq. x 2.5 cm T

PTW 23342

0.02 cm³ Small Soft X-ray Chamber



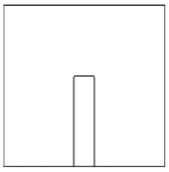
The chamber hole has special curved sides.

Chamber is flush with surface.

Item #	Phantom Material	Size
636-915	Polystyrene	25 cm sq. x 2.5 cm T
636-915-2	Polystyrene Chamber Plug	
636-916	Acrylic	25 cm sq. x 2.5 cm T
636-916-2	Acrylic Chamber Plug	

PTW 23344

.02 cm³ Big Soft X-ray Chamber

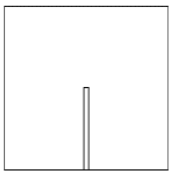


Chamber is flush with surface.

Item #	Phantom Material	Size
636-911	Polystyrene	25 cm sq. x 2.5 cm T
636-912	Acrylic	25 cm sq. x 2.5 cm T

PTW T60003

Riga Diamond Detector Chamber without Build-Up Cap

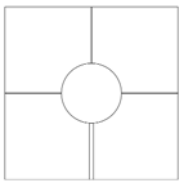


Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-521	Polystyrene	25 cm sq. x 2.5 cm T
636-522	Acrylic	25 cm sq. x 2.5 cm T

PTW 34070

Bragg Peak Chamber



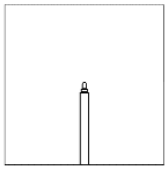
Chamber is flush with surface.

Item #	Phantom Material	Size
636-752	Acrylic	30 cm sq. x 2 cm T

PHANTOMS FOR EXRADIN IONIZATION CHAMBERS

EXRADIN MODEL A1

0.056 cm³ Chamber without Build-Up Cap

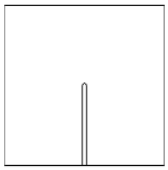


Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-211	Polystyrene	25 cm sq. x 2.5 cm T
636-212	Acrylic	25 cm sq. x 2.5 cm T
636-214	Solid Water	30 cm sq. x 2 cm T

EXRADIN MODEL A1SL

0.056 cm³ Chamber without Build-Up Cap



Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-206	Polystyrene	25 cm sq. x 2.5 cm T
636-207	Acrylic	25 cm sq. x 2.5 cm T

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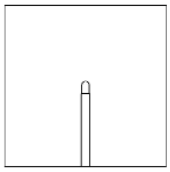
EXRADIN MODEL A2

0.5 cm³ Chamber without Build-Up Cap

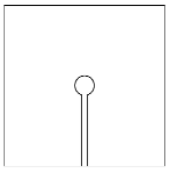


Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-201	Polystyrene	25 cm sq. x 2.5 cm T
636-202	Acrylic	25 cm sq. x 2.5 cm T
636-203	Aluminum Stem Spacer	

0.051 cm³ EXRADIN A10

0.051 cm³ Chamber

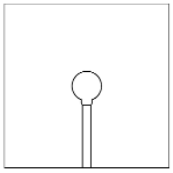


Chamber is flush with surface.

Item #	Phantom Material	Size
636-701	Polystyrene with Cable Cover	25 cm sq. x 2.5 cm T
636-702	Acrylic with Cable Cover	25 cm sq. x 2.5 cm T
636-704-2	Plastic Water Cable Cover	

EXRADIN MODEL A11

0.62 cm³ Chamber

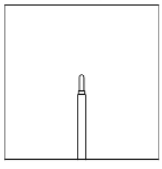


Chamber is flush with surface.

Item #	Phantom Material	Size
636-223	Polystyrene	25 cm sq. x 2.5 cm T
636-224	Acrylic	25 cm sq. x 2.5 cm T

EXRADIN MODEL A12

0.65 cm³ Chamber without Build-Up Cap



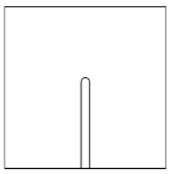
Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-215	Polystyrene	25 cm sq. x 2.5 cm T
636-216	Acrylic	25 cm sq. x 2.5 cm T

PHANTOMS FOR EXRADIN IONIZATION CHAMBERS

EXRADIN MODEL A12

0.65 cm³ Chamber with Build-Up Cap



Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-219	Polystyrene	25 cm sq. x 2.5 cm T
636-220	Acrylic	25 cm sq. x 2.5 cm T

EXRADIN MODEL A12S

0.25 cm³ Chamber without Build-Up Cap

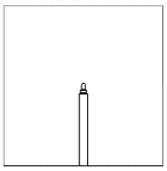
Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-240	Polystyrene	25 cm sq. x 2.5 cm T
636-241	Acrylic	25 cm sq. x 2.5 cm T

R

EXRADIN MODEL 14

0.009 cm³ Chamber without Build-Up Cap

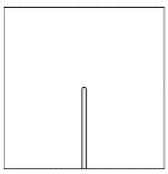


Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-230	Polystyrene	25 cm sq. x 2.5 cm T
636-231	Acrylic	25 cm sq. x 2.5 cm T

EXRADIN MODEL A14SL

0.009 cm³ Chamber without Build-Up Cap

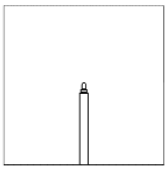


Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-236	Polystyrene	25 cm sq. x 2.5 cm T
636-237	Acrylic	25 cm sq. x 2.5 cm T

EXRADIN MODEL A16

0.007 cm³ Chamber without Build-Up Cap

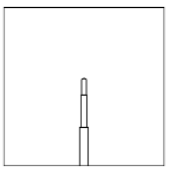


Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-400	Polystyrene	25 cm sq. x 2.5 cm T
636-401	Acrylic	25 cm sq. x 2.5 cm T
636-4011	Acrylic Chamber Plug	

EXRADIN A19

0.6 cm³ Farmer Style Chamber without Build-Up Cap



Most Common

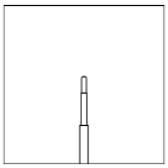
Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-001	Polystyrene	25 cm sq. x 2.5 cm T
636-002	Acrylic	25 cm sq. x 2.5 cm T

PHANTOMS FOR CAPINTEC IONIZATION CHAMBERS

CAPINTEC PR-06G

0.6 cm³ Farmer Style Chamber without Build-Up Cap



Most Common

Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-001	Polystyrene	25 cm sq. x 2.5 cm T
636-002	Acrylic	25 cm sq. x 2.5 cm T

CAPINTEC PR-06C OR G

0.6 cm³ Farmer Style Chamber without Build-Up Cap

Drawing Unavailable

A large outer chamber hole accommodates the TNC or BNC style connector.

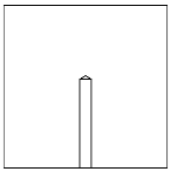
Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-011	Polystyrene	25 cm sq. x 2.5 cm T
636-012	Acrylic	25 cm sq. x 2.5 cm T

R

CAPINTEC PR-06C OR G

0.6 cm³ Farmer Style Chamber with Build-Up Cap

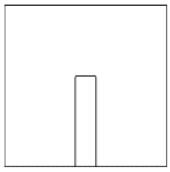


The chamber hole accommodates the TNC or BNC style connector.

Chamber Hole Depth:
1.2 cm from top to center of hole.

Item #	Phantom Material	Size
636-017	Polystyrene	25 cm sq. x 2.5 cm T
636-018	Acrylic	25 cm sq. x 2.5 cm T

CAPINTEC PS-033



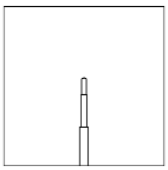
Chamber is flush with surface.

Item #	Phantom Material	Size
636-711	Polystyrene	25 cm sq. x 2.5 cm T
636-712	Acrylic	25 cm sq. x 2.5 cm T
636-714	Solid Water	30 cm sq. x 2 cm T

PHANTOMS FOR BICRON / NE AND THERMO SCIENTIFIC IONIZATION CHAMBERS

BICRON / NE 2571, 2581, 2505/3 A OR B

0.6 cm³ Farmer Style Chamber without Build-Up Cap



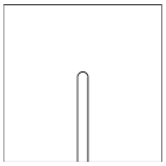
Most Common

Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-001	Polystyrene	25 cm sq. x 2.5 cm T
636-002	Acrylic	25 cm sq. x 2.5 cm T

BICRON / NE 2505/3

0.6 cm³ Farmer Style Chamber with Build-Up Cap



Chamber Hole Depth:
1.2 cm from top to center of hole and has a diameter of 1.65 cm.

Item #	Phantom Material	Size
636-101	Polystyrene	25 cm sq. x 2.5 cm T
636-102	Acrylic	25 cm sq. x 2.5 cm T
636-104	Plastic Water	30 cm sq. x 3 cm T

BICRON / NE 2571

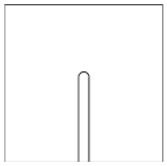
0.6 cm³ Farmer Style Chamber with Delrin Build-Up Cap

Chamber Hole Depth:
1.0 cm from top to center of hole and has a diameter of 1.53 cm.

Item #	Phantom Material	Size
636-121	Polystyrene	25 cm sq. x 2.5 cm T
636-122	Acrylic	25 cm sq. x 2.5 cm T

BICRON / NE 2581

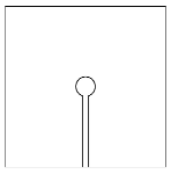
0.6 cm³ Farmer Style Chamber with Polystyrene Build-Up Cap



Chamber Hole Depth:
1.0 cm from top to center of hole and has a diameter of 1.86 cm.

Item #	Phantom Material	Size
636-131	Polystyrene	25 cm sq. x 2.5 cm T
636-132	Acrylic	25 cm sq. x 2.5 cm T

THERMO SCIENTIFIC 2534



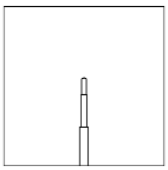
Chamber is flush with surface.

Item #	Phantom Material	Size
636-701	Polystyrene with Cable Cover	25 cm sq. x 2.5 cm T
636-702	Acrylic with Cable Cover	25 cm sq. x 2.5 cm T
636-704-2	Plastic Water Chamber Plug	

PHANTOMS FOR NUCLEAR ASSOCIATES IONIZATION CHAMBERS

NUCLEAR ASSOCIATES 30-351

0.6 cm³ Farmer Style Chamber without Build-Up Cap



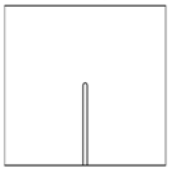
Most Common

Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-001	Polystyrene	25 cm sq. x 2.5 cm T
636-002	Acrylic	25 cm sq. x 2.5 cm T

NUCLEAR ASSOCIATES 30-350

0.1 cm³ Chamber without Build-Up Cap



Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-501	Polystyrene	25 cm sq. x 2.5 cm T
636-502	Acrylic	25 cm sq. x 2.5 cm T

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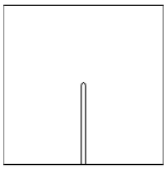
NUCLEAR ASSOCIATES 30-344

0.125 cm³ Chamber without Build-Up Cap

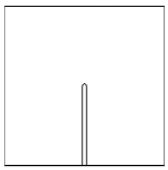


Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-511	Polystyrene	25 cm sq. x 2.5 cm T
636-512	Acrylic	25 cm sq. x 2.5 cm T

NUCLEAR ASSOCIATES 30-361 AND 30-317

0.3 cm³ Chamber without Build-Up Cap



Chamber Hole Depth:
0.7 cm from top to center of hole.

Item #	Phantom Material	Size
636-301	Polystyrene	25 cm sq. x 2.5 cm T
636-302	Acrylic	25 cm sq. x 2.5 cm T

Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-311	Polystyrene	25 cm sq. x 2.5 cm T
636-312	Acrylic	25 cm sq. x 2.5 cm T

PHANTOMS FOR NUCLEAR ASSOCIATES IONIZATION CHAMBERS

NUCLEAR ASSOCIATES 30-334

0.02 cm³ Small Soft X-ray Chamber

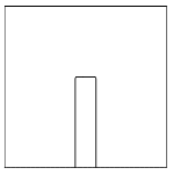
The chamber hole has special curved sides.

Chamber is flush with surface.

Item #	Phantom Material	Size
636-915	Polystyrene	25 cm sq. x 2.5 cm T
636-915-2	Polystyrene Chamber Plug	
636-916	Acrylic	25 cm sq. x 2.5 cm T
636-916-2	Acrylic Chamber Plug	

NUCLEAR ASSOCIATES 30-330

0.2 cm³ Big Soft X-ray Chamber



Chamber is flush with surface.

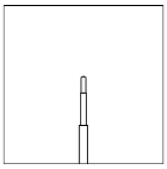
Item #	Phantom Material	Size
636-911	Polystyrene	25 cm sq. x 2.5 cm T
636-912	Acrylic	25 cm sq. x 2.5 cm T
636-913	Plastic Water	25 cm sq. x 2 cm T
636-914	Solid Water	30 cm sq. x 2 cm T

R

PHANTOMS FOR VICTOREEN AND RMI IONIZATION CHAMBERS

VICTOREEN 580-006 AND RMI 448

0.6 cm³ Farmer Style Chamber without Build-Up Cap

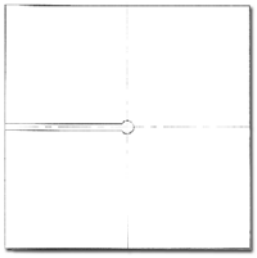


Most Common

Chamber Hole Depth:
1.0 cm from top to center of hole.

Item #	Phantom Material	Size
636-001	Polystyrene	25 cm sq. x 2.5 cm T
636-002	Acrylic	25 cm sq. x 2.5 cm T

EQUIDOSE II DIODE PHANTOM



Specifications

Material: Polystyrene
Size: 9.8" x 9.8" x 1" (25 x 25 x 2.54 cm)

This phantom is also available in other materials. Call RPDinc for more information.

Item #	Description
638-000	Equidose II Diode Phantom

ACRYLIC PHANTOM

The Acrylic Phantom consists of:
(1) 1/32" (0.80 mm) x 25 cm sq acrylic sheet
(1) 1/16" (1.57 mm) x 25 cm sq acrylic sheet
(1) 1/8" (3.43 mm) x 25 cm sq acrylic sheet
(1) 1/4" (6.30 mm) x 25 cm sq acrylic sheet
(1) 1/2" (12.7 mm) x 25 cm sq acrylic sheet
(8) 1" (25 mm) x 25 cm sq acrylic sheet
(1) 1" (25 mm) x 25 cm sq with farmer chamber hole

The standard chamber hole will fit the following chambers:
Capintec - PR-06G
PTW - 23333 / 233633 / 30001 / 30010 / 30002 / 30011 / 30004, 30012, 30006 / 30013
Bicron - NE2571, 2505/3 A or B
Nuclear Associates - 30-351, 30-352 and 30-361

Chamber holes other than the standard are available upon request. **Please specify chamber to be used in phantom**. To accommodate a 2nd chamber, one of the 1" plates can be machined to fit the chamber.

Markings
All of the Acrylic Sheets are marked "ACRYLIC" and state the material thickness with a special black ink that is etched into the acrylic.

Specifications

Material: Clear acrylic
Density: 1.17 to 1.20 g/cm³
Size: 25 cm sq x approx. 25 cm T.

Item #	Description
602-0000	Acrylic Phantom
600-0010	Machining Extra Standard Chamber Hole

POLYSTYRENE AND ACRYLIC SHEETS

Polystyrene

Acrylic

All of the Sheets are marked "POLYSTYRENE" or "ACRYLIC" and state the material thickness with a special black ink that is etched into the material.

The thickness of the sheets is not exact and varies within the tolerance of industry standards. If a precise thickness is needed please state the thickness desired when placing your order.

All 1" and 2" Polystyrene Sheets are machined flat on the top and the bottom. This reduces air gaps when stacking the sheets.

Specifications

Polystyrene Density: 1.05 g/cm³
Size: 25 cm sq.

Acrylic Density: 1.185 g/cm³
Size: 25 cm sq.

Item #	Description	Approximate Thickness
601-0020	Polystyrene Sheet - Color: Clear	1/51" (0.50 mm)
601-0032	Polystyrene Sheet - Color: White	1/32" (0.80 mm)
601-0062	Polystyrene Sheet - Color: White	1/16" (1.57 mm)
601-0125	Polystyrene Sheet - Color: White	1/8" (3.18 mm)
601-0187	Polystyrene Sheet - Color: White	3/16" (4.75 mm)
601-0250	Polystyrene Sheet - Color: White	1/4" (6.35 mm)
601-0500	Polystyrene Sheet - Color: White	1/2" (12.7 mm)
601-1000	Polystyrene Sheet - Color: White	1" (25 mm)
601-2000	Polystyrene Sheet - Color: White	2" (50 mm)

Item #	Description	Approximate Thickness
602-0032	Acrylic Sheet - Color: Clear	1/32" (0.80 mm)
602-0062	Acrylic Sheet - Color: Clear	1/16" (1.57 mm)
602-0125	Acrylic Sheet - Color: Clear	1/8" (3.18 mm)
602-0250	Acrylic Sheet - Color: Clear	1/4" (6.30 mm)
602-0500	Acrylic Sheet - Color: Clear	1/2" (12.7 mm)
602-1000	Acrylic Sheet - Color: Clear	1" (25 mm)
602-2000	Acrylic Sheet - Color: Clear	2" (50 mm)

CTG SOLID WATER®

Density: 1.04 g/cm³

The Certified Therapy Grade Solid Water® is manufactured to the most exact quality assurance standards in the industry and is ideally suited to TG-51 protocol recommendations. Each slab undergoes meticulous analysis to ensure the highest possible quality. A Certificate of Conformance is provided with each slab and includes calculated elemental composition, calculated mass, volume electron densities, electron and photon transmission characteristics and measured physical dimensions. A radiograph is also provided demonstrating the product is free from voids, contamination or other artifacts.

CTG Solid Water® is designed for electron and photon beam measurements including relative ionization, depth dose and uniformity.

Reference Material

Attix, M.S., Constantinou, Chris, & Paliwal, Bhudatt R. (1982). A solid water phantom material for radiotherapy x-ray and y-ray beam calibrations. Med. Phys. 9 (3), 436-441.

Darlison, R., Martin R.J,. & White D.R. (1977). Epoxy resin based tissue substitutes. British Journal of Radiology, 50, 814-821.

Hanson, W.F,. Tailor, R.C., & Tello, V.M. (1995). How water equivalent are water-equivalent solid materials for output calibration of photon and electron beams? Med. Phys. 22, (7), 1177-1189.

Specifications

Electron and Photon Stopping Power
Linear attenuation coefficient relative to water shall be 1.030 ±0.01 for photon energies from100 kV to 24 MV.

Homogeneity
Material shall be free from air bubbles or other artifacts greater than 1 mm in diameter within 5 cm of the center of the slab. No more than two (2) air bubbles or other artifacts greater than 2 mm in diameter outside the 5 cm radius, but within 10 cm of center. Scanning for homogeneity shall be done by x-ray at 50 kVp, no filtration, with a dose sufficient to produce an x-ray image of 0.8 to 1.2 o.d.

Dimensions
Tolerance for the length and width, or diameter of the CTG Solid Water® material shall be the nominal ±0.5 mm
Thickness Tolerance: ±0.006" (0.15 mm)
Flatness: ±0.006" (0.15 mm)
Squareness: Where applicable, shall be within 90° ±0.3°
Sizes: 20x20 cm, 30x30 cm and 40x40 cm
Thicknesses: 0.2 cm to 6.0 cm

Thickness	Item #	Size	Item #	Size	Item #	Size
0.2 cm	604-202	20 cm sq.	604-302	30 cm sq.	Not Available	
0.3 cm	604-203	20 cm sq.	604-303	30 cm sq.	Not Available	
0.5 cm	604-205	20 cm sq.	604-305	30 cm sq.	604-405	40 cm sq.
1.0 cm	604-210	20 cm sq.	604-310	30 cm sq.	604-410	40 cm sq.
1.5 cm	604-215	20 cm sq.	604-315	30 cm sq.	604-415	40 cm sq.
2.0 cm	604-220	20 cm sq.	604-320	30 cm sq.	604-420	40 cm sq.
2.0 cm with Cavity	604-272	20 cm sq.	604-372	30 cm sq.	604-472	40 cm sq.
2.5 cm	Not Available		Not Available		604-425	40 cm sq.
3.0 cm	604-230	20 cm sq.	604-330	30 cm sq.	604-430	40 cm sq.
3.0 cm with Cavity	604-273	20 cm sq.	604-373	30 cm sq.	604-473	40 cm sq.
4.0 cm	604-240	20 cm sq.	604-340	30 cm sq.	604-440	40 cm sq.
4.0 cm with Cavity	604-274	20 cm sq.	604-374	30 cm sq.	604-474	40 cm sq.
5.0 cm	604-250	20 cm sq.	604-350	30 cm sq.	604-450	40 cm sq.
5.0 cm with Cavity	604-275	20 cm sq.	604-375	30 cm sq.	604-475	40 cm sq.
6.0 cm	604-260	20 cm sq.	604-360	30 cm sq.	Not Available	
6.0 cm with Cavity	604-276	20 cm sq.	604-376	30 cm sq.	Not Available	

Item	Description
604-460	Solid Water, Drilling for Thimble Chamber Specify Chamber and depth in Solid Water Material
604-464	Solid Water, Milling for Rectangular Parallel Plate Chamber Specify Chamber
604-465	Solid Water, Milling for Circular Parallel Plate Chamber Specify Chamber
604-466	Solid Water Plug for Thimble Chamber - Replacement Specify Chamber
604-467	Scribing on Solid Water - 10"x10" square with Crosshairs at the Center

Solid Water Material is Ordered Separately.
Plug for Cavity is Included with Phantoms Drilled for Most Thimble Type Chambers.

SOLID WATER® HE

Density: 1.032 g/cm³

Solid Water® High Equivalency (HE) is the next generation of Solid Water by Gammex. Designed for both therapy and imaging, with improved uniformity and durability in mind, Solid Water HE uses new nanospheres to create homogeneous slabs while mimicking true water within 0.5% across a wide range of energies.

Specifications

Certified Solid Water HE includes a certificate of conformity including measured density, measured thickness, ionization measurements, calculated electron densities, calculated effective atomic number and elemental composition.

Depth ionization relative-to-water (using 6MV photons and 18 MeV electrons)
Photons: 1.000 ±0.005
Electrons: 1.000 ±0.005

Density
Mass Density (g/cm3): 1.032 ±0.005
Electron Density (e-/cm3): 0.557 ±0.001 * NA
Solid Water HE / Water electron density ratio: 1.000 ±0.005

R

Thickness	Item #	Size	Item #	Size	Item #	Size
0.1 cm	604-501	20 cm sq.	604-601	30 cm sq.	Not Available	
0.2 cm	604-502	20 cm sq.	604-602	30 cm sq.	Not Available	
0.3 cm	604-503	20 cm sq.	604-603	30 cm sq.	Not Available	
0.5 cm	604-505	20 cm sq.	604-605	30 cm sq.	604-705	40 cm sq.
1.0 cm	604-510	20 cm sq.	604-610	30 cm sq.	604-710	40 cm sq.
1.5 cm	604-515	20 cm sq.	604-615	30 cm sq.	604-715	40 cm sq.
2.0 cm	604-520	20 cm sq.	604-620	30 cm sq.	604-720	40 cm sq.
2.0 cm with Cavity	604-572	20 cm sq.	604-672	30 cm sq.	604-772	40 cm sq.
2.5 cm	Not Available		Not Available		604-725	40 cm sq.
3.0 cm	604-530	20 cm sq.	604-630	30 cm sq.	604-730	40 cm sq.
3.0 cm with Cavity	604-573	20 cm sq.	604-673	30 cm sq.	604-773	40 cm sq.
4.0 cm	604-540	20 cm sq.	604-640	30 cm sq.	604-740	40 cm sq.
4.0 cm with Cavity	604-574	20 cm sq.	604-674	30 cm sq.	604-774	40 cm sq.
5.0 cm	604-550	20 cm sq.	604-650	30 cm sq.	604-750	40 cm sq.
5.0 cm with Cavity	604-575	20 cm sq.	604-675	30 cm sq.	604-775	40 cm sq.
6.0 cm	604-560	20 cm sq.	604-660	30 cm sq.	Not Available	
6.0 cm with Cavity	604-576	20 cm sq.	604-676	30 cm sq.	Not Available	

Item	Description
604-460	Solid Water, Drilling for Thimble Chamber Specify Chamber and depth in Solid Water Material
604-464	Solid Water, Milling for Rectangular Parallel Plate Chamber Specify Chamber
604-465	Solid Water, Milling for Circular Parallel Plate Chamber Specify Chamber
604-466	Solid Water Plug for Thimble Chamber - Replacement Specify Chamber
604-467	Scribing on Solid Water - 10"x10" square with Crosshairs at the Center

Solid Water Material is Ordered Separately.
Plug for Cavity is Included with Phantoms Drilled for Most Thimble Type Chambers.

PLASTIC WATER®

Density 1.02 g/cm³

Plastic Water® - 150 keV - 100 MeV

- Agrees with true water within 0.5% above 7 MeV
- Easy to machine
- Custom cavities are available to accommodate any ion chamber
- Un-breakable
- Includes a 5-Year Warranty

Plastic Water® is flexible and will not break under impact and is the only calibration material available in 1 mm thicknesses. Plastic Water® is the only material which agrees with true water within 0.5% above 7 MeV.

Specifications

Material: Epoxy resins and powders to control density and radiation properties
Density: 1.02 g/cm³

Thickness	Item #	Size	Item #	Size
0.1 cm	603-301	30 cm sq.	603-401	40 cm sq.
0.2 cm	603-302	30 cm sq.	603-402	40 cm sq.
0.3 cm	603-303	30 cm sq.	603-403	40 cm sq.
0.5 cm	603-305	30 cm sq.	603-405	40 cm sq.
1.0 cm	603-310	30 cm sq.	603-410	40 cm sq.
2.0 cm	603-320	30 cm sq.	603-420	40 cm sq.
3.0 cm	603-330	30 cm sq.	603-430	40 cm sq.
4.0 cm	603-340	30 cm sq.	603-440	40 cm sq.
5.0 cm	603-350	30 cm sq.	603-450	40 cm sq.
6.0 cm	603-360	30 cm sq.	603-460	40 cm sq.
7.0 cm	603-370	30 cm sq.	603-470	40 cm sq.

Item #	Plastic Water®
603-325	30 x 30 x 2 cm Thick with Cavity for Ion Chamber
603-326	Plug for Chamber Cavity in 30 x 30 cm Phantom
603-425	40 x 40 x 2 cm Thick with Cavity for Ion Chamber
603-426	Plug for Chamber Cavity in 40 x 40 cm Phantom
603-500	DRILLING, 30 x 30 x >2 cm Thick with Cavity at 1 cm from Top
603-505	DRILLING, 30 x 30 x >2 cm Thick with Cavity at Midplane

VIRTUAL WATER™

Virtual Water™ is designed for photon and electron beam calibrations. It eliminates the inconvenience of transporting, setting-up, and filling water tanks. Virtual Water™ is free of air and other imperfections and is not affected by humidity or temperature changes.

Virtual Water™ scatters and attenuates diagnostic and radiotherapy range x-rays the same way as water without the charge storage problems. It can be used for both photon and electron beam calibrations, including relative ionization, depth dose measurements, and absolute calibrations without the need for correction and scaling factors. Ionization readings obtained in Virtual Water™ are practically the same as those in liquid water for the same depth and exposure duration.

Each batch of Virtual Water™ is tested at an independent calibration lab and verified to be within 0.5% of water at photon energies.

Custom cavities are available to accommodate various types of ion chambers in any size section and in thicknesses of 2cm or more. Customer must specify ion chamber.

No positive (plug) is supplied with the chamber cavity. Plugs can be ordered separately.

Specifications

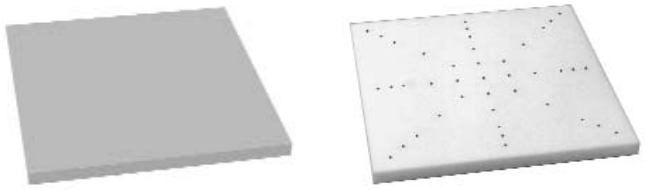
Material: Epoxy resins and powders to control density and radiation properties
Density: 1.04g/cm³
Flatness: 0.2mm (0.008 in)
Length and Width Tolerance: ± 0.02" (0.5 mm)
Thickness Tolerance: ± 0.006" (0.15 mm)
Batch Consistency: ± 0.02% (measured)

Thickness	Item #	Size	Item #	Size	Item #	Size
0.1 cm	605-201	20 cm sq.	605-301	30 cm sq.	Not Available	
0.2 cm	605-202	20 cm sq.	605-302	30 cm sq.	605-402	40 cm sq.
0.3 cm	605-203	20 cm sq.	605-303	30 cm sq.	605-403	40 cm sq.
0.5 cm	605-205	20 cm sq.	605-305	30 cm sq.	605-405	40 cm sq.
1.0 cm	605-210	20 cm sq.	605-310	30 cm sq.	605-410	40 cm sq.
2.0 cm	605-220	20 cm sq.	605-320	30 cm sq.	605-420	40 cm sq.
3.0 cm	605-230	20 cm sq.	605-330	30 cm sq.	605-430	40 cm sq.
4.0 cm	605-240	20 cm sq.	605-340	30 cm sq.	605-440	40 cm sq.
5.0 cm	605-250	20 cm sq.	605-350	30 cm sq.	605-450	40 cm sq.
6.0 cm	605-260	20 cm sq.	605-360	30 cm sq.	Not Available	

Virtual Water™ is a trademark of Med-Cal, Inc.

Item #	Virtual Water™
605-500	DRILLING for Chamber
605-505	MILLING for Chamber
605-510	Fly-Cut A-10 & A-11
605-520	Scribe 10" x 10" and Crosshairs (per Face)
605-521	Scribe + on 3 Sides
605-503	Plug for Drilled Chamber Hole
605-508	Plug for Milled Chamber Hole
605-515	Custom Plug

FLATNESS PHANTOM PLATE



Item	Material	cm²	Thickness
657-005	Acrylic	45	0.5"
657-010	Acrylic	45	1.0"
657-012	Acrylic	40	0.5"
657-013	Acrylic	40	1.0"
657-014	Acrylic	50	1.0"
657-303	Polystyrene	30	1.0"
657-304	Polystyrene	40	1.0"
657-305	Polystyrene	50	1.0"

Tungsten Pins can be Customed Drilled in Phantom
Custom Made Items are Nonreturnable

R

METAL SHEETING

Brass **Aluminum** **Copper**

Specifications

Half-Hard Brass Sheets
Type 260: 70% Copper, 30% Zinc
Density: 8.515 g/cm³
Size: 6" sq.

Copper Sheets
Type C110: 99.9% Copper
Density: 8.9 g/cm³
Size: 6" sq.

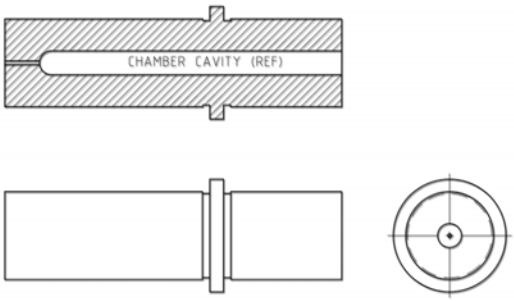
Aluminum Sheets
Density: 2.718 g/cm³
Size: 6" sq.

Item	Material	Thickness
650-0020	Brass	0.020" (0.50 mm)
650-0032	Brass	0.032" (0.80 mm)
650-0064	Brass	0.064" (1.65 mm)
650-0125	Brass	0.125" (3.10 mm)
650-0190	Brass	0.187" (4.76 mm)
650-0250	Brass	0.250" (6.35 mm)
650-0500	Brass	0.500" (12.7 mm)
650-1000	Brass	1.000" (25.4 mm)
651-0020	1100 Aluminum	0.020" (0.50 mm)
651-0040	1100 Aluminum	0.040" (1.02 mm)
651-0080	1100 Aluminum	0.080" (2.03 mm)

Item	Material	Thickness
651-0250	6061 Aluminum	0.250" (6.35 mm)
651-0375	6061 Aluminum	0.375" (9.52 mm)
651-0500	6061 Aluminum	0.500" (12.7 mm)
651-1000	6061 Aluminum	1.000" (25.4 mm)
652-0011	Copper	0.010" (0.25 mm)
652-0021	Copper	0.021" (0.55 mm)
652-0032	Copper	0.032" (0.84 mm)
652-0064	Copper	0.064" (1.64 mm)
652-0125	Copper	0.125" (3.18 mm)
652-0187	Copper	0.187" (4.76 mm)

GAMMA KNIFE PHANTOMS

Phantom Plate



Phantom Cylinder

Specifications

Item 638-100 Phantom Plate
Material: Black ABS or Customer Supplied Material
Density: 1.04 gm/cm³
Size: 6.3" L x 5.12" W x 0.39" T (16 x 13 x 1 cm)

Item 638-200 Phantom Cylinder
Material: Solid Water or Customer Supplied Material
Density: 1.03 gm/cm³
Size: 0.9 / 1.2" diameter x 3.6" L (2.4 / 3.1 x 9.2 cm)

Item	Leksell Gamma Knife Phantom
638-100	Phantom Plate
638-102	Drilling Phantom Plate for Capintec PR05P
638-103	Drilling Phantom Plate for PTW 233642/31002/31005/31010
638-104	Drilling Phantom Plate for PTW 31006
638-105	Drilling Phantom Plate for Exradin A16
638-106	Drilling Phantom Plate for Exradin A14SL
638-200	Phantom Cylinder
638-201	Drilling Phantom Cylinder for Exradian A14SL
638-202	Drilling Phantom Cylinder for Exradian A1SL
638-203	Drilling Phantom Cylinder for PTW 31006 Pinpoint
638-204	Drilling Phantom Cylinder for PTW 233642/31002/31005/31010

Customer Can Provide Phantom Plate or Cylinder for Drilling
Custom Drilling is Available

R

QA PHANTOM FOR ARC THERAPY AND FIELD ABUTMENT VERIFICATION

The 622-305 Phantom was designed to provide a means of verification for abuting fields and gaps using film.

Item 622-305 is an acrylic phantom that is split in half to accommodate an 8x10 or 10 x 12 film. There are four aluminum screws that are tightened after film placement to keep the film from moving and keep the phantom halves aligned. The phantom has springs loaded into the screw holes which cause the phantom halves to separate when the screws are loosened. One end of the phantom has a scale for rotation on each half of the phantom. One scale goes from 0° to 180° with 30°, 60°, 90°, 120° and 150° numbered and with markings at every 10°. The other scale goes from 180° to 360° and also has the 10° markings with numbers at 210°, 240°, 270°, 300° and 330°. The scales can be used to position the phantom to match the gantry angle.

The ends of the stand are acrylic plates that have a scribed line for alignment of the phantom. Two wood dowels between the stand ends provide the phantom support which allows for rotation of the phantom and also gives minimal radiation obstruction. A rubber pad on the bottom of the acrylic end plates prevents the stand from moving.

This item can be customized or a chamber cavity can be added. Contact RPDinc for customization or for a chamber cavity.

Item 622-305 Includes

Phantom, Stand, Hex Driver and Carrying Case

Specifications

Phantom
Overall Size: 20 cm Diameter x 25 cm Long (7.87" x 9.84")
Material: Acrylic and Aluminum Screws

Stand
Overall Size: 20.4 W x 35.8 cm L (8.03" x 14.1")
Material: Acrylic and Wood

Item	Description
622-305	QA Phantom for ArcTherapy and Field Abutment Verification

ALUMINUM FILM COMPRESSOR

The Aluminum Film Compressor is used to compress polystyrene, acrylic, plastic water, or solid water phantom pieces together with a Ready Pack Film placed in the center.

Specification

For: 25 cm sq., 30 cm sq. and 35 cm sq.
Size: 15.65" W x 9.5" L
Inside Width: 30 cm
Plates: 1/2" T. Aluminum

Item #	Description
622-302	Aluminum Film Compressor

FILM DOSIMETRY CASSETTES

The two piece, Film Dosimetry Cassette keeps the edge of the film at the surface of the cassette. A light hole at the bottom marks the film orientation.

To insert film loosen screws 1/2 turn and slide film in. The film will stop at the stoppers between the two pieces. The edge of the film should be flush with top edge of the cassette. Tighten the screws. To remove film, loosen screws, turn the cassette over and the film will slide out.

The Film Dosimetry Cassette is light sealed with rubber tubing on 3 sides. The film entry side must be covered with black tape to prevent light exposure.

The Film Dosimetry Cassette can be used in any plane: parallel, perpendicular or angled.

Scribing is available upon request. Custom thicknesses are available upon request.

BLACK ACRYLIC FILM DOSIMETRY CASSETTE

Density: 1.17 to 1.20 g/cm^3

Item #	Size	Sides	Film Size
623-025	25cm W x 30cm L x 3.6cm T	1.8cm & 1.8cm	8" x 10"
623-030	30cm W x 30cm L x 2.4cm T	1.2cm & 1.2cm	8" x 10"
623-035	30cm W x 40cm L x 5cm T	2.5cm & 2.5cm	10" x 12"

BLACK ABS* FILM DOSIMETRY CASSETTE

***(ACRYLONITRILE-BUTADINE STYRENE) Density: 1.04 g/cm^3**

Item #	Size	Sides	Film Size
623-128	30cm W x 30cm L x 4cm T	2.0cm & 2.0cm	8" x 10"
623-130	30cm W x 30cm L x 5cm T	2.5cm & 2.5cm	8" x 10"
623-135	30cm W x 40cm L x 5cm T	2.5cm & 2.5cm	10" x 12"

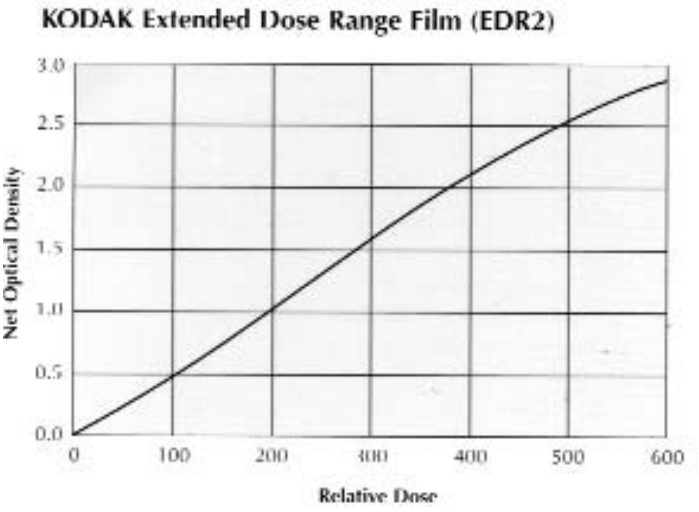
SOLID WATER 457-CTG FILM DOSIMETRY CASSETTE

Density: 1.015 g/cm^3

Item #	Size	Sides	Film Size
623-230	30cm W x 30cm L x 3cm T	1cm & 2cm	8" x 10"
623-235	30cm W x 40cm L x 5cm T	2cm & 3cm	10" x 12"

EDR2 FILM

Extended Dose Range (EDR) Ready-Pack Film for Monitoring and Evaluation of Exposures at Therapy Energies



The curve above shows the approximate relative dose response for EDR2 film. The curve is representative only - - the exact results will depend on the exposing, processing, and scanning conditions at each facility. EDR2 film will saturate in direct exposure at ~ 700 cGy

EDR2 film is designed specifically for oncology applications. Compared to most x-ray films, it is relatively insensitive to x-ray energies and, hence, has a response which extends to very high exposures. Intended for direct exposure applications, it is not suitable for portal imaging radiographs.

EDR2 FEATURES

- **Large area**
- **Low cost, widely available**
- **Excellent for relative dosimetry (e.g., field uniformity, equipment characterization: field shapes, port openings, MLCs)**
- **With appropriate calibration, film may be applicable to absolute dosimetry (e.g., high-dose treatment strategies such as IMRT**

FEATURES OF EDR2 DIRECT EXPOSURE APPLICATIONS

- **Wide response range**
- **Approximately linear**
- **Robust processing**

DOSE RESPONSE FOR EVALUATION

Exact dose responses are a function of facility dependent factors including processing conditions (processing time, processing temperature, processing equipment, processing chemistry), the density sampling (digitizer equipment and calibration), and exposure monitoring equipment. The exact response relationship should be measured and verified for the local conditions. The films should be processed using recommendations found in Kodak Service Bulletin #30 (refer to EC film guidelines).

MEASUREMENT TECHNIQUE

The dose response of a film should be measured using appropriate amounts of build-up and backscatter material. Many references have discussed methodology for measuring the response of a film.

REFERENCES

M.D.C. Evans and L.J. Schreiner, “A simple technique for film dosimetry,” Radiotherapy. Oncol. Vol 23, pages 265-267, 1992.

J. I. Hale, A. T. Kerr, and P. C. Shragge, “Calibration of film for accurate mega voltage photon dosimetry,” Med. Dosimetry Vol 19, pages 43-46, 1994.

Inhwan J. Yeo, C-K Chris Wang, and Sandra E. Burch, “A filtration method for improving film dosimetry in photon radiation therapy,” Medical Physics Vol 24, pages 1943-1953, December 1997.

J. L. Robar and B. G. Clark, “The use of radiographic film for linear accelerator stereotactic radiosurgical dosimetry,” Medical Physics Vol 26, pages 2144-2150, 1999.

CE

Item	Description
624-100	EDR2 Film - 10" x 12" (50/box, 4 box min order)
624-105	EDR2 Film - 14" x 17" (50/box, 2 box min order)

GAFCHROMIC® EBT2, EBT3 AND EBT3+ FILM

- **No processing required**
- **Wide exposure range**
- **Exceptional image resolution**
- **Large measurement area**
- **Less sensitive to indoor lighting**
- **Built-in uniformity indicator**

ADDITIONAL FEATURES OF EBT3

- **Symmetrical**
- **Anti-newton coated**

R

GAFCHROMIC® EBT2 and EBT3 dosimetry film has been designed specifically as a time-and-cost-saving tool that addresses the needs of medical physicists and dosimetrists working in radiotherapy environments. It is targeted toward applications in external beam radiotherapy and supports the processor-less environment of the modern hospital.

TECHNICAL BENEFITS

- Supports all major RT technologies
- Large measurement area
- Develops in real time with no processing (eliminates processing discrepancies)
- Density changes stabilize rapidly
- Energy-independent dose response
- Reduces scattered radiation
- Near tissue-equivalent
- Uniformity better than ±3% in dose
- High spatial resolution
- Can be handled in room light
- Eliminates the need for a darkroom
- Water resistant, water immersible
- Usable with water phantoms
- Withstands temperatures up to 70°C

EBT2 SPECIFIC TECHNICAL BENEFITS

- Wide dose range, 1 cGy to 40 Gy
- Special uniformity indicator
- Improved indoor lighting resistance

EBT3 SPECIFIC TECHNICAL BENEFITS

- Wide dose range, 1 cGy to > 40 Gy
- Symmetrical
- Helps avoid Newton's rings

EBT3+ offering is an enhanced version of GafChromic EBT3 film that has been conveniently formatted for application of the "One-Scan" protocol recently published in the Journal of Medical Physics[1]. By combining measurement with calibration and eliminating many inter-scan variables, the "One-Scan" protocol improves dose measurement accuracy to better than 1%. Moreover, this protocol allows the user to obtain dose measurements within a few minutes of exposure. No more waiting overnight for results.

All these advantages, plus the inherent advantages of radiochromic film - high spatial resolution, water/tissue equivalence, minimal energy dependence and no angular dependence - make GafChromic EBT3+ film the ideal choice for patient-specific QA of treatment plans for IMRT, VMAT, SRS, etc.

1. "An efficient protocol for radiochromic film dosimetry combining calibration and measurement in a single scan," D. Lewis, A. Micke, X. Yu and M. F. Chan, Medical Physics 39(10) p6339-50, October 2012

ECONOMIC BENEFITS

- Eliminates the expense of a processor
- Eliminates the costs and dangers of photo chemical wastes
- Convenient to handle and easy to cut
- Easily noted on with marker pen (notes easily erased if necessary)
- Cut and shape the film to your needs
- Economical and competitive pricing
- Use with professional flatbed scanner
- Saves time and money, with improved accuracy and outstanding convenience
- Available in two sheet sizes

CONFIGURATION AND STRUCTURE

GAFCHROMIC® EBT2 and EBT3 is made by laminating an active layer between two polyester layers. The polyester surface makes an exceptionally robust product and allows water immersion.

OPTIMIZING THE SENSITOMETRIC RESPONSE

Since the absorbance spectra of the active component of GAFCHROMIC® EBT2 and EBT3 peaks at 636 nm, the sensitivity is maximized by measurement with red light. Transmission densitometers that are commonly used to measure visual density with conventional films are suitable for use with EBT2 or EBT3 film. Better results can be obtained from the red color channel with a color densitometer. Further improvement of results can be obtained by using a narrow band pass filter with central wavelength at about 636 nm and 10 nm bandwidth while making measurements.

EBT2 FEATURES

A PRECISION 5-LAYER LAMINATED COMPOSITION

A clear polyester . . . . . 50 microns
B adhesive layer . . . . . 25 microns
C top coat . . . . . 5 microns
D active substrate layer . . . . . 30 microns
E clear polyester . . . . . 175 microns

Approximate thicknesses, actual values may vary slightly.

EBT3 AND EBT3+ FEATURES

A PRECISION 3-LAYER LAMINATED COMPOSITION

A clear polyester . . . . . 125 microns
B active substrate layer . . . . . 30 microns
C clear polyester . . . . . 125 microns

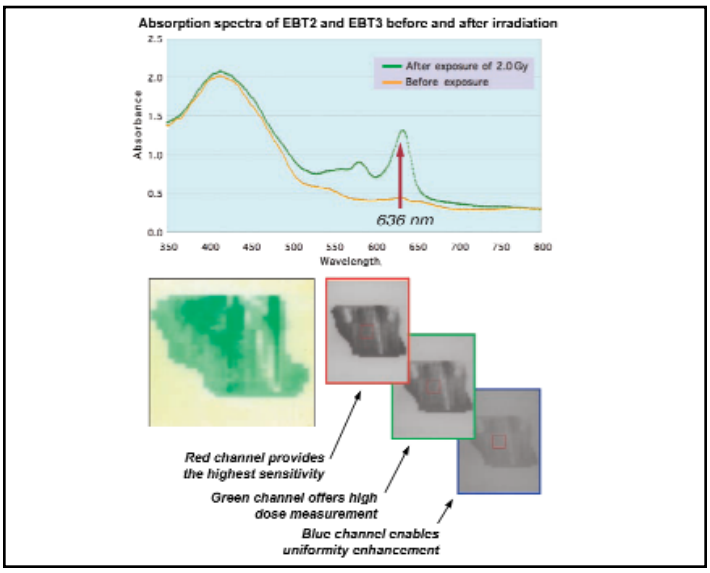
Approximate thicknesses, actual values may vary slightly.

VERSATILE PERFORMANCE

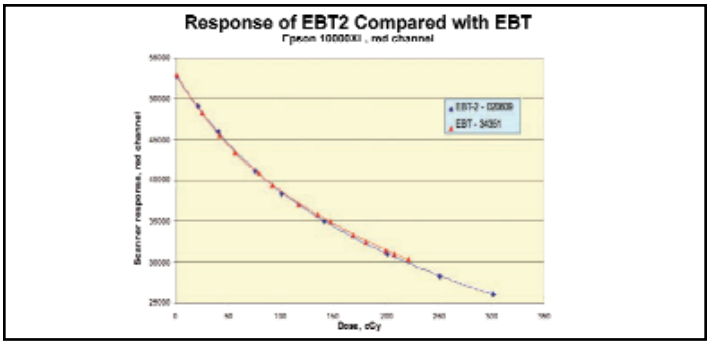
GAFCHROMIC® EBT2 nad EBT3 dosimetry film can also be read with a film scanner or digitizer. As with densitometers, the response of the film can be enhanced if the spectral response of the scanner is matched to the absorbance of the film.

Many high-quality scanners are available to digitize colored films. The Epson® 10000XL PHOTO flatbed color scanner, which is designed to digitize film 8" x 10" in size, and even as large as 12" x 16" in size, is recommended to scan EBT2 and EBT3 film. For doses up to 8 Gy, the Epson® 10000XL provides the most sensitive response for EBT2 and EBT3 film from the red color channel. The green channel can be used to measure doses between 8 Gy and 40 Gy for EBT2 and between 8 Gy and > 40Gy for EBT3. The blue channel provides a response signal for automatic film uniformity enhancement via a special marker dye in the active layer of EBT2 and EBT3 film. The recommended scan orientation for the film is landscape.

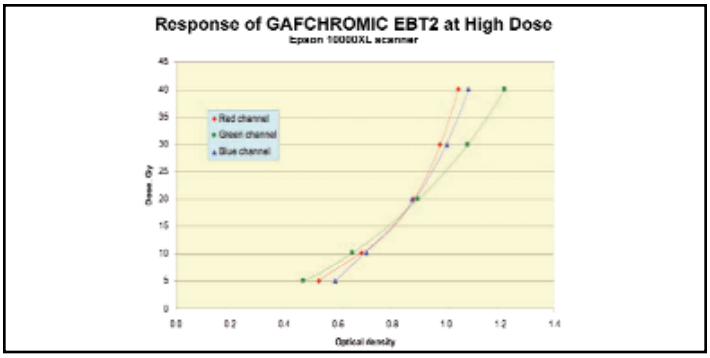
EPSON 10000XL
PHOTO FLATBED COLOR SCANNER PERFORMANCE



NOTE: The response of GAFCHROMIC® EBT2 and EBT3 dosimetry film is dependent upon factors specific to the facility such as the energy spectrum of the radiation source, the characteristics of the densitometer, film scanner or other means of measurement and the elapsed time between exposure and measurement etc. Therefore, the user should determine the dose-density response under the conditions pertaining to the user's facility and measurement protocol. Since the absolute response of GAFCHROMIC® EBT2 and EBT3 dosimetry film may vary from lot to lot, the user should re-measure response when changing to a new lot number.



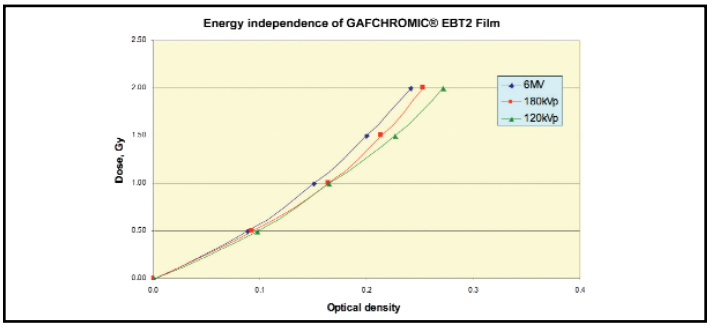
Responses of CAFCHROMIC® EBT2 and EBT to dose up to 3Gy



Response of GAFCHROMIC® EBT2 to doses between 5Gy and 40 Gy, with the Epson® XL10000 PHOTO flatbed color scanner

ENERGY INDEPENDENCE

GAFCHROMIC® EBT2 radiochromic film has been designed to measure absorbed dose from high-energy radiation used in RT. The response to photons has been found to be highly energy-independent in the MeV range and measurements at lower energies show that the response changes by only ten percent, even down to keV range.



DOSE FRACTIONATION

EBT2 film exposed to a single fraction yields the equivalent amount of response as the film given fractionated exposure and establishes EBT2 film as an effective dose integrator.

POST-EXPOSURE DENSITY GROWTH

GAFCHROMIC® EBT2 film self-develops in real time. The time interval between the exposure and the scan should be kept approximately the same for all films in an analysis.

STORAGE AND HANDLING

GAFCHROMIC® EBT2 film is designed to be handled in interior room light, however it is recommended that the film be kept in darkness when not in use. Exposure to sunlight should be avoided. The film may be stored at room temperature (20°- 25°C), but the best practice is to store the film at refrigerator temperature. The film's shelf-life is two years when stored at room ambient temperature. It can tolerate brief exposures (e.g. <1 min.) to temperatures up to 70°C, or more prolonged exposure (e.g. <1 day) at temperatures of 50°C. However, it is recommended that the film be handled, exposed and measured at room ambient temperature (20°- 25°C).

NOTES

1. GAFCHROMIC® EBT3 8" x 10" is available with or without holes. These holes are fiducial markers used as guides for the end user.

2. GAFCHROMIC® EBT3+ film contains 20 8" x 11" films paired for separation into 8" x 9.5" sheets and matched 8" x 1.5" strips, plus an additional 10 8" x 1.5" films for use as calibration or reference strips.

Item #	Gafchromic® EBT2 Film	Sheets
115-015	8" x 10" (20.3 x 25.4 cm)	25
115-017	13" x 17" (33.0 x 43.2 cm)	10

Item #	Gafchromic® EBT3 Film	Sheets
115-016	8" x 10" (20.3 x 25.4 cm)	25
115-018	8" x 10" (20.3 x 25.4 cm) w/Fiducial Markings	25
115-019	13" x 17" (33.0 x 43.2 cm)	10

Item #	Gafchromic® EBT3+ Film
115-014	8" x 11" (20.3 x 27.9 cm), 20 Films and 10 Strips/Box

GAFCHROMIC® RTQA2 FILM

R

The GAFCHROMIC® RTQA2 self-developing radiochromic QA films are for faster, easier, more convenient, and less costly QA testing of radiotherapy sources and the commissioning of therapy equipment. Specifically designed for LINAC / accelerator machine QA such as light field / radiation field alignment tests, precision star shots; also position verification for HDR, and autoradiograpy of implantable seeds, plaques and other sources.

QUALITY ASSURANCE PLUS
- Easy to use
- Instant results
- Size the film to your exact requirement and save

GAFCHROMIC® RTQA2 is a high performance processor-less film for quality assurance exceptional accuracy with ease of use and featuring outstanding cost effectiveness. GAFCHROMIC® RTQA2 quality assurance film has been designed by leading radiochromic film scientists and provides state-of-the-art results in radiotherapy environments, while tapping all the exciting advantages of processor-less technology.

TECHNICAL BENEFITS
- Developed specifically for
  - light field alignment
  - radiation field alignment
  - precision star shots
  - position verification for HDR
  - autoradiography of implantable seeds, plaques and other sources
- Dynamic range from 0.02 Gy to 8 Gy
- Large measurement area
- Self develops in real time and requires no processing
- Near tissue-equivalent
- High spatial resolution
- Can be handled in room light
- Water resistant, water immersible (usable with water phantoms)
- Withstands temperatures up to 70°C
- Now with improved indoor lighting resistance

ECONOMIC BENEFITS
- No processor required - no darkroom
  - eliminates processing discrepancies
  - eliminates chemical waste
  - environmentally friendly
- Convenient to handle and easy to cut (cut and shape the film to your needs)
- Easily noted on with marker pen (notes easily erased if necessary)
- Economical and competitive pricing
- Available in three sizes

OUTSTANDING PERFORMANCE
GAFCHROMIC® RTQA2 radiotherapy film is an excellent, hassle-free tool for the contemporary and processor-less environment. Just position and shoot. With real-time self-developing, your results are available in seconds! No darkroom or chemicals are needed. After exposure, if the light field is not aligned with the radiation field, the discrepancy is visible immediately. Simply adjust the field accordingly and move on. In most cases, a second exposure is not required. Alignment can be achieved in an exceedingly short time. RTQA2 can even be observed through the monitor, and evaluated while it develops! Saves time and money as less film is used for each alignment, the film can be handled in room light and can be easily cut to the exact size called for. Excellent for autoradiography of implantable seeds, plaques and other sources.

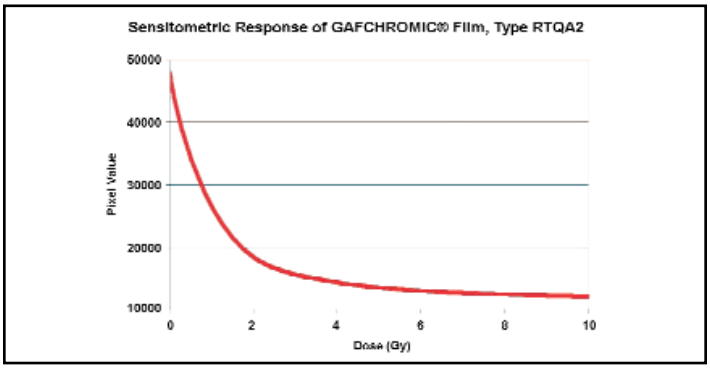
CONFIGURATION AND STRUCTURE
Gafchromic® RTQA2 is made by laminating an active layer between two polyester layers. The polyester surface makes an exceptionally robust product and allows water immersion.

PRECISION 5-LAYER LAMINATED COMPOSITION

A	yellow polyester	97 microns
B	pressure sensitive adhesive	12 microns
C	active layer	17 microns
D	surface layer	3 microns
E	white polyester	97 microns

Approximate thicknesses, actual values may vary slightly.

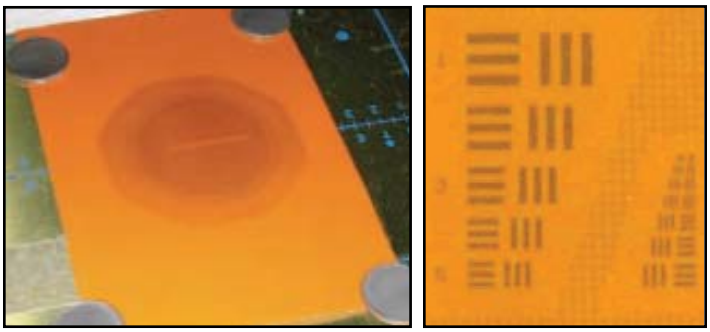
HDR APPLICATIONS
GAFCHROMIC® RTQA2-111 strips are designed for HDR positioning verification. They are designed for use within a phantom, or taped directly under a catheter. RTQA2-111 strips provide excellent results when the catheter position is marked and then the autoradiographic image is checked against the marks. Key advantages of RTQA2-111 strips are their stability and alignment. They eliminate concerns about film movement inside a ready pack and thus increase the accuracy of measurement. With dwell times between 0.5 second to 2.0 seconds (depending on the source) RTQA2-111 film strips exhibit sharp images, and clearly show source positions.



NOTE: The response of GAFCHROMIC® RTQA2 radiotherapy film is dependent upon factors specific to the facility such as the energy spectrum of the radiation source, the characteristics of the densitometer, film scanner or other means of measurement and the elapsed time between exposure and measurement etc. Therefore, the user should determine the dose-density response under the conditions pertaining to the user's facility and measurement protocol. Since the absolute response of GAFCHROMIC® RTQA2 film may vary from lot to lot, the user should re-measure response when changing to a new lot number.

Item #	Gafchromic®	Application	Size	Sheets	Minimum Order
115-020	RTQA2-1010	Light field alignment test	10" x 10" (25.4 x 25.4 cm)	25	1
115-022	RTQA2-1010P	Pre-scaled Film	10" x 10" (25.4 x 25.4 cm)	25	1
115-024	RTQA2-111	Brachytherapy Source Positioning	1.25" x 11" (3.2 x 27.9 cm)	25	2
115-026	RTQA2-1417	Larger light-field alignment test	14" x 17" (35.6 x 43.2 cm)	10	1

GAFCHROMIC® XR-QA2 FILM



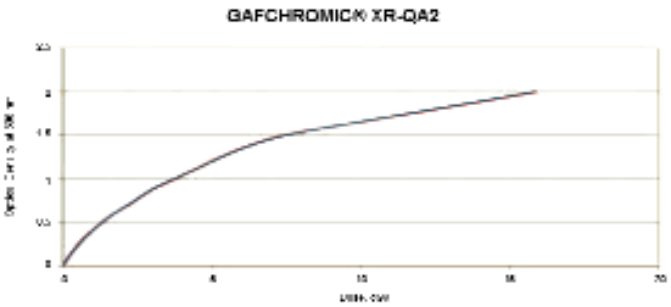
- **No processor required**
- **Sensitive to dose range 0.1 cGy to 20 cGy**
- **Instant calibration results**
- **High data integrity**
- **Cost effective, easy to use**
- **Improved contrast**
- **Can be handled in room light**

GAFCHROMIC® XR-QA2 film is designed specifically as a QA tool for radiology applications in a processor-less environment. Like all GAFCHROMIC® films, it can be cut and handled in room light. Energy range: 20 KVp to 200 KVp.

STRUCTURE

A	yellow polyester	97 microns
B	pressure sensitive adhesive	15 microns
C	active layer	25 microns
D	surface layer	3 microns
E	white polyester	97 microns

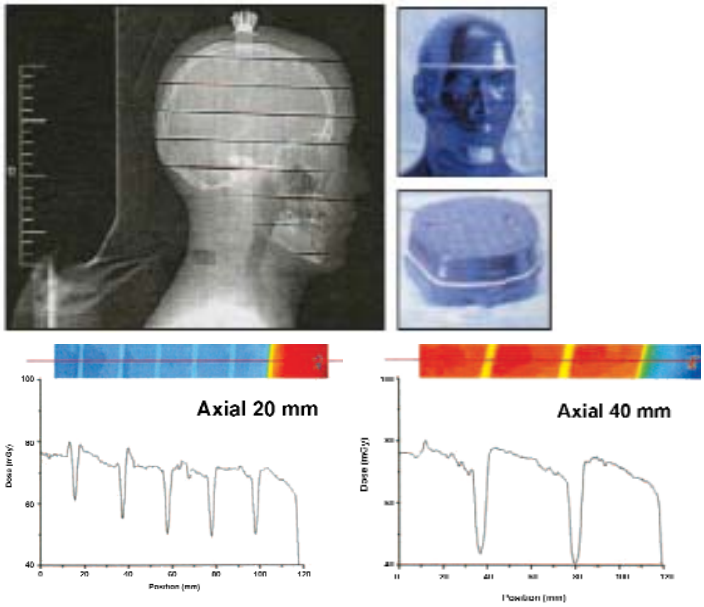
Actual film layer thicknesses may vary slightly



Sensitometric Response of GAFCHROMIC® XR-QA2 Film

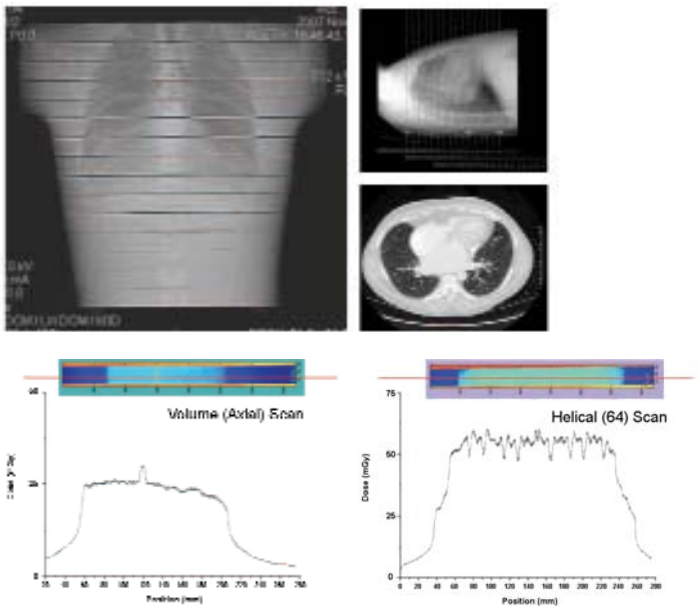
Imaging detail with high resolution and contrast State-of-the-art quality production techniques for XR-QA2 assure consistent and reliable high contrast results, with imaging detail at greater than 5000 dpi. Results are easy to read; and data is easy to understand.

HEAD PHANTOM DOSIMETRY APPLICATION



Typical head phantom radiation analysis XR-QA2 film is easy to use, cost effective, and compatible with a wide variety of phantoms.

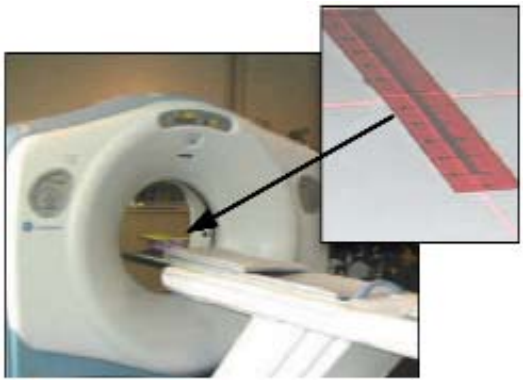
CHEST PHANTOM DOSIMETRY APPLICATION

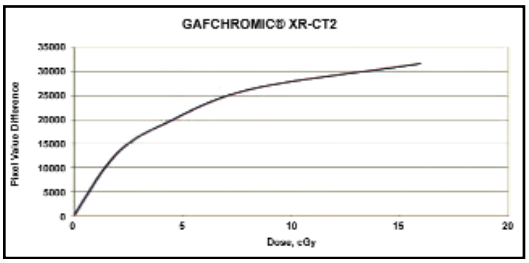


Typical chest radiation analysis, results taken from an in vivo study for a chest exam with 64 slices made with a CT scanner.

Item #	Gafchromic®	Sheets
115-034	XR-QA2, 10" x 12" (25.4 x 30.5 cm)	10
115-036	XR-QA2, 8" x 10" (20.3 x 25.4 cm)	10

GAFCHROMIC® XR-CT2 FILM





Sensitometric Response of GAFCHROMIC® XR-CT2 Film

- **Excellent for CT QA**
- **Sensitive to dose range 0.1 cGy to 20 cGy**
- **High data integrity**
- **Instant calibration results**
- **Self-developing in real time**
- **Easy to use**
- **Improved contrast**
- **Cost effective**

The GAFCHROMIC® XR-CT2 film is for measuring radiation beam slice width and beam position alignment on CT scanners. It has high accuracy and superior data integrity, and self-develops. A printed scale helps determine positions of light and radiation field, and beam slice width, with a single exposure.

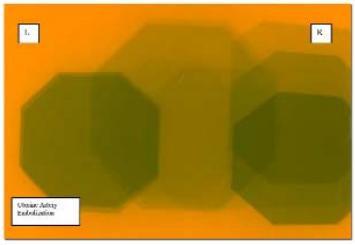
Specifications

Energy Range: 20 KVp to 200 KVp
Size: 0.75" x 5" (1.9 x 12.7 cm)
Quantity: 50 strips per package

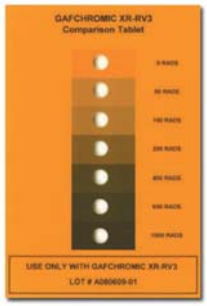
Item #	Gafchromic®	Strips
115-032	XR-CT2, 0.75"x5"	50

GAFCHROMIC® XR-RV3 FILM

For Peak Skin Dose Measurement



An exposed film with patient's orientation with respect to the film



115-031 Comparator Strip

- **An excellent tool for the processor-less environment**
- **Sensitive to wide dose range 0.01 Gy to 30 Gy**
- **An easy to use film with high data integrity**
- **Improved resistance to indoor lighting**
- **Shelf life: 18 month at room ambient temperature**

The GAFCHROMIC® XR-RV3 film is designed for surface peak skin dose measurement in interventional procedures guided by fluoroscopy. .A comparator strip is also available for quick visual estimation of dose at a point, requiring no digitizing. Energy range: 30 keV to 30 MeV.

Structure of GAFCHROMIC® film, type XR-RV3

A yellow polyester . . . . . 97 microns
B pressure sensitive adhesive . . . . . 12 microns
C active layer . . . . . 17 microns
D surface layer . . . . . 3 microns
E white polyester . . . . . 97 microns

Specifications

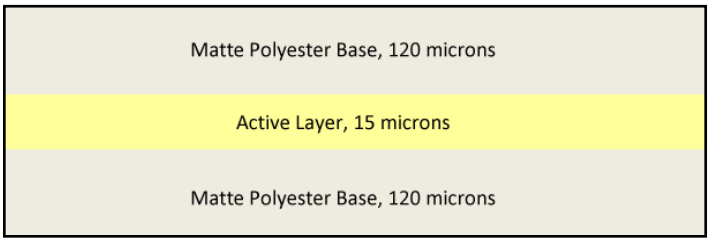
Configuration: 3-layer laminate (substrate - active layer - substrate)
Substrate: White and yellow polyester

Item #	Gafchromic®	Sheets
115-030	XR-RV3, 13" x 17" (33.0 x 43.2 cm)	25
115-031	Comparator Strip for XR-RV3 Film	

GAFCHROMIC® MD-V3 DOSIMETRY MEDIA

The GAFCHROMIC MD-V3 radiochromic dosimetry film is designed for the measurement of absorbed dose of high-energy photons. The response of the filim is energy-independent to photons of 0.2MeV energy or more. The GAFCHROMIC MD-V3 is a direct replacement for the GAFCHROMIC MD-V2-55 Flim.

The structure of GAFCHROMIC MD-V3 radiochromic dosimetry film is comprised of an active layer, nominally 15µm thick, containing the active component, marker dye, stabilizers and other components giving the film its near energy-independent response. The thickness of the active layer may vary slightly from batch-to-batch. The active layer is sandwiched between two 120µm matte polyester substrates.



Structure of the GAFCHROMIC MD-V3 Dosimetry Media

Key technical features of GAFCHROMIC MD-V3 include:

- Dynamic Dose range: 1 Gy to 100 Gy
- Develops in real time without post-exposure treatment;
- Energy-dependence: minimal response difference from 100keV into the MV range;
- Near tissue equivalent;
- High spatial resolution - can resolve features to at least 5µm;
- Can be handled in room light - eliminates the need for a darkroom;
- Active coating exposed for detection of low energy photon and electron

New and improved features over the previous generation (GAFCHROMIC MD-V2-55):

- Proprietary new technology incorporating a marker dye in active layer to enable use of multichannel dosimetry[1] with FilmQA Pro 3.0 software[2] corrects scanner and film artifacts including uniformity
- Mitigates lateral response dependence
- Enables channel-to-channel consistency measurement as an integrity check
- Decreases UV/light sensitivity;
- New matte film base to eliminate Newton's Rrings artifact associated with scanning of the film
- Improved uniformity of response
- Stable at temperatures up to 140°F (60°C)

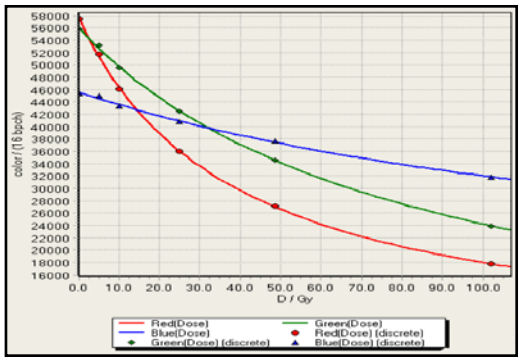
The most exciting new feature of GAFCHROMIC® MD-V3 over the previous generation of GAFCHROMIC® HD810 dosimetry film is the incorporation of a yellow marker dye. Used in conjunction with an rgb film scanner and FilmQAPro™ software, the marker dye in MD-V3 film enables all the benefits of multi-channel dosimetry. Using the marker dye feature is not mandatory. You can continue to perform dosimetry using only the red color channel, but you give up all the advantages of the multi-channel method that will make your film dosimetry better.

Performance Data and Practical User Guidelines

The GAFCHROMIC MD-V3 dosimetry film can be handled in normal room light for at least several hours without noticeable effects. However, it is suggested that the film should not be left exposed to room light indefinitely, but rather should be kept in the dark when it is not being handled. When the active component in GAFCHROMIC® MD-V3 film is exposed to radiation, it reacts to form a blue colored polymer with absorption maxima at approximately 633 nm.

GAFCHROMIC MD-V3 radiochromic dosimetry film may be measured with transmission densitometers, film scanners or spectrophotometers. The response of MD-V3 is enhanced by measurement with red light. In using a spectrophotometer the greatest response is obtained by scanning the film and using the peak absorbances. Most densitometers measure over a band of wavelengths and transmission densitometers for measuring colored films measure over various narrow color bands within the visible spectrum, e.g. visual, red, green and blue. Such densitometers are commonly and widely employed in the photographic industry.

To obtain two-dimensional information in speedy fashion, flatbed color scanners will work well with all GAFCHROMIC films including MD-V3 films. The commonly available professional photo scanners suchvas EPSON Expression 10000XL, V750, V700 and 1680 flatbed color scanners can be used. These scanners are color scanners and measure the red, green and blue color components of the film at a color depth of 16 bit per channel.



Response of GAFCHROMIC MD-V3 in all Color Channels

1. Micke, A., Lewis, D.F., Yu, X. "Multichannel film dosimetry with nonuniformity correction," Med Phys, 38(5), 2523-2534 (2011).

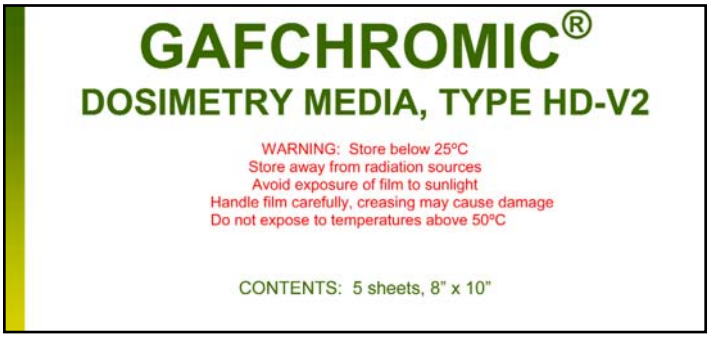
2. FilmQA Pro 3.0 software can be downloaded at www.filmqapro.com

Specifications

Configuration: Active layer on 5 mil (120µ) matte polyester substrate
Size: 5" x 5"
Dynamic Dose Range: 1 to 100 Gray
Energy Dependency: <5% difference in net density when exposed at 1 MeV and 18 Mev
Dose Fractionation Response: <5% difference in net density for a single 100 Gy dose and five cumulative 20 Gy doses at 30 min. intervals
Dose Rate Response: <5% difference in net density for 10 Gy exposures at rates of 3.4 Gy/min. and 0.034 Gy/min.
Stability in Light: <0.005 change in density per 1000 lux-day
Stability in Dark (Preexposure): <5x10^{-4} density change/day at 23 °C (73.4°F) and <2x10^{-4} density change/day refrigerated
Uniformity: Better than 3% in sensitometric response from mean

Item	Gafchromic®
115-002	MD-V3, 5" x 5"

GAFCHROMIC® HD-V2 DOSIMETRY FILM



R

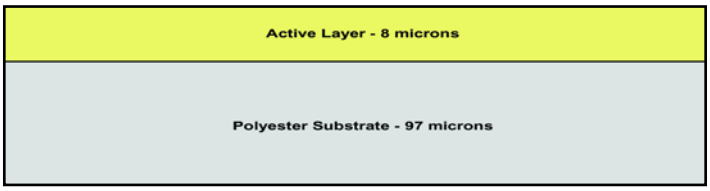
GAFCHROMIC® HD-V2 is a radiochromic dosimetry film designed for the quantitative measurement of absorbed dose of high-energy photons. As a self-developing film, HD-V2 is a perfect fit for the processorless environment. Since radiochromic film requires no post-exposure processing, there are no chemicals to dispose of and the film can be handled and used without need of a darkroom.

Key technical features of GAFCHROMIC® H-VD2 include:
- Dynamic Dose range: 10 Gy to 1000 Gy
- Develops in real time without post-exposure treatment;
- Energy-dependence: minimal response difference from 100keV into the MV range;
- Near tissue equivalent;
- High spatial resolution - can resolve features to at least 5?m;
- Can be handled in room light - eliminates the need for a darkroom;
- Active coating exposed for detection of low energy photon and electron

New Features
- Proprietary new technology incorporating a marker dye in active layer:
  - Enables non-unformity correction by using multichannel dosimetry
  - Decreases UV/light sensitivity;
- Better uniformity
- Stable at temperatures up to 60°C;

The most exciting new feature of GAFCHROMIC® HD-V2 over the previous generation of GAFCHROMIC® HD810 dosimetry film is the incorporation of a yellow marker dye. Used in conjunction with an rgb film scanner and FilmQAPro™ software, the marker dye in HD-V2 film enables all the benefits of multi-channel dosimetry. Using the marker dye feature is not mandatory. You can continue to perform dosimetry using only the red color channel, but you give up all the advantages of the multi-channel method that will make your film dosimetry better.

The structure of GAFCHROMIC® HD-V2 film is comprised of a active layer, nominally 8µm thick, containing the active component, marker dye, stabilizers and other components giving the film its energy-independent response. The thickness of the active layer may vary slightly from batch-to-batch. The active layer is coated on a clear, 97 µm polyester substrate.



Configuration of GAFCHROMIC® HD-V2 Dosimetry Film

GAFCHROMIC® HD-V2 film has an asymmetrical cross section shown above. Measurements indicate that the response of scanner or densitometer may be dependent on which side of the film is facing the light source. It is advised that HD-V2 film be consistently measured with the same side of the film facing the light source regardless of whether landscape or portrait orientation is used.

To help in distinguishing between the sides, sheets of GAFCHROMIC® HD-V2 film are marked with a small slit near one corner. When film is viewed in a landscape orientation with the slit in the top right corner as shown below, the unlaminated active layer is on the side facing the viewer.

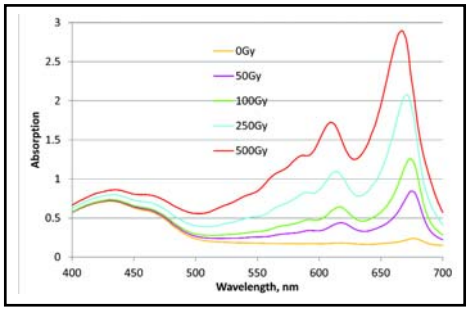
GAFCHROMIC® HD-V2 film in landscape view showing slit in top right corner.

Specifications

Configuration: Active layer on 3.8 mil (97 µ) clear polyester substrate
Size: 8" x 10"
Dynamic Dose Range: 10 to 1000 Gray
Energy Dependency: <5% difference in net density when exposed at 1 MeV and 18 Mev
Dose Fractionation Response: <5% difference in net density[2] for a single 100 Gy dose and five cumulative 20 Gy doses at 30 minute intervals
Dose Rate Response: <5% difference in net density[2] for 10 Gy exposures at rates of 3.4 Gy/min. and 0.034 Gy/min.
Stability in Light: <0.005 change in density per 1000 lux-day
Stability in Dark (Pre-exposure): <5x10-4 density change/day at 23 °C and <2x10-4 density change/day refrigerated
Uniformity: Better than 3% in sensitometric response from mean

PERFORMANCE DATA AND PRATICAL USER GUIDELINES

When the active component in GAFCHROMIC® HD-V2 film is exposed to radiation, it reacts to form a blue colored polymer with absorption maxima at approximately 670 nm as shown below.



Spectra of GAFCHROMIC® HD-V2 as a function of adsorbed doses

GAFCHROMIC® HD-V2 radiochromic dosimetry film may be measured with transmission densitometers, film scanners or spectrophotometers. As one can infer from the figure above, the response of the dosimetry film media is enhanced by measurement with red light. In using a spectrophotometer the greatest response is obtained by scanning the film and using the peak absorbances. Most densitometers measure over a band of wavelengths and transmission densitometers for measuring colored films measure over various narrow color bands within the visible spectrum, e.g. visual, red, green and blue. Such densitometers are commonly and widely employed in the photographic industry.

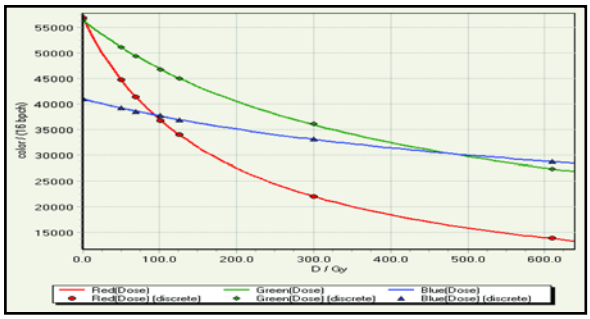
To obtain two-dimensional information in speedy fashion, flatbed color scanners are shown to work well with all GAFCHROMIC® films including HD-V2 films. The commonly available professional photo scanners such as EPSON Expression 10000XL and 1680 flatbed color scanners can be used. These scanners are color scanners and measure the red, green and blue color components of the film in a color depth of 16 bit per channel.

A typical dose response of HD-V2 film on an rgb color scanner is shown below. We recommend to fit the calibration curve in function form of

$$\bar{d}_X(D) = -\log\left(\frac{a+b\,D}{c+D}\right),$$

where dx(D) is the optical density of film in scanner channel x at dose D, and a, b, c are the equation parameters to be fitted. The advantages of these functions are:

- They are simple to invert and determine density as a function of dose, or dose as a function of density;
- They have rational behavior with respect to the physical reality that the density of the film should increase with increasing exposure yet asymptote towards a near constant value at high exposures - polynomial functions characteristically have no orrespondence to physical reality outside the data range over which they are fitted;
- Since these functions have the described rational behavior, fewer calibration points are required saving time and film:
  - To cover a dose range of 0 - 1000 Gy requires 6-8 dose points, for example, 0, 25, 50, 100, 200, 400, 800 and 1200 Gy.



Response of GAFCHROMIC® HD-V2 in all Color Channels

Item	Gafchromic®
115-006	HD-V2, 8" x 10"

ALUMINUM HALF VALUE LAYER ATTENUATOR SET

Determining the Half Value Layer (HVL) of the x-ray beam is the standard method for specifying the quality of the x-ray beam. For a given kVp, a measurement of the HVL gives information on the total filtration in the x-ray beam. Too little filtration results in unnecessary radiation to the patient and too high of a HVL may require increased kVp and mAs, increasing tube loading and reducing tube life.

Half Value Layer Attenuator Set contains nine (9) sheets of 1100 Aluminum Alloy ranging in thicknesses from 0.1 to 2.0 mm. For your convenience these sheets come in a plastic storage case to help maintain flatness and for ease of storage and transportation.

Specifications

Construction: 1100 Aluminum Alloy (99.0% Pure)
Size: 4" x 4" (10x10 cm)
Weight: 0.4 lb (0.2 kg)
Nine (9) Individual Aluminum Sheets: (3) 0.1 mm, (1) 0.2 mm, (2) 0.5 mm, (2) 1.0 mm and (1) 2.0 mm

- **Easy to use and customize in thicknesses for specific tasks**
- **Easy to store**
- **Economical**
- **Compact**

Item	Description
115-500	Aluminum Half Value Layer Attenuator Set

COPPER HALF VALUE LAYER ATTENUATOR SET

Regulatory test protocols for fluoroscopic systems increasingly specify copper attenuators to simulate heavier patients. When doing these tests, it is often useful to apply additional copper to drive the systems to maximum output. Copper filters are still used for specifying the Half Value Layer (HVL) of x-ray beams generated between 140 and 400 kVp.

The Pure Copper Half Value Layer Attenuator Set is comprised of nine sheets, 10x10 cm in thicknesses ranging from 0.1 mm to 2.0 mm. A plastic storage case is provided to protect and to help maintain flatness of the filters.

Specifications

Construction: Pure copper
Size: 4" x 4" (10x10 cm)
Weight: 1.1 lb (0.55 kg)
Nine (9) Individual Aluminum Sheets: (4) 0.1 mm, (1) 0.25 mm, (1) 0.5 mm, (2) 1.0 mm and (1) 2.0 mm

- **Copper attenuators to simulate heavier patients**
- **Wide range of thicknesses for different testing conditions**
- **Satisfy regulatory requirements for fluoroscopic systems**

Item	Description
116-000	Copper Half Value Layer Attenuator Set

FIXED ROLLING RADIATION SHIELDS

The Fixed Rolling Radiation Shields have a 1" thick sheet lead which will reduce the dose from a cesium source by over 90%. The shield is mounted on a base that has four 6" diameter swivel, locking, ball bearing casters which provide easy mobility. The shield also has handles on each end and side.

964-040
to
964-055

958-058

958-000

Specifications for Item 964-040 through 964-055

Lead Size: 36" W x 24" H x 1" T
Base Height: 10 1/2"
Casters: Four 6" dia. swivel locking ball bearing
Finish: Durable tan textured polyurethane enamel paint
Weight: 434 to 500 lbs
Interlocks to form corner with Bed End Shield (Item 965-000)

959-000

Specifications for Item 959-000

Lead Size: 36" W x 48" H x 1" T
Overall Size: 40" W x 72" H x 34" D
Lead Mounted: 24" from floor
Base Height: 10 1/2"
Casters: Four 6" dia. swivel locking ball bearing
Finish: Durable tan textured polyurethane enamel paint
Weight: 900 lbs

Specifications for Item 958-000

Lead Size: 36" W x 30" H x 1" T
Overall Size: 40" W x 48" H x 24" D
Lead Mounted: 18" from floor
Base Height: 10 1/2"
Casters: Four 6" dia. swivel locking ball bearing
Finish: Durable tan textured polyurethane enamel paint
Weight: 575 lbs

Specifications for Item 958-058

Lead Size: 30" W x 36" H x 1" T
Overall Size: 34" W x 58" H x 30" D
Lead Mounted: 22" from floor
Base Height: 10 1/2"
Casters: Four 6" dia. swivel locking ball bearing
Finish: Durable tan textured polyurethane enamel paint
Weight: 575 lbs

Item #	Description	Overall Size
964-040	Fixed Rolling Radiation Shield	40" W x 40" H x 24" D
964-042	Fixed Rolling Radiation Shield	40" W x 42" H x 24" D
964-045	Fixed Rolling Radiation Shield	40" W x 45" H x 24" D
964-048	Fixed Rolling Radiation Shield	40" W x 48" H x 24" D
964-055	Fixed Rolling Radiation Shield	40" W x 55" H x 30" D
958-000	Fixed Rolling Radiation Shield	40" W x 48" H x 24" D
958-058	Fixed Rolling Radiation Shield	34" W x 58" H x 30" D
959-000	Fixed Rolling Radiation Shield	40" W x 72" H x 34" D
964-930	Optional Lead Filled Vertical Posts	

ROLLING BED END SHIELD

The Bed End Shield is capable of interlocking with all other Radiation Shields to form a corner. Handles on both sides and ends allow for easier handling.

Specifications

Lead Size: 42" W x 36" H x 1" T (107.1 x 91.8 x 2.5 cm)
Overall Size: 46" W x 56" H x 30" D (117.3 x 142.7 x 76.5 cm)
Lead Mounted: 20" (51 cm) from floor
Base Height: 13" (33.1 cm)
Casters: Four 6" (15.3 cm) dia. swivel locking ball bearing
Finish: Durable tan textured polyurethane enamel paint
Weight: 800 lb (362.9 kg)

Item	Description
965-000	Bed End Shield

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ADJUSTABLE HEIGHT ROLLING RADIATION SHIELD

- **Only adjustable shield with 36" W x 24" H lead**
- **Easy-to-adjust**

The Adjustable Lead Shield can be moved over a 9" (22.9 cm) height range by using a screw jack. The jack is operated by a hand crank or a flat blade (both included) for a 3/8" (0.95 cm) Drill. The shield is set in a metal frame and mounted on a base with four 6" (15.3 cm) diameter swivel, locking, ball bearing casters that provide easy mobility.

Specifications

Lead Size: 36" W x 24" H x 1" T (91.8 x 61.2 x 2.5 cm)
Overall Size: 42.5" W x 24" D (108.3 x 61.2 cm)
Base Height: 10.5" (26.8 cm)
Casters: Four 6" (15.3 cm) dia. swivel locking ball bearing
Finish: Durable tan textured polyurethane enamel paint
Weight: 500 lb (226.8 kg)

Item	Description
960-024	Adj. Height Rolling Radiation Shield, Height Adj. 36" to 45"
960-030	Adj. Height Rolling Radiation Shield, Height Adj. 39" to 48"

HEIGHT ADJUSTABLE PATIENT LOADING SHIELDS

Afterloading or Intravascular

960-300 **960-302**

The Height Adjustable Patient Loading Shields provide complete protection to the head and torso or head, torso and legs. They roll easily into position on four 6" diameter swivel, locking, ball bearing casters.

Item 960-300 has a 16" wide x 34" high x 1" thick shield and can be adjusted over a 10" range from a shield height of 54.5" to 64.5". Item 960-302 is the same shield on top, but also includes a lower shield.

Specifications

Item 960-300
Lead Glass Size: 8" sq. x 2" T (20.4 x 5.1 cm)
Lead Glass Density: 5.2 g/cm^3
Lead Size: 16" W x 34" H x 1" T (40.8 x 86.7 x 2.5 cm)
Overall Size: 19" W x 24.5" D (48.4 x 62.5 cm)
Height Adjustment: 54.5" to 64.5" H (138.9 to 164.4 cm)
Base Height: 10.5" (26.8 cm)
Casters: Four 6" (15.3 cm) dia. swivel locking ball bearing.
Finish: Durable tan textured polyurethane enamel paint
Weight: 250 lb (113.4 kg)

Item 960-302
Lead Glass Size: 8" sq. x 2" T (20.4 x 5.1 cm)
Lead Glass Density: 5.2 g/cm^3
Upper Lead Shield: 16" W x 34" H x 1" T (40.8 x 86.7 x 2.5 cm)
Lower Lead Shield: 18" W x 21"H x 1"T (45.9 x 53.5 x 2.5 cm)
Maximum Height: 56" (142.7 cm)
Minimum Height: 38" (96.7 cm)
Casters: Four 6" (15.3 cm) dia. swivel locking ball bearing.
Finish: Durable tan textured polyurethane enamel paint

Item	Description
960-300	Height Adjustable Patient Loading Shield
960-302	Height Adjustable Patient Loading Shield w/Lower Shield

INTRAVASCULAR SHIELDS

Item 996-800

Item 996-800 - Fixed Height
Lead Size: 60” W x 36” H x 5/8” T
Overall Size: 64” W x 70” H x 35” D
Shield Height: 32” from the floor
Casters: Four 6” dia. swivel, locking, ball bearing
Finish: Durable tan textured polyurethane enamel paint
Weight: 786 lb (357 kg)

Item #	Description
996-800	60” Wide Intravascular Shield

Item 996-810

Item 996-810 - Fixed Height
Lead Size: 48” W x 36” H x 5/8” T
Overall Size: 52” W x 70” H x 35” D
Shield Height: 32” from the floor
Casters: Four 6” dia. swivel, locking, ball bearing
Finish: Durable tan textured polyurethane enamel paint
Weight: 500 lbs

Item #	Description
996-810	48” Wide Intravascular Shield

Item 996-820

The adjustable height shield is built with a 9” range of movement. When ordering the adjustable shield, specify the height range of the lead shielding needed (ie: 61” - 70” - keep in mind the lead shield is 36”high and add 4” for framework). A screw jack moves the shield. The jack is operated by a hand crank or a flat blade (both included) for a 3/8” drill.

Item 996-820 - Adjustable Height
Lead Size: 48” W x 36” H x 5/8” T
Overall Size: 52” W x 35” D - height will vary
Height Adjustment Range: 9”
Casters: Four 6” dia. swivel, locking, ball bearing
Finish: Durable tan textured polyurethane enamel paint
Weight: 500 lbs

Item #	Description
996-820	Adjustable 48” Wide Intravascular Shield

SHIELD STEP

The Shield Step can be attached to the base of the radiation shield with four screws. The width of the shield step is 9” and has a 6” wide anti-skid material. When ordering please specify the item number of the shield that the step will be attached to.

Item #	Description
964-900	Shield Step 39 1/2” Long
960-900	Shield Step 38” Long

Custom Sizes Available

CUSTOM SHIELDS AVAILABLE UPON REQUEST

OVER BED RADIATION SHIELD

• Provides radiation protection to patients in the room above necessary if the ceiling construction is thin

The portable Over Bed Radiation Shield is made of 1" lead covered with stainless steel and mounted on a steel plate which is welded to the top of a tubular steel frame. Wheel extensions on the base provide extra stability when moving.

Lead Size: 24" sq. x 1" T
Overall Size: 24" W x 50 1/2" H x 40 1/2" D
Top of Shield: Covered with 16 ga. stainless steel
Top Frame Height: 47"
Bottom Frame Height: 10 1/2"
Inside Depth: 34"
Casters: Four 6" dia. swivel, locking, ball bearing
Finish: Durable tan textured polyurethane enamel paint
Weight: 380 lbs

Item #	Description
957-000	Over Bed Radiation Shield

OVER AND UNDER BED RADIATION SHIELD

• Provides radiation protection to patients in rooms above and below
• Necessary if the ceiling and floor construction is thin

The portable Over and Under Bed Radiation Shield, has a top and bottom shield. Each shield is made of 1" lead covered with 16 ga. steel and mounted on a steel plate which is welded to the tubular steel frame.

Item 957-020

Lead Size: Two 24" sq. x 1" T
Overall Size: 28" W x46 3/4" H x40" D
Floor to Top of Over Shield: 46 3/4"
Floor to Bottom of Over Shield: 44 3/4"
Floor to Top of Under Shield: 9 1/4"
Floor to Bottom of Under Shield: 7 1/2"
Inside Depth: 34"
Casters: Four 6" swivel locking ball bearing
Finish: Durable tan textured polyurethane enamel paint
Weight: 620 lbs

Item 957-022

Lead Size: Two 24" sq. x 1" T
Overall Size: 28" W x43" H x 40" D
Floor to Top of Over Shield: 43"
Floor to Bottom of Over Shield: 41"
Floor to Top of Under Shield: 5 1/2"
Floor to Bottom of Under Shield: 3 3/4
Inside Depth: 34"
Casters: Four 2 1/2" swivel
Finish: Durable tan textured polyurethane enamel paint
Weight: 610 lbs

Item #	Description
957-020	Over and Under Bed Radiation Shield - 6" Casters
957-022	Over and Under Bed Radiation Shield - 2 1/2" Casters

UNDER BED RADIATION SHIELDS

- **Provides radiation protection to patients in room below, necessary if the floor construction is thin**
- **Lead shield is raised and lowered by using ratchet wrench**
- **Shield is adjustable from 9” to 25”**

The portable, adjustable Under Bed Radiation Shield is made of 1” lead covered with stainless steel and is mounted on a steel plate which is welded to the top of a scissors jack. The scissors jack is screw operated to prevent any decrease in height during treatment. Outrigger type wheel extensions on the base provide extra stability when moving. The shield raises and lowers with any 1/2” square drive ratchet wrench (not included).

Lead Size: 24” sq. x 1” T
Height Adjustment: 9” to 25”
Top of shield: Covered with 16 ga. stainless steel
Casters: Four swivel rubber
Weight: 350 lbs

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Item #	Description
956-000	Under Bed Radiation Shield
956-500	10” Ratchet with 2 1/2” Extension

UNDER BED RADIATION SHIELD

Lead: 36”sq. lead covered with steel mounted on 1/4” steel plate
Overall Size: 36” W x 36” L x 5 1/2” H
Casters: Two 4” dia. swivel, locking and two 4” dia. locking
Stay Anywhere Handle
Finish: Durable tan textured polyurethane enamel paint
Weight: 330 lbs

Item #	Description	Lead Size
956-036	Under Bed Radiation Shield	36” sq. x 1/2” T
956-038	Under Bed Radiation Shield	36” sq. x 1” T

PIG CART WITH TWO 4 1/8" SQUARE HOLES

The Pig Cart is designed to accommodate the Heyman Carrier (Item 948-020), the Side Opening Carrier (Item 949-200) or any round pig up to 4" (10.16 cm) diameter (929-001, 929-002, 99-003m 929-005) or up to a 4" (10.16 m) squore pig. The two 8" (20.32 cm) diameter ball bearing wheels and one 3" (7.62 cm) diameter swivel, locking, ball bearing caster facilitate easy mobility of the cart. A 36" (91.4 cm) long friction held “Stay Anywhere Handle” permits easy towing. The optional Removable Paper and Forceps Holder has a slot for paperwork and 2 forceps.

Specifications

Each Square Hole: 4 1/8" x 4 1/8" x 3 3/8" H (10.48 x 10.48 x 8.57 cm)
Base Size: 9" W x 13.5" L (22.9 x 34.3 cm)
Finish: Durable tan textured polyurethane enamel paint
Weight: 20 lb (9.07 kg)

Item	Description
949-260	Pig Cart with Two 4 1/8" Square Holes
949-262	Optional Removable Paper and Forceps Holder

FLETCHER / HEYMAN CARRIER SYSTEM

Radiation Exposure
The radiation level at 1 meter from the side of the carrier is 5mR/hr when loaded with 100 mg Ra-eq Cesium 137. There are high radiation levels at the top and a high overall exposure when the core is lifted. See the Low Dose Carrier System for lower exposure levels.

The sealed stainless steel Heyman Carrier has a 2.1” inside diameter x 12 3/4” usable depth. The lead protection on the sides and the bottom of the inner tube is 2 cm thick. A drop-in cover with a knob, has 2.5 cm lead. A leather strap handle is used for lifting the unit into a cart. The Heyman Carrier can be used with Heyman or Iridium Pig Cart (Item 949-260) or the 1” Lead Shielded Cart (Item 949-310).

Specifications

Shielded Height: 13.4 cm
Overall Size: 4” dia. x 16 1/8” H
Weight: 27 lbs.

Item #	Description
948-020	Heyman Carrier

Item 948-030 the unshielded stainless steel Heyman Core holds 12 Heyman capsules. The core is made of 12 separate tubes marked A - L, that are 8 mm diameter and 27 cm deep. There is a 1 1/8” handle on the top

Item 948-032 the unshielded stainless steel Fletcher-Suit-Delclos Core has three holes each 1.4 cm dia. x 12 cm deep. The core holds two afterloading bucket carriers and one plastic tandem afterloader.

Both cores can be used with the Heyman Stainless Steel Lead Carrier (Item 948-020).

Item #	Description
948-030	Heyman Core for 12 Heyman Capsules
948-032	Fletcher-Suit-Delclos Core

DOT RADIATION SOURCE CONTAINER AND CART

The Department of Transportation (DOT) Radiation Source Container holds 7 radiation sources (3 mm x 21 mm) in a lockable steel container with 2" thick lead and 1/4" thick steel walls. The top screws onto the bottom. It can all be transported in the cart. The two 8" diameter ball bearing wheels and one 3" diameter swivel, locking, ball bearing caster facilitate easy mobility of the cart. The cart has a "Stay Anywhere Handle" that is friction held at any position which permits easy towing. This unit can be transported in trunk, if using a van, the unit must be secured with a strap through the container handle.

Specifications

Dimensions: 5 1/2" dia. x 5 1/2" H
Cart Size: 9 1/2" W x 13" L
Finish: Durable tan textured polyurethane enamel paint
Container Weight: 50 lbs
Cart Weight: 16 lbs

Item #	Description
952-007	DOT Container and Cart

Optional Paper/Forceps Carrier Available Upon Request

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DOT RADIATION SOURCE TRANSPORTER

The Department of Transportation (DOT) Radiation Source Transporter has a stainless steel center tube that measures 2.1" inside diameter and 13 7/8" deep which will accommodate the FSD Leaded Core (Item 949-215). The lockable steel container has 2 1/2" thick lead and 1/4" thick steel outside walls. The two 12" diameter roller bearing rear wheels and one 6" diameter front swivel, locking, ball bearing caster facilitate easy mobility of the transporter. The DOT radiation source transporter is used to transport bucket carriers and tandems to a remote hospital/clinic by van with a wheelchair lift. The unit must be secured inside a van with nylon straps thru securing ring at rear of container. This cart has the "Stay Anywhere Handle" that is friction held at any position.
Note: The unit is not complete without FSD Leaded Core.

Specifications

Dimensions: 7" dia. x 16 3/8" H
Finish: Durable tan textured polyurethane enamel paint
Weight: 350 lbs

Item #	Description
952-010	DOT Transporter
949-215	FSD Leaded Core

Optional Paper/Forceps Carrier Available Upon Request

DOT SOURCE TRANSPORT PIG FOR NINE (9) CS-137 SOURCES

Rental Only

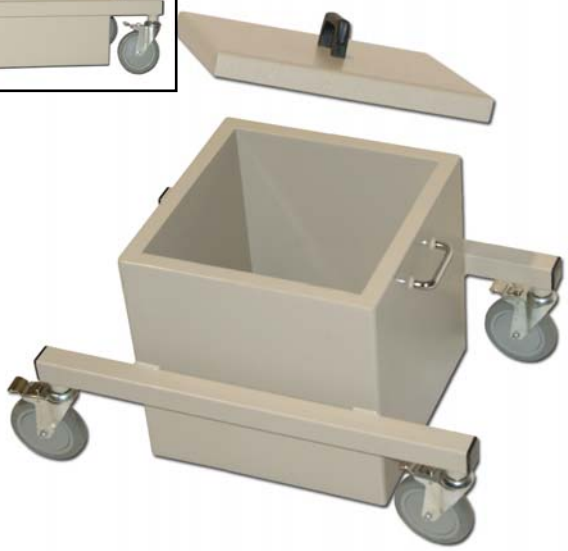
The DOT Source Transport Pig for Nine (9) Cesium-137 Sources provides for safe temporay storage and transport of up to nine (9) Cesium-137 tube sources. The set consists of a pail with a cover and handle for carrying, foam insert, stainless steel container and cap, lead pig with nine holes for sources and a lead cap. Item 067-650 is for rental only. Rental time is 30 days.

Specifications

Pig Cap: 37 mm Lead
Pig Sides: 35 mm Lead
Pig Bottom: 30 mm Lead
Hole Size: 3.17 mm Diameter x 16.5 mm
Stainless Steel Container: 29 mm bottom
Weight: 35 lbs (16 kg)

Item	Description
067-650	DOT Source Transport Pig, RENTAL ONLY

HDR CART - 1" PB, FOR RELOADING CONTAINER



The HDR Cart is designed to store HDR Source Buckets upon arrival to the department before loading into the HDR System. The four walls of the cart have a 1" (2.54 cm) lead thickness. The bottom of the cart and the cover have no lead shielding. The cart has two chrome handles on the sides and the cover has one handle. The bottom of the cart sits 1" (2.54 cm) above the floor. The container is welded to two support bars for the casters. It has four locking swivel casters for ease of moving.

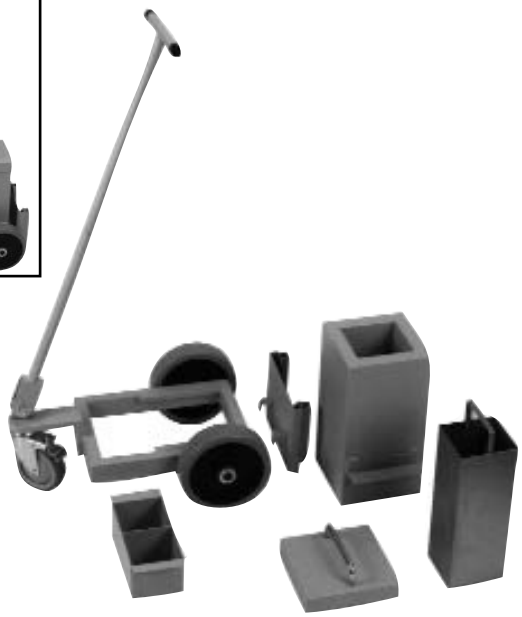
Specifications

Overall Dimensions: 24.5" W x 40.25" L x 19" H (62.2 x 102.2 x 48.3 cm)
Frame Dimensions: 22.74" W x 32.27" L (57.8 x 81.9 cm) excludes caster extension
Outside Container Dimensions: 18.74" x 18.74" x 18" H (47.6 x 47.6 x 45.7 cm)
Inside Container Dimensions: 16" x 16" x 18" H (40.6 x 40.6 x 45.7 cm)
Wall thickness: 1" (2.54 cm) lead
Wall Material: Steel and lead
Casters: Four 6" diameter (15 cm) swivel and locking
Finish: Durable tan textured polyurethane enamel paint
Weight: 734 lb (334 kg)

Item	Description
950-095	HDR Cart - 1" Pb, for Reloading Container

TRANSPORT CART AND CONTAINER

1" Thick Lead Shielded Container



The Transport Cart can accommodate the double pig holder and the 1" (2.5 cm) shielded container at the same time. The steel pig holder is 3.5" (8.9 cm) deep and divided to accommodate 2 Iridium pigs or Heyman carriers up to 4 1/16" (10.3 cm) diameter. The large steel container is shielded with 1" (2.5 cm) thick lead, and has a removable stainless steel liner with a handle.

The cover is 1" (2.5 cm) thick lead covered with steel, the inside surface is stainless steel and it has a chrome handle.

The heavy duty cart is constructed of steel tubing and 1/2" (1.3 cm) thick steel bar. There are two 8" (20.4 cm) diameter roller bearing wheels and one 5" (12.7 cm) diameter swivel, locking, ball bearing front caster to allow easy mobility. The “Stay Anywhere Handle” is friction held at any position.

A paper/forceps holder clips onto the rear of the cart frame and holds two forceps and a chart or paper work. The pig holder, shielded container, and paper/forceps holder are all removable from the cart.

The following are included with this item

- Pig Holder with two holes each 4 1/8" x 4 1/8" x 3" deep (10.5 x 10.5 x 7.6 cm)
- 1" (2.5 cm) Thick lead shielded container and cover
- Removable 18 gauge stainless steel liner with handle, Size: 4.75" x 4.75" x 11.5" H (12.1 x 12.1 x 29.3 cm)
- Cart with handle
- Paper/forceps carrier

Specifications

Size: 16" W x 22" L x 45" H w/handle up (40.8 x 56.1 x 114.7 cm)
Finish: Durable tan textured polyurethane enamel paint
Weight: 241 lb (109.3 kg)

Item	Description
950-100	Transport Cart with 1" Lead Container

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TRANSPORT CART AND CONTAINER

With 2” Thick Lead, Sliding Cover and Removable Liner

The bottom and sides of the steel container are made of 2” thick lead walls. The sliding 2” thick lead cover (64 lbs.) has a security lock. The steel container has a removable 18 gauge stainless steel liner for easy cleaning. The liner dimensions are 4” sq. x 5 7/8” deep, and the container dimensions are 4 1/2” sq. x 6” deep.

The cart is made of tubular welded steel with 3/4” axles. There are 2 - 10” diameter rear ball bearing wheels and 1 - 5” diameter swivel, locking, ball bearing front caster for easy mobility. The cart has the friction held “Stay Anywhere Handle”.

Specifications

Floor Clearance: 1”
Load Capacity: 300 lbs
Finish: Durable tan textured polyurethane enamel paint
Weight: 290 lbs

Item #	Description
950-200	Transport Cart with 2” Lead Container
950-101	Paper/Forceps Holder

Custom Sizes Available

LOW DOSE CARRIER SYSTEM

SIDE OPENING CARRIER

Stainless Steel With Lock

Easy access is provided with the side opening feature. This reduces the dose rate received because the inner core does not have to be raised to remove the source carriers. This unit provides 6" high x 3/4" thick lead shielding around the sides and 1" on the bottom. The top is shielded with 2 1/8" diameter x 1 1/8" thick lead. All lead is sealed in stainless steel for fire protection. A lock is furnished with the unit. This unit will fit in the Lead Shielded Cart (Item 949-310) or Heyman Iridium Pig Cart (Item 949-260).

Specifications

Inside Dimensions: 2 1/8" dia. x 12 1/2" H
Overall Size: 4" dia. x 15 1/4" H
Weight: 39 lbs

Item #	Description
949-200	Side Opening Carrier

FSD LEADED CORE

949-200

949-215

This lead filled stainless steel core holds four afterloading bucket carriers and two tandems. Radiation streaming from the top is minimal. The FSD Leaded Core can be used with the Side Opening Carrier (Item 949-200) and the Lead Shielded Cart (Item 949-310).

Specifications

Base Size: 2" dia. x 6" H
Overall Height: 12 1/2"
Weight: 6 lbs

Item #	Description
949-215	FSD Leaded Core

NEEDLE RACK CORE

The lead filled core holds twelve needles. The core holes have an inside diameter of 0.125" (3.1 mm) and a depth of 4.5" (114 mm). The Needle Rack Core can be used with the Side Opening Carrier (Item 949-200) and the Lead Shielded Cart (Item 949-310).

Specifications

Base Size: 2" dia. x 5 1/4" H
Overall Height: 12 1/2"
Weight: 6 3/4 lbs

Item #	Description
949-230	Needle Rack Core

LOW DOSE CARRIER SYSTEM (CONTINUED)

Radiation Survey Around Cesium 137 Source Carrier and Cart

Cesium Sources	Nominal Strength	Actual mg Ra-eq	Core in Carrier Lateral	Carrier in 1" Lead Cart		
				Lateral	Handle 45° Angle	1 Meter Above
Ovoid and Tandem						
2 3	20 mg 20-10-10 mg	35.0 mg 17.5-7.5-7.5 67.5 Total	3.2 mR/hr	0.1 mR/hr	0.2 mR/hr	Carrier with 6.0 - Open Door 0.4 - Closed Door
Heyman						
5	10 mg	52.0 mg	2.5 mR/hr	0.1 mR/hr	0.1 mR/hr	0.6 - Open Door
Ovoid, Tandem and Heyman						
2 3 5	20 mg 20-10-10 mg 10 mg	35.0 mg 17.5-7.5-7.5 52.0 119.5 Total	5.0 mR/hr	0.2 mR/hr	0.2 mR/hr	6.5 - Open Door 0.4 - Closed Door

Core: Minimum 1/4" Lead Plus Steel
Source Carrier: Minimum 3/4" Lead Plus 1/8" Stainless Steel
Cart: Minimum 1" Lead Plus 3/8" Steel

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LEAD SHIELDED CART

For Low Dose Carrier System or Nuclear Medicine

949-310

949-310 with 949-200

This Lead Shielded Cart can carry the Side Opening Carrier (Item 949-200). The radiation exposure to the body and hands is very low. The cart is constructed of steel and shielded with 1" thick lead. It has two 8" diameter roller bearing rear wheels, one 5" diameter swivel, locking, ball bearing caster and a 36" long "Stay Anywhere Handle" that is friction held at any position. An optional removable paper and forceps holders attaches to the cart on the rear axle.

Radioactive materials for Nuclear Medicine can be transported in this cart using the lead cover (Item 949-311) and drop in container (Item 949-330).

Specifications

Inside Dimensions: 4 1/2" dia. x 5 3/4" D
Finish: Durable tan textured polyurethane enamel paint
Weight: 83 lbs.

949-312

LEAD COVER

The 1" Lead Cover is constructed of steel and shielded with 1" thick lead. The inside is stainless steel and the steel\nickel chromed handle provides easy handling. The Lead Cover will fit snugly over the Lead Shielded Cart (Item 949-310).

Specifications

Dimensions: 7 1/4" dia.
Finish: Durable tan textured polyurethane enamel paint
Weight: 20 lbs

DROP IN CONTAINER

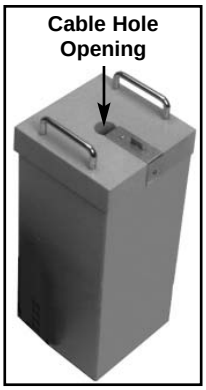
This 24 gauge stainless steel container with handle fits into the Lead Shielded Cart (Item 949-310). It can be cleaned easily.

Specifications

Inside Dimensions: 4 1/8" dia. x 5 5/8" D

Item #	Description
949-310	Lead Shielded Cart
949-311	Lead Cover
949-312	Paper Forceps Holder for 949-310
949-330	Drop-In Container

HDR EMERGENCY CONTAINER AND CART



The HDR Container is used to hold remote radiation applicator if a problem occurs. The steel container is filled with 1“ thick (2.54 cm) lead and has a removable 18 gauge stainless steel liner with a handle for easy cleaning. The liner measures 4.75" sq. x 11.5" high (12.1 x 29.2 cm). The cover is 1" thick (2.54 cm) lead filled steel with a chrome handle and stainless steel inside surface. The container has a steel lip on the sides to set in the transport cart.

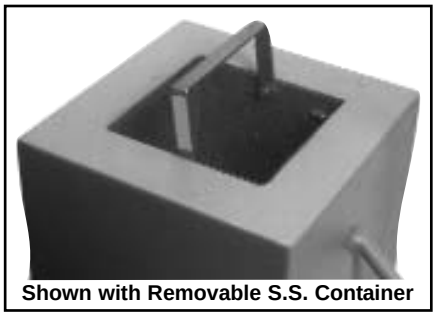
The cart is made of tubular steel and has two 8" diameter (20.3 cm) roller bearing wheels and a 5" diameter (12.7 cm) front swivel, locking, ball bearing caster. The cart has a ”Stay Anywhere Handle” which is friction held at any position and allows for easy steering and pulling.

Note: The depth and cable opening in the cover is made to customers specifications. When ordering please specify depth and cable opening size, name of contact person and phone number.

Item	Description
950-050	HDR Emergency Container
950-060	HDR Transportation Cart
950-101	Paper/Forceps Holder

HDR EMERGENCY CONTAINER

1.5" Lead Walls


Shown with Removable S.S. Container

The HDR Emergency Container is used to hold a remote applicator if a problem occurs. This container has 1.5" (3.8 cm) thick lead shielding on all sides. All walls are made of welded steel plate, sealed and filled with lead. A removable 18 gauge stainless steel container with handle fits inside which can be easily removed and cleaned. The cover is 1.5" (3.8 cm) thick with a slot for the cables. A drop-in lead plug fills the slot after the cable has been installed. The two 12" (30.5 cm) diameter roller bearing rear wheels and a 6" (15.2 cm) diameter front swivel, locking, ball bearing caster will roll easily on all floors. The “Stay Anywhere Handle” which is friction held in any position and allows for easy steering and pulling.

Specifications

Item 950-070
Inside Dimensions: 4 7/8" Sq. x 17" D (12.38 x 43.18 cm)
Overall Dimensions: 16 7/8" W x 23 1/8" L x 23" H (42.86 x 58.74 x 58.42 cm)
Cable Hole: 1" (2.54 cm) diameter hole
Handle Length: 36" L (91.44 cm)
Weight: 507 lb (230 kg)

Item 950-071
Inside Dimensions: 4 7/8" Sq. x 13 1/8" D (12.38 x 33.34 cm)
Overall Dimensions: 16 7/8" W x 23 1/8" L x 19 1/8" H (42.86 x 58.74 x 48.58 cm)
Cable Hole: 1 1/2" (3.8 cm) diameter hole
Handle Length: 36" L (91.44 cm)
Weight: 436 lb (198 kg)

Finish: Durable Tan Textured Polyurethane Enamel Paint

Item	Description
950-070	HDR Emergency Container - 1" Dia. Cable Hole
950-071	HDR Emergency Container - 1 1/2" Dia. Cable Hole
949-312	Paper/Forceps Holder

RADIOACTIVE MATERIAL CONTAINER AND CART
With 1/2" Lead Walls

Shown with Optional Foam Insert

The outside of the radiation container is 1/8" (0.32 cm) welded stainless steel. The 1 1/2" (3.8 cm) thick steel chrome plated doors are overlapping, and have heavy duty hinges. The inside and bottom are lined with 1/2" (1.27 cm) thick lead. It is made to be easily cleaned with a removable 16 gauge stainless steel inner liner. The inside dimensions are 10 1/8" W x 11 5/8" L x 10 3/4" D (25.72 x 29.53 x 27.31 cm). The container comes with a security lock.

The Cart is made of a tubular welded steel frame with 3/4" (1.9 cm) axles. The “Stay Anywhere Handle” is friction held in any position. Two 10" (25.4 cm) diameter ball bearing wheels and one 5" (12.7 cm) diameter front swivel, locking, ball bearing caster make for easy mobility.

An optional foam insert is available for the 950-000 Cart. The foam insert is made of polyethylene foam and is 7" (17.78 cm) high with four 4" (10.16 cm) diameter x 6" (15.24 cm) deep cutouts.

Specifications

Lead: 1/2" T (1.27 cm)
Dimensions: 18 1/2" W x 26" L x 16" H (47 x 66 x 40.5 cm)
Floor Clearance: 1" (2.54 cm)
Finish: Durable tan textured polyurethane enamel paint
Weight: 280 lb (127.3 kg)

Item	Description
950-000	Radioactive Material Container with Liner and Cart
950-001	Foam Insert Bottle Holder for 950-000 Cart
950-101	Paper/Forceps Holder

RECTANGULAR LEAD AND STEEL WALL CONTAINERS

The rectangular Lead and Steel Wall Container is designed for the storage and shipment of radioactive materials. The removable stainless steel liner is optional. The container has 2 side handles. The hinged cover may be locked with a padlock. There is a handle on the lead shielded lid.

The cart is a tubular welded steel frame and has a support plate for the container and 3/4" (1.9 cm) axles. There are two 10" (25.5 cm) ball bearing wheels and a 5" (12.75 cm) diameter swivel, locking, ball bearing front caster for easy mobility. The cart has the friction held “Stay Anywhere Handle”.

Note: Lead is exposed, therefore, this container **will not** meet the Fire Protection Standards or DOT (Department of Transportation) requirements.

Specifications

Item 951-100
Lead Walls: 1" T (2.5 cm)
Outisde Dimensions: 8" square x 11" (20.4 x 28 cm)
Inside Dimensions: 6" sq. x 8" H (15.3 x 20.4 cm)
Weight: 175 lb (79.5 kg)

Item	Description
951-100	1" Lead and Steel Wall Container
951-101	Stainless Steel Liner for 1” Lead Container
951-058	Cart for Lead Container
950-101	Paper/Forceps Holder

HDR EMERGENCY SHIELD FOR VARISOURCE

The HDR Emergency Shield was designed to shield the VariSource HDR system in the case of source retraction failure. The HDR Emergency shield can be rolled into position with the shield in front and covering the top of the VariSource. This will allow the Physicist or therapist protection from exposure while moving the VariSource to a corner of the room in an emergency situation. The patient can then be removed from the room.

The top, front and both sides of the shield are 1" (2.54 cm) lead covered with steel and painted. The vertical supports in the front are lead filled so there is no corner leakage. The bottom of the lead shield is 15.6" (39.6 cm) from the floor. The depth of the side shielding at the bottom of the shield is 8.5" (21.6 cm) and 20.5" (52.1 cm) at the top of the shield. The angled supports provide bracing for the shield.

The shield has one handle in the front and two on the sides with all three located in a shield area. The four casters also facilitate easy movement and the locks assure the shield stays in place.

Specifications

Overall Dimensions: 26.7" W x 32" D x 47" H
(67.8 x 81.3 x 119.4 cm) excluding casters
Lead Thickness: 1" (2.54 cm) Lead
Casters: Four 6" (15.24 cm) diameter swivel locking ball bearing
Finish: Durable tan textured polyurethane enamel paint
Weight: 898 lb (409 kg)

Item	Description
950-080	HDR Emergency Shield f/ VariSource

LEAD STORAGE CONTAINER FOR HDR

The Lead Storage Container for HDR has a 2" thick (5.08 cm) lead wall and is designed to store the source end of an HDR cable if there is a problem with the retracting system. This container can be easily moved in the cart which has 2" diameter (5.08 cm) swivel casters. The container wall and lid are made of 2" thick (5.08 cm) lead, and the container has an inside diameter of 1" (2.54 cm) and a depth of 10" (25.4 cm).

Optional: The "Stay Anywhere" Handle can be welded to the base plate of Item 994-071. The "Stay Anywhere Handle" is friction held in any position and allows for easy steering and pulling.

Specifications

Inside Dimensions: 1" Dia x 10" Deep (2.54 x 25.4 cm)
Cart Dimensions: 10" Square (25.4 cm)
Lead Wall: 2" Thick (5.08 cm)
Swivel Casters: 2" Dia (5.08 cm)
Finish: Durable tan textured polyurethane enamel paint
Weight: 100 lb (45.5 kg)

Item #	Description
994-071	Storage Container w/Cover & Cart
950-020	Optional "Stay Anywhere" Handle System

TANDEM CARRIER PIGS

Stainless Steel

970-800

970-801

The side entering Tandem Carrier Pig (Item 970-800) gives good hand protection when carrying or it can be used for emergency tandem storage in patient's room. The carrier is made of stainless steel, filled with lead and has a tandem tube made of stainless steel that is welded in place.

The top entering Tandem Carrier Pig (Item 970-801) is used for emergency tandem storage in patient's room or placed inside a lead lined radiation cart.

Specifications

Item 970-800
Lead Size: 2" sq. x 10 1/2" H
Hole Size: 8 mm W x 22 cm D
Weight: 17 lbs

Item 970-801
Lead Size: 2" sq. x 6" H
Hole Size: 8 mm W x 12.7 cm D
Weight: 16 lbs

Item #	Description
970-800	Tandem Carrier Pig with Handle
970-801	Tandem Carrier Pig

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IRIDIUM STORAGE CONTAINERS

For Iridium Ribbons

Top View

Each container in this set is marked into four quadrants. Each quadrant contains twelve stainless steel tubes for ribbons containing the same amount of seeds. Quadrants are marked for the number of seeds in each ribbon and allow 2 cm of lead shielding above the top seed. A stainless steel coil spring around the top plate allows each ribbon to be held in place by spring compression between the coils.

Item 901-030 is for ribbons containing 3-6 seeds; weight: 18 lbs., height: 6 7/8". This container is solid lead

Item 901-070 is for ribbons containing 7-10 seeds; weight: 22 1/4 lbs., height: 8 3/8". This container is solid lead

Item 901-110 is for ribbons containing 11-14 seeds; weight: 23 3/4 lbs., height: 10 3/8". This container has 3/4" of lead in the top and 5/8" of lead around the sides and bottom. This allows the largest container to be light enough for easy handling.

The nickel-chrome plated steel covers are 4" diameter x 1 3/8" thick and are secured to the main pig with a threaded stud and stainless steel T-handle.

Item #	Description	
901-000	Set of Iridium Storage Containers	
901-030	Iridium Storage Container	3 to 6
901-070	Iridium Storage Container	7 to 10
901-110	Iridium Storage Container	11 to 14

LEAD CARRYING CASES (1" Pb)

929-001

929-002

Specifications

Lead Walls: Top and Bottom: 1" Thick Lead (2.54 cm)

Item 929-001
Cavity: 1.5" Diameter x 3" Deep (3.82 x 7.65 cm)
Overall Size: 3.5" Diameter x 5" H (8.92 x 12.75 cm)
Weight: 19 lb (8.64 kg)

Item 929-002
Cavity: 1.5" Diameter x 4" Deep (3.82 x 10.2 cm)
Overall Size: 3.5" Diameter x 6" H (8.92 x 15.29 cm)
Weight: 21.5 lb (9.77 kg)

Item	Description
929-001	Lead Carrying Case (1" Pb), Cavity 1.5" Dia x 3" Deep
929-002	Lead Carrying Case (1" Pb), Cavity 1.5" Dia x 4" Deep

STAINLESS STEEL STORAGE CONTAINER
With 1" Lead

This lead shielded storage container has a stainless steel inner and outer shell. There is 1" of lead between the two shells. The lid is made of 1" thick painted lead and has a plastic handle.

This container has been designed with a lip along the rim which gives you the option to place it into a 6.5" diameter countertop hole.

Specifications

Outside Dimension: 6.4" Dia. x 7.88" H (16.2 x 20 cm), height does not include handle
Inside Dimensions: 4" Dia. x 5.6" H (10.1 x 14.3 cm)
Lead Wall: 1" (2.5 cm) thick
Lid: 1" (2.5 cm) thick lead with attached handle
Weight: 78 lb (35.38kg)

Item	Description
994-072	Stainless Steel Storage Container with 1" Lead

LEAD CARRYING CASES (3/4" Pb)

Specifications

Lead Walls: Top and Bottom: 3/4" (1.91 cm) Thick Lead
Cavity: 2" Diameter x 4" Deep (5.1 x 10.2 cm)
Overall Size: 3.5" Diameter x 5.5" H (8.92 x 14.02 cm)
Weight: 19 lb (8.64 kg)

Item	Description
929-005	Lead Carrying Case (3/4" Pb) Cavity 2" Dia x 4" Deep

LEAD LINED STORAGE CONTAINER

The Lead Lined Storage Container is ideal for storing syringes or other items that have been contaminated with low energy gamma or beta radiation residue. It provides 1/8" (0.32 cm) lead shielding to store items for decay prior to disposal. Use disposable poly liners inside the storage container.

Specifications

Shielding: 1/8" (0.32 cm) Lead
Size: 5" dia. x 6.5" H (12.75 x 16.57 cm)
Weight: 7 lb (3.2 kg)

Item	Description
929-475	Lead Lined Storage Container
929-476	Disposable Poly Liners 50/Pkg

LEAD SHIELDED SYRINGE HOLDER/PIG

The Lead Shielded Syringe Holder/Pig will accommodate unshielded syringes that contain radioisotopes, ranging from 1 cc to 20 cc. The entire syringe holder offers 1/2" of lead shielding. Its large diameter base prevents the holder from toppling over.

Specifications

Shielding: 1/2" lead
Inside Dimensions: 13/16" dia. x 5 5/8" H
Overall Size: 3 7/8" W x 6 1/2" H
Weight: 6 lbs

Item #	Description
929-100	Lead Shielded Syringe Holder/Pig

STAINLESS STEEL SYRINGE CARRIER

Lead Filled With Fixed Handle

The Stainless Steel Syringe Carrier is constructed of stainless steel inside and out, with ALL enclosed lead - not painted. The lead walls are poured between the stainless steel, so there is no exposed lead. The syringe carrier will store and transport syringes, vials or ampules up to 9" (22.94 cm) long. The lid is overlapping with a latch to prevent streaming. The lid opens 180° for easy access. There are four (4) rubber feet attached to the bottom of the carrier.

Note: Other Manufactures paint over the lead.

Specifications

Item 929-091
Overall Dimensions with Handle:
3.2" W x 10.15" L x 6.5" H (8.16 x 25.87 x 16.57 cm)
Carrier Dimensions:
2.7" W x 9.6" L x 2.5" H (6.88 x 24.47 x 6.37 cm)
Inside Dimensions:
2" W x 9" L x 2" H (5.1 x 22.94 x 5.1 cm)
Material: Stainless steel and Lead
Lead Shielding:
Top, Bottom, Sides and Ends: 1/8" T (0.317 cm)
Weight: 8 lb (4 kg)

Item 994-065
Overall Dimensions with Handle:
3.4" W x 10.9" L x 6.7" H (8.67 x 27.78 x 17.08 cm)
Carrier Dimensions:
2.9" W x 10.35" L x 2.76" H (7.39 x 26.38 x 7.04 cm)
Inside Dimensions:
2" W x 9" L x 2" H (5.1 x 22.94 x 5.1 cm)
Material: Stainless steel and Lead
Lead Shielding:
Top, Bottom and Sides: 1/4" T (0.64 cm)
Ends: 1/2" T (1.3 cm)
Weight: 16 lb (8 kg)

Item	Description
929-091	Stainless Steel Syringe Carrier, 1/8" Lead Walls
994-065	PET Stainless Steel Syringe Carrier, 1/4" Lead Walls

SHIELDED SYRINGE CARRIER

The Shielded Syringe Carriers reduce exposure while storing or transporting radioactive material. The overlapping lid design with snap-latch closure prevents streaming. The ends of the carrier are double thick to reduce the exposure from the ends of the syringes.

Specifications

Item 929-095
Inside Dims: 3" W x 8.25" L x 2.9" H (7.65 x 21.03 x 7.4 cm)
Outside Dims: 4.4" W x 9.5" L x 3.5" H (11.22 x 24.22 x 8.92 cm)
Lead Shielding:
Sides, top and bottom: 0.125" thick (0.32 cm)
Ends: 0.25" thick (0.64 cm)
Weight: 11.3 lb (5.14 kg)

Item 929-096
Inside Dims: 1.9" W x 8" L x 1.97" H (4.84 x 20.39 x 5.02 cm)
Outside Dims: 3.4" W x 9.25" L x 2.6" H (8.67 x 23.58 x 6.63 cm)
Lead Shielding:
Sides, top and bottom: 0.125" thick (0.32 cm)
Ends: 0.25" thick (0.64 cm)
Weight: 7.5 lb (3.4 kg)

Item	Description
929-095	1/8" Lead-Lined Syringe Carrier, Large
929-096	1/8" Lead-Lined Syringe Carrier, Small

CESIUM AND RADIUM SHIELDED WORK STATION

The Cesium and Radium Shielded Work Station is the ideal vehicle for the safe storage of cesium and radium. It provides optimum protection to personnel from radiation exposure when storing sources, and has sufficient work and storage area to allow flexibility when using its contents. The steel table with drawer and heavy-duty 6" diameter swivel casters lend mobility from receiving area to final work area.

Each item sold separately on the following pages.

As a guide to determine maximum isotope content for a desired surface radiation level, the Tenth-Value Layers (in lead) are shown in this table.

Cesium-137	Iridium- I92	Radium	Cobalt 60	Gold-198
2.1 cm	2.0 cm	4.6 cm	4.0 cm	1.1 cm

*National Council on Radiation Protection and Measurements. Report No. 40, "Protection Against Radiation from Brachytherapy Sources".

- **Provides optimum working conditions when using cesium and radium**
- **Designed for maximum protection and versatility**

Item #	Description
998-004	Shielded Storage Safe - 4 Drawer
998-006	Shielded Storage Safe - 6 Drawer
990-288	L-Block Lead Shield - 2" Thick Lead Glass
990-488	L-Block Lead Shield - 4" Thick Lead Glass
992-020	Steel Table with Drawer and Shelf
999-054	Halogen Spot Lamp
990-900	Stainless Steel Tray

STEEL TABLES

This steel table has smooth, round-edges and the top shelf will support both a Storage Safe (Item 998-004 or 998-006) and a L-Block Shield (Item 990-488). The table has a locking storage drawer and a heavy duty lower shelf for storing radiation pigs and supplies. The support frame of the table is tubular steel with welded joints for maximum strength. The table is welded to four 6" diameter swivel, locking, casters rated at 1,200 pounds each.

Specifications

Dimensions: 28" W x 36" D x 33 3/4" H
Inside Drawer Size: 20" W x 20" D x 5" H
Finish: Durable tan textured polyurethane enamel paint

Item #	Description	Weight
992-020	Steel Table with Drawer and Shelf	150 lbs.

This steel table has smooth, rounded edges with a stainless steel top, a locking storage drawer, and a lower shelf made of 1/8" steel. The support frame is 2" square tubular steel with welded joints for maximum strength.

Specifications

Dimensions: 24" W x 24" D x 36" H
Inside Drawer Size: 16" W x 20" D x 6 3/4" H
Finish: Durable tan textured polyurethane enamel paint

Item #	Description
992-040	Steel Table with Storage Drawer

STEEL TABLES

These Steel Tables are made with a 2" (5.08 cm) square steel tubing framework and Stainless Steel shelves. The two front legs have adjustable leveling feet. The two back legs are a fixed length.

Item	Steel Table, 2 Shelves
992-060	36" W x 24" D x 36" H (91.44 x 60.96 x 94.44 cm)
992-147	48" W x 24" D x 36" H (121.92 x 60.96 x 94.44 cm)

LEAD SIDE SHIELDS FOR STEEL TABLE

Side Shields are used when radiation protection is needed to the sides of the radiation loading area The shield's steel framework is bolted to the side of the table and the 2" thick lead blocks are stacked inside. A steel cover plate is then secured in place.

Specifications (Per Side of Shield)

Dimensions: Front Opening - 4 3/4" W x 13 3/4" H x 2" T
Side - 20" H x 24" D x 2" T

Lead Blocks: 15 blocks - 2" x 4" x 8"
1 block - 2" x 4 1/2" x 6"

Finish: Durable tan textured polyurethane enamel paint
Weight: 475 lbs

Item #	Items Shown in Photo and Sold Separately
992-020	Steel Table with Drawer and Shelf
992-132	Right - Lead Side Shield for Steel Table
992-134	Left - Lead Side Shield for Steel Table
990-288	L-Block Lead Shield - 2" Thick Lead Glass
990-488	L-Block Lead Shield - 4" Thick Lead Glass

DUAL WORKSTATION WITH LEAD SIDE SHIELDS

Lead Walls: 2" Thick
Frame: 2" steel tubing
Overall Size: 64" W x 50 1/4" H x 36" D
Casters: 4 rear fixed 6" diameter
2 front swivel 6" diameter
2 front swivel 6" diameter w/brakes
Bottom Shelf: 32" W x 36" D x 9 5/8" from floor
Side Shields: 16 7/16" H
Work Surface: 34 1/8" from floor, 28" & 30" W x x 34" D
Shelf to Bottom of Drawer: 15 1/8"
Locking Drawer Inside Dimensions: 20" W x 20" D x 5" H
Finish: Durable tan textured polyurethane enamel paint
Weight: 475 lbs

Item #	Description
992-140	Dual Workstation with Lead Side Shields

SHIELDED STORAGE SAFES

- **Latching door lock**
- **Reversible door**
- **Door opens 180º**
- **Optional Lamp Holder Stud**

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These safes are constructed of steel and shielded with 4" lead. They provide maximum protection from radiation exposure and are fire-proof. The door opens 180º so it is out of the way. The door is also reversible to open in either direction. It has a key lock which is used only to open the door. No key is needed to lock the door, simply close the door and it will latch lock. The stainless steel storage drawers (with knob) have a storage space 6" long x 1 1/2" wide x 1 1/2" deep. Drawer Inserts (Item 998-014 and 998-066) are needed for radiation sources. The shelf enclosure is made completely of stainless steel for the safe drawer to slide into. An eye bolt is furnished on top of the safe for lifting. The eye bolt can be removed and replaced with a lamp holder stud (Item 999-042 or 999-053) for supporting a lamp.

Specifications

Item 998-004
4 Drawer Safe
Size: 12 3/4" H x 12 3/4" W x 14 1/2" D
Weight: 950 lbs

Item 998-006
6 Drawer Safe
Size: 12 3/4" H x 15" W x 14 1/2" D
Weight: 1150 lbs

Finish: Durable tan textured polyurethane enamel paint

Item #	Description	Size
998-004	Shielded Storage Safe	4 Drawer
998-006	Shielded Storage Safe	6 Drawer

Order Lead Drawer Inserts Separately

SAFE DRAWER INSERTS

998-014

998-014 shown in safe drawer

998-050

The 14 Hole Lead Inserts have black plastic caps that are used to block the unused source holes. These inserts provide adequate storage space for most applications. Each insert can be marked for source size (10 mg, 15 mg, etc.). If marking of the insert is requested, specify mg Ra equivalent to be marked. The marking will be at the front of the insert. Blank Inserts are used to fill the empty drawers.

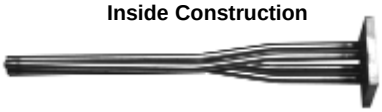
Source Size: 2.65 or 3.1 mm dia. x 20 or 21mm L
Insert Size: 1.8" Sq. x 5.9" L
14 Hole Insert Weight: 7.2 lbs
Blank Insert Weight: 7.6 lbs

Item #	Description
998-014	14 Hole Lead Insert
998-050	Blank Insert

PRE-LOADED TANDEM STORAGE DRAWER

Replaces Standard Safe Drawer

Inside Construction



The Pre-loaded Tandem Storage Drawer contains four holes. Each hole is 0.5 cm diameter x 26 cm long and made of stainless steel tubing welded into the stainless steel drawer. The drawer is then filled with lead. Radiation streaming is prevented by a curve in the tubing.

Drawer Size: 2" sq. x 13.7" L

Item #	Description
998-066	Pre-Loaded Tandem Storage Drawer

FLUORESCENT LAMP

With Magnifier

- **Convenient outlet and ballast in base**
- **6 foot - 3-conductor cord - grounded plug**
- **UL listed**

Make intricate details easier to see with bright light and magnification. This magnifying lamp can be used for radiation source inspection and reading serial numbers. A 45” steel swivel arm with tension controls allows for easy movement. A clamp-on style “D” bracket accommodates mounting on up to a 2” thickness. A 5” diameter, 3 diopter (1.75 x) lens magnifies the view while the 22-watt circular fluorescent tube floods the viewing area with light. This unit can be mounted to the top of the radiation safe by removing the eye bolt and installing a Lamp Holder Stud.

Power: 110 - 120 VAC, 60 Hz
Weight: 7.25 lbs

Item #	Description
999-041	Fluorescent Lamp
999-041-1	Replacement Fluorescent Bulb
999-042	Lamp Holder Stud for Mounting Fluorescent Lamp

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HALOGEN SPOT LAMP

With Adjustable Arm

- 20 watt halogenlamp provides projected high intensity light for over 2,000 hours.
- 24" (61.18 cm) articulated arm has 5 adjustment points.
- Compact head - 2.5" (6.37 cm) diameter.
- 4 hole universal base which can be mounted vertically or horizontally.
- A 4d + 12d magnifier can be clipped onto the light to make intricate details easier to see.

Power: 120 VAC

Item	Description
999-054	Halogen Spot Lamp
999-052	Magnifier (Optional)
999-053	Lamp Holder Stud for Mounting Halogen Spot Lamp

L-BLOCK LEAD SHIELD

With Wide View Window

The L-Block Lead Shield's tilted wide view leaded glass window provides easy viewing of the radiation loading area. 3" of lead on each side of the viewing window give maximum protection to the head. The 8" square window is made of 2" or 4" thick leaded glass. The L-Block is made of sheet steel with lead shielding inside. Two holes are provided for lifting the unit.

Specifications

Leaded Glass Size: 8" Sq. x 2" or 4" T
Lead Glass Density: 5.2 g/cm³
Tenth Value Thickness (Cesium^{137}) = 4.8 cm leaded glass
4" T. (10 cm) leaded glass = 4 cm lead equivalence
Finish: Durable tan textured polyurethane enamel paint

Item 990-288 or 990-488

Overall Size: 14" W x 17 1/2" D x 24 1/2" H x 2 1/4" T
Weight: 420 lbs or 450 lbs

Item 990-250 or 990-251

Overall Size: 14" W x 17 1/2" D x 24 1/2" H x 1 3/4" T
Weight: 280 lbs or 300 lbs

Item #	Description
990-250	L-Block Lead Shield - 1 1/2" Thick Pb, 4" Thick Pb Glass
990-251	L-Block Lead Shield - 1 1/2" Thick Pb, 2" Thick Pb Glass
990-288	L-Block Lead Shield - 2" Thick Pb, 2" Thick Pb Glass
990-488	L-Block Lead Shield - 2" Thick Pb, 4" Thick Pb Glass
990-900	Stainless Steel Tray

LEAD "L" BLOCK SHIELD

With Extra Wide View

The 1.5" thick Lead "L" Block Shield provides exceptional protection to the clinician when loading iodine and iridium.

The face shielding is made of optically clear 12" W x 8" L x 2" thick lead glass, cantilevered for unimpaired viewing of the work area. The leaded glass has a density of 5.2 g/cm³ to give maximum eye and face protection.

Specifications

Leaded Glass Size: 12" W x 8" H x 2" T (30.6 x 20. 4 x 5.1 cm)
Lead Glass Density: 5.2 g/cm³
Lead Glass: 2 cm lead equivalent (^{137}Cs energy)
Lead Thickness: 1 1/2" (3.8 cm)
Lead Density: 11.35 g/cm³
Overall Size: 12 3/8" W x 13 1/2" D x 16 7/8" H
(31.5 x 34.4 x 43.0 cm)
Front Shield Size: 12 3/8" W x 11 1/8" H (31.5 x 28.4 cm)
Finish: Durable tan textured polyurethane enamel paint
Weight: 210 lb (95.25 kg)

Item #	Description
989-415	Lead L-Block Shield

TABLE TOP SHIELD

1/2" Thick Lead with 5/8" Thick Lead Glass

The Table Top Shield with 1/2" (1.27 cm) thick lead provides exceptional protection to the clinician when filling syringes or for general hot lab work. The shield has 1/2" (1.27 cm) lead protection on all five sides. The inside stainless steel bottom is welded on all corner seams to prevent radiation sources or liquids from hiding under any edges or in any cracks, thus, providing easy cleaning. The reinforced frame work prevents any bending or twisting. One 5/8" (1.59 cm) thick leaded glass piece is inserted into a steel frame with 1/2" (1.27 cm) lead overlapping on the front of the shield.

Specifications

Leaded Glass Size: 16" W x 12" H x 5/8" T (40.8 x 30.9 x 1.59 cm)
Leaded Glass Density: 5.0 g/cm³
Lead Equivalancy @ 150 kvp: 4 mm total
Lead Thickness: 0.5" (1.27 cm)
Lead Density: 11.35 g/cm³
Viewing Area: 15.4" W x 11.35" H (39.3 x 28.9 cm)
Front Shield Size: 16" W x 15" H (40.8 x 38.2 cm)
Side and Rear Shield Size: 10" (25.5 cm) H with 6" (15.3 cm) sq. arm openings on sides
Overall Size: 16" W x 18" D x 23.5" H (40.8 x 45.9 x 59.9 cm)
Finish: Durable tan textured polyurethane enamel paint
Weight: 265 lb (120.2 kg)

Item	Description
989-320	Table Top Shield, 1/2" T Lead with 5/8" T Lead Glass

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MINI BETA SHIELD

For ^{125}Iodine or ^{103}Palladium

Shown with Optional Arm Rest

The free standing Mini Beta Shield is made of 1/8" (3.2 mm) thick stainless steel and specifically designed to protect personnel when handling beta-emitting isotopes. The shield easily fits on a bench top or cart. The shield is ideal for protection against ^{125}Iodine and ^{103}Palladium. A 8 mm thick x 10" (25.4 cm) square lead glass viewing area. The bottom of the shield has a 3/4" (2 cm) lip to contain any dropped seeds.

The optional arm rest is made of clear acrylic and has rubber pads to cushion the arms. The arm rest is 29" wide and 3.5" deep (73.7 x 9 cm). The optional arm rest can be easily mounted to the stainless steel shield with two bolts into pre-drilled holes. The arm rest can be mounted in two different positions to the front of the shield, with arm rest forwards or backwards.

Shielding Equivalency
^{125}Iodine: 10th 1/2 Value Layer = 0.056 mm lead
^{103}Palladium: 10th 1/2 Value Layer = 0.05 mm lead
Lead Density: 0.0056 cm x 11.35 g/cm³ = 0.06356
Stainless Steel Density: 1/8" (0.3175 cm) thick x 7.916 g/cm³ = 2.513

Specifications

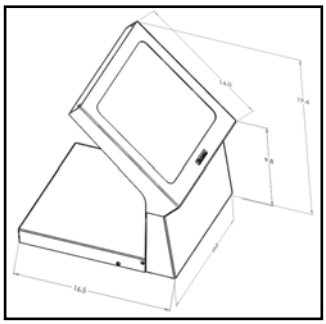
Material: 1/8" (3.175 mm) thick stainless steel
Stainless Steel Density: 7.916 g/cm³
Viewing Area: 10.25" (26 cm) Square
Leaded Glass Density: 5.0 g/cm³
Lead Equivalancy @ 150 kvp: 2 mm total
Lead Density: 11.35 g/cm³
Sterilization: Gas

Item 906-081 Mini Beta Shield Short
Size: 12" W x 12" D x 17" H (30.5 x 30.5 x 43 cm)
Weight: 31 lb (14 kg)

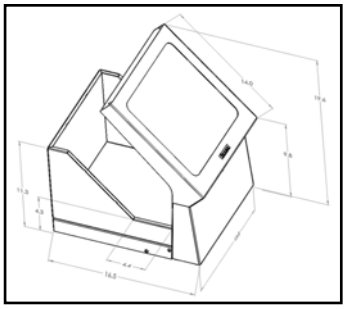
Item 906-083 Mini Beta Shield Tall
Size: 12" W x 12" D x 24.5" H (30.5 x 30.5 x 62 cm)
Weight: 36 lb (16.5 kg)

Item	Description
906-081	Mini Beta Shield Short (17" H), Stainless Steel
906-083	Mini Beta Shield Tall (24.5" H), Stainless Steel
906-082	Arm Rest for Mini Beta Shield

TABLETOP SHIELD
With 0.5" Thick Lead Glass



989-350



989-350 Shown with Side Shield

Protects the face and body when working with radioactive material. Seamless work area is easy to clean/decontaminate.

- **Shields both Beta and Gamma Radiation**
- **Seamless Stainless Steel work area for easy cleaning and decontamination**

This Tabletop Shield provides protection while working with mid- to low-energy beta and gamma radioactive materials. The shield is designed to resist tipping and incorporate shielding overlap to eliminate radiation streaming. The entire interior work surface is one continuous piece of steel for easy clean up and decontamination.

The front wall of the shield is constructed of .5" (1.2 cm) thick lead and completely encased with powder-coated steel. A lead glass window (2.0 mm LE) and a Plexiglas® panel are included. This shielding combination attenuates gamma and beta radiation, and errant bremsstrahlung, with unimpaired viewing of the work area. An optional 2.0 mm LE lead glass window is available to achieve 4.0 mm lead equivalency.

Optional side and bottom shields offer additional protection. Manufactured to be durable, the Beta/Gamma Tabletop Shield is framed in steel with a powder-coat finish.

Specifications

Tabletop Shield
Lead Shielding: 0.5" thick (1.2 cm)
Dimensions: 13.8" W x 16.5" D x 19.6" H (35.1 x 42.0 x 49.8 cm)
Viewing Panel
Lead Equivalency: 2 mm (an optional lead glass panel can be paired to achieve 4.0 mm lead equivalency)
Clear Plexiglas®: For beta Shielding
Viewing Area: 11.1" x 11.1" (28.2 x 28.2 cm)
Finish: Silver powder coat
Side Shield
Lead Shielding: 0.25" thick (0.64 cm)
Finish: Silver powder coat
Dimensions: See drawing featured above
Shipping Weight
Item 989-350: 79 lb (35.8 kg)
Item 989-352: 10 lb (4.5 kg)
Item 989-354: 42 lb (19 kg)
Item 989-356: 10 lb (4.5 kg)

Item	Description
989-350	Tabletop Shield, 0.5" Thick Lead
989-352	Optional Lead Glass Plate. 0.8mm T x 12" x 12"
989-354	Optional Side Shield, 0.25" T Lead
989-356	Optional Bottom Shield, 0.25" T Lead

PERMA-DOC PHANTOM

Compatible with VariSource® / MicroSelectron® / GammaMed® HDR Afterloading Systems

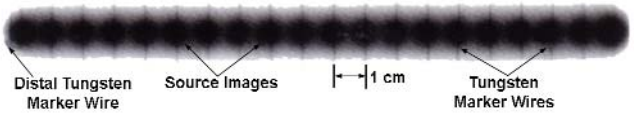
The PermaDoc Phantom is shown with the permanently embedded tungsten wire centimeter scale and removable 3mm diameter tandems.

"Your Daily Quality Assurance performed with Ease and Confidence!"

- **Verifies Source Positioning and Stepping Accuracy**
- **Images Centimeter Scale Directly on Film**
- **Requires Single Exposure Only**
- **Set-up Accomplished in Seconds**
- **Eliminates All Guess-Work**
- **Precision Built**
- **Compatible with All HDR Units**
- **Fulfills Documentary QA Requirements**

The Perma-Doc Phantom provides the necessary permanent documentation required by the NRC's new and stringent quality assurance tests associated with HDR. The Perma-Doc Phantom, with its centimeter scale automatically transferred to the film by fluorescent radiation, identifies up to 20 source positions and their stepping accuracy. Two matching 3/8" plexi plates allow for insertion of a 10" x 12" ready-pack V-film. The film is exposed by the HDR Ir-192 source with dwell times of I second over a maximum of 20 positions spaced 1 cm apart. The resulting film displays the source images superimposed on the image of the centimeter scale.

Source Images are Superimposed on the Image of the Centimeter Scale



Shown is part of the V-film exposed with an HDR Ir-192 source for dwell times of 1 second over a distance of 20 cm. Source position and stepping accuracy are verified by scale lines that pass exactly through the centers of the corresponding source images. Most importantly, the first two distally located markers are spaced such as to represent the distance from tip of tandem to center of active source.

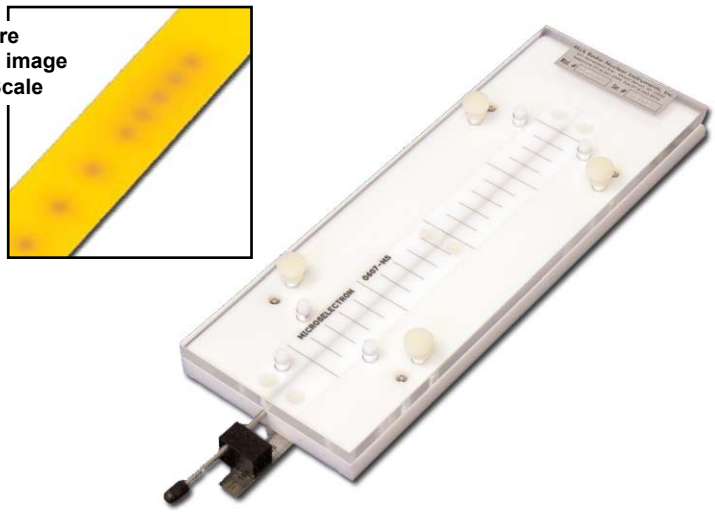
For example: Tip of tandem to center of source for the GammaMed 12i sources is 3.75mm, i.e., separation of the first two tungsten wires is 3.75mm. With the incorporation of the distal marker wire, the necessity to prick a hole into the film is therefore eliminated.

Item #	Description
940-400-V	Perma-Doc Phantom, VariSource® HDR
940-400-M	Perma-Doc Phantom, microSelectron® HDR
940-400-G	Perma-Doc Phantom, GammaMed® 12i(t) HDR
940-400-GM	Perma-Doc Phantom, GammaMed® Plus HDR

Specify Connector Type: Click Fit or Screw

PERMA-DOC GC PHANTOM

For use with GAFCHROMIC® RTQA Film



- **Verifies Source Positioning and Stepping Accuarcy**
- **Images Centimeter Scale Directly on Film**
- **Requires Single Exposure Only**
- **Set-Up Accomplished in Seconds**
- **Eliminates All Guess-Work**
- **Small / Lightweight and Precision Built**
- **Compatible with all HDR Remote Afterloaders**
- **Fulfills Documentary QA Requirements**
- **GAFCHROMIC® RTQA Film is "Self-Developing"**
- **Eliminates the Need of a Darkroom**
- **Film can be Handled in Room Light**
- **Simple, Easy and Efficient QA Management**

The Perma-Doc GC Phantom is designed to check source positioning and stepping accuracy of all popular HDR remote afterloading systems and provides a permanent record. The Perma-Doc GC Phantom has a centimeter scale, which is projected onto the GAFCHROMIC® RTQA film by fluorescent radiation, and readily locates, up to 20 source positions.

The device consists of two plexi-glass plates stacked on top of each other with five locating pins and four knobs to ensure alignment. Four embedded ball plungers provide a space for easy insertion of the film. A 3 mm diameter groove is provided for the insertion of a straight tandem. A metric ruler is attached to the microSelectron® phantom below the tandem to assist in setting the tandem to the calibrated position. A thumbscrew is provided to keep the tandem securely in place.

According to U.S. Regulatory Commission 10 CFR 35.633, source positioning accuracy on remote afterloading units is to be within ± 1 mm. Additionally, it is highly recommended to check source positioning accuracy daily or prior to HDR treatments. The test consists of 3 easy steps: insertion of GAFCHROMIC® RTQA film into PermaDoc Phantom, attachment of the source transfer tube to the PermaDoc Phantom and exposing the GAFCHROMIC® RTQA film. Due to the "self-developing" attribute of the film, the need for a visit to the darkroom is therefore eliminated.

Specifications

Size: 4" x 13" x 1 5/8" (10.2 x 33 x 4.2 cm) Tandem Inserted
Weight: 1.75 lb (0.8 kg)

Note: The PermaDoc GC Phantom can only be used with GAFCHROMIC® RTQA film strips.

Item #	Description
940-406-G	PermaDoc GC Phantom, GammaMed12i(t)HDR/Gafchromic RTQA
940-406-GM	PermaDoc GC Phantom, GammaMed PlusHDR/Gafchromic RTQA
940-406-M	PermaDoc GC Phantom, microSelectron HDR/Gafchromic RTQA
940-406-V	PermaDoc GC Phantom, VariSource HDR & Gafchromic RTQA
115-024	Gafchromic Film, RTQA2-111, 1.25" x 11"

DOT SOURCE TRANSPORT PIG FOR NINE (9) CS-137 SOURCES

Rental Only

The DOT Source Transport Pig for Nine (9) Cesium-137 Sources provides for safe temporay storage and transport of up to nine (9) Cesium-137 tube sources. The set consists of a pail with a cover and handle for carrying, foam insert, stainless steel container and cap, lead pig with nine holes for sources and a lead cap. Item 067-650 is for rental only. Rental time is 30 days.

Specifications

Pig Cap: 37 mm Lead
Pig Sides: 35 mm Lead
Pig Bottom: 30 mm Lead
Hole Size: 3.17 mm Diameter x 16.5 mm
Stainless Steel Container: 29 mm bottom
Weight: 35 lbs (16 kg)

Item	Description
067-650	DOT Source Transport Pig, RENTAL ONLY

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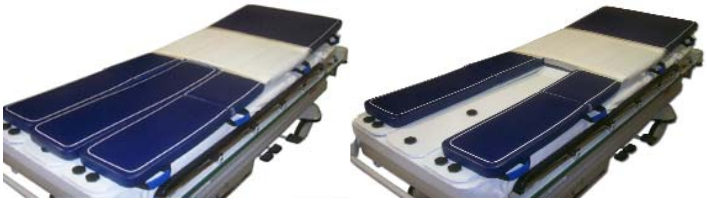
SLESSINGER BOARD FOR HDR BRACHYTHERAPY



Photos courtsey of S.Dahlbeck, MD and A. Fung, PhD, University Medical Center, Lubbock, TX

- **CT and MR Compatible**
- **Easy to Clean**

The Slessinger Board is a padded sliding board that is CT and MR compatible. It is designed to facilitate HDR brachytherapy, specifically for pelvic treatments. The patient can be transferred onto the board from the operating room couch and remain on the board in recovery, during imaging for planning and until the HDR treatment is given. The intent is to minimize patient movement to ensure that the imaging for planning is not compromised by patient leg movement prior to treatment and thus delivering the treatment plan faithfully. The legs are slightly elevated, affording ready access to the perineum and preventing applicators from resting against anything. Leg elevation is maintained with the use of two (2) tightening knobs at the end of the elevation panels. Transfers on and off CT/MR/simulator couches are relatively easy due to the smooth plastic bottom surface and side handles. The board is also very useful when a patient is transferred via ambulance from the surgical facility to the treatment facility.

Image guided HDR brachytherapy is gaining in prominence. Prostate and gynecological applications are reliant on patient stability and comfort between the acquisition of imaging for planning and treatment. Although the Slessinger Board was devised to facilitate precise prostate HDR brachytherapy its application for image guided GYN HDR is also very significant with increasing reliance on DVH analyses. The concept of limiting rotation of a multichannel APBI balloon is yet another possible application, by avoiding the patient walking between imaging and treatment prior to each treatment fraction. The rationale and description of the Slessinger Board has also been described in the Brachytherapy Journal article by Slessinger, entitled "Practical considerations for prostate HDR brachytherapy", published early in 2010.

The Slessinger Board can be easily cleaned with non-caustic germicidal cloths or sprays. Patients may not be carried on the Slessinger Board, but rather are transferred directly from one support to another.

Specifications

Base Dimensions: 24" W x 72" L x 0.75" T (61 x 183 x 1.9 cm)
Base Material: Corrugated polypropylene
Pad Dimensions: 23.5" W x 69" L x 1.5" T (60 x 175 x 3.8 cm)
Pad Material: Vinyl coated closed cell foam
Weight Limit: 350 lb (159 kg)

Item	Description
946-000	Slessinger Board for HDR Brachytherapy

CESIUM-137 BRACHYTHERAPY TUBE SOURCES (EZIP)

The EZIP Cesium-137 brachytherapy tube sources contain a cesium labeled ceramic rod as the active element surrounded by two stainless steel encapsulations, each of which is of welded construction. The tube sources are available as standard size tubes, 20 mm long x 3.05 mm diameter, the inner ceramic active element is 14.8 mm long x 1.52 mm in diameter.

Each source is engraved with the manufacturer name, nuclide (Cs-137) nominal activity in MCi, and serial number.

There is a colored ring, visible from the side and one end to facilitate easy source strength identification.

CE

Item #	mg Ra-226 Equivalent (mg)	Color Code	Apparent Nominal Cesium-137 Activity (mCi)	Air Kerma Strength Nominal (μGy m²/h⁻¹)	Air Kerma Strength (μGy m²/h⁻¹)	Air Kerma Tolerance (%)
067-6505	5	Purple	12.5 mCi	36.1	32.5 - 39.7	10
067-6510	10	Red	25.0 mCi	72.3	65.0 - 79.5	10
067-6515	15	Black	37.5 mCi	108.4	97.6 - 119.2	10
067-6520	20	White	50.0 mCi	144.5	130.1 - 159.0	10
067-6525	25	Blue	62.5 mCi	180.7	162.6 - 198.7	10
067-6530	30	Orange	75.0 mCi	216.8	198.2 - 235.5	8.60
067-6535	35	Green	87.5 mCi	252.9	236.0 - 269.9	6.70
067-6540	40	Gray	100.0 mCi	289.1	270.0 - 308.2	6.60

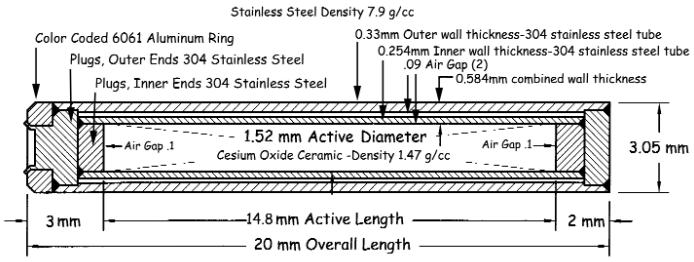


Table 1

Decay Chart for Cesium-137, Half-Life 30.0 years

Years	Decay Factor	Years	Decay Factor
0.0	1.00	5.5	.88
0.5	.99	6.0	.87
1.0	.98	6.5	.86
1.5	.97	7.0	.85
2.0	.95	7.5	.84
2.5	.94	8.0	.83
3.0	.93	8.5	.82
3.5	.92	9.0	.81
4.0	.91	9.5	.80
4.5	.90	10.0	.79
5.0	.89		

Documentation Needed to Place Order:
- A copy of your NRC license
- End Use Statement

Assumptions:
- Cesium-137 Energy: 0.66 MeV
- Gamma Factor for Cs-137: 3.3
- Gamma Factor (filtered) for Ra-266: 8.25
- Air Kerma Strength: 7.227uGy m2h-1 / mgRaEq10
- Tolerance: 5%

Radiation Protection
The HVL in lead for Cesium-137 is 6.5 mm
The TVL in lead for Cesium-137 is 21 mm

Physical Characteristics
Cesium-137 has a half-life of 30.0 years and decays with the emission of a monoenergetic gamma ray of 0.66 MeV.

To correct for physical decay of Cesium-137, the decay factors at selected years after the assay date are shown in Table 1.

How Supplied
EZIP Cesium-137 tube sources are packaged in a lead pig which is labeled to indicate the isotope, amount of activity, and calibration date. A calibration certificate and instructions for safe handling and use are also supplied.

Leak Testing
EZIP Cesium-137 tube sources are leak tested prior to shipment and the results provided with shipping certification papers that accompany each shipment.

Licensing
The U.S. Nuclear Regulatory Commission has approved this sealed source (SSDR# CA0406S125S) for distribution to persons licensed to use by product material identified in §35.400 of 10 CFR Part 35, to persons who hold an equivalent licenser issued by an Agreement State, and outside the United States, to person authorized by the appropriate authority.

Federal law restricts this device for sale by or on the order of a physician. Please observe the Department of Transportation (DOT) regulations for hazardous material contained in Title 49, code of Federal Regulations (HMR;49CFR), transport and use of radioactive material.

Isodose Curves Available Upon Request
Visit us at www.rpdinc.com or call 1.800.497.2071 for additional information,specifications, or MSDS information.

HANDLING INSTRUMENTS

Item #	Description
970-439	10" Curved Forceps
970-440	10" Tweezers for 1/8" (3mm) Dia. Source Handling
970-4402	12" Tweezers for 1/8" (3mm) Dia. Source Handling
970-441	10" Tweezers
970-442	12" Tweezers
970-443	6.5 " Reverse Action Tweezers with Groove
1006-01	5 1/2" Scissors

HOLDING FORCEPS

Item #	Forceps
970-952	Straight, Serrated, 9 1/2"
970-960	Curved, Serrated, 9 1/2"
970-978	Straight, Smooth, 9 1/2"
970-986	Curved, Smooth, 9 1/2"

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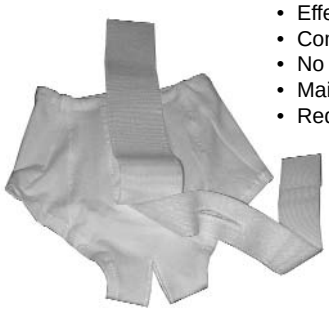
RADIATION IMPLANT BRIEF



- Effective means of securing the implant
- Comfortable - no sutures
- No skin irritation - no tape
- Maintains patient dignity
- Reduces staff exposure to radiation

The radiation implant brief will accommodate LDR and HDR gyn brachytherapy applicators. The brief is made of a soft cotton lycra spandex and is sized according to a womens standard undergarment size. A slit in the fabric allows the physician to insert the applicator and catheters and to pack the vaginal cavity with gauze. The implant is held in place by a strap that goes between the leg from front to back.

The brief is comfortable for the patient as no labia sutures or tape are needed. The brief covers the patient genitalia and perineum which helps maintain the patient's dignity.

Item #	Radiation Implant Brief
970-050	S, Fits 36-38" Hips (underpant 5)
970-051	M, Fits 39-41" Hips (underpant 6)
970-052	L, Fits 42-44" Hips (underpant 7)
970-053	XL, Fits 45-47" Hips (underpant 8)
970-054	1X, Fits 48-50" Hips (underpant 9)

Item #	Radiation Implant Brief
970-055	2X, Fits 51-53" Hips (underpant 10)
970-056	3X, Fits 54-56" Hips (underpant 11)
970-057	4X, Fits 57-59" Hips (underpant 12)
970-058	5X, Fits 60-62" Hips (underpant 13)

ROUNDED NYLON DILATORS

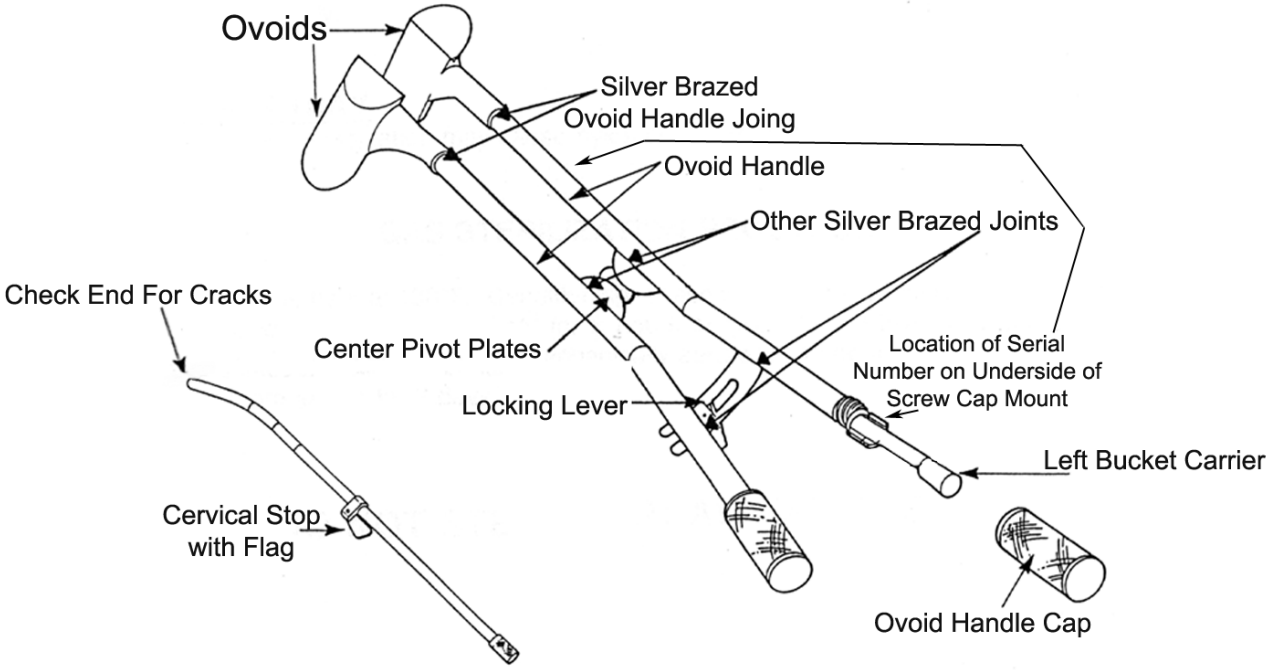
The Rounded Nylon Dilator has one elliptical radius end and one full rounded end. The dilator is 10" long and very durable. It can take a drop to the floor without breaking.

Sterilization: Gas

Item #	Rounded Nylon Dilator
970-656-10	10 mm Diameter
970-656-15	15 mm Diameter
970-656-20	20 mm Diameter
970-656-25	25 mm Diameter
970-656-30	30 mm Diameter
970-656-35	35 mm Diameter
970-656-40	40 mm Diameter
970-656-45	45 mm Diameter
970-656-50	50 mm Diameter

Repair and Testing Services for ALL Aferloading Applicators, Call for Details.

FLETCHER-SUIT-DELCLOS (FSD) APPLICATOR INSPECTIONS, TESTS AND REPAIRS



Complete units, including the bucket carriers, must be sent to Radiation Products Design for repair. When sending in an applicator for repair the following information is needed: contact name, phone number, address and what repairs are needed.

Radiation Products Design does fiber optic inspection of tungsten shielding inside of the ovoid. We can detect if the tungsten shields are mounted at the top and the bottom of the ovoid.

The following tests can be conducted at Radiation Products Design or within your organization:

Separate the Fletcher-Suit-Delclos (FSD) Applicator into two halves and conduct **Tests A, B, C and D** on each half as follows:

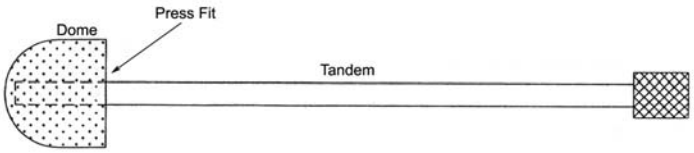
Mechanical Test A
Gently manipulate each ovoid with one hand while holding the ovoid handle with the other. Each ovoid should be solidly attached to the handle. If the ovoid is loose, Test A fails and unit may be repaired. No other tests need to be done. If test A passes, continue to Test B.

Visual Test B
Visually inspect each half of the FSD for hairline cracks at the top and bottom of the ovoid and the ovoid handle joint. Inspect silver-brazed joints where center pivots and the locking brackets attach to the ovoid handles. If cracks are seen, Test B fails and unit may be repaired. No other tests need to be done. If Test B passes, continue to Test C.

Pressure Test C
Conduct the following test on each half of the FSD:
Test 1: Remove the ovoid handle cap from the end of the ovoid handle
Test 2: Remove the bucket carrier
Test 3: Stand the ovoid in a cup of water to a depth above the ovoid handle joint
Test 4: Apply slight air pressure on the open end of the FSD handle (using for example, a 20 cc syringe connected to surgical tubing connected to the FSD handle), and look for air bubbles escaping from the ovoid or ovoid handle joint. If bubbles are seen, Test C fails and unit may be repaired. If Test C passes, the ovoid is solidly attached to the ovoid handle and no immediate action is necessary.

Fiber Optics or Radiograph Test D
Use fiber optic inspection for tungsten placement or radiograph using film.
If Tests A, B, C or D fails stop using the FSD for patient therapy.

DELCLOS UTERINE/VAGINAL AFTERLOADING APPLICATOR TEST AND INSPECTION



Mechanical Test for Dome Tandem Assembly
With one hand grip the dome and with the other hand grip the tandem then try pulling the two apart. If the two pull apart stop using the unit for patient therapy.

CAUTION FOR FLETCHER-SUIT APPLICATORS

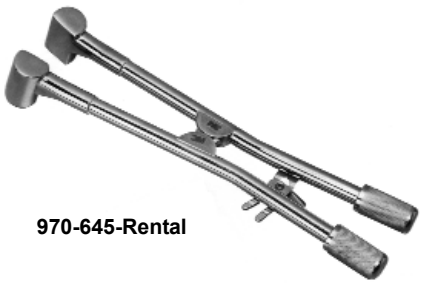
"The U.S. Food and Drug Administration (FDA) has received reports of eight incidents in which the closed end of the intrauterine colpostats of a Fletcher Suit applicator separated from the applicator and remained in the uterus after the applicator had been removed, necessitating an additional removal procedure. Clearly this can cause undesirable complications for patients and holds the potential for the loss radioactive sources within the patient's uterus. The reasons for these separations is unknown. However, cleaning the applicator with hydrogen peroxide or glutaraldehyde (Cidex) prior to autoclaving or cold sterilization can result in corrosion of the applicator's welds.

FDA is using this notice to alert users of Fletcher Suit applicators of this potential problem. FDA believes that all Fletcher Suit applicators should be inspected to determine whether or not the closed end of the colpostats or the colpostats themselves are adequately secured, and that any applicators that are questionable should not be used. Until recently, manufacturers guidance on cleaning and sterilization may not have been clear. The applicators should be cleaned using **only** a mild detergent and water, and then thoroughly rinsed with water before sterilization.

Although, to date, FDA has only received reports of the problems with Fletcher Suit applicators, it is also recommending that all applicators of similar design be checked, and that the same cleaning instructions be followed."

The above article appears in the American Association of Physicists in Medicine. Volume 14 No. 3, May/June 1988, Pages 7 and 8.

RENTALS AND REPLACEMENT PARTS FOR 3M #6586 FSD AFTERLOADING APPLICATOR



970-645-Rental

The 3M #6586 FSD Applicator is no longer available for purchase. Item 970-642, 970-650 and 970-653 on the following pages are suggested replacements.

Complete units including the bucket carriers must be sent to Radiation Products Design for repair or fitting of Ovoid Caps When sending in an applicator for repair the following information is needed: contact name, phone number, address and what repairs are needed.

Item #	Description
970-645-RENTAL	Rental for 3M #6586 FSD Applicator

Replacement parts for the 3M #6586 Fletcher-Suit Delclos Shielded Afterloading Applicators

Item #	Description
970-000	12 Plastic Tandems and Pushers
970-010	12 Plastic Tandems
970-020	12 Plastic Pushers
970-200	Straight Standard Tandem w/Cap
970-201	#1 - 15º Standard S.S. Tandem w/Cap
970-202	#2 - 30º Standard S.S. Tandem w/Cap
970-203	#3 - 45º Standard S.S. Tandem w/Cap
970-204	#4 - 60º Standard S.S. Tandem w/Cap
970-212	S.S. Cap for Tandem
970-216	S.S. Cervical Stop
970-217	S.S. Flagged Cervical Stop
970-218	S.S. Screw Cervical Stop #4-40 x 5/16"
970-220	S.S. 3/32" Allen Wrench
970-229	Optional - S.S. Tandem Support Bracket w/1/16" Wrench

Item #	Description
970-645-06	Sterilization Tray
970-645-12	S.S. Cap for Ovoid Handle
970-645-15	S.S. Locking Knob #6-32
970-645-16	S.S. Locking Lever 3M #6-32
970-645-19	2.0 cm Right "D" Shape Nylon Ovoid Cap
970-645-20	2.0 cm Left "D" Shape Nylon Ovoid Cap
970-645-21	2.0 cm Right Nylon Ovoid Cap w/Tungsten
970-645-22	2.0 cm Left Nylon Ovoid Cap w/Tungsten
970-645-26	2.5 cm Right Nylon Ovoid Cap w/Tungsten
970-645-27	2.5 cm Left Nylon Ovoid Cap w/Tungsten
970-645-31	3.0 cm Right Nylon Ovoid Cap w/Tungsten
970-645-32	3.0 cm Left Nylon Ovoid Cap w/Tungsten
970-645-40	Right S.S. Bucket Carrier
970-645-42	Left S.S. Bucket Carrier

GYN APPLICATORS & ACCESSORIES

PLASTIC AFTERLOADERS

970-000

970-030

Item	Description
970-000	12 Plastic Tandems and Pushers
970-010	12 Plastic Tandems **Only**
970-020	12 plastic Pushers **Only**
970-030	50 Nylon Spacer Balls - 3/32" Dia. (2.4 mm)
970-040	12 Mini plastic Tandems and Pushers

TUNGSTEN DUMMY SOURCES

985-001 985-010 985-020 985-030 985-031

Item	Description
985-001	Tungsten Dummy Source 3.2 mm Dia. x 20 mm L
985-010	Tungsten Mini Dummy Source 1.6 mm Dia. x 19 mm L
985-020	3M FSD Al Cased Tungsten Dummy Source with Hole Outside: 3.0 mm Dia. x 20 mm L Tungsten: 1.5 mm Dia. x 13.8 mm L
985-030	3M FSD Tungsten Mini Dummy Source 3.0 mm Dia. x 20 mm L
985-031	3M Tungsten Mini Dummy Source 3.0 mm Dia. x 16 mm L

T

STANDARD AND MINI TANDEMS

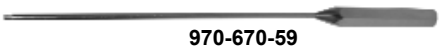
970-201 to 970-206

970-212

970-216

970-217

970-670-59



970-218

970-242

970-243

970-246

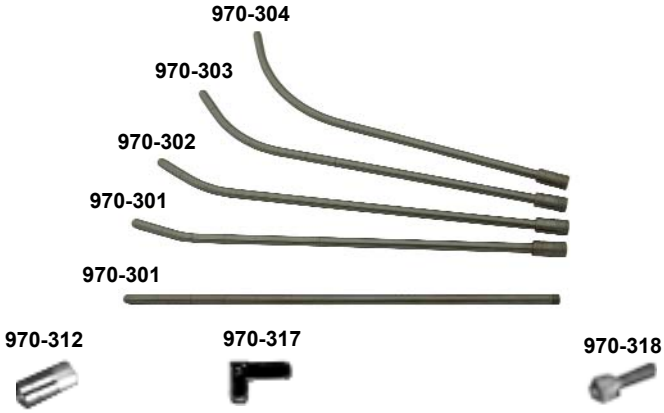
970-231 to 970-233

970-220

Item #	Description
970-200	Straight Standard S.S. Tandem w/Cap
970-201	#1 - 15° Standard S.S. Tandem w/Cap
970-202	#2 - 30° Standard S.S. Tandem w/Cap
970-203	#3 - 45° Standard S.S. Tandem w/Cap
970-204	#4 - 60° Standard S.S. Tandem w/Cap
970-205	#3 - 45° Double Curved S.S. Tandem for Bracket w/Cap
970-206	#4 - 60° Double Curved S.S. Tandem for Bracket w/Cap
970-212	S.S. Cap for Tandem (3M Style)
970-216	S.S. Cervical Stop
970-217	S.S. Flagged Cervical Stop
970-218	S.S. Screw Cervical Stop #4-40 x 5/16”
970-220	S.S. 3/32” Allen Wrench
970-670-59	S.S. 3/32” Long Handle Allen Wrench

Item #	Description
970-231	Mini #1 - 15° S.S. Tandem w/Cap
970-232	Mini #2 - 30° S.S.Tandem w/Cap
970-233	Mini #3 - 45° S.S. Tandem w/Cap
970-242	Mini S.S. Cervical Stop
970-243	Mini S.S. Flagged Cervical Stop
970-246	FSD S.S. Bucket Liner for Mini Sources

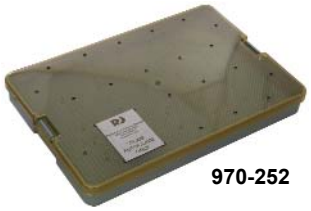
TITANIUM STANDARD TANDEMS AND ACCESSORIES



Item #	Description	Material
970-300	Straight Standard Tandem w/Cap	Titanium
970-301	#1 - 15° Standard Tandem w/Cap	Titanium
970-302	#2 - 30° Standard Tandem w/Cap	Titanium
970-303	#3 - 45° Standard Tandem w/Cap	Titanium
970-304	#4 - 60° Standard Tandem w/Cap	Titanium
970-312	Cap for Tandem	Titanium
970-317	Flagged Cervical Stop	Titanium
970-318	Screw Cervical Stop #4-40 x 5/16"	Titanium
970-670-08	15 cm Threaded Tandem for Dome	Titanium
970-220	3/32" Allen Wrench	Stainless Steel
970-670-59	3/32" Long Handle Allen Wrench	Stainless Steel

T

STERILIZATION TRAYS



Specifications

Overall Size: 15.5" W x 10.3" D x 1.85" H (39.5 x 26.5 x 4.7 cm)

Item	Description
970-250	Sterilization Tray with RPD Nameplate
970-252	Sterilization Tray with Autoclave Nameplate
970-254	Sterilization Tray with Gas Nameplate

WEEKS CT MINI-OVOID APPLICATOR SET

The Weeks CT Applicator Afterloading Set (with CT Mini-Ovoid, Stainless Steel Pivot, and Shielded Gold Buckets), was designed for the patient with narrow vault anatomy that will not accommodate the round ovoid of the standard Fletcher Suit Applicator. The ovoid is flattened medially. The handle is 19 cm long to the ovoid center. The ovoids, made of high temperature plastic, are 13 mm in width and 30 mm high and have a 15° angle. The handle is made of stainless steel for durability with light weight titanium knob and caps. The applicator's shielded gold bucket carriers accommodate Cesium 137 (Cs-137) sources up to 3.2 mm diameter x 20 mm long for LDR Brachytherapy treatments. Two CT Dummy Bucket Carriers with markers indicating radiation source location are also provided. Included with the set are 2 cm, 2.5 cm, and 3 cm ovoid caps made of high temperature plastic. The set also includes four 8 mm diameter coated aluminum tandems with curvatures of 15°, 30°, 45°, and 60° with caps made of high temperature plastic. The tandems are marked every 2 cm over a 12 cm range from the tip. Also included are two flagged cervical stops made of high temperature plastic.

Specifications

High temperature plastic density: 1.28 g/cm³
Gold density: 19.3 g/cm³

Sterilization

Autoclavable
Clean using detergent

Item 970-360 Weeks CT Mini-Ovoid Set Includes

(1) Applicator with Stainless Steel Pivot
(2) Shielded Gold Bucket Carriers
(2) CT Bucket Carriers for Left or Right Side
(2) 2.0 cm Diameter High Temperature Plastic (HTP) Ovoid Caps
(2) 2.5 cm Diameter High Temperature Plastic (HTP) Ovoid Caps
(2) 3.0 cm Diameter High Temperature Plastic (HTP) Ovoid Caps
(4) Coated Aluminum Tandems and Caps (15°, 30°, 45°, and 60°)
(2) Flagged Cervical Stops, High Temperature Plastic
(1) 3/32" Allen Wrench
(4) Plastic Tandems and Pushers for Sources
(1) Sterilization Tray

Item	Description
970-360	Weeks CT Mini-Ovoid Pivot S.S. Applicator Set w/Tray
970-360-001	Weeks CT Mini-Ovoid Pivot S.S. Applicator (Set Only)
970-360-002	Weeks CT Mini-Ovoid Pivot S.S. Applicator ONLY

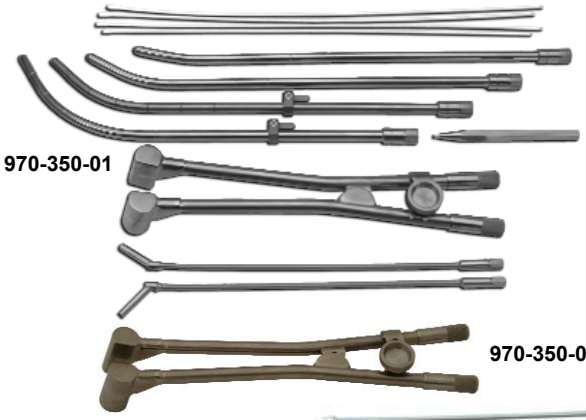
Replacement parts for Weeks CT Applicator Item 970-360

Item	Description
970-000	12 Plastic Tandems and Pushers
970-010	12 Plastic Tandems
970-020	12 Plastic Pushers
970-101	DVD on Fletcher Colpostat Technique
970-220	3/32" Allen Wrench
970-360-10	Bucket Carrier, Right, Shielded Gold
970-360-11	Bucket Carrier, Left, Shielded Gold
970-360-25	CT Bucket Carrier (Right or Left Side)
970-360-30	Cap, Titanium, for Ovoid Handle
970-360-32	Knob, Locking, Titanium
970-360-50	2.0cm Right Ovoid HTP Cap, No Tungsten
970-360-51	2.0cm Left Ovoid HTP Cap, No Tungsten
970-360-52	2.5cm Right Ovoid HTP Cap, No Tungsten

Item	Description
970-360-53	2.5cm Left Ovoid HTP Cap, No Tungsten
970-360-54	3.0cm Right Ovoid HTP Cap, No Tungsten
970-360-55	3.0cm Left Ovoid HTP Cap, No Tungsten
970-371	#1 - 15°, 8mm Dia. Tandem, Coated Alum. w/ Cap
970-372	#2 - 30°, 8mm Dia. Tandem, Coated Alum. w/ Cap
970-373	#3 - 45°, 8mm Dia. Tandem, Coated Alum. w/ Cap
970-374	#4 - 60°, 8mm Dia. Tandem, Coated Alum. w/ Cap
970-375	Flagged Cervical Stop, High Temperature Plastic
970-3752	Screw Aluminum Cervical Stop #4-40 x 5/16"
970-377	Cap for Tandem, High Temperature Plastic
970-379	Dummy Source for CT, Teflon
970-645-06	Sterilization Tray

TITANIUM MINI-OVOID LONG HANDLE AFTERLOADING APPLICATOR SET WITH TITANIUM PIVOT

970-350



970-350-01

970-350-02

970-353-70

970-353-60

Optional
970-650-40 to 970-650-45

Optional
970-229

The Titanium Mini-Ovoid Long Handle Afterloading Applicator Set with Titanium Pivot was designed for the patient with a narrow or tortuous vault that will not accommodate the round ovoid of the standard Fletcher-Suit Applicator. The ovoid is flattened medially to accommodate a very small anatomy. The flattened area results in an increased dose to the cervix. The handle is 19 cm long to the ovoid center. The ovoids are 12 mm in width, 29 mm high, have a 15° angle and **do not have shielding**. The applicator bucket carriers accommodate Cesium 137 sources up to 3.2 mm diameter x 20 mm long. Option dummy sources are available (Item 985-000 to Item 985-031). Tungsten shielded high temperature plastic ovoid caps are optional. The titanium tandems are marked every 2 cm over a 12 cm range.

T

Sterilization:
Clean using detergent
Autoclavable

Item 970-350 Titanium Mini-Ovoid Long Handle Afterloading Applicator Set with Titanium Pivot includes:
(1) Applicator with titanium pivot and two bucket carriers
(4) Titanium tandems and caps -15°, 30°, 45° and 60°
(2) Titanium flagged cervical stops
(1) 3/32" Allen wrench
(4) Plastic tandems and pushers
(1) Sterilization tray

Item 970-350-01 is the same as Item 970-350 without the sterilization tray.

Item 970-350-02 is the applicator with titanium pivot and two bucket carriers.

Item #	Description
970-350	Mini-Ovoid Applicator Set with Sterilization Tray
970-350-01	Mini-Ovoid Applicator Set without Sterilization Tray
970-350-02	Mini-Ovoid Applicator with (2) Bucket Carriers

Replacement parts for the Titanium Mini-Ovoid with Pivot Applicator Item 970-350, 970-350-01 and 970-350-02

Item #	Description
970-000	12 Plastic Tandems and Pushers
970-010	12 Plastic Tandems
970-020	12 Plastic Pushers
970-300	Optional Straight Standard Titanium Tandem w/Cap
970-301	#1 - 15° Standard Titanium Tandem w/Cap
970-302	#2 - 30° Standard Titanium Tandem w/Cap
970-303	#3 - 45° Standard Titanium Tandem w/Cap
970-304	#4 - 60° Standard Titanium Tandem w/Cap
970-312	Cap for Tandem - Titanium
970-317	Flagged Cervical Stop - Titanium
970-318	Screw for Flagged Cervical Stop #4-40 x 5/16" - Titanium
970-220	3/32" Allen Wrench
970-670-59	Optional - 3/32" Large Handle Allen Wrench

Item #	Description
970-353-12	Cap for Ovoid Handle - Titanium
970-350-18	Optional Tandem Support Hook Assembly - Titanium
970-353-70	Right/Left Bucket Carrier - Stainless Steel
970-353-60	Optional Right/Left CT Bucket Carrier - Titanium/Delrin
970-350-50	Knob #6-32 - Titanium
970-645-06	Sterilization Tray
970-650-40	Optional 2.0 cm Right Ovoid HTP Cap w/Tungsten
970-650-41	Optional 2.0 cm Left Ovoid HTP Cap w/Tungsten
970-650-42	Optional 2.5 cm Right Ovoid HTP Cap w/Tungsten
970-650-43	Optional 2.5 cm Left Ovoid HTP Cap w/Tungsten
970-650-44	Optional 3.0 cm Right Ovoid HTP Cap w/Tungsten
970-650-45	Optional 3.0 cm Left Ovoid HTP Cap w/Tungsten
970-229	Optional Tandem Support Bracket S.S. w/1 1/16" Wrench

FLETCHER-SUIT DELCLOS SHIELDED ROUND OVOID STAINLESS STEEL APPLICATOR

- **Lightweight**
- **Easy Source Loading Procedure**
- **Unbreakable Joints**

FSD Shielded Round Ovoid Long Handle Applicator with Stainless Steel Pivot employs the same features as the Rectangular Handle Fletcher-Suit Afterloading applicator but is less bulky, lighter, and has an easier source loading procedure. The lead (density 11.35 g/cm^3) shields were replaced with high density 19.3 g/cm^3 tungsten. The handle is 19 cm long to the ovoid center. The ovoid's are 20 mm in diameter, 30 mm high, have a 15° angle. The ovoid's have immovable tungsten shielding for bladder and rectal protection. The handle is stainless steel for durability with a lightweight titanium knob and lightweight titanium ovoid handle caps. The handle is completely Heli-Arc welded at all joints including pivot and locking for unbreakable joints. The applicator bucket carriers accommodate Cesium 137 sources up to 3.2 mm diameter x 20 mm long. A hole in the bucket carrier allows the user to push the source out, if the source gets stuck inside the bucket carrier. Ovoid caps increase the diameter of the ovoid. Four ovoid caps, (2) 2.5 cm and (2) 3.0 cm diameter are furnished with the applicator. The stainless steel tandems are marked every 2 cm over a 12 cm range. Optional items available include Stainless Steel Tandem Support Bracket with 1/16" Allen Wrench (Item 970-229) Tungsten Dummy Sources (Item 985-030) and Cesium 137 Tube Sources (Items 067-6510 to 067-6540).

Item 970-541 Includes
(1) Applicator with Stainless Steel Pivot and Two Bucket Carriers
(2) 2.5 cm Diameter Nylon Ovoid Cap
(2) 3.0 cm Diameter Nylon Ovoid Cap
(4) Stainless Steel Tandems and Caps (15°, 30°, 45°, and 60°)
(1) Cervical Stop
(2) Flagged Cervical Stops
(1) 3/32" Allen Wrench
(4) Plastic Tandems and Pushers for Sources
(1) Sterilization Tray

Item 970-541-1 Includes
(1) Applicator with Stainless Steel Pivot and Two Bucket Carriers
(2) 2.5 cm Diameter Nylon Ovoid Cap
(2) 3.0 cm Diameter Nylon Ovoid Cap
(4) Stainless Steel Tandems and Caps (15°, 30°, 45°, and 60°)
(1) Cervical Stop
(2) Flagged Cervical Stops
(1) 3/32" Allen Wrench
(4) Plastic Tandems and Pushers for Sources

Item 970-541-2 Includes
(1) Applicator with Stainless Steel Pivot and Two Bucket Carriers
(2) 2.5 cm Diameter Nylon Ovoid Cap
(2) 3.0 cm Diameter Nylon Ovoid Cap

Item	Description
970-541	F.S.D. Shielded Round Ovoid, Stainless Steel Pivot Applicator Set with Sterilization Tray
970-541-1	F.S.D. Shielded Round Ovoid, Stainless Steel Pivot Applicator Set, No Sterilization Tray
970-541-2	F.S.D.Shielded Round Ovoid, Stainless Steel Pivot Applicator with Caps ONLY

Item	Optional Items
067-6510	Cs-137 TUBE SOURCE, 10 mg Ra Equivalent-Red
067-6515	Cs-137 TUBE SOURCE, 15 mg Ra Equivalent-Black
067-6520	Cs-137 TUBE SOURCE, 20 mg Ra Equivalent-White
067-6525	Cs-137 TUBE SOURCE, 25 mg Ra Equivalent-Blue
067-6530	Cs-137 TUBE SOURCE, 30 mg Ra Equivalent-Orange
067-6535	Cs-137 TUBE SOURCE, 35 mg Ra Equivalent-Green
067-6540	Cs-137 TUBE SOURCE, 40 mg Ra Equivalent-Gray
970-101	DVD on Fletcher Colpostat Technique
970-200	Straight Standard S.S. Tandem with Cap
970-229	S.S. Tandem Support Bracket with 1/16" Allen Wrench
985-030	Tungsten Dummy Source, 3.0 mm Dia. x 20 mm L

Item	Replacement Parts
970-000	Afterloading Plastic TANDEMS & PUSHERS (12/pkg)
970-010	Afterloading Plastic TANDEMS ONLY
970-020	Afterloading Plastic PUSHERS ONLY
970-201	#1 Tandem-15° Standard S.S with Cap (970-212)
970-202	#2 Tandem-30° Standard S.S with Cap (970-212)
970-203	#3 Tandem-45° Standard S.S. with Cap (970-212)
970-204	#4 Tandem-60° Standard S.S. with Cap (970-212)
970-212	Cap for Tandems (3M), Stainless Steel
970-216	Cervical Stop, Stainless Steel
970-217	Flagged Cervical Stop, Stainless Steel
970-218	Screw, S.S., f/Cervical Stop #4-40x5/16" Socket Head
970-220	3/32" Allen Wrench, Stainless Steel
970-360-30	Cap, Titanium, for Ovoid Handle
970-360-32	Locking Knob, Titanium
970-541-40	Bucket Carrier Right, Stainless Steel
970-541-42	Bucket Carrier Left, Stainless Steel
970-541-50	2.5cm Left/Right Nylon Ovoid Cap
970-541-52	3.0cm Left/Right Nylon Ovoid Cap
970-645-06	Sterilization Tray

FLETCHER-SUIT DELCLOS SHIELDED ROUND OVOID LONG HANDLE APPLICATOR

- **Lightweight**
- **Easy Source Loading Procedure**
- **Unbreakable Joints**

FSD Shielded Round Ovoid Long Handle Applicator with Bracket Pivot employs the same features as the Rectangular Handle Fletcher-Suit Afterloading Applicator but is less bulky, lighter, and has an easier source loading procedure. The lead (density 11.35 g/cm^3) shields were replaced with high density 19.3 g/cm^3 tungsten. The handle is 19 cm long to the ovoid center. The ovoids are 20 mm in diameter, 30 mm high, have a 15° angle. The ovoid's have immovable tungsten shielding for bladder and rectal protection. The applicator uses a two piece adjustable handle pivot bracket with a tandem supprt hook. The applicator is completely Heli-Arc welded at all joints for unbreakable joints. The applicator bucket carriers accommodate Cesium 137 sources up to 3.2 mm diameter x 20 mm long. A hole in the bucket carrier allows the user to push the source out, if the source gets stuck inside the bucket carrier. Ovoid caps increase the diameter of the ovoid. Four ovoid caps, (2) 2.5 cm and (2) 3.0 cm diameter are furnished with the applicator. The stainless steel tandems are marked every 2 cm over a 12 cm range. Optional items available include Tungsten Dummy Sources (Item 985-030) and Cesium 137 Tube Sources (Items 067-6510 to 067-6540).

Item 970-543 Includes
(1) Applicator with Bracket Pivot and Two Bucket Carriers
(2) 2.5 cm Diameter Nylon Ovoid Cap
(2) 3.0 cm Diameter Nylon Ovoid Cap
(4) Stainless Steel Tandems and Caps (15°, 30°, 45°, and 60°)
(1) Cervical Stop
(2) Flagged Cervical Stops
(1) 3/32" Allen Wrench
(1) 1/16" Allen Wrench
(4) Plastic Tandems and Pushers for Sources
(1) Sterilization Tray

Item 970-543-1 Includes
(1) Applicator with Bracket Pivot and Two Bucket Carriers
(2) 2.5 cm Diameter Nylon Ovoid Cap
(2) 3.0 cm Diameter Nylon Ovoid Cap
(4) Stainless Steel Tandems and Caps (15°, 30°, 45°, and 60°)
(1) Cervical Stop
(2) Flagged Cervical Stops
(1) 3/32" Allen Wrench
(1) 1/16" Allen Wrench
(4) Plastic Tandems and Pushers for Sources

Item 970-543-2 Includes
(1) Applicator with Bracket Pivot and Two Bucket Carriers
(2) 2.5 cm Diameter Nylon Ovoid Cap
(2) 3.0 cm Diameter Nylon Ovoid Cap
(1) 1/16" Allen Wrench

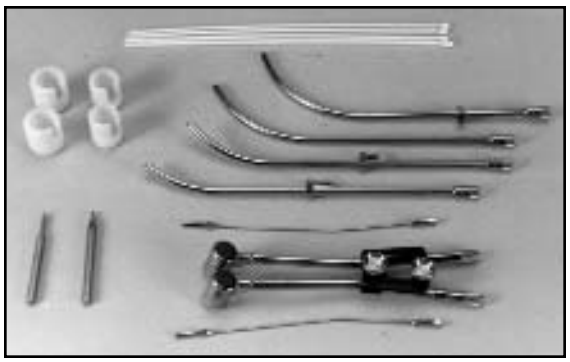
Item	Description
970-543	F.S.D. Shielded Round Ovoid, Bracket Pivot Applicator Set with Sterilization Tray
970-543-1	F.S.D. Shielded Round Ovoid, Bracket Pivot Applicator Set, No Sterilization Tray
970-543-2	F.S.D. Shielded Round Ovoid, Bracket Pivot Applicator with Caps and 1/16" Allen Wrench ONLY

Item	Optional Items
067-6510	Cs-137 TUBE SOURCE, 10 mg Ra Equivalent-Red
067-6515	Cs-137 TUBE SOURCE, 15 mg Ra Equivalent-Black
067-6520	Cs-137 TUBE SOURCE, 20 mg Ra Equivalent-White
067-6525	Cs-137 TUBE SOURCE, 25 mg Ra Equivalent-Blue
067-6530	Cs-137 TUBE SOURCE, 30 mg Ra Equivalent-Orange
067-6535	Cs-137 TUBE SOURCE, 35 mg Ra Equivalent-Green
067-6540	Cs-137 TUBE SOURCE, 40 mg Ra Equivalent-Gray
970-101	DVD on Fletcher Colpostat Technique
970-200	Straight Standard S.S. Tandem with Cap
985-030	Tungsten Dummy Source, 3.0 mm Dia. x 20 mm L

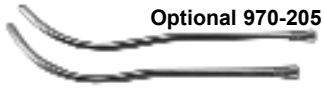
Item	Replacement Parts
970-000	Afterloading Plastic TANDEMS & PUSHERS (12/pkg)
970-010	Afterloading Plastic TANDEMS ONLY
970-020	Afterloading Plastic PUSHERS ONLY
970-201	#1 Tandem-15° Standard S.S with Cap (970-212)
970-202	#2 Tandem-30° Standard S.S with Cap (970-212)
970-203	#3 Tandem-45° Standard S.S. with Cap (970-212)
970-204	#4 Tandem-60° Standard S.S. with Cap (970-212)
970-212	Cap for Tandems (3M), Stainless Steel
970-216	Cervical Stop, Stainless Steel
970-217	Flagged Cervical Stop, Stainless Steel
970-218	Screw, S.S., f/Cervical Stop #4-40x5/16" Socket Head
970-220	3/32" Allen Wrench, Stainless Steel
970-643-22	Handle Bracket Set, Complete with Knobs and Wrench
970-360-30	Titanium Cap for Ovoid Handle
970-541-40	Bucket Carrier Right, Stainless Steel
970-541-42	Bucket Carrier Left, Stainless Steel
970-541-50	2.5cm Left/Right Nylon Ovoid Cap
970-541-52	3.0cm Left/Right Nylon Ovoid Cap
970-645-06	Sterilization Tray

FLETCHER-SUIT DELCLOS SHIELDED ROUND LONG HANDLE AFTERLOADING APPLICATOR SET
With Tandem Support
Replacement for Rectangular Handle Fletcher-Suit Applicator

970-643



970-643-01



Optional 970-205

Optional 970-206

The FSD Shielded Round Long Handle S.S. Afterloading Applicator employs the same features as the Rectangular Handle Fletcher-Suit S.S. Afterloading Applicator but is less bulky, lighter, and has an easier loading procedure of the source. The S.S. applicator handle measures 19 cm long to the ovoid. The stainless steel ovoids are 20 mm diameter x 30 mm high and have an angle of 15°. They have immovable tungsten shielding for bladder and rectal protection. The applicator uses a two piece S.S. adjustable handle pivot bracket with a tandem support hook. The applicator S.S. bucket carriers accommodate either Cesium 137 or Radium 226 sources up to 3.4 mm diameter x 23 mm long. Dummy sources are available (Item 985-000 to 985-031). The S.S. tandems are marked every 2 cm over an 8 cm range.

Item 970-643 FSD Shielded Round Long Handle Afterloading Applicator Set with Tandem Support includes:
(1) S.S. Applicator with adjustable handle bracket with a tandem support hook and two S.S. bucket carriers
(2) Each of the 2.5 and 3.0 cm diameter nylon ovoid caps
(4) Stainless steel tandems and caps - 15º, 30º, 45º and 60º
(1) S.S. Cervical stop
(2) S.S. Flagged cervical stops
(2) S.S. Allen wrenches
(4) Plastic tandems and pushers
(1) Sterilization tray

Item 970-643-01 is the same as Item 970-643 without the sterilization tray.

Item 970-643-02 is the applicator with handle bracket and tandem support hook, two bucket carriers, and a wrench.

Item #	Description
970-643	FSD Long Handle S.S. Applicator Set with Sterilization Tray
970-643-01	FSD Long Handle S.S. Applicator Set w/out Sterilization Tray
970-643-02	FSD Long Handle S.S. Applicator with Bucket Carriers

Replacement parts for the FSD Shielded Round Long Handle Applicator with Tandem Support Item 970-643, 970-643-01 and 970-643-02

Item #	Description
970-000	12 Plastic Tandems and Pushers
970-010	12 Plastic Tandems
970-020	12 Plastic Pushers
970-200	Straight Standard S.S. Tandem w/Cap
970-201	#1 - 15º Standard S.S. Tandem w/Cap
970-202	#2 - 30º Standard S.S. Tandem w/Cap
970-203	#3 - 45º Standard S.S. Tandem w/Cap
970-204	#4 - 60º Standard S.S. Tandem w/Cap
970-205	#3 - 45º Double Curved S.S. Tandem for Bracket w/Cap
970-206	#4 - 60º Double Curved S.S. Tandem for Bracket w/Cap
970-212	S.S. Cap for Tandem
970-216	S.S. Cervical Stop
970-217	S.S. Flagged Cervical Stop
970-218	S.S. Screw Cervical Stop #4-40 x 5/16"
970-220	3/32" S.S. Allen Wrench
970-670-59	Optional - 3/32" Large Handle S.S. Allen Wrench

Item #	Description
970-229-6	1/16" S.S. Allen Wrench
970-641-12	S.S. Cap for Ovoid Handle
970-641-2	2.5 cm Nylon Ovoid Cap
970-641-3	3.0 cm Nylon Ovoid Cap
970-643-18	S.S. Tandem Support Hook
970-643-19	S.S. Tandem Support Hook - Extra Long 5 mm
970-643-20	S.S. Upper Left Handle Bracket
970-643-21	S.S. Lower Right Handle Bracket
970-643-22	S.S. Handle Bracket Set
970-643-23	Nylon Pivot for Bracket
970-643-40	Right S.S. Bucket Carrier (Long Handle)
970-643-42	Left S.S. Bucket Carrier (Long Handle)
970-643-50	S.S. Knob w/Holes #10-32
970-643-51	S.S. "U" Knob #10-32
970-643-52	S.S. "U" Knob #10-32 - Extra Long 5 mm
970-645-06	Sterilization Tray

DELCLOS MINI-OVOID LONG HANDLE STAINLESS STEEL PIVOT APPLICATOR SET

- **Accommodates a Very Small Anatomy**
- **Unbreakable Joints**

The Delclos Mini-Ovoid Long Handle Afterloading Applicator Set with Stainless Steel Pivot was designed for the patient with a narrow or tortuous vault that will not accommodate the round ovoid of the standard Fletcher-Suit Applicator. The ovoid is flattened medially to accommodate a very small anatomy. The flattened area results in an increased dose to the cervix. The handle is 19 cm long to the ovoid center. The ovoid's are 12.8 mm in width, 30 mm high, have a 15° angle and **do not have shielding**. The handle is stainless steel for durability with a lightweight titanium knob and lightweight titanium ovoid handle caps. The handle is completely Heli-Arc welded at all joints including pivot and locking for unbreakable joints. The applicator bucket carriers accommodate Cesium 137 sources up to 3.2 mm diameter x 20 mm long. A hole in the bucket carrier allows the user to push the source out, if the source gets stuck inside the bucket carrier. The stainless steel tandems are marked every 2 cm over a 12 cm range. Optional items available include Stainless Steel Tandem Support Bracket with 1/16" Allen Wrench (Item 970-229), 2.0 cm, 2.5 cm and 3.0 cm diameter Tungsten Shielded High Temperature Plastic Ovoid Caps (Items 970-650-40 to 970-650-45), Cesium 137 Tube Sources (Items 067-6510 to 067-6540) and Tungsten Dummy Sources (Item 985-030).

Item 970-550 Includes
(1) Applicator with Stainless Steel Pivot and Two Bucket Carriers
(4) Stainless Steel Tandems and Caps (15°, 30°, 45°, and 60°)
(1) Cervical Stops
(2) Flagged Cervical Stops
(1) 3/32" Allen Wrench
(4) Plastic Tandems and Pushers for Sources
(1) Sterilization Tray

Item 970-550-1 Includes
(1) Applicator with Stainless Steel Pivot and Two Bucket Carriers
(4) Stainless Steel Tandems and Caps (15°, 30°, 45°, and 60°)
(2) Flagged Cervical Stops
(1) 3/32" Allen Wrench
(4) Plastic Tandems and Pushers for Sources

Item 970-550-2 Includes
(1) Applicator with Stainless Steel Pivot and Two Bucket Carriers

Item	Optional Items
067-6510	Cs-137 TUBE SOURCE, 10 mg Ra Equivalent-Red
067-6515	Cs-137 TUBE SOURCE, 15 mg Ra Equivalent-Black
067-6520	Cs-137 TUBE SOURCE, 20 mg Ra Equivalent-White
067-6525	Cs-137 TUBE SOURCE, 25 mg Ra Equivalent-Blue
067-6530	Cs-137 TUBE SOURCE, 30 mg Ra Equivalent-Orange
067-6535	Cs-137 TUBE SOURCE, 35 mg Ra Equivalent-Green
067-6540	Cs-137 TUBE SOURCE, 40 mg Ra Equivalent-Gray
970-101	DVD on Fletcher Colpostat Technique
970-200	Straight Standard S.S. Tandem with Cap
970-229	S.S. Tandem Support Bracket with 1/16" Allen Wrench
970-650-40	2.0cm Right Mini Ovoid HTP Cap w/Tungsten Shield
970-650-41	2.0cm Left Mini Ovoid HTP Cap w/Tungsten Shield
970-650-42	2.5cm Right Mini Ovoid HTP Cap w/Tungsten Shield
970-650-43	2.5cm Left Mini Ovoid HTP Cap w/Tungsten Shield
970-650-44	3.0cm Right Mini Ovoid HTP Cap w/Tungsten Shield
970-650-45	3.0cm Left Mini Ovoid HTP Cap w/Tungsten Shield
985-030	Tungsten Dummy Source, 3.0 mm Dia. x 20 mm L

Item	Description
970-550	Delclos Mini-Ovoid Long Handle Stainless Steel Pivot Applicator Set with Sterilization Tray
970-550-1	Delclos Mini-Ovoid Long Handle Stainless Steel Pivot Applicator Set, No Sterilization Tray
970-550-2	Delclos Mini-Ovoid Long Handle Stainless Steel Pivot Applicator

Item	Replacement Parts
970-000	Afterloading Plastic TANDEMS & PUSHERS (12/pkg)
970-010	Afterloading Plastic TANDEMS ONLY
970-020	Afterloading Plastic PUSHERS ONLY
970-201	#1 Tandem-15° Standard S.S with Cap (970-212)
970-202	#2 Tandem-30° Standard S.S with Cap (970-212)
970-203	#3 Tandem-45° Standard S.S. with Cap (970-212)
970-204	#4 Tandem-60° Standard S.S. with Cap (970-212)
970-212	Cap for Tandems (3M), Stainless Steel
970-216	Cervical Stop, Stainless Steel
970-217	Flagged Cervical Stop, Stainless Steel
970-218	Screw, S.S., f/Cervical Stop #4-40x5/16" Socket Head
970-220	3/32" Allen Wrench, Stainless Steel
970-360-30	Titanium Cap for Ovoid Handle
970-360-32	Locking Knob, Titanium
970-541-40	Bucket Carrier Right, Stainless Steel
970-541-42	Bucket Carrier Left, Stainless Steel
970-645-06	Sterilization Tray

DELCLOS MINI-OVOID LONG HANDLE BRACKET PIVOT APPLICATOR SET

- **Accommodates a Very Small Anatomy**
- **Unbreakable Joints**

The Delclos Mini-Ovoid Long Handle Afterloading Applicator Set with Bracket Pivot was designed for the patient with a narrow or tortuous vault that will not accommodate the round ovoid of the standard Fletcher-Suit Applicator. The ovoid is flattened medially to accommodate a very small anatomy. The flattened area results in an increased dose to the cervix. The handle is 19 cm long to the ovoid center. The ovoids are 12.8 mm in width, 30 mm high, have a 15° angle and **do not have shielding**. The applicator uses a two piece adjustable handle pivot bracket with a tandem support hook. The applicator is completely Heli-Arc welded at all joints for unbreakable joints. The applicator bucket carriers accommodate Cesium 137 sources up to 3.2 mm diameter x 20 mm long. A hole in the bucket carrier allows the user to push the source out, if the source gets stuck inside the bucket carrier. The stainless steel tandems are marked every 2 cm over a 12 cm range. Optional items available include Tungsten Dummy Sources (Item 985-030), 2.0 cm, 2.5 cm and 3.0 cm diameter Tungsten Shielded High Temperature Plastic Ovoid Caps (Items 970-650-40 to 970-650-45) and Cesium 137 Tube Sources (Items 067-6510 to 067-6540).

Item 970-553 Includes
(1) Applicator with Bracket Pivot and Two Bucket Carriers
(4) Stainless Steel Tandems and Caps (15°, 30°, 45°, and 60°)
(1) Cervical Stop
(2) Flagged Cervical Stops
(1) 3/32" Allen Wrench
(1) 1/16" Allen Wrench
(4) Plastic Tandems and Pushers for Sources
(1) Sterilization Tray

Item 970-553-1 Includes
(1) Applicator with Bracket Pivot and Two Bucket Carriers
(4) Stainless Steel Tandems and Caps (15°, 30°, 45°, and 60°)
(1) Cervical Stop
(2) Flagged Cervical Stops
(1) 3/32" Allen Wrench
(1) 1/16" Allen Wrench
(4) Plastic Tandems and Pushers for Sources

Item 970-553-2 Includes
(1) Applicator with Bracket Pivot and Two Bucket Carriers
(1) 1/16" Allen Wrench

Item	Description
970-553	Delclos Mini-Ovoid Long Handle Applicator Set with Bracket Pivot, Tandem Support Hook and Sterilization Tray
970-553-1	Delclos Mini-Ovoid Long Handle Applicator Set with Bracket Pivot and Tandem Support Hook, No Sterilization Tray
970-553-2	Delclos Mini-Ovoid Long Handle Applicator with Bracket Pivot and Tandem Support Hook

Item	Optional Items
067-6510	Cs-137 TUBE SOURCE, 10 mg Ra Equivalent-Red
067-6515	Cs-137 TUBE SOURCE, 15 mg Ra Equivalent-Black
067-6520	Cs-137 TUBE SOURCE, 20 mg Ra Equivalent-White
067-6525	Cs-137 TUBE SOURCE, 25 mg Ra Equivalent-Blue
067-6530	Cs-137 TUBE SOURCE, 30 mg Ra Equivalent-Orange
067-6535	Cs-137 TUBE SOURCE, 35 mg Ra Equivalent-Green
067-6540	Cs-137 TUBE SOURCE, 40 mg Ra Equivalent-Gray
970-101	DVD on Fletcher Colpostat Technique
970-200	Straight Standard S.S. Tandem with Cap
970-650-40	2.0cm Right Mini Ovoid HTP Cap w/Tungsten Shield
970-650-41	2.0cm Left Mini Ovoid HTP Cap w/Tungsten Shield
970-650-42	2.5cm Right Mini Ovoid HTP Cap w/Tungsten Shield
970-650-43	2.5cm Left Mini Ovoid HTP Cap w/Tungsten Shield
970-650-44	3.0cm Right Mini Ovoid HTP Cap w/Tungsten Shield
970-650-45	3.0cm Left Mini Ovoid HTP Cap w/Tungsten Shield
985-030	Tungsten Dummy Source, 3.0 mm Dia. x 20 mm L

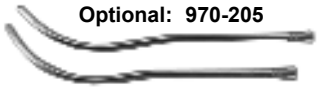
Item	Replacement Parts
970-000	Afterloading Plastic TANDEMS & PUSHERS (12/pkg)
970-010	Afterloading Plastic TANDEMS ONLY
970-020	Afterloading Plastic PUSHERS ONLY
970-201	#1 Tandem-15° Standard S.S with Cap (970-212)
970-202	#2 Tandem-30° Standard S.S with Cap (970-212)
970-203	#3 Tandem-45° Standard S.S. with Cap (970-212)
970-204	#4 Tandem-60° Standard S.S. with Cap (970-212)
970-212	Cap for Tandems (3M), Stainless Steel
970-216	Cervical Stop, Stainless Steel
970-217	Flagged Cervical Stop, Stainless Steel
970-218	Screw, S.S., f/Cervical Stop #4-40x5/16" Socket Head
970-220	3/32" Allen Wrench, Stainless Steel
970-360-30	Titanium Cap for Ovoid Handle
970-541-40	Bucket Carrier Right, Stainless Steel
970-541-42	Bucket Carrier Left, Stainless Steel
970-643-22	Handle Bracket Set, Complete with Knobs and Wrench
970-645-06	Sterilization Tray

DELCLOS MINI-OVOID LONG HANDLE AFTERLOADING APPLICATOR SET
With Tandem Support

970-653

970-653-01

Optional
970-650-40 to 970-650-45



Optional: 970-205

Optional: 970-206

The Delclos Mini-Ovoid Long Handle stainless steel Afterloading Applicator was designed for the patient with a narrow or tortuous vault that will not accommodate the round ovoid of the standard Fletcher-Suit Applicator. The stainless steel ovoid is flattened medially to accommodate a very small anatomy. The flattened area results in an increased dose to the cervix. The stainless steel handle is 19 cm long to the ovoid. The stainless steel ovoids are 12 mm in width x 29 mm high, have an angle of 15° and **do not have shielding**. The applicator uses a two piece adjustable stainless steel handle pivot bracket with a stainless steel tandem support hook. The applicator stainless steel bucket carriers accommodate Cesium 137 sources or Radium 226 sources up to 3.4 mm diameter x 23 mm long. Dummy sources are available (Item 985-000 through Item 985-031). Tungsten shielded High Temperature Plastic (HTP) ovoid caps are optional. The stainless steel tandems are marked every 2 cm over an 8 cm range.

T

Item 970-653 Delclos Mini-Ovoid Long Handle Applicator Set with Tandem Support includes:
(1) Stainless Steel Applicator with adjustable S.S. handle bracket with a Stainless Steel tandem support hook and two S.S. bucket carriers
(4) Stainless Steel tandems and caps - 15º, 30º, 45º and 60º
(1) Stainless Steel Cervical stop
(2) Stainless Steel Flagged cervical stops
(2) Stainless Steel Allen wrenches
(4) Plastic tandems and pushers
(1) Sterilization tray

Item 970-653-01 is the same as Item 970-653 without the sterilization tray.

Item 970-653-02 is the applicator with handle bracket and tandem support hook, two bucket carriers, and a wrench.

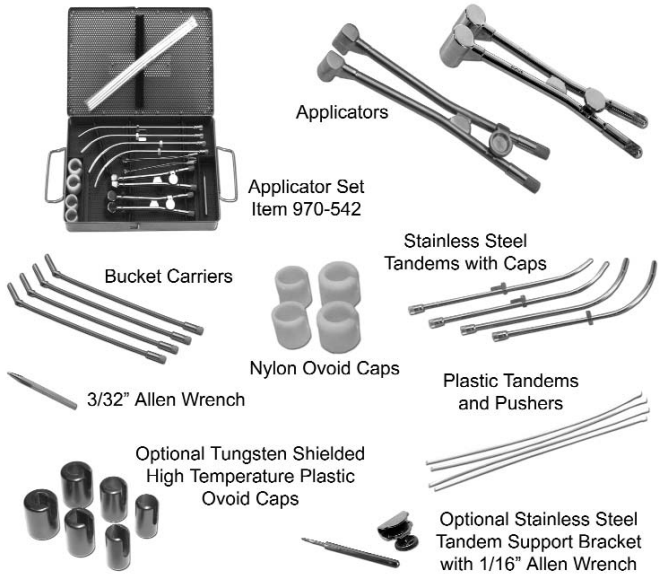
Item #	Description
970-653	Mini-Ovoid Long Handle S.S. Applicator Set with Sterilization Tray
970-653-01	Mini-Ovoid Long Handle S.S. Applicator Set, without Sterilization Tray
970-653-02	Mini-Ovoid Long Handle S.S. Applicator with S.S. Bucket Carriers

Replacement parts for the Delclos Mini-Ovoid Long Handle Applicator With Tandem Support Item 970-653, 970-653-01 and 970-653-02

Item #	Description
970-000	12 Plastic Tandems and Pushers
970-010	12 Plastic Tandems
970-020	12 Plastic Pushers
970-200	Straight Standard S.S. Tandem w/Cap
970-201	#1 - 15º Standard S.S. Tandem w/Cap
970-202	#2 - 30º Standard S.S. Tandem w/Cap
970-203	#3 - 45º Standard S.S. Tandem w/Cap
970-204	#4 - 60º Standard S.S. Tandem w/Cap
970-205	#3 - 45º Double Curved S.S. Tandem for Bracket w/Cap
970-206	#4 - 60º Double Curved S.S. Tandem for Bracket w/Cap
970-212	S.S. Cap for Tandem
970-216	S.S. Cervical Stop
970-217	S.S. Flagged Cervical Stop
970-218	S.S. Screw Cervical Stop #4-40 x 5/16”
970-220	S.S. 3/32” Allen Wrench
970-670-59	Optional - 3/32” Large Handle S.S. Allen Wrench
970-229-6	S.S. 1/16” Allen Wrench

Item #	Description
970-641-12	S.S. Cap for Ovoid Handle
970-643-18	S.S. Tandem Support Hook
970-643-20	Upper Left Handle S.S. Bracket
970-643-21	Lower Right Handle S.S. Bracket
970-643-22	S.S. Handle Bracket Set
970-643-23	Nylon Pivot for Bracket
970-643-40	Right S.S. Bucket Carrier (Long Handle)
970-643-42	Left S.S. Bucket Carrier (Long Handle)
970-643-50	S.S. Knob w/Holes #10-32
970-643-51	S.S. “U” Knob #10-32
970-645-06	Sterilization Tray
970-650-40	Optional - 2.0 cm Right Ovoid HTP Cap w/Tungsten
970-650-41	Optional - 2.0 cm Left Ovoid HTP Cap w/Tungsten
970-650-42	Optional - 2.5 cm Right Ovoid HTP Cap w/Tungsten
970-650-43	Optional - 2.5 cm Left Ovoid HTP Cap w/Tungsten
970-650-44	Optional - 3.0 cm Right Ovoid HTP Cap w/Tungsten
970-650-45	Optional - 3.0 cm Left Ovoid HTP Cap w/Tungsten
970-101	DVD on Fletcher Colpostat Technique

COMBINATION FSD SHIELDED ROUND OVOID AND DELCLOS MINI-OVOID LONG HANDLE APPLICATOR SET



- **Lightweight**
- **Easy Source Loading Procedure**
- **Accommodates a Very Small Anatomy**
- **Unbreakable Joints**

FSD Shielded Round Ovoid Long Handle Applicator with Stainless Steel Pivot employs the same features as the Rectangular Handle Fletcher-Suit Afterloading applicator but is less bulky, lighter, and has an easier source loading procedure. The ovoid's have immovable tungsten shielding for bladder and rectal protection. The applicator bucket carriers accommodate Cesium 137 sources up to 3.2 mm diameter x 20 mm long.

Item	Description
970-542	Combination FSD Shielded Round Ovoid Long Handle Applicator with Stainless Steel Pivot and Delclos Mini-Ovoid Long Handle Applicator with Stainless Steel Pivot Set, Includes Tandems and Sterilization Tray

Item	Optional Items
067-6510	Cs-137 TUBE SOURCE, 10 mg Ra Equivalent-Red
067-6515	Cs-137 TUBE SOURCE, 15 mg Ra Equivalent-Black
067-6520	Cs-137 TUBE SOURCE, 20 mg Ra Equivalent-White
067-6525	Cs-137 TUBE SOURCE, 25 mg Ra Equivalent-Blue
067-6530	Cs-137 TUBE SOURCE, 30 mg Ra Equivalent-Orange
067-6535	Cs-137 TUBE SOURCE, 35 mg Ra Equivalent-Green
067-6540	Cs-137 TUBE SOURCE, 40 mg Ra Equivalent-Gray
970-101	DVD on Fletcher Colpostat Technique
970-200	Straight Standard S.S. Tandem with Cap
970-229	S.S. Tandem Support Bracket with 1/16" Allen Wrench
970-650-40	2.0cm Right Mini Ovoid HTP Cap w/Tungsten Shield
970-650-41	2.0cm Left Mini Ovoid HTP Cap w/Tungsten Shield
970-650-42	2.5cm Right Mini Ovoid HTP Cap w/Tungsten Shield
970-650-43	2.5cm Left Mini Ovoid HTP Cap w/Tungsten Shield
970-650-44	3.0cm Right Mini Ovoid HTP Cap w/Tungsten Shield
970-650-45	3.0cm Left Mini Ovoid HTP Cap w/Tungsten Shield
985-030	Tungsten Dummy Source, 3.0 mm Dia. x 20 mm L

The Delclos Mini-Ovoid Long Handle Afterloading Applicator Set with Stainless Steel Pivot was designed for the patient with a narrow or tortuous vault that will not accommodate the round ovoid of the standard Fletcher-Suit Applicator. The ovoid is flattened medially to accommodate a very small anatomy. The flattened area results in an increased dose to the cervix. The ovoid's are 12.8 mm in width, 30 mm high, have a 15° angle and **do not have shielding.** The applicator bucket carriers accommodate Cesium 137 sources up to 3.2 mm diameter x 20 mm long.

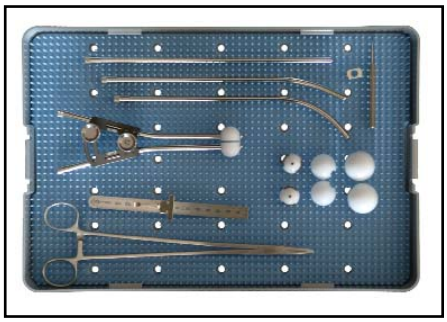
Optional items available include Stainless Steel Tandem Support Bracket with 1/16" Allen Wrench (Item 970-229), 2.0 cm, 2.5 cm and 3.0 cm diameter Tungsten Shielded High Temperature Plastic Ovoid Caps (Items 970-650-40 to 970-650-45), Cesium 137 Tube Sources (Items 067-6510 to 067-6540) and Tungsten Dummy Sources (Item 985-030).

Item 970-542 Includes

(1) FSD Shielded Round Ovoid Long Handle Applicator with Stainless Steel Pivot and Two Bucket Carriers
(2) 2.5 cm Diameter Nylon Ovoid Cap
(2) 3.0 cm Diameter Nylon Ovoid Cap
(1) Delclos Mini-Ovoid Long Handle Applicator with Stainless Steel Pivot and Two Bucket Carriers
(4) Stainless Steel Tandems and Caps (15°, 30°, 45°, and 60°)
(1) Cervical Stop
(2) Flagged Cervical Stops
(1) 3/32" Allen Wrench
(4) Plastic Tandems and Pushers for Sources
(1) Sterilization Tray

Item	Replacement Parts
970-000	Afterloading Plastic TANDEMS & PUSHERS (12/pkg)
970-010	Afterloading Plastic TANDEMS ONLY
970-020	Afterloading Plastic PUSHERS ONLY
970-201	#1 Tandem-15° Standard S.S with Cap (970-212)
970-202	#2 Tandem-30° Standard S.S with Cap (970-212)
970-203	#3 Tandem-45° Standard S.S. with Cap (970-212)
970-204	#4 Tandem-60° Standard S.S. with Cap (970-212)
970-212	Cap for Tandems (3M), Stainless Steel
970-216	Cervical Stop, Stainless Steel
970-217	Flagged Cervical Stop, Stainless Steel
970-218	Screw, S.S., f/Cervical Stop #4-40x5/16" Socket Head
970-220	3/32" Allen Wrench, Stainless Steel
970-360-30	Cap, Titanium, for Ovoid Handle
970-360-32	Locking Knob, Titanium
970-541-2	FSD Shielded Round Ovoid, SS Pivot Applicator w/Caps
970-541-40	Bucket Carrier Right, Stainless Steel
970-541-42	Bucket Carrier Left, Stainless Steel
970-541-50	2.5cm Left/Right Nylon Ovoid Cap
970-541-52	3.0cm Left/Right Nylon Ovoid Cap
970-550-2	Delclos Mini-Ovoid Long Handle Applicator w/S.S. Pivot
970-645-06	Sterilization Tray

MODIFIED HENSCHKE CERVICAL APPLICATOR SET



The Modified Henschke Cervix Applicator can be afterloaded with standard Cs-137 tube sources. The tandem can be affixed longitudinally but packing may be required to maintain the tandem's position between the ovoids. The applicator may conform to anatomically asymmetrical conditions. The 2cm diameter ovoids are provided with anterior and posterior removable tungsten shields. Tandems are provided straight, medium and maximum curved.

The Modified Henschke Cervix Applicator Set includes the following:
(2) Colpostats - Left and Right
(2) Colpostat End Caps
(2) Source Carriers for Colpostats
(1) Spacing Bracket
(2) Shielded Ovoids & Caps Set
(3) Tandems: straight, medium curved and maximum curved
(3) Tandem End Caps
(1) Source Carrier for Tandem
(1) Cervical Stop
(4) Ovoid Caps: 2.5 cm set and 3.0 cm set
(1) Stainless Steel Allenwrench
(1) Stainless Steel Ruler - 15 cm
(1) Kelly Hemostat - 10" (grooved)
(1) Stainless Steel Sterilization Tray
(1) Carrying Case

The Modified Henschke Applicator and accessories can be AUTOCLAVED.

Item #	Description
970-448	Modified Henschke Cervical Applicator Set

VIDEO ON FLETCHER COLPOSTAT TECHNIQUE

Item #	Description
970-101	DVD on Fletcher Colpostat Technique

DELCLOS UTERINE/VAGINAL AFTERLOADING APPLICATOR SET

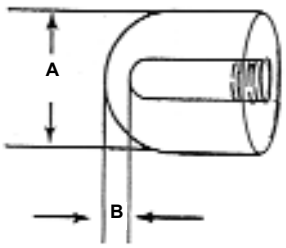
With Type "B" Dome Assembly.

970-670-01

The Delclos Uterine/Vaginal Type "B" Applicator was originally manufactured by Radium Chemical then Radium Accessories. **The dimension from the source to tip of the dome for all dome cylinders is the same (Dimension B).**

The Delclos Uterine/Vaginal Afterloading Applicator and Dome Assembly is used primarily to irradiate the vagina where the tumor extends downward from the cervix along the vaginal wall. The acrylic vaginal cylinders are 2.5 cm long permitting a maximum assembled length of 15 cm and come in diameters from 2.0 cm to 4.5 cm to accommodate different vaginal sizes. The cylinders have four stainless steel pins .1" from edge to identify the location radiographically and have an inside groove to facilitate removal with the cylinder extractor. The 15°, 30° and 45° S.S. tandems are marked every 2 cm over an 8 cm range. The dome cylinders are threaded to accommodate a 15 cm long threaded tandem.

Type "B" Threaded Dome



Dimension

A	B
2.0 cm	0.1 cm
2.5 cm	0.1 cm
3.0 cm	0.1 cm
3.5 cm	0.1 cm
4.0 cm	0.1 cm
4.5 cm	0.1 cm

Item 970-670-01 includes:

(3) S.S. Tandems with caps - 15°, 30°, 45°
(3) S.S. Cervical stops
(1) 15 cm Threaded S.S. Tandem with Cap for Dome
(2) S.S. Flagged Cylinder Stop
(1) S.S. Flat End Vaginal Tandem with Cap
(4) Plastic Tandems and Pushers
(2) 3/32" S.S. Allen Wrenches (short and long handle)
(1) S.S. Cylinder Extractor
(6) Threaded Acrylic Domes - 2.0, 2.5, 3.0, 3.5, 4.0, 4.5 cm
(5) Cylinders for Flat End Tandem - 2.5, 3.0, 3.5, 4.0, 4.5 cm
(5) 2.0 cm Acrylic Cylinders
(4) Acrylic Cylinders of each - 2.5, 3.0, 3.5, 4.0, 4.5 cm
(1) Sterilization Tray

Item 970-670-02 does not include the 3 Tandems and Cervical Stops, 1 Short Handle Allen Wrench and Sterilization Tray.

Item #	Description
970-670-01	Type "B" Applicator Set with Sterilization Tray
970-670-02	Type "B" Applicator **Without** 3 Tandems, 3 Cervical Stops, 1 Wrench & Sterilization Tray

Replacement parts for Delclos Uterine/Vaginal Afterloading Applicator With Type "B" Dome Assembly Item 970-670-01 and 970-670-02

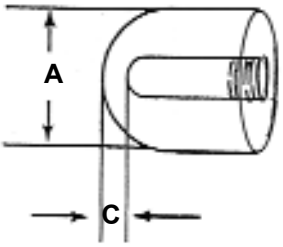
Item #	Description
970-000	12 Plastic Tandems and Pushers
970-200	Straight Standard S.S. Tandem w/Cap
970-201	#1 - 15° Standard S.S. Tandem w/Cap
970-202	#2 - 30° Standard S.S. Tandem w/Cap
970-203	#3 - 45° Standard S.S. Tandem w/Cap
970-204	#4 - 60° Standard S.S. Tandem w/Cap
970-212	S.S. Cap for Tandem
970-216	S.S. Cervical Stop
970-217	Optional: S.S. Flagged Cervical Stop
970-218	S.S. Screw Cervical Stop #4-40 x 5/16"
970-670-06	Sterilization Tray
970-670-18	15 cm Threaded S.S. Tandem for Dome
970-670-19	2.0 cm Acrylic Dome w/Thread
970-670-21	2.0 cm Acrylic Cylinder
970-670-23	15 cm Vaginal S.S. Tandem w/Flat End
970-670-24	2.5 cm Acrylic Dome w/Thread
970-670-26	2.5 cm Acrylic Cylinder
970-670-27	2.5 cm Acrylic Cylinder for Flat End Tandem

Item #	Description
970-670-29	3.0 cm Acrylic Dome w/Thread
970-670-31	3.0 cm Acrylic Cylinder
970-670-32	3.0 cm Acrylic Cylinder for Flat End Tandem
970-670-34	3.5 cm Acrylic Dome w/Thread
970-670-36	3.5 cm Acrylic Cylinder
970-670-37	3.5 cm Acrylic Cylinder for Flat End Tandem
970-670-39	4.0 cm Acrylic Dome w/Thread
970-670-41	4.0 cm Acrylic Cylinder
970-670-42	4.0 cm Acrylic Cylinder for Flat End Tandem
970-670-44	4.5 cm Acrylic Dome w/Thread
970-670-46	4.5 cm Acrylic Cylinder
970-670-47	4.5 cm Acrylic Cylinder for Flat End Tandem
970-670-49	S.S. Cylinder Extractor
970-670-52	S.S. Cylinder Stop w/Flag
970-670-54	Optional: S.S. Cylinder Stop
970-670-56	Tapered S.S. Allen Screw 4-40 x 1/4"
970-670-59	3/32" Long Handle S.S. Allen Wrench
970-670-60	3/32" Short Handle S.S. Allen Wrench

DELCLOS UTERINE/VAGINAL AFTERLOADING APPLICATOR SET
With Type "C" Dome Assembly

970-670-03

Type "C" Threaded Dome



Dimensions

A	C
2.0 cm	0.5 cm
2.5 cm	0.8 cm
3.0 cm	1.0 cm
3.5 cm	1.0 cm
4.0 cm	1.0 cm
4.5 cm	1.3 cm

The Delclos Uterine/Vaginal Type "C" Applicator was originally manufactured by 3M. **The dimension from the source to tip of dome varies for the cylinders (Dimension C).**

The Delclos Uterine/Vaginal Afterloading Applicator and Dome Assembly is used primarily to irradiate the vagina where the tumor extends downward from the cervix along the vaginal wall. The acrylic vaginal cylinders are 2.5 cm long permitting a maximum assembled length of 15 cm and come in diameters from 2.0 cm to 4.5 cm to accommodate different vaginal sizes. The cylinders have four stainless steel pins .1" from edge to identify the location radiographically and have an inside groove to facilitate removal with the cylinder extractor. The 15°, 30° and 45° S.S. tandems are marked every 2 cm over an 8 cm range. The acrylic dome cylinders are threaded to accommodate a 15 cm long threaded S.S. tandem.

Item 970-670-03 includes:
(3) S.S. Tandems with caps - 15°, 30°, 45°
(3) S.S. Cervical Stops
(1) 15 cm Threaded S.S. Tandem with Cap for Dome
(2) S.S. Flagged Cervical Stop
(1) Flat End Vaginal S.S. Tandem with Cap
(4) Plastic Tandems and Pushers
(2) 3/32" S.S. Allen Wrenches (short and long handle)
(1) S.S. Cylinder Extractor
(6) Threaded Acrylic Domes - 2.0, 2.5, 3.0, 3.5, 4.0, 4.5 cm
(5) Acrylic Cylinders for Flat End Tandem- 2.5, 3.0, 3.5, 4.0, 4.5 cm
(5) 2.0 cm Acrylic Cylinders
(4) Acrylic Cylinders of each - 2.5, 3.0, 3.5, 4.0, 4.5 cm
(1) Sterilization Tray

Item 970-670-04 does not include the 3 Tandems and Cervical Stops, 1 Short Handle Allen Wrench and Sterilization Tray.

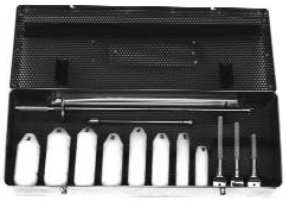
Item #	Description
970-670-03	Type "C" Applicator Set with Sterilization Tray
970-670-04	Type "C" Applicator **Without** 3 Tandems, 3 Cervical Stops, 1 Wrench & Sterilization Tray

Replacement parts for the Delclos Uterine/Vaginal Afterloading Applicator With Type "C" Dome Assembly Item 970-670-03 and 970-670-04

Item #	Description
970-000	12 Plastic Tandems and Pushers
970-200	Straight Standard S.S. Tandem w/Cap
970-201	#1 - 15° Standard S.S. Tandem w/Cap
970-202	#2 - 30° Standard S.S. Tandem w/Cap
970-203	#3 - 45° Standard S.S. Tandem w/Cap
970-204	#4 - 60° Standard S.S. Tandem w/Cap
970-212	S.S. Cap for Tandem
970-216	S.S. Cervical Stop
970-217	Optional: S.S. Flagged Cervical Stop
970-218	S.S. Screw Cervical Stop #4-40 x 5/16"
970-670-06	Sterilization Tray
970-670-18	15 cm Threaded S.S. Tandem for Dome
970-670-20	2.0 cm Acrylic Dome w/Thread
970-670-21	2.0 cm Acrylic Cylinder
970-670-23	15 cm Vaginal S.S. Tandem w/Flat End
970-670-25	2.5 cm Acrylic Dome w/Thread
970-670-26	2.5 cm Acrylic Cylinder
970-670-27	2.5 cm Acrylic Cylinder for Flat End Tandem

Item #	Description
970-670-30	3.0 cm Acrylic Dome w/Thread
970-670-31	3.0 cm Acrylic Cylinder
970-670-32	3.0 cm Acrylic Cylinder for Flat End Tandem
970-670-35	3.5 cm Acrylic Dome w/Thread
970-670-36	3.5 cm Acrylic Cylinder
970-670-37	3.5 cm Acrylic Cylinder for Flat End Tandem
970-670-40	4.0 cm Acrylic Dome w/Thread
970-670-41	4.0 cm Acrylic Cylinder
970-670-42	4.0 cm Acrylic Cylinder for Flat End Tandem
970-670-45	4.5 cm Acrylic Dome w/Thread
970-670-46	4.5 cm Acrylic Cylinder
970-670-47	4.5 cm Acrylic Cylinder for Flat End Tandem
970-670-49	S.S. Cylinder Extractor
970-670-52	S.S. Cylinder Stop w/Flag
970-670-54	Optional: S.S. Cylinder Stop
970-670-56	S.S. Tapered Allen Screw 4-40 x 1/4"
970-670-59	3/32" Long Handle S.S. Allen Wrench
970-670-60	3/32" Short Handle S.S. Allen Wrench

BURNETT AFTERLOADING VAGINAL APPLICATOR SET



970-700

970-700-02

The Burnett Afterloading Applicator is effective in reducing vaginal recurrence when used post-hysterectomy for cancer of the endometrium. Eight combinations of length and diameter are available.

Item 970-700 Burnett Afterloading Vaginal Applicator Set includes:
(8) Nylon cylinders
(1) Cylinder afterloading tandem
(1) Loading handle
(3) Screw caps with 5.7, 7.6, 8.4 cm source carriers
(4) Four plastic tandems and pushers
(1) Sterilization tray

Item 970-700-02 Burnett Afterloading Vaginal Applicator includes:
(8) Nylon cylinders
(1) Cylinder afterloading tandem
(4) Plastic tandems and pushers
(1) Sterilization tray

Specifications

Material: Nylon
Density: 1.14 -1.15 g/cm³

Item #	Description
970-700	Burnett Applicator Set
970-700-02	Burnett Applicator

Replacement parts for the Burnett Afterloading Vaginal Applicator Item 970-700, and 970-700-02

Item #	Description
970-000	12 Plastic Tandems and Pushers
970-010	12 Plastic Tandems
970-020	12 Plastic Pushers
970-212	S.S. Cap for Tandem
970-700-06	Sterilization Tray
970-700-11	“A” 20 x 66 mm Nylon Cylinder
970-700-12	“B” 20 x 87 mm Nylon Cylinder
970-700-13	“C” 25 x 87 mm Nylon Cylinder
970-700-14	“D” 30 x 87 mm Nylon Cylinder
970-700-15	“E” 35 x 87 mm Nylon Cylinder

Item #	Description
970-700-16	“F” 25 x 95 mm Nylon Cylinder
970-700-17	“G” 30 x 95 mm Nylon Cylinder
970-700-18	“H” 35 x 95 mm Nylon Cylinder
970-700-20	S.S. Screw Cap for Source Carrier
970-700-22	S.S. Loading Handle for Screw Cap w/Carrier
970-700-25	5.7 cm Long Source Carrier
970-700-27	7.6 cm Long Source Carrier
970-700-28	8.4 cm Long Source Carrier
970-700-30	S.S. 6” Afterloading Tandem with Cap for Cylinders
970-700-30-17	Sleeve Nylon Centering Set, for A,B,C,D,E,F,G,H

VAGINAL AFTER-LOADING CYLINDER SET

Vaginal Afterloading Acrylic Cylinder Set includes

(1) Acrylic Cylinder
(1) Threaded delrin plug
(2) Rectangular delrin afterloading sliders
(1) 6 cm threaded stainless steel afterloading barrel with cap
(1) Adjustable stainless steel suture ring with screw
(1) 3/32" ball hex driver
(1) Source pusher for the rectangular afterloading slider

Specifications

Vaginal Afterloading Cylinder
Material: Acrylic
Density: 1.185 g/cm³
Item 976-033: 3.3 cm dia. x 12 cm L
Item 976-038: 3.8 cm dia. x 12 cm L
Item 976-040: 4.0 cm dia. x 12 cm L

Afterloading Slider
Material: Delrin
Density: 1.425 g/cm³

Sterilization: Gas only
DO NOT clean with alcohol this may fracture the acrylic.

The Vaginal After-Loading Acrylic Cylinders are of special value where cervical tumors are large and exophytic, where the uterus has been removed, when the vagina is quite small (sometimes due to post irradiation changes) or when the cervix cannot be identified or entered because of tumor deformity. Often the applicator can be placed without more than local infiltrative anesthesia into the labia; packing is not required to hold the applicator in place. It can be adapted to irradiate both cervical and vaginal cancers and is simple to apply and afterload.

The vaginal acrylic cylinder has a 6.6 mm diameter center hole for a Fletcher tandem or an afterloading tandem. If using a afterloading tandem, a threaded delrin plug is screwed into the tip. The acrylic cylinder has two channels for the rectangular afterloading sliders and an adjustable stainless steel suture ring. The rectangular afterloading sliders are made of delrin and use a vertical source. The separation between vertical sources in the afterloading sliders is 15 mm for the 33 mm cylinder and 20 mm for the 38 mm and 40 mm cylinders. A locking spring secures the afterloading slider in the cylinder and a pressure spring holds the source in the afterloader. A source pusher is used to remove sources. Optional Lead sliders can be placed into the after-loading channel to provide shielding to the rectum or bladder.

Original paper printed in OBSTETRICS AND GYNECOLOGY, Vol. 40, No. 1, July 1972, “A New After-Loading Applicator for Treatment of Cancer of the Cervix and Vagina” by William J. Peeples, MD ET AL, Norfolk General Hospital, Norfolk, VA.

Item	Vaginal Afterloading Acrylic Cylinder Set
976-033	33 mm
976-038	38 mm
976-040	40 mm

Item	Accesories and Replacement Parts
970-000	12 Plastic Tandems and Pushers
970-010	12 Plastic Tandems
970-020	12 Plastic Pushers
976-042	Source Pusher
976-065	Optional Lead Slider for Vaginal Cylinder
977-065-33	33 mm Adjustable S.S. Suture Ring
977-065-40	40 mm Adjustable S.S. Suture Ring
977-066	Optional Lead Slider for Vaginal Cylinder w/Lock
977-067	S.S. Ball Style Hex Driver
977-068	6 cm Afterloading S.S. Barrel w/Cap
977-069	S.S. Cap for Afterloading Barrel
977-070	Delrin Threaded Plug for Cylinders

LEAD CONTAINER

For Shielding Rectangular Afterloading Slider

The Lead Container will hold four delrin afterloading sliders that are used in Items 976-033 or 976-040 loaded with ^{137}Cs.

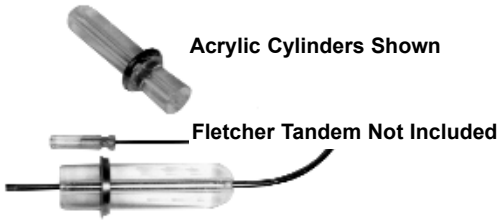
Specifications

Lead Wall: 1" (2.54 cm) Thick Lead
Lead Density: 11.35 g/cm³
Size: 6" W x 2.25" D x 3" H (15.2 x 5.7 x 7.6 cm)
Weight: 16.75 lb (7.6 kg)

Item	Description
976-060	Lead Container for Sliders

VAGINAL CYLINDERS

With 6.6 mm Diameter Tandem Hole



Acrylic Cylinders Shown

Fletcher Tandem Not Included

The Vaginal Acrylic or UHMW Cylinders are 12 cm long with a 6.6 mm diameter hole through the center for a Fletcher Tandem. Included is an adjustable stainless steel collar with suture holes for securing to the patient and a 3/32" ball socket type screwdriver for tightening the collar screw. **The tandem is not included.**

Optional:
A delrin threaded plug (Item 977-070) may be used to close the tip of the vaginal cylinder. An afterloading stainless steel barrel (Item 977-068) may be screwed in to the cylinder to hold the source tandem.

Specifications

Sterilization: Gas only
Do Not clean with alcohol, this may fracture the acrylic.
Acrylic Density: 1.185 g/cm³
UHMW Density: 0.94 g/cm³

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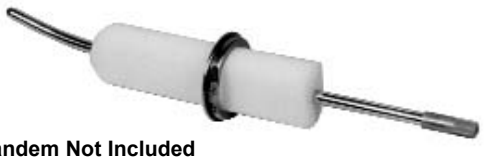
Item #	Description
970-000	12 Plastic Tandems and Pushers
970-010	12 Plastic Tandems
970-020	12 Plastic Pushers
977-019	19 mm Dia. Acrylic Cylinder w/Suture Ring
977-025	25 mm Dia. Acrylic Cylinder w/Suture Ring
977-032	32 mm Dia. Acrylic Cylinder w/Suture Ring
977-038	38 mm Dia. Acrylic Cylinder w/Suture Ring
977-060	Custom Made Acrylic Cylinder **Only** - State Size
977-065-19	19 mm Adjustable S.S. Suture Ring **Only**
977-065-25	25 mm Adjustable S.S. Suture Ring **Only**
977-065-33	33 mm Adjustable S.S. Suture Ring **Only**

Item #	Description
977-065-38	38 mm Adjustable S.S. Suture Ring **Only**
977-067	Ball Style Hex Driver
977-068	Afterloading Stainless Steel Barrel w/Cap
977-069	S.S. Cap for Afterloading Barrel
977-070	Delrin Threaded Plug for Cylinders
977-119	19 mm Dia. UHMW Low Density Cylinder w/Suture Ring
977-125	25 mm Dia. UHMW Low Density Cylinder w/Suture Ring
977-133	33 mm Dia. UHMW Low Density Cylinder w/Suture Ring
977-138	38 mm Dia. UHMW Low Density Cylinder w/Suture Ring
977-160	Custom Made - UHMW Low Density Cylinder **Only**

OBLONG UHMW LOW DENSITY CYLINDER



Fletcher Tandem Not Included

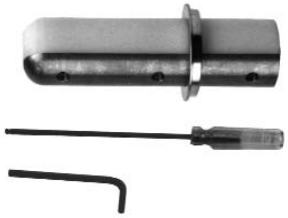
The oblong UHMW, Low Density Cylinder measures 20 mm wide x 38 mm diameter x 12 cm long with an adjustable stainless steel suture ring. It can be used with a tandem (not furnished) or it can be filled with radiation sources using the stainless steel afterloading barrel (Item 977-068) and a front end screw-in delrin plug (Item 977-070). The Plastic Tandem/Pusher (Item 970-000) source carrier can also be used. A ball hex driver is included for locking the suture ring in place.

Item #	Description
978-638	UHMW Low Density Cylinder w/Suture Ring & Hex Driver
977-068	Optional - S.S. Afterloading Barrel w/Cap
977-070	Optional - Delrin Threaded Plug

Specifications

UHMW Density: 0.94 g/cm³
Sterilization: Gas Only

NYLON CYLINDER WITH LEAD OR TUNGSTEN



The Nylon Cylinder with Lead or Tungsten has an 11 mm lead or tungsten bottom and an adjustable stainless steel suture ring. The lead or tungsten is coated with a clear polyurethane paint and easily cleaned by removing six screws with a 7/64" allen wrench (included). This unit can be used with a tandem (not furnished) or it can be filled with radiation sources using the stainless steel afterloading barrel (Item 977-068) and a front end screw-in delrin plug (Item 977-070).

The Plastic Tandem/Pusher (Item 970-000) source carrier can also be used. A ball hex driver is included for locking the suture ring in place.

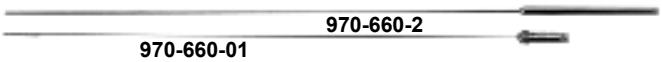
Specifications

Cylinder Weight: .8 lbs
Diameter: 33 mm
Length: 12 cm

Item #	Description
979-070	Lead/Nylon Cylinder w/Suture Ring and 2 Wrenches
979-072	Tungsten/Nylon Cylinder w/Suture Ring and 2 Wrenches
977-068	Optional - S.S. Afterloading Barrel w/Cap
977-070	Optional - Delrin Threaded Plug

Custom diameters and lengths can be made to order.

DISPOSABLE SIMON-HEYMAN APPLICATORS FOR 3M CESIUM SOURCES*



The disposable Simon-Heyman Afterloading Applicators are 6 mm in diameter and 31 mm long. They are for use with 3M Heyman Sources*. The locking end of each capsule is threaded to fit the screw-in handle on both the dummy source and the actual source. Each applicator is individually numbered and has a stainless steel obturator. There are 10 disposable afterloading applicators in each package.

The Simon-Heyman dummy sources are individually notched at both ends and numbered on the screw-in handle to correspond with each numbered Simon-Heyman disposable applicator.

***Note: 3M Heyman Sources are no longer available.**

Item #	Description
970-660-0	Simon-Heyman 3M Disposable Applicators, 10/set
970-660-2	Simon-Heyman Inserter
970-660-01	Simon- Heyman Dummy Source #1
970-660-02	Simon- Heyman Dummy Source #2
970-660-03	Simon-Heyman Dummy Source #3
970-660-04	Simon-Heyman Dummy Source #4
970-660-05	Simon-Heyman Dummy Source #5
970-660-06	Simon-Heyman Dummy Source #6
970-660-07	Simon-Heyman Dummy Source #7
970-660-08	Simon-Heyman Dummy Source #8
970-660-09	Simon-Heyman Dummy Source #9
970-660-10	Simon-Heyman Dummy Source #10

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DISPOSABLE SIMON-HEYMAN APPLICATORS FOR MICRAD** SOURCES

Picture shown with Micrad Source

The Micrad** Disposable Simon-Heyman Afterloading Applicators are for use with Micrad Heyman sources. The locking end of each capsule is threaded to fit the screw-in handle on both the dummy source and the actual source. Each applicator is individually numbered, has a stainless steel obturator, and a radio-opaque marker on the distal end. There are 10 disposable afterloading applicators in each package

****Micrad Sources manufactured by Nuclear Associates.**

Item #	Description
902-504	4 mm Dia. x __L Simon-Heyman Micrad Applicator, 10/set
902-506	6 mm Dia. x __L Simon-Heyman Micrad Applicator, 10/set
902-508	8 mm Dia. x __L Simon-Heyman Micrad Applicator, 10/set
902-510	10 mm Dia. x __L Simon-Heyman Micrad Applicator, 10/set

Customer must specify source length when ordering.

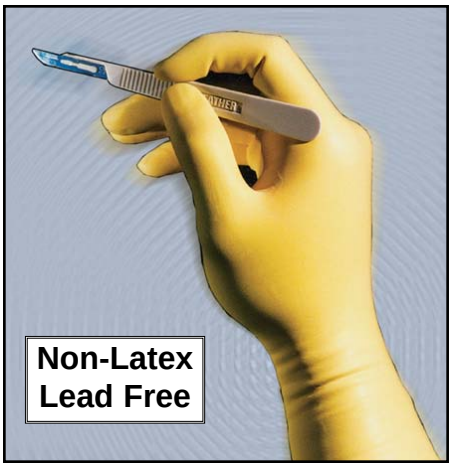
DISPOSABLE SIMON-HEYMAN APPLICATORS FOR IRIDIUM

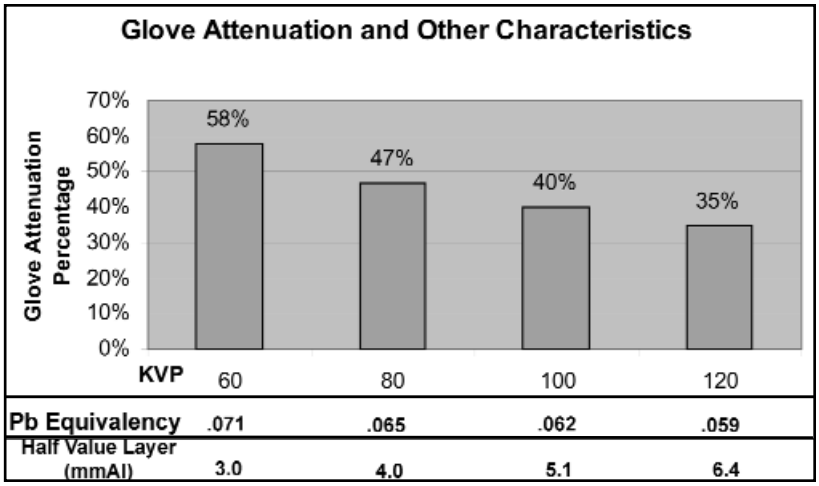
The Simon-Heyman Disposable Afterloading Applicators are available in the sizes listed below. Each applicator has a Luer fitting, a radio-opaque marker in the tip, a stainless steel obturator, and is individually numbered. These applicators are for use with Iridium-192 ribbons. There are 10 applicators in each package. Color variations for each capsule are due to the material. Optional Luer Caps with a stainless steel crimping insert are available.
Not CT Compatible.

Item #	Description
902-142	4.0 mm Dia. x 20 mm L. Simon-Heyman Disp. Applicator
902-143	4.0 mm Dia. x 30 mm L. Simon-Heyman Disp. Applicator
902-161	6.4 mm Dia. x 15 mm L. Simon-Heyman Disp. Applicator
902-162	6.4 mm Dia. x 20 mm L. Simon-Heyman Disp. Applicator
902-163	6.4 mm Dia. x 30 mm L. Simon-Heyman Disp. Applicator
902-182	8.0 mm Dia. x 20 mm L. Simon-Heyman Disp. Applicator
902-183	8.0 mm Dia. x 30 mm L. Simon-Heyman Disp. Applicator
902-202	10 mm Dia. x 20 mm L. Simon-Heyman Disp. Applicator
902-203	10 mm Dia. x 30 mm L. Simon-Heyman Disp. Applicator
902-212	Luer Caps - 10/Pkg.

STERILE ATTENUATING GLOVES

Fluoroscopic Protection and Touch Sensitivity





Test Method: ASTM F2547-06

Thickness:
Only 9 mils in thickness, Attenuating Gloves offer excellent flexibility, dexterity, and touch sensitivity. The thinness of the Attenuating Glove also helps reduce finger fatigue.

Lead-Free, Synthetic Rubber Composition:
Our synthetic rubber formulation avoids the proteinaceous sensitivities associated with natural latex. The lead-free composition of Attenuating Gloves eliminates EPA heavy-metal toxicity disposal concerns**.**

Sterile:
Each pair of Attenuating Gloves comes in a sterile package.

Item #	Description	Size
906-800	Attenuating Gloves	6 1/2
906-801	Attenuating Gloves	7
906-802	Attenuating Gloves	7 1/2
906-803	Attenuating Gloves	8
906-804	Attenuating Gloves	8 1/2
906-805	Attenuating Gloves	XL

SEED LOADING VACUUM TWEEZERS KIT

The Seed Loading Vacuum Tweezers Kit consists of a compact vacuum pump with a line switch, 5 feet of clear tubing, a vacuum line filter, a quick disconnect assembly, a vacuum pen and a 19 Ga. x 24 cm long vacuum needle (with a 130° bend).

Optional Accessories:
- Remote Foot Switch
- Vacuum Needle 19 Ga. x 24 cm L

Specifications

Vacuum: 14 Hg
Air Flow: 125 in³/min
Power: 115 VAC., 60 Hz, 2 Watts
Foot Switch Power: 125 VAC, 7 Amps

Item #	Description
906-001	Seed Loading Vacuum Kit (115 Vac)
906-002	Optional: Remote Foot Switch
162-000-01	Vacuum Pump, 115 Volts
162-000-04	Vacuum Line Filter Complete
906-008	5' Long Vacuum Hose
906-012	Quick Disconnect for Vacuum Hose
906-014	Vacuum Pen with Insulators
906-020	Optional: Vacuum Needle 19 Ga. x 24 cm Long
906-022	Vacuum Needle 19 Ga. x 24 cm Long w/ 130° Bend
455-050	50 S.S. Makers - 0.8 mm Dia. x 5 mm L (used for practice)

MINI BETA SHIELD

For ^{125}Iodine or ^{103}Palladium

Arm Rest Optional

The free standing Mini Beta Shield is made of 1/8" thick stainless steel and specifically designed to protect personnel when handling beta-emitting isotopes. The shield easily fits on a bench top or cart. The shield is ideal for protection against ^{125}Iodine and ^{103}Palladium. A 8 mm thick x 10 " square lead glass viewing area. The bottom of the shield has a 3/4" lip to contain any dropped seeds.

The optional arm rest is made of clear acrylic and has rubber pads to cushion the arms. The arm rest is 29" wide and 3 1/2" deep. The optional arm rest can be easily mounted to the stainless steel shield with two bolts into pre-drilled holes. The arm rest can be mounted in two different positions to the front of the shield, with arm rest forwards or backwards.

Specifications

Viewing Area: 10 1/4" Sq.
Material: 1/8" thick stainless steel
Stainless Steel Density: 7.916 g/cm³
Leaded Glass Density: 2.0 mm lead equivalency
Lead Glass: 4.8 g/cm³
Lead Density: 11.35 g/cm³
Shielding Equivalency:
1/2 Value Layer (^{125}Iodine) = .025 mm lead
Size: 12" W x 12" D x 20 1/2" H
Sterilization: Gas
Weight: 20 lbs

Item #	Description
906-081	Mini Beta Shield
906-082	Arm Rest for Mini Beta Shield

VERTICAL / HORIZONTAL NEEDLE BOX

For Iodine^{125} and Palladium^{103}

The Vertical / Horizontal Needle Box is made of stainless steel with a delrin needle top and a protective cover. The delrin needle top is scribed with an alphanumeric grid pattern, which can be customized. The needle box will accept a needle length of 25 cm. There are 169 needle holes, 13 horizontal and 13 vertical rows. The needle box fits into and latches to a removable bottom, for easy retrieval of loose seeds. The box has 2 side handles for easy mobility. The protective cover has a handle on top and latches to the needle box when not in use. The needle box can be used vertical or at a 60º slope when the legs are locked.
Note: This item can be custom made to customers specifications.

Specifications

Material: 11 Ga. Stainless Steel with 1/2" thick Delrin top
Density of Stainless Steel: 7.95 g/cm³
Density of Delrin: 1.415 g/cm³
Overall Size: 9 1/4" Sq. x 16 5/8" H
Needle Box Size: 9 1/4" Sq. x 11" H
Weight: 25 lbs
Sterilization: Gas or autoclave

Item #	Description
906-110	Vertical / Horizontal Needle Box

NEEDLE LOADING BOX

For Iodine^{125} and Palladium^{103}

The needle loading box is made of 1/4" thick aluminum. The box has a removable bottom with handles for easy retrieval of dislodged bone wax and radiation seeds from needles. The box has 6 needle tubes that are 9 mm in diameter. The rotating seed tray screws to the box and has seed and spacer holding areas (2.5 cm diameter x 3 mm deep) with a side rail to catch a seed/spacer not inserted into needle. Use the Seed Loading Vacuum Tweezers (Item 906-001) to insert seeds and spacers into needles.

Specifications

Overall Size: 4" W x 6" L x 9 1/4" H
Box Size: 4" W x 6" L x 5" H
Density: 2.7 g/cm^3
Sterilization: Gas or Autoclave

Item #	Description
906-108	Needle Loading Box

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STERILIZATION VIAL FOR RADIOACTIVE SEEDS

The Sterilization Vial is made of 1/8" stainless steel. Inside is a 1" diameter stainless steel mesh basket with the bottom of the basket made of 1/8" stainless steel. The basket bottom is shielded where the vial bottom is open. The vial bottom has a 2 cm diameter opening, which allows the gas or steam to go around and enter the mesh basket. The top has a screw on stainless steel cap with a Teflon® seal.

Specifications

Container Material: 1/8" Stainless Steel
Container Dimension: 1 5/8" Dia. x 2 7/8" H
Basket Material: 100 Mesh Stainless Steel
Basket Dimension: 1" Dia. x 1 7/8"
Sterilization: Autoclaved or Gas

Item #	Description
906-060	Sterilization Vial for Radioactive Seeds, Stainless Steel

DIDDLER

The Diddler is a device to adjust the position of transperineal needles as they are implanted through the templates. The Diddler is constructed of stainless steel and consists of a slender tip and knurled handle. This tip is constructed such that needles can be adjusted up, down, and sideways, even if there is a needle right next to it.

Sterilization: The Diddler can be Autoclaved.

Item #	Description
906-230	Diddler

SPRING LOCK FOR PROSTATE NEEDLES

This spring lock can be used to tighten the needles used in prostate implants.

Item #	Description
906-290	Spring Lock for Prostate Needles

SEED IMPLANT ACCESSORIES

PROSTATE MARKER IMPLANTER WITH ADJUSTABLE STOP

Specifications

Material: Stainless Steel
Point Angle: 30° Beveled
Overall Length: 26.3 cm
Outside Diameter: 1.47 mm
Inside Diameter: 1.07 mm
Stylet Diameter: 0.89 mm

Item	Description
455-005	Prostate Marker Implanter with Adjustable Stop
455-009	Adjustable Stop for 17ga. Needle for Cervix/Prostate

Implanter MUST be Sterilized Before Use

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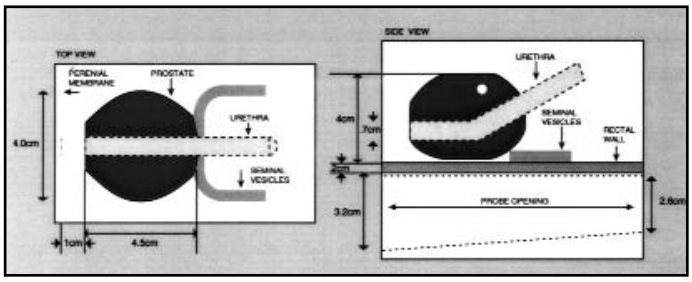
ULTRASOUND PROSTATE TRAINING PHANTOM



The Ultrasound Prostate Training Phantom is a disposable phantom developed for practicing permanent seed implantation procedures. It contains several unique features to assist the teaching and learning process.

The simulated perineal membrane permits needle insertion with realistic resistance. In addition, the area below the rectal wall is a clear gel to permit visualization of probe orientation. The prostate is transparent to allow visual verification of seed placement. The phantom also includes a removable pubic arch simulation.

This modification was developed with Dr. Peter Grimm and his associates at the Seattle Prostate Institute.

Specifications

Container:
Material: Clear acrylic
Dimensions: 11.5 cm x 7.0 cm x 9.5 cm
Front Probe Opening: 3.2 cm diameter
Rear Probe Opening: 2.6 cm diameter

Perineal Membrane:
3 mm thick urethane

Background Gel:
Similar to water with very little backscatter attenuation £ 0.07 db/cm/MHz

Urethra:
Dimensions: 0.7 cm diameter
Material: Zerdine®™ (1), high scatter

Seminal Vesicles:
Dimensions: 7 mm diameter x 10 cm long
Material: Zerdine™ (1)
Properties: Speed = 1540 m/s
Attenuation = 0.5 dB/cm/MHz
Backscatter similar to liver tissue

Prostate:
Dimensions: 4 cm x 4.5 cm x 4.0 cm
Material: Zerdine®™ (1), low scatter

Rectal Wall:
Dimensions: 6 cm x 11 cm x .2 cm
Material: Zerdine®™ (1), high scatter
Properties: Speed = 1540 m/s
Attenuation = 0.5 dB/cm/MHz
Backscatter similar to liver tissue

Note: This phantom is not intended to ultrasonically mimic the human prostate.

Other Features:
Removable pubic arch
(1) US Patent # 5196343

Item	Description
906-400	Ultrasound Prostate Training Phantom

ATOMLAB™ 400 DOSE CALIBRATOR

Designed for Facilities Receiving Unit Doses Including PET and Beta

- **Pre-programmed for 88 most commonly used radionuclides**
- **Large, easy-to-read backlit LCD**
- **Small footprint economizes workspace**
- **Ultra-fast response**
- **Automatic range selection; ranges up to 40 Curies of Tc-99m or 10 Curies of F-18**
- **Displays in Curies or Becquerels**
- **Remote Ionization Chamber**
- **Self-Diagnostic Software**
- **Desktop or wall mount display**
- **Two-year warranty**
- **RS-232 bi-directional serial communications port**

New low pressure chamber. Atomlab Dose Calibrators are shipped air or ground as standard goods.

The Atomlab™ 400 provides fast, accurate radionuclide activity measurements with performance that easily complies with the most stringent regulatory requirements.

The unit is simple to operate. There is a routine list of ten pre-programmed isotopes plus another seven that are user selected from the library. The library contains 88 isotopes listed alphabetically, including Y-90 and Sr-89. Four isotopes are displayed at a time.

Activity is displayed on a LCD panel in either Curie or Becquerel units. Background correction is performed at the touch of a button. Range selection is automatic.

Activity measurements are performed by a microprocessor-controlled electrometer located within the detector assembly of the ionization chamber. The chamber is shielded with .25" (6.3 mm) lead. It can be located up to eight feet (2.4 m) away from the display unit. Chamber bias is generated within the display unit by an electronic high voltage supply, eliminating the need for expensive battery changes.

The RS-232 port enables the Atomlab™ 400 Dose Calibrator to communicate with most commercially available nuclear medicine management systems.

Item 993-000 Atomlab™ 400 Dose Calibrator Includes

- Smart Display
- Ionization Chamber
- RS-232 Port
- Vial/Syringe Dipper
- Well Insert

Item #	Description
993-000	Atomlab™ 400 Dose Calibrator
993-050	Dose Calibrator Shielding Rings, Interlocking, 2.25" Lead
993-052	Moly Assay Shield for Syringe, 0.3" Lead
993-054	Moly Assay Shield for Vial, 0.3" Lead
993-056	Lineator for Atomlab™ Dose Calibrators

Specifications

Isotope Selection Keys: Ten pre-programmed – Tc-99m, Tl-201, Co-57, Cs-137, I-131, In-111, Ga-67, Xe-133, I-123, and Mo-99; seven additional keys for user-set isotopes; two new isotope keys and a full alphabetical list of 88 isotopes.
Activity Range: 0.01 µCi to 40 Ci (.0004 MBq to 1500 GBq) of Tc-99m or 10 Ci of F-18
Energy Range: 25 keV to 3 MeV photons
Response Time: One to two seconds for doses greater than 200 uCi; three seconds for doses greater than 20 uCi; 50-100 seconds below 20 uCi of Tc-99m with default threshold, threshold adjustable to reduce counting time
Detector Linearity: ±1% or 0.2 µCi, whichever is greater
Electrometer Linearity: ±1% or 0.2 µCi, whichever is greater
Electrometer Accuracy: ±1% or 0.2 µCi, whichever is greater
Overall Accuracy: ±3% or 0.3 µCi, whichever is greater; overall accuracy is affected by such factors as the accuracy of the specific source calibration, geometric variations due to sample volume or configuration, detector linearity, electrometer accuracy and readout accuracy
Repeatability: ±0.3% above 1 mCi short term (24 hr); 1% long term (one yr); exclusive of background
Digital Calibration Dial: Four-digit LED dial display with increment/decrement keys to change the value; range is from 0.0 to 999.9
Detector: Well-type pressurized ionization chamber, with Argon fill gas; well opening 2.75" (7 cm), well depth 10.25" (26 cm)
Chamber Gas Pressure: 149KPa gauge (21.6 psig) at 20°C or 250KPa absolute (36.3 psia) at 20°C. IATA regulation 3.2.2.4 Exempts Gases of Division 2.2 from Dangerous Goods Regulations when transported at pressure less than 200KPa gauge (29 psig) at 20°C. Device is shipped standard goods.
Detector Shielding: .25" (6.3 mm) lead on all sides except top well opening; supplementary shielding available
Chamber Bias: 355 ±5 volts
Environmental Operating Conditions:
Temperature: 0-40°C
Humidity: 0-90% rh, non-condensing
Power Requirements: 100 to 240 VAC, 0.6 – 0.3 amps, auto switching; APS Power Supply (APS22ES-150160), for medical use.
Line Frequency: 50/60 Hz; detachable line cord; built-in EMI filter and transient suppression
Detector and Interface Cables: 8' (243 cm) long, six conductor cables (two carry power, two for chassis ground, two carry serial data for digital I/O)
Display Unit:
Dimensions: 6.75" W x 6" depth x 5" H (17.1 x 15.3 x 12.7 cm)
Weight: 3.6 lb (1.64 kg); desktop or wall mountable
Detector Unit:
Dimensions: 6" Dia x 15.5" H (15.24 x 39.37 cm)
Well I.D.: 2.75" Dia x 10.5" H (7 x 26.7 cm)
Well I.D. with Liner: 2.5" Dia x 10.25" H (6.35 x 26 cm)
Lead Shielding: .25" thick (6.3 mm)
Weight: 35 lb (16 kg)
Approvals: ETL to UL 60601-1 and cETL to CAN/CSA C22.2 No. 601-1-M90 IEC 60601-1, IEC 60601-1-4 and IEC 60601-1-2
Warranty: Two Year

CE ETL

Item #	Description
993-058	Syringe Reference Source Set for Atomlab™ Calibrators
993-060	Vial Reference Source Set for Atomlab™ Calibrators
993-062	Vial/Syringe Dipper, Replacement for Atomlab™ Calibrators
993-064	Well Insert, Replacement for Atomlab™ Calibrators

ATOMLAB™ 500 DOSE CALIBRATOR

V

An extensive selection of quality assurance applications streamlines and simplifies hot lab administration requirements

- **Easy to use, large color touch screen display with intuitive menus**
- **Automatic range selection; ranges up to 100 Curies of Tc-99m or 25 Curies of F-18**
- **Pre-programmed for 88 most commonly used radionuclides; any 12 can be conveniently touch selected**
- **Displays in Curies or Becquerels**
- **Small footprint economizes workspace**
- **Ultra-fast response**
- **Robust software and extensive functionality**
- **Report and label printers available**
- **The USB ports also allow software upgrades via USB memory devices**
- **Desktop or wall mount display**
- **Remote Ionization Chamber**
- **Self-diagnostic software**
- **Communicates with most commercially available NM management systems via bi-directional serial communications port**
- **USB ports offer the ability to accommodate a USB mouse and printing devices**
- **Upgradeable at any time to include a wipte tet counter**
- **Two-year warranty**

NEW FEATURES FOR ATOMLAB 500

• An enhanced “zero background” feature allows users to configure system background count time for 30, 60 or 100 seconds. This new feature changes the counting time when selecting the “zero background” button in all functions, including the Moly Assay application.

• Expanded isotope libraries in both the dose calibrator and wipe test counter include Lu-177 and Ra-223 isotopes. Libraries include updated dial values, isotope ROIs and efficiency settings.

• Half-Life Verification App included in the nuclear pharmacy menu. Simply select the isotope, choose two or three readings for the calculation, and set the time between readings. The results show the calculated half-life and the variance to the real half-life for the selected isotope.

Standard Apps for Atomlab 500 include:

- Automated Quality Assurance APPs
  - -Constancy and Expanded Constancy
  - -Linearity and Auto Linearity
  - -Accuracy
  - -Geometry
- Nuclear Pharmacy Apps:
  - -Future dose and volume computation
  - -Inventory control of 25 samples, correcting volume, activity and moly concentration
  - -NEW Moly Assay
  - -NEW Half-Life Verification

New low pressure chamber. Atomlab Dose Calibrators are shipped air or ground as standard goods.

The Atomlab™ 500 can be used for a wide variety of nuclear medicine, PET and radioimmunotherapy applications, with proven performance for fast, accurate measurements. The system consists of a low pressure ionization chamber, electrometer with extraordinary linearity and an auto-ranging color touch screen display. Additionally, there are advanced, but easy-to-use programs for nuclear pharmacy, radiochemistry and radiochromatography.

Activity measurements are performed by the microprocessor controlled electrometer located within the chamber assembly. The chamber is shielded with .25" (6.3 mm) lead. It can be located up to eight feet (2.4m) away from the display unit. Chamber bias is generated by an electronic high voltage supply, eliminating the need for expensive battery changes.

Every element of the design and technical development will increase dose accuracy, department productivity and regulation compliance. The attractive and intuitive human interface guides the user through each operation. Software can easily be updated via the Biodex website or by using a convenient memory card. The touch-screen display can rest on a bench or mount on the wall of a hot lab, hot cell or laminar flow hood.

In addition to powerful self diagnostics, the Atomlab™ 500 includes an exclusive chamber monitoring technology to assure longer life and accuracy. Integrated pressure and temperature sensors feedback data so that the influence of gas pressure change will not effect an accurate reading.

OPERATION

The system is easy to use. There are 12 isotope selection touch keys pre-programmed for the most commonly used radionuclides. Any of those keys can be reprogrammed by the user for a desired isotope. There are 89 isotope-specific dial values listed in the library. Dial values can easily be changed if required.

Activity is displayed on the touch screen color display in either Curie or Becquerel units. Background correction is performed at the touch of a button. Range selection is automatic, from .01 microcurie to 100 Curies of Tc-99m or 25 Curies of F-18.

ACCURACY

Atomlab Dose Calibrators have consistently proven to be highly accurate. Biodex and chamber manufacturer Sun Nuclear Corporation have participated in the isotope program sponsored by National Institute of Standards and Technology. Each month a certified isotope is received from National Institute of Standards and Technology and is measured in the Atomlab™ Dose Calibrator, producing direct traceability to National Institute of Standards and Technology.

QUALITY ASSURANCE

The Atomlab™ 500 has been designed to make life easier. The extensive selection of quality assurance applications streamlines and simplifies hot lab administration requirements. The system stores and decay corrects multiple reference sources and compares the measured activity to the calculated activity for the daily constancy test.

Linearity tests can be performed in the traditional manual method or by a fully automated program that allows for readings from a source to be taken, and automatically recorded at specified intervals. The system will graph the results.

The attenuation tube test for linearity can be performed using software that will guide the user through the procedure, store the values and make all calculations.

COMMUNICATIONS

The RS-232 port and two USB ports communicate in real time with most commercially available nuclear medicine management systems, connect to external monitor or upload software upgrades.

COMMERCIAL NUCLEAR PHARMACY
The Atomlab™ 500 Dose Calibrator features a nuclear pharmacy "Dose Calculation Screen" to meet the needs of a commercial nuclear pharmacy. All the information needed to draw doses efficiently is readily available on one screen. The feature easily performs pre- and post-decay calculations, volume calculations for specific times and isotope changes all with minimal screen touches. No calculators needed! Atomlab Dose Calibrators can read up to 100 Curies of Tc-99m, thereby eliminating the need for an aliquot preparation, a significant time saver every time a generator is milked.

INDUSTRIAL NUCLEAR PHARMACY
The Atomlab™ 500 provides inventory control for 25 samples, storing and correcting the volume, activity, and moly concentration. The system will perform both volume and future dose calculations. In addition to inventory management, the Atomlab™ 500 provides quality assurance and record keeping functions. The inkjet printer allows hard copy records to be produced for all functions. The label printer allows the user to print labels for the syringe or vial.

RADIOCHROMATOGRAPHY
The radiopharmaceutical quality control program is exceptional. The Atomlab 500 performs all counting and calculations for paper chromatography tests, computing the percentages of free pertechnetate, hydrolyzed reduced Tc-99m and labeled radiopharmaceuticals.

RADIOCHEMISTRY
Up to seven ionization chambers, or six ionization chambers and a well counter can be connected via daisy chain to a single display. The activity in each detector can be selected and viewed from the single display.

DATA DOWNLOAD
The Atomlab™ Data Manager is available as an option. The Windows™ based utility allows wipe test and dose calibrator QA results to be downloaded using a USB/serial converter. The results can be viewed and printed from the data manager software as required. In addition, information stored in the data manager can be exported into Microsoft® Excel or to department management systems.

Item 993-010 Atomlab™ 500 Dose Calibrator Includes

- Smart Display
- Ionization Chamber
- RS-232 Port
- Vial/Syringe Dipper
- Well Insert

Specifications

Display: LCD Touch Panel 6.5" x 5" (16.5 cm x 12.7 cm), function keys are displayed for the operation being performed
Connectors: RJ-12 for well cable
Power: This system uses XP Power Supply for Medical Use, Model #PDM60US15
Line Voltage: 100 to 240 VAC, auto selectable by the power supply, 1.5-0.75 amps
Line Frequency: 50/60 Hz, detachable line cord, built-in EMI filter and transient suppression
Auxiliary Port: Two USB ports, one RS-232 port
Memory: Stores: Inventory and QA tests
Isotope Selection Keys: Twelve pre-programmed – Tc-99m, Tl-201, I-123, I-131, Cs-137, Co-57, Xe-133, Ga-67, In-111, F-18, Y-90s, Ba-133; 25 user-defined isotopes and a full alphabetical list of 89 isotopes.
Activity Range: : 0.01 uCi to 100 Ci (.0004 MBq to 3700 GBq) of Tc-99m or 25 Ci of F-18
Energy Range: 25 keV to 3 MeV photons
Response Time: One to two seconds for doses greater than 200 uCi; three seconds for doses greater than 20 uCi; 50-100 seconds below 20 uCi of Tc-99m with default threshold; threshold adjustable to reduce counting time
Detector Linearity: ± 1% or 0.2 µCi, whichever is greater
Electrometer Linearity: ± 1% or 0.2 µCi, whichever is greater, up to 40 curies of Tc-99m, ± 1.5% up to 100 curies of Tc-99m
Electrometer Accuracy: ± 1% or 0.2 µCi, whichever is greater
Overall Accuracy: ± 3% or 0.3 µCi, whichever is greater; overall accuracy is affected by such factors as the accuracy of the specific source calibration, geometric variations due to sample volume or configuration, detector linearity, electrometer accuracy and readout accuracy
Repeatability: ± 0.3% above 1 mCi short term (24 hr); 1% long term (one yr)
Digital Calibration Dial: Four-digit dial with increment/decrement keys to change the value; range is from 0.0 to 999.9
Detector: Well-type pressurized ionization chamber, with Argon fill gas; well opening 2.75" (7 cm), well depth 10.25" (26 cm). Up to seven chambers can be serially connected to one display.
Chamber Gas Pressure: 149KPa gauge (21.6 psig) at 20°C or 250KPa absolute (36.3 psia) at 20°C. IATA regulation 3.2.2.4 Exempts Gases of Division 2.2 from Dangerous Goods Regulations when transported at pressure less than 200KPa gauge (29 psig) at 20°C. Device is shipped standard goods.
Detector Shielding: .25" (6.3 mm) lead on all sides except top well opening; supplementary shielding available
Chamber Bias: 355 ± 5 volts
Environmental Operating Conditions: Temperature: 0-40°C; Humidity: 0-90% rH, non-condensing
Power Requirements: 100 to 240 VAC, 0.38 – 0.15 amps, auto switching; XP Power Supply (PDM60US15), for medical use.
Line Frequency: 50/60 Hz; detachable line cord; built-in EMI filter and transient suppression
Detector and Interface Cables: 8' (243 cm) long, six conductor cables (two carry power; two chassis ground; two carry serial data for digital I/O)
Display Unit:
Dimensions: 9.5" W x 12" depth x 12" H (24.1 x 30.5 x 30.5 cm)
Weight: 6.3 lb (2.9 kg); desktop or wall mountable
Detector Unit:
Dimensions: 6" dia x 15.5" H (15.24 x 39.37 cm)
Well I.D.: 2.75" dia x 10.5" H (7 x 26.7 cm)
Well I.D. with Liner: 2.5" dia x 10.25" H (6.35 x 26 cm)
Lead Shielding: 0.25" lead (6.3 mm)
Weight: 35 lb (16 kg)
Approvals: ETL to UL 60601-1 and cETL to CAN/CSA C22.2 No. 601-1-M90 IEC 60601-1, IEC 60601-1-4 and IEC 60601-1-2 and CE marked
Warranty: Two-year

Item #	Description
993-010	Atomlab™ 500 Dose Calibrator
993-030	Data Manager Software for Atomlab™ 500
993-032	Copper Dipper for Atomlab™ 500
993-035	Printer, Dymo (Label) for Atomlab™ 500
993-036	Printer, Ink Jet (Report) for Atomlab™ 500
993-050	Dose Calibrator Shielding Rings, Interlocking, 2.25" Lead
993-052	Moly Assay Shield for Syringe, 0.3" Lead

Item #	Description
993-054	Moly Assay Shield for Vial, 0.3" Lead
993-056	Lineator for Atomlab™ Dose Calibrators
993-058	Syringe Reference Source Set for Atomlab™ Calibrators
993-060	Vial Reference Source Set for Atomlab™ Calibrators
993-062	Vial/Syringe Dipper, Replacement for Atomlab™ Calibrators
993-064	Well Insert, Replacement for Atomlab™ Calibrators

ATOMLAB™ 500*PLUS* - DOSE CALIBRATOR
and Wipe Test Counter

- **Display provides the ability to connect to an external monitor**
- **Easy-to-use, large, color touch-screen display with intuitive menus**
- **Automatic range selection; ranges up to 100 Curies of Tc-99m or 25 Curies of F-18**
- **Pre-programmed for 89 most commonly used radionuclides; any 12 can be conveniently touch selected**
- **Displays in Curies or Becquerels**
- **Small footprint economizes workspace**
- **Ultra-fast response**
- **Robust software and extensive functionality**
- **Remote Ionization Chamber**
- **One wipe counter and up to six ionization chambers can be connected**
- **Report and label printers available**
- **USB ports offer the ability to accommodate a USB mouse and printing devices.**
- **Self-diagnostic software**
- **The USB ports also allow software upgrades via USB memory devices**
- **Communicates with most commercially available NM management systems via bi-directional serial communications port**
- **Meets NRC/State regulations**
- **64 Channel MCA**
- **Adjustable wide window and individual isotopes**
- **2x2 NaI drilled-well detector**
- **Remote shielded well**
- **Energy spectrums with individual ROI**
- **Ability to help identify isotopes causing contamination**
- **User-specific wipe locations and trigger levels**
- **Wipes that exceed trigger levels are immediately recognized: flashes on screen and prints in red**
- **Detailed wipe reports including cpm and dpm**
- **Wipe testing results stored**
- **Desktop or wall mount display**
- **Two-year warranty**

NEW FEATURES FOR ATOMLAB 500*Plus*

• An enhanced “zero background” feature allows users to configure system background count time for 30, 60 or 100 seconds. This new feature changes the counting time when selecting the “zero background” button in all functions, including the Moly Assay application.

• Expanded isotope libraries in both the dose calibrator and wipe test counter include Lu-177 and Ra-223 isotopes. Libraries include updated dial values, isotope ROIs and efficiency settings.

• Half-Life Verification App included in the nuclear pharmacy menu. Simply select the isotope, choose two or three readings for the calculation, and set the time between readings. The results show the calculated half-life and the variance to the real half-life for the selected isotope.

The Atomlab 500*PLUS* combines the industry gold standard Atomlab 500 Dose Calibrator and Wipe Test Counter, offering you a complete and cost-effective solution for all of your molecular imaging needs. The intuitive Atomlab 500*PLUS* provides fast, accurate radionuclide activity measurements with performance that complies with the most stringent regulatory requirements. It’s comprehensive, easy-to-use and feature rich. The software mirrors the way you think and work. It guides when necessary, but does not burden the advanced user. The touch-screen and easy-to-follow on-screen prompts mean you won’t need “cheat sheets.”

When required, you can be confident that every operation is captured and documented. That documentation makes compliance a breeze. The Atomlab™ 500 Dose Calibrator is upgradable. You can easily install software updates via the Biodex website or by using a convenient memory card.

Standard APPs for Atomlab 500*Plus* include

- Automated Quality Assurance APPs
  Constancy and Expanded Constancy
  Linearity and Auto Linearity
  Accuracy
  Geometry
  Full Width at Half max (FWHM)
  Chi Square
  Minimum Detectable Activity (MDA)

- Nuclear Pharmacy APPs:
  Future dose and volume computation
  Inventory control of 25 samples, correcting volume, activity and moly concentration
  NEW Half-Life Verification
  NEW Moly Assay

New low pressure chamber. Atomlab Dose Calibrators are shipped air or ground as standard goods.

Item 993-015 Atomlab™ 500*Plus* - Dose Calibrator and Wipe Test Counter Includes

- Smart Display
- Ionization Chamber
- Well Counter
- RS-232 Port
- Vial/Syringe Dipper
- Well Insert

Specifications

DISPLAY (A single "Smart Display" controls both Dose Calibrator and Wipe applications)

Display: LCD Touch Panel 6.5" x 5", function keys are displayed for the operation being performed

Display Unit:

Dimensions: 9.5" W x 12" H x 12" depth (24.1 x 30.5 x 30.5 cm)

Weight: 4.2 lb (1.9 kg)

Connectors: RJ-12 for well cable

Power: This system uses XP Power Supply for Medical Use, Model #PDM60US15

Line Voltage: 100 to 240 VAC, auto selectable by the power supply, 1.5 – 0.75 amps

Line Frequency: 50/60 Hz, detachable line cord, built-in EMI filter and transient suppression

Auxiliary Port: Two USB ports and one RS-232 port

Memory

Dose Calibrator: Stores Inventory and QA tests

Wipe Test Counter: Stores wipe, calibration, background, high voltage, isotope specification, isotope efficiency, Chi-Square testing results, technologist list, wipe locations list and latest MDA calculation. Results can be displayed and printed.

ATOMLAB™ 500 DOSE CALIBRATOR

Isotope Selection Keys: Twelve pre-programmed – Tc-99m, Tl-201, I-123, I-131, Cs-137, Co-57, Xe-133, Ga-67, In-111, F-18, Y-90s, Ba-133; 25 user-defined isotopes and a full alphabetical list of 89 isotopes.

Activity Range: : 0.01 µCi to 100 Ci (.0004 MBq to 3700 GBq) of Tc-99m or 25 Ci of F-18

Energy Range: 25 keV to 3 MeV photons

Response Time: One to two seconds for doses greater than 200 µCi; three seconds for doses greater than 20 µCi; 50-100 seconds below 20 µCi of Tc-99m with default threshold, threshold adjustable to reduce counting time

Detector Linearity: ± 1% or 0.2 µCi, whichever is greater

Electrometer Linearity: ± 1% or 0.2 µCi, whichever is greater, up to 40 curies of Tc-99m, ± 1.5% up to 100 curies of Tc-99m

Electrometer Accuracy: ± 1% or 0.2 µCi, whichever is greater

Overall Accuracy: ± 3%or 0.3 µCi, whichever is greater; overall accuracy is affected by such factors as the accuracy of the specific source calibration, geometric variations due to sample volume or configuration, detector linearity, electrometer accuracy and readout accuracy

Repeatability: ± 0.3% above 1 mCi short term (24 hr); 1% long term (one yr)

Digital Calibration Dial: Four-digit dial with increment/decrement keys to change the value; range is from 0.0 to 999.9

Detector: Well-type pressurized ionization chamber, with Argon fill gas; well opening 2.75" (7 cm), well depth 10.25" (26 cm). Up to seven chambers can be serially connected to one display.

Chamber Gas Pressure: 149KPa gauge (21.6 psig) at 20°C or 250KPa absolute (36.3 psia) at 20°C. IATA regulation 3.2.2.4 Exempts Gases of Division 2.2 from Dangerous Goods Regulations when transported at pressure less than 200KPa gauge (29 psig) at 20°C.

Detector Shielding: .25" (6.3 mm) lead on all sides except top well opening; supplementary shielding available

Chamber Bias: 355 ±5 volts

Environmental Operating Conditions: Temperature: 0-40°C; Humidity: 0-90% rH, non-condensing

Power Requirements: 100 to 240 VAC, 0.38 – 0.15 amps, auto switching; XP Power Supply (PDM60US15), for medical use.

Line Frequency: 50/60Hz; detachable line cord; built-in EMI filter and transient suppression

Detector and Interface Cables: : 8' (243 cm) long, six conductor cables (two carry power; two chassis ground; two carry serial data for digital I/O)

Detector Unit:

Dimensions: 6" Dia x 15.5" H (15.24 x 39.37 cm)

Well I.D.: 2.75" Dia x 10.5" H (7 x 26.7 cm)

Well I.D. with Liner: 2.5" Dia x 10.25" H (6.35 x 26 cm)

Lead Shielding: 0.25" lead (6.3 mm)

Weight: 35 lb (16 kg)

Approvals: ETL to UL 60601-1 and cETL to CAN/CSA C22.2No. 601-1-M90, IEC 60601-1, IEC 60601-1-4 and IEC 60601-1-2 and CE Marked

Warranty: Two-year

ATOMLAB™ WIPE TEST COUNTER

Detector Cable

Length: Standard 8 ft. (2.4 m); custom cable lengths available up to 20 meters

Conductors: Six total – 2 for power, two for chassis ground, two for serial data

Connectors: RJ-12

Well Counter

Detector: 2" x 2" NaI (Tl) integral line scintillation detector with a 0.75" dia. x 1.44 " depth well (1.9 x 3.7 cm)

Style: Remote Detector

Channels: 64

MCA: Integral to Well Counter

Spectral Resolution: FWHM 10%

Count Rate: (Maximum) 30,000 cps

Connectors: RJ-12 for power and signal

Lead Shielding: 0.5" (1.2 cm) integral lead shield

Optional Calibration Source: 0.1 µCi Cs-137 Rod Source

Optional Additional Shield: 0.5" (1.2 cm) lead shield, slides over integral shield for total of 1.0" of shielding – includes cover

Cover: Fits optional additional lead shield, has 0.25" (.6 cm) lead shielding

Physical Data

Display Unit

Size: 9.5" W x 12" H x 12" D (24.1 x 30.5 x 30.5 cm)

Weight: 4.2 lb (1.9 kg)

Well Counter

Size: 6" D x 11" H (15.24 x 27.9 cm)

Weight: 29 lb (3.2 kg)

Approvals: ETL listed to UL 60601-1 and CAN/CSA C22.2 No. 601-1M90, IEC 60601-1, IEC 60601-1-4 and IEC 60601-1-2 and CE marked

Item #	Description
993-015	Atomlab™ 500*Plus* - Dose Calibrator & Wipe Test Counter
993-030	Data Manager Software for Atomlab™ 500
993-032	Copper Dipper for Atomlab™ 500
993-035	Printer, Dymo (Label) for Atomlab™ 500
993-036	Printer, Ink Jet (Report) for Atomlab™ 500
993-040	Rod Source, Cs-137, for AtomLab™ Wipe Test Counter
993-042	Wipe Test Kit for Atomlab™ 500*Plus* Wipe Test Counter
993-050	Dose Calibrator Shielding Rings, Interlocking, 2.25" Lead

Item #	Description
993-052	Moly Assay Shield for Syringe, 0.3" Lead
993-054	Moly Assay Shield for Vial, 0.3" Lead
993-056	Lineator for Atomlab™ Dose Calibrators
993-058	Syringe Reference Source Set for Atomlab™ Calibrators
993-060	Vial Reference Source Set for Atomlab™ Calibrators
993-062	Vial/Syringe Dipper, Replacement for Atomlab™ Calibrators
993-064	Well Insert, Replacement for Atomlab™ Calibrators

ATOMLAB™ WIPE TEST COUNTER

Eliminate the tedium of wipe testing with the Atomlab™ Wipe Test Counter

- **Easy-to-use, large touch screen display with intuitive menus**
- **Meets NRC/State regulations**
- **64 Channel MCA**
- **Adjustable wide window and individual isotopes**
- **2x2 NaI drilled-well detector**
- **Remote shielded well**
- **Energy spectrums with individual ROI**
- **Ability to help identify isotopes causing contamination**
- **User-specific wipe locations and trigger levels**
- **Wipes that exceed trigger levels are immediately recognized: flashes on screen and prints in red**
- **Detailed wipe reports including cpm and dpm**
- **Wipe testing results stored**
- **Upgradable at any time to a dose calibrator by adding an ionization chamber**
- **Optional printer for hard-copy archives**
- **Two-year warranty**
- **Communicates with most commercially available NM management systems via bi-directional serial communications port**

Standard APPs for Atomlab Wipe Test Counter include:

- Automated Quality Assurance APPs
  -Full Width at Half Max (FWHM)
  -Chi Square
  -Minimum Detectable Activity (MDA)

The Atomlab Wipe Test Counter is easy to use, easy to understand, fast and dependable. A color touch-screen display utilizing intuitive software eliminates the tedium of wipe testing. Simply perform a daily calibration and background count, then count the wipe for each predetermined location. Trigger levels can be set for any isotope at any location including 200 dpm for iodine. In seconds the system will determine if the location is above or below the user defined trigger level.

When performing a wipe test, the full spectrum is displayed. A wide window that includes the isotope energies expected in a particular department is set by the user. The efficiencies of the isotopes selected for the window can be either factory defaults or user determined using an integrated detector efficiency program. Individual isotope ROIs along with the wide window can be set. This feature helps identify the isotope(s) causing contamination.

Up to 50 wipe locations can be entered as a restricted area, unrestricted area, sealed source or package. The results are displayed in dpm, cpm, µCi or kBq.

The system consists of a lead shielded 2" x 2" (5 x 5 cm) sodium iodide (NaI) well detector and a 64 channel multi-channel analyzer. The displayed energy range (spectrum) is 0-800 KeV, which is typically found in nuclear medicine departments.

The wipe counter is designed to meet or exceed all NRC (10 CFR 35.70, 10 CFR 20.1906 and 10 CFR 35.2067) and state wipe test requirements. There are automated programs for the quality assurance functions: calibration, FWHM, chi-square and minimum detectable activity (MDA).

Item 993-020 Atomlab™ Wipe Test Counter Includes

- Smart Display
- Well Counter
- RS-232 Port

Specifications

DISPLAY

Display: LCD Touch Panel 6.5" x 5" (16.5 x 12.7 cm), function keys are displayed for the operation being performed
Connectors: RJ-12 for well cable
Power: This system uses XP Power Supply for medical use, Model #PDM60US15
Line Voltage: 100 to 240 VAC, auto selectable by the power supply, 1.5 – 0.75 amps
Line Frequency: 50/60 Hz, detachable line cord, built-in EMI filter and transient suppression
Auxiliary Port: Two USB ports, one RS-232 port
Memory: Stores wipe, calibration, background, high voltage, isotope specification, isotope efficiency, Chi-Square testing results, technologist list, wipe locations list and latest MDA calculation. Results can be displayed and printed.
Preset Radionuclides: 27 including Tc-99m, Co-57, Cs-137, Ga-67, Tl-201, I-123, I-125, I-131, In-111, F-18

DETECTOR CABLE

Length: Standard 8 ft. (243 cm); custom cable lengths available up to 20 meters
Conductors: Six total – 2 for power, two for chassis ground, two for serial data
Connectors: RJ-12

WELL COUNTER

Detector: 2" x 2" (5 x 5 cm) NaI (Tl) integral line scintillation detector with a 0.75" dia x 1.44 " depth well (1.9 x 3.7 cm)
Style: Remote Detector
Channels: 64
MCA: Integral to Well Counter
Spectral Resolution: FWHM 10%
Count Rate: (Maximum) 30,000 cps
Connectors: RJ-12 for power and signal
Lead Shielding: 0.5" (1.2 cm) integral lead shield
Optional Calibration Source: 0.1 µCi Cs-137 Rod Source
Optional Lead Shield: 0.5" (1.2 cm) lead shield, slides over integral shield for total of 1.0" of shielding - includes cover
Optional Additional Shield: 0.5" (1.2 cm) lead shield, slides over integral shield for total of 1.0" (2.5 cm) of shielding – includes cover
Cover: Fits optional additional lead shield, has 0.25" (.6 cm) lead shielding

PHYSICAL DATA

Display Unit
Size: 9.5" w x 12" h x 12" d (24.1 x 30.5 x 30.5 cm)
Weight: 4.2 lb (1.9 kg)

Well Counter
Size: 6" d x 11" h (15.24 x 27.9 cm)
Weight: 29 lb (3.2 kg)

Approvals: ETL listed to UL 60601-1 and CAN/CSA C22.2 No. 601-1M90, IEC 60601-1, IEC 60601-1-4 and IEC 60601-1-2 and CE marked
Warranty: Two Year

Item #	Description
993-020	Atomlab™ Wipe Test Counter
993-036	Printer, Ink Jet (Report) for Atomlab™ 500
993-040	Rod Source, Cs-137, for AtomLab™ Wipe Test Counter
993-042	Wipe Test Kit for Atomlab™ 500Plus Wipe Test Counter
993-044	Lead Shield for Wipe Test Chamber
993-046	Well Liners, Disposable, 100/Pkg

COPPER SYRINGE DIPPER

- For use with I-123 and In-111
- Eliminate variations

Designed for use with I-123 and In-111, the Copper Dipper removes variation in readings caused by attenuation differences from different materials and thicknesses used in syringes and vials.

Specifications

Dimensions: 10.25" H x 1.63" Dia (26 x 4.1 cm)
Weight: 0.75 lb (.34 kg)

Item #	Description
993-032	Copper Syringe Dipper

ROD SOURCES

To calibrate well type scintillation crystals, Biodex offers a variety of Rod Sources to meet department needs. You can count on consistent accuracy. Rod Sources are calibrated as NIST traceable with an accuracy of ±5% at the 95% confidence level.

Specifications

Dimensions: 2.96" L x .47" dia (76 x 11.9 mm)
Nominal Total Activity: 0.1 µCi

Item #	Description
993-040	Rod Source, Cs-137 for Atomlab™ Wipe Test Counter

Radioactive Material License Required

V

WIPE TEST KIT

Wipe Test Kits may be used to perform wipe tests as indicated in NRC and Agreement State Regulations. They provide an efficient, convenient means of sampling contaminated areas with radioactivity on either wet or dry surfaces.

Each box of wipes includes 500 record folders which may be used to
- identify each sample wipe
- prevent cross-contamination of smears
- transfer the wipe to the counting facility
- store the wipe until discarded

Specifications

Size: 1.75" (4.4 cm) Dia.
Quantity: 500/Box

Item #	Description
993-042	Wipe Test Kit for Atomlab™ 500 Plus Wipe Test Counter

DOSE CALIBRATOR SHIELDING RINGS

Especially Suited for PET and Applications

The Dose Calibrator Shielding Rings offer an additional 2.25" (5.7 cm) of lead shielding around the remote chamber for working with 511 keV radionuclides, such as FDG F-18.

Specifications

Dimensions: 10.6" dia x 14.9" h (27 cm x 37.9 cm)
I.D.: 6.1" dia (15.5 cm)
Lead Shielding: 2.25" thick (5.7 cm)
Weight: 359 lb (162.5 kg)
Shipping Weight: 388 lb (175.7 kg)

Item #	Description
993-050	Dose Calibrator Shielding Rings

MOLY ASSAY SHIELD

Moly Assay Shields are a convenient method to a unit dose. Whether working with syringes or vials, either unit will fit into the well chamber of any Atomlab™ Dose Calibrator.

The leaded shields are cradled by a metal holder for easy handling to ensure proper placement inside the chamber.

Specifications

Moly Assay Shield for Syringe, Item 993-052
Dimensions: 9.125" H x 2.125" Dia (23.2 x 5.4 cm)
Lead Shielding: .3" Thick (7.6 mm)

Moly Assay Shield for Vial, Item 993-054
Dimensions: 3.5" H x 2" Dia (8.9 x 5.1 cm)
Lead Shielding: .3" Thick (7.6 mm)

Item #	Description
993-052	Moly Assay Shield for Syringe
993-054	Moly Assay Shield for Vial

V

LINEATOR

Simulates eight different source strengths - using only one source!

- Simplifies compliance with NRC and state requirements
- Checks linearity without sample decay or fractioning
- Covers diagnostic or therapeutic quantities in a single pass

The Lineator is a simple device to accurately and reliably verify the linearity of your dose calibrator. Test results are available in minutes, without waiting days for decay, making it feasible to perform a linearity test more often. Early identification can prevent problems before they occur.

The Lineator is a set of five tubes. Four tubes are used to perform the test and an interchangeable tube is used depending on the dynamic range needed to cover.

To perform a linearity test, insert a source of Tc-99m of the maximum activity to be measured into the central tube, then place the tube into the chamber of your dose calibrator and count. The remaining lead-lined tubes are placed, one at a time, concentrically over the central tube and counted individually or in combination. The readings are then normalized with predetermined factors, and the degree of linearity can be seen virtually at a glance.

Using only one source, the Lineator can simulate up to eight different source strengths. Each outer tube absorbs a portion of the source radiation and reduces the effective source activity seen by the dose calibrator.

Item #	Description	Weight
993-056	Lineator	6 lb (3 kg)

SYRINGE REFERENCE SOURCE SET

The daily calibration of your dose calibrator is recommended to ensure accurate and reproducible instrument response. Calibration, using long-lived standards, should be performed in a manner that most closely represents how you use your dose calibrator. The Syringe Dose Calibrator Source was designed for imaging facilities that obtain their radiopharmaceuticals in unit dose syringes.

The sources are solid cast epoxy, 3 ml active volume in a 5 cc “mock” syringe. They are calibrated within ± 5% accuracy at 99% confidence level, NIST traceable.

Each source includes a certificate of calibration, leak test certificate, and radiation safety and handling sheet. The source is packaged in an individual lead shield that is color coded to the source. Syringe Dose Calibrator Sources are available individually or as an economical set.

Syringe Dose Calibrator Reference Sources:
All sources calibrated to ±5%.

Item 993-058 Syringe Reference Source Set Includes

- Ba-133, 250 µCi
- Cs-137, 200 µCi
- Co-57, 5 mCi

Note: A photocopy of your NRC or Agreement State License must accompany orders for radioactive sources and must clearly indicate your authority to possess the source being ordered.

Item #	Description
993-058	Syringe Reference Source Set for Atomlab™ Calibrators

VIAL REFERENCE SOURCE SET

The daily calibration of dose calibrators is recommended to ensure accurate and reproducible instrument response. Calibration is easily achieved and maintained by the use of long-lived reference sources.

These sources are solid cast epoxy, 20 ml active volume in the 27 ml Vial E. They are calibrated with ±5% accuracy at the 99% confidence level, NIST traceable. Dose Calibrator Reference Sources are registered with the U.S. Food and Drug Administration Center for Devices and Radiological Health and the U.S. Nuclear Regulatory Commission.

Each source includes a certificate of calibration, a leak test certificate, and a radiation safety and handling sheet. The source is packaged in an individual lead shield that is color coded and vinyl covered to eliminate exposure to the lead. Dose Calibrator Reference Sources are available individually or as an economical set.

Vial Dose Calibrator Reference Sources:
All sources calibrated to ±5%.

Item 993-058 Syringe Reference Source Set Includes

- Ba-133, 250 µCi
- Cs-137, 200 µCi
- Co-57, 5 mCi

Note: A photocopy of your NRC or Agreement State License must accompany orders for radioactive sources and must clearly indicate your authority to possess the source being ordered.

Item #	Description
993-060	Vial Reference Source Set for Atomlab™ Calibrators

VIAL/SYRINGE DIPPER

This rugged,Vial/Syringe Dipper has a comfortable handle and it will hold 1 cc to 10 cc syringes or up to a 30 ml vial. Included with every Atomlab™ Dose Calibrator, the Vial/Syringe Dipper will also fit any well chamber with 2.5" x 10" interior dimension. The material used will not cause attenuation problems and is very resistant to breaking.

Item #	Description
993-062	Vial/Syringe Dipper, Replacement for Atomlab™ Calibrators

WELL INSERT

The Well Insert is included with the purchase of any Atomlab™ Dose Calibrator. The durable, clear Plexiglas insert is designed to protect the chamber from contamination and can be easily removed for cleaning. The insert will fit any well chamber with 2.5" x 10" (6.35 x 25.4 cm) interior dimension.

Keep a spare on hand for use while the other insert is being decontaminated.

Item #	Description
993-064	Well Insert, Replacement for Atomlab™ Calibrators

CRC®-15BT BRACHYTHERAPY DOSE CALIBRATOR

For HDR or LDR Brachytherapy

- **Sealed, gas filled ionization chamber (no temperature or pressure corrections required)**
- **Auto ranging**
- **Max activity up to 12 Ci**
- **Remote ionization chamber with 8' cable (2.4 m) longer lengths are available**
- **Microprocessor controlled**
- **Large LCD display with nuclide name, activity (in Ci or Bq) and calibration number**
- **Daily QC functions, including zero adjust, background subtraction, system test, accuracy (with deviation percentage) and constancy**
- **Library of over 80 nuclides and half-life with room for 10 additional nuclides**
- **Menu driven programming for easy navigation**

Accurate high activity brachytherapy measurements present new challenges in Radiation Therapy, the CRC®-15BT easily overcomes these challenges. Both HDR and LDR brachytherapy sources are quickly and precisely measured by the CRC®-15BT.

Both HDR and LDR brachytherapy sources are quickly and precisely measured by the CRC®-15BT.

The console of the CRC®-15BT is designed for ease and efficiency. There are 14 programmable nuclide keys and a large LCD display that will show the isotope name, activity (in Ci or U) and calibration number. A custom alphanumeric keyboard drives all of the menus and functions.

The chamber of the CRC®-15BT has 1/8” (3.2 mm) mechanically reinforced lead shielding. The chamber is a sealed thin wall, deep well design with 2.5 atmospheres of Argon gas and a 500V bias in order to achieve optimal response time (within 2 seconds) without temperature or pressure corrections.

ADCL Calibration is available with the CRC®-15BT to ensure maximum accuracy. Calibrated with the specific brachytherapy source(s) utilized in your department, activity can be measured precisely in either Curies (Ci) or Air Kerma strength (U).

The CRC®-15BT software is a menu driven design that will allow the user to move rapidly through all of the system functions. The Daily QC protocol will perform zero adjust, background subtraction, system test, accuracy (with a deviation percentage) and constancy. The nuclide library is programmed with more than 80 nuclides and half-lives, plus available space for 10 additional nuclides. The system memory can also support up to 20 brachytherapy sources with isotope name, calibration number, Air Kerma strength and ADCL factor.

Overall the CRC®-15BT is quick, reliable and cost effective. With optional features such as the RS-232 computer interface port, a selection of printers or the CRC-AD15 auxiliary display you can configure a system that is right for your department.

For those customers who require a more portable measurement solution, the BT is also available as a stand alone chamber, which can be connected directly to your department’s electromer.

Specifications

Ionization Chamber: Thin wall, deep well, Argon gas [16.3cm (6.4") deep x 6.1cm (2.4") dia. opening]
Chamber Shielding: 1/8" (3.2mm) mechanically reinforced lead
Measurement Range: Autoranging, up to 12 Ci
Resolution: 0.001 MBq (0.01 µCi)
Electrometer Accuracy: Better than ±2%
Linearity: Within ±2%
Response Time: Within 2 seconds, 4 to 16 sec. for very low activity (user selectable)
Nuclide Keys: 14 user defined
Calibration Key: Over 200 Nuclides
Printer Interface: Provided for serial printer
System Memory: Over 80 Nuclides (w/ half-life),
Ability to add 10 nuclides and 20 brachytherapy sources (w/cal #, U and ADCL factor)
Interconnecting Cable: 8' (2.4m)
Metal cable connectors with thumb screws
No battery required
Power Requirements: 100-240 VAC 0.1A or 50/60 Hz 120mA
Display External Dimensions: 4.75” x 10” x 10.5” (12.1 x 25.4 x 26.7 cm)
Weight: 4 lb (2 kg)
Chamber Unit Dimensions: 12.3” H x 6.7” dia (31.3 x 17 cm)
Weight: 26.8 lb (12.2 kg)

Source holders can be found on the following page and can only be purchased with an order for the calibrator.

Item #	Description
344-030	CRC®-15BT Dose Calibrator
344-031	CRC®-15BT RS-232-R Serial Port
344-032	CRC®-15BT Stand Alone Chamber
344-033	CRC®-AD15 Auxiliary Display for CRC®-15BT
344-042	Liner for CRC®-15BT
344-043	Dipper for CRC®-15BT

The Liner and Dippler can ONLY be purchased with the Calibrator
Call for Printer Options

SOURCE HOLDERS FOR CRC-15BT BRACHYTHERAPY DOSE CALIBRATOR

Item 344-035 Cs-137 Brachytherapy Seed Holder Set is specially designed to fit Capintec dose calibrators. The set positions Cs-137 seeds in the ionization chamber for accurate assays of activity.

The tube has centimeter markings that allow convenient positioning and determination of source length. The centrally positioned tube is easily adjusted with a thumb screw.

Item 344-036 Tube only for Cs-137 seed holder.

Item #	Description
344-035	Cs-137 Seed Holder Set
344-036	Cs-137 Seed Holder, Tube Only

V

Item 344-037 Ir-192 Ribbon Holder positions Ir-192 seeds in the ionization chamber for accurate assays of activity. The coil holds up to 12 Ir-192 seeds with 1 cm spacing and no overlap.

Item #	Description
344-037	Ir-192 Ribbon Holder

Item 344-038 I-125 Brachytherapy Seed Holder Set features a tube with a thin-walled section (1 cm L x 1.5 mm dia.) for counting I-125 source seeds.

Item 344-039 Tube only for I-125 seed holder. This tube will also fit in the Cs-137 holder.

Item #	Description
344-038	I-125 Seed Holder Set
344-039	I-125 Seed Holder, Tube Only

Item 344-040 Mick-Bard Source Holder is specifically designed to hold seed cartridges. This device allows cartridges to be properly placed in any Capintec standard length Dose Calibrator chamber for the most accurate and reproducible measurement available.

Item 344-041 Mick Cartridge Holder is designed to allow the Mick Cartridge to be properly placed in the CRC-series dose calibrator chamber for the most accurate and reproducible measurement.

Item #	Description
344-040	Mick-Bard Source Holder for Standard Chamber
344-041	Mick Cartridge Holder

The Source Holders can only be purchased with Item 344-030, CRC®-15BT Dose Calibrator.

INTERLOCKING LEAD RING SETS

2" Thick Lead Rings

The 2" thick (5.08 cm) lead rings provide additional shielding around a dose calibrator chamber thereby giving maximum protection when working with 511 keV radionuclides.

The interlocking ring set consists of eight (8) interlocking lead rings that stack on top of a 2" thick (5.08 cm) lead base block which is surrounded by an interlocking ring.

The 2" thick (5.08 cm) lead rings offer three interlocks: two where the ring halves connect and another on top of the ring to fit into the bottom of the next ring.

Specifications

Lead Shielding: 2" thick (5.08 cm)
Overall Height: 18" (45.7 cm)
Inside Height: 16" (40.6 cm)
Outer Diameter: 11" Dia. (27.9 cm)
Inner Diameter: 7" (17.8 cm)
Finish: Precision tan smooth paint
Weight: 450 lb (205 kg)
Ships via Truck

Item #	Description
344-100	Lead Rings, 2" Thick, Set-Interlocking f/ Well Chamber

INTERLOCKING LEAD RING SETS

1" Thick Lead Rings

The 1" thick (2.5cm) Interlocking lead ring set provides additional shielding for the Capintec CRC-15R Well Chamber.

The interlocking ring set consists of a 1” high interlocking top ring, eight (8) 2” high interlocking lead rings that stack on top of a 1" thick (2.5 cm) lead base block which is surrounded by an interlocking ring.

The 1" thick (2.5 cm) lead rings offer three interlocks: two where the ring halves connect and another on top of the ring to fit into the bottom of the next ring.

Specifications

Lead Shielding: 1" thick (2.5 cm)
Overall Height: 18" (45.7 cm)
Inside Height: 17" (43.2 cm)
Outer Diameter: 9" Dia. (22.8 cm)
Inner Diameter: 7" (17.8 cm)
Finish: Precision tan smooth paint
Weight: 180 lb (82 kg)
Ships via Truck

Item #	Description
344-120	Lead Rings, 1" Thick, Set-Interlocking f/ Well Chamber

LEAD CABINET FOR NUCLEAR MEDICINE

955-036

955-037

955-037

The cabinet is 1/2" (1.27 cm) thick lead encased in steel, so there is no exposed lead. The work surface is stainless steel with a 5" (12.7 cm) tall backsplash and 1/2" (1.27 cm) beveled edge on the other three sides to prevent any spills from draining off the top. The vertical supports of the cabinet are steel filled with lead. There is a 4" (10.16 cm) diameter chute to dispose of used syringes into a Sharps container (not included) that sits on a sliding pullout shelf in the cabinet. The chute has a stainless steel encased 1/2" 1.27 cm) lead cover.

The unit includes a well for the dose calibrator well chamber.

The two stainless steel shelves are height adjustable and have a 5/8" (1.59 cm) spill lip on all four sides. A fixed shelf below the Sharps container does not pull out but is height adjustable. The other shelf can be pulled out 18" (45.7 cm) and is also height adjustable. The floor surface inside the cabinet is stainless steel.

The two doors on the cabinet open from center to 180°. Both are 1/2" (1.27 cm) lead encased in steel and have an L-handle with a key lock. The latching feature on the L-handle allows closing the door when it is locked. The doors have a 7/8" (2.2 cm) overlap on the cabinet openings.

The L-block is also made of 1/2" (1.27 cm) lead encased with steel and a steel framework around the 1/2" (1.27 cm) thick leaded glass. The viewing window is bent to a 45° angle from the front of the L-block. The L-block is attached to the cabinet with two bolts that screw into mounting plates that are adjustable left and right.

The cabinet is painted with tan textured paint except for the stainless work surface, shelves and inside cabinet floor.

Two base options are available. It can sit on a 3" (7.6 cm) steel frame base that provides a toe kick (Item 955-036) or it can have four (4) 3" (7.6 cm) high adjustable leveling legs (Item 955-037).

An optional Side Shield System is available for the top of the cabinet. The Side Shield System is 1/2" (1.27 cm) lead covered with stainless steel. It fits together using "L" brackets and vertical corner gussets (included).

Specifications

Cabinet Dimensions
Work Surface: 36" L x 30" D x 36 1/8" H (91 x 76 x 91.8 cm)
Top of Backsplash: 41 1/8" H (104.5 cm)
Cabinet Openings: 14.25" W x 24.5" H (36.2 x 62.2 cm)

Shelf Sizes
Container Shelf: 5.5" W x 8.5" D x 15/16" H (14 x 21.6 x 2.4 cm)
Pullout Shelf: 12.25" W x 25.25" D x 5/8" H (31.1 x 64.1 x 1.6 cm)
Fixed Shelf: 13.75" W x 25.25" D x 5/8" H (35 x 64 x 1.6 cm)
Well for Dose Calibrator: 8.0" Dia. x 9.5" D (20.3 x 24 cm)

L-Block Dimensions
Front Size: 14.625" W x 18.5" H x 0.75" Thick (37.2 x 47 x 1.9 cm)
Window Viewing Area: 13.5" W x 12" H (34.3 x 30.5 cm)
Overall Height: 28.5" H (72.4 cm)
Window Angle: 45°
Lead Glass Thickness: 0.5" (1.27 cm)
Lead Equivalency of Glass: 1/8" (0.32 cm)

Optional Side Shield System
Each Side: 27" L x 18.5" H x 0.5" T (68.6 x 47 x 1.27 cm)
Back: 30" L x 18.5" H x 0.5" T (76.2 x 47 x 1.27 cm)
Material: 1/2" (1.27 cm) Lead covered with Stainless Steel and framed in stainless steel channels

Item #	Description	Lead Thickness	Size
955-036	Cabinet for Nuclear Medicine with 3" (7.6 cm) Steel Base	0.5" (1.27 cm)	36" L x 30" D x 41 1/8" H (91 x 76 x 104.5 cm)
955-037	Cabinet for Nuclear Medicine with Four 3" (7.6 cm) Legs	0.5" (1.27 cm)	36" L x 30" D x 41 1/8" H (91 x 76 x 104.5 cm)
995-012	Optional Side Shield System	0.5" (1.27 cm)	(2) 27" L x 18.5" H x 0.5" T (68.6 x 47 x 1.27 cm) (1) 30" L x 18.5" H x 0.5" T (76.2 x 47 x 1.27 cm)

PET WORKSTATION

L-Block sold separately

994-036

W

The PET Workstation consists of a steel table with a drawer, lower shelf, container well, and side and back shields. The L-Block must be ordered separately.

The workstation table is made of 2" (5.08 cm) steel tubing. The sides and back walls are 2" (5.08 cm) thick lead bricks covered with steel panels on both sides. The four corner posts are filled with lead.

The container well is 19.5" (49.5 cm) from the front of the table and has 2.5" (6.35 cm) thick lead walls for the detector chamber to be placed into. The 2.5" (6.35 cm) leaded bottom of the container well rotates to accommodate the insertion of the detector chamber from the bottom. The container well bottom then rotates back and is bolted in place. The container well rises 4" (10.16 cm) above the table top and is 16" (40.64 cm) deep. The overall diameter of the container well is 13.5" (34.29) with an inside diameter of 7" (17.8 cm). This size container well accommodates the Capintec CRC®-15PET detector chamber.

The workstation has 4 heavy duty casters. The two rear casters are fixed and the two front casters are swivel and locking. Each caster is rated at 2,000 lb (909 kg).

Options for PET Workstation

Item 990-488: 2" (5.08 cm) Thick lead L'Block with a 8" W x 8" L x 4" thick (20.3 x 20.3 x 10.2 cm) lead glass window.
L-Block Dimensions: 14" W x 17.5" D x 24.75" H (35.6 x 44.5 x 63 cm)

Item 994-036 and 994-036-1: Stainless steel tray that holds the dose calibration display unit.

Item 994-021: Pair of steel channels that distribute the heavy weight of this workstation over a large floor area.

Item 994-020-21: 2.5" Thick (6.35 cm) Leaded Rotating Well Top Cover

Specifications

Workstation:
Overall Dimensions: 27.75" W x 35.75" L x 61" H (70.5 x 90.8 x 155 cm)
Table Top Dimensions: 23.25" W x 31.25" L x 34.75" H (59 x 79 x 88 cm)
Side/Back Wall Height: 16" (40.6 cm)
Color: Durable tan textured polyurethane enamel paint
Approximate Weight: 2,650 lb (1205 kg)

Note: The workstation can be manufactured to fit other dose detector chambers. When placing an order please specify manufacturer of dose calibrator detector, model, outside diameter and height.

Item #	Description
994-020	PET Workstation w/ Drawer, Container Well & Side Shields
994-020-21	2.5" (6.35 cm) Thick Leaded Rotating Well Top Cover
994-021	Floor Channels for Weight Distribution - 2/Set
994-036	Tray for Dose Calibrator, 10.75" Square (27.3 cm)
994-036-1	Tray for Dose Calibrator, 12" Square (30.5 cm)
990-488	"L" Block - 2" Thick (5.08 cm) Lead
990-900	Stainless Steel Tray for "L" Block

DUAL WORKSTATION
with Lead Side Shields

Lead Walls: 2" thick (5.08 cm)
Frame: 2" (5.08 cm) steel tubing
Overall Size: 64" W x 36" D x 50.25" H (162.6 x 91.4 cm x 127.6)
Side Shields: 2" thick x 16 7/16" H (5.1 x 41.8 cm)
Work Surfaces: 28" W x 34" D (71.1 x 86.4 cm) and 30" W x 34 " D (76.2 x 86.4 cm)
Work Surface Height: 34 1/8" (86.7 cm) from floor
Drawer Inside Size: 20" W x 20" D x 5" H (50.8 x 50.8 x 12.7 cm)
Clearance Under Drawer to Bottom Shelf: 15 1/8" (38.4 cm)
Bottom Shelf: 32" W x 36" D (81.2 x 91.4 cm), 9 5/8" (24.5 cm) from floor
Casters: Four rear fixed 6" (15.24 cm) diameter, two front swivel 6" (15.24 cm) diameter, two front swivel 6" (15.24 cm) diameter w/brakes
Finish: Durable tan textured polyurethane enamel paint
Weight: 475 lb (216 kg)

Item #	Description
992-140	Dual Workstation with Lead Side Shields (Made from Items 992-138 and 992-139)
992-138	Workstation with 3 Side Shields
992-139	Workstation with 2 Side Shields

STEEL TABLE

This steel table has smooth, round edges and the top shelf will support both a Storage Safe (Item 994-300) and a L-Block Shield (Item 990-488). The table has a locking storage drawer and a heavy duty lower shelf for storing radiation pigs and supplies. The support frame of the table is tubular steel with welded joints for maximum strength. The table is welded to four 6" (15.24 cm) diameter swivel locking casters rated at 1,200 pounds (545 kg) each.

Specifications

Dimensions: 28" W x 36" D x 33.75" H (71.1 x 91.4 x 85.7 cm)
Inside Drawer Size: 20" W x 20" D x 5" H (50.8 x 50.8 x 12.7 cm)
Finish: Durable tan textured polyurethane enamel paint
Weight: 150 lb (68.2 kg)

Item #	Description
992-020	Steel Table with Drawer and Shelf

STEEL TABLES

These Steel Tables are made with a 2" (5.08 cm) square steel tubing framework and Stainless Steel shelves. The two front legs have adjustable leveling feet. The two back legs are a fixed length.

Item	Steel Table, 2 Shelves
992-060	36" W x 24" D x 36" H (91.44 x 60.96 x 94.44 cm)
992-147	48" W x 24" D x 36" H (121.92 x 60.96 x 94.44 cm)

CABINET 6mm (1/4") LEAD-LINED

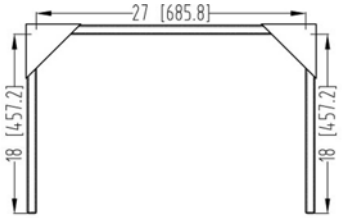
The cabinet is made of 0.25" (6.37 mm) sheet lead and covered on both sides with steel. The doors are also 0.25" (6.37 mm) sheet lead covered with stainless steel and have a key lock handle on each door. The outside of the cabinet and the interior walls are painted with a tan textured polyurethane enamel paint. A toe kick at the bottom prevents anything from sliding underneath the cabinet.

Specifications

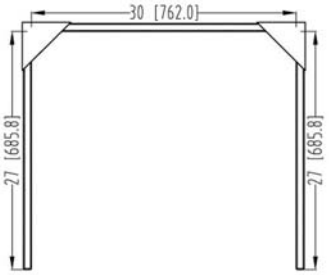
Overall size: 40" W x 24" D x 28" H (102 x 61 x 71 cm)
Finish: Durable tan textured polyurethane enamel paint
Approximate weight: 1200 lb (545.5 kg)

Item #	Description
955-041	Stainless Steel Covered Lead Cabinet

STAINLESS STEEL COVERED SIDE SHIELD SYSTEMS FOR CABINET TOP OR TABLE



995-011



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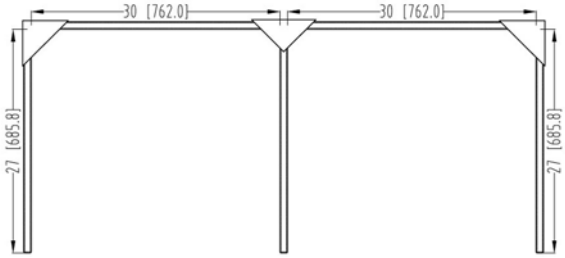
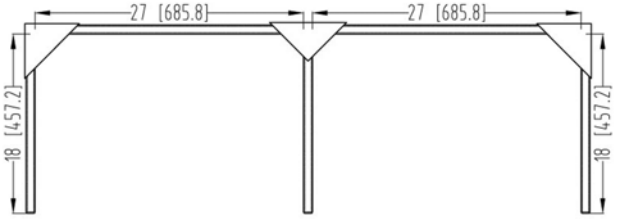


995-013



995-014

Side Shield Systems are available for the top of a cabinet, counter or table. The Side Shield Systems are 1/2" (1.27 cm) lead covered with stainless steel. It fits together using "L" brackets and vertical corner gussets (included).

Material: 1/2" (1.27 cm) Lead covered with Stainless Steel and framed in stainless steel channels

Item	Description	Lead Thickness	Dimensions	Weight
995-011	Side Shield System, Single	0.5" (1.27 cm)	Each Side: 18" L x 18.5" H x 0.5" T (45.7 x 47 x 1.27 cm) Back: 27" L x 18.5" H x 0.5" T (68.6 x 47 x 1.27 cm)	125 lb (57 kg)
995-012	Side Shield System, Single	0.5" (1.27 cm)	Each Side: 27" L x 18.5" H x 0.5" T (68.6 x 47 x 1.27 cm) Back: 30" L x 18.5" H x 0.5" T (76.2 x 47 x 1.27 cm)	355 lb (162 kg)
995-013	Side Shield System, Double	0.5" (1.27 cm)	Each Side: 27" L x 18.5" H x 0.5" T (68.6 x 47 x 1.27 cm) Each Back: 30" L x 18.5" H x 0.5" T (76.2 x 47 x 1.27 cm)	595 lb (271 kg)
995-014	Side Shield System, Double	0.5" (1.27 cm)	Each Side: 18" L x 18.5" H x 0.5" T (45.9 x 47 x 1.27 cm) Each Back: 27" L x 18.5" H x 0.5" T (68.6 x 47 x 1.27 cm)	475 lb (216 kg)

L-BLOCK LEAD SHIELD

With Wide View Window

Shown with Optional Stainless Steel Tray (Item 990-900)

The L-Block Lead Shield's tilted wide view leaded glass window provides easy viewing of the radiation loading area. 3" (7.6 cm) of lead on each side of the viewing window give maximum protection to the head. The 8" (20.3 cm) square window is made of 4" (10.2 cm) thick leaded glass that has a density of 5.2 g/cm³. The L-Block is made of sheet steel with 2" (5.08 cm) of lead shielding inside. Two holes are provided for lifting the unit.

Specifications

Leaded Glass Dim: 8" Sq. x 4" T (20.3 x 10.2 cm)
Lead Glass Density: 5.2 g/cm³
Tenth Value Thickness (Cesium^{137}) = 4.8 cm leaded glass
4" T (10.2 cm) leaded glass = 4 cm lead equivalence
Overall Dim: 14" W x 17 1/2" D x 24 3/4" H x 2" T
(35.6 x 44.5 x 62.9 x 5.08 cm)
Finish: Durable tan textured polyurethane enamel paint
Weight: 450 lb (205 kg)

Item #	Description
990-488	L-Block Lead Shield
990-900	Stainless Steel Tray

LEAD "L" BLOCK SHIELD

With Extra Wide View

The 1 1/2" (3.8 cm) thick Lead "L" Block Shield provides protection to the clinician when working with 511 KeV nuclides.

The face shielding is made of optically clear 12" W x 8" L x 2" thick (30.5 x 20.3 x 5.08 cm) lead glass, cantilevered for unimpaired viewing of the work area. The leaded glass has a density of 5.2 g/cm³ to give maximum eye and face protection.

Specifications

Leaded Glass Dim: 12" W x 8" H x 2" T (30.5 x 20.3 x 5.08 cm)
Lead Glass Density: 5.2 g/cm³
Lead Glass: 2 cm lead equivalent (^{137}Cs energy)
Lead Thickness: 1 1/2" (3.8 cm)
Lead Density: 11.35 g/cm³
Overall Dim: 12 3/8" W x 13 1/2" D x 16 7/8" H (31.5 x 34.3 x 42.9 cm)
Front Shield Dim: 12 3/8" W x 11 1/8" H (31.5 x 28.3 cm)
Finish: Durable tan textured polyurethane enamel paint
Weight: 210 lb (95.5 kg)

Item #	Description
989-415	Lead L-Block Shield

PET STORAGE SAFE

This Storage Safe is ideal for storing large quantities of high activity radioisotopes. Shielded with a thickness of 2" (5.08 cm) of lead, the safe is encased in a powder coated steel jacket and features an adjustable shelf. The lead lined door is hung with heavy duty non-sagging hinges and is key-locked to prevent unauthorized access.

Transporting this half-ton safe is made easier with the built-in lifting handles for use with a hoist or other means.

Specifications

Exterior Dim: 17.4" W x 17" D x 19" H (44.2 x 43.2 x 48.3 cm)
Inside Dim: 12" x 12" x 12" (30.5 x 30.5 x 30.5 cm)
Wall Thickness: 2" (5.08 cm)
Finish: Durable, powder coat paint
Weight: 1,050 lb (477.3 kg)

Item #	Description
994-300	PET Storage Safe with Door

W

PET WASTE WELL

The PET Waste Well stores used syringes and vials used in PET applications until proper disposal.

The Waste Well has 2" (5.08 cm) thick lead brick walls covered with steel panels on the outside and inside. The bottom is lead covered with stainless steel. The frame of the waste well is 2" (5.08 cm) square steel tubing welded together.

Optional: Half cover made of stainless steel filled with lead. The cover has rollers that allow the user to easily roll the cover forward or backward using the handle.

Note: The Waste Well can be custom made to your specifications.

Specifications

Overall Dimensions: 24" W x 24" L x 51.5" H (61 x 61 x 131 cm)
Inside Well Dimensions: 20" W x 20" L x 16" Deep (51 x 51 x 41 cm)
Wall Thickness: 2" (5.08 cm) Lead
Weight: Approx 1,250 lbs (569 kg)
Color: Durable tan textured polyurethane enamel paint.

Item #	Description	Lead Thickness
994-010	PET Waste Well	2" (5.08 cm) Lead Walls and 1/2" (1.27 cm) Lead Floor
994-011	Half Cover for PET Waste Well	1/2" (1.27 cm) Lead
994-012	PET Waste Well	2" (5.08 cm) Lead Walls and 1" (2.54 cm) Lead Floor
994-013	Half Cover for PET Waste Well	1" (2.54 cm) Lead

SHARPS CONTAINER SHIELD FOR PET

The Sharps Container Shield for PET is a simple, safe and convenient solution for disposal of syringes that have been contaminated with high energy radionuclides. The shield is constructed of steel and lined with 1" thick (2.54 cm) lead.

The shield is designed to be used with Item 994-413 Monoject Sharps Containers. It features a lockable sliding cover for container removal and a hinged top door for syringe disposal.

The shield can stand independently or can be recessed into a cabinet or countertop. It uses one Monoject Sharps Container.

Specifications

Item 994-412 Sharps Container Shield, PET
Dimensions: 12" H x 8.75" Dia (30.5 x 22.2 cm)
Lead Shielding:
Sides and Bottom: 1" thick (2.5 cm)
Rotating Cover: .875" thick (2.2 cm)
Hinged Door: .625" thick (1.5 cm)
Weight: 175 lb (79.5 kg)

Item #	Description
994-412	Sharps Container Shield, PET
994-413	Sharps Container, Monoject, 12/Pkg

ADJUSTABLE HEIGHT ROLLING RADIATION SHIELD FOR PET

2" (5.08 cm) Thick Lead

- **Only adjustable shield with 36" W x 24" H (91 x 61 cm) lead**
- **Easy-to-adjust**

The Adjustable Lead Shield can be moved over a 9" (23 cm) height range by using a screw jack. The jack is operated by a hand crank or a flat blade (both included) for a 3/8" Drill. The shield is set in a metal frame and mounted on a base with four 6" (15.24 cm) diameter swivel, locking, ball bearing casters that provide easy mobility.

Specifications

Lead Size: 36" W x 24" H x 2" T (91 x 61 x 5.08 cm)
Overall Size: 42.5" W x 24" D (108 x 61 cm)
Base Height: 10.5" (26.7 cm)
Casters: Four 6" (15.24 cm) dia. swivel locking ball bearing
Finish: Durable tan textured polyurethane enamel paint
Weight: 850 lb (387 kg)

Item #	Description
964-030	Adjustable Height Rolling Radiation Shield Height Adjusts 39" to 48" (99 to 122 cm)

INTERLOCKING RADIATION SHIELDS FOR PET

2" (5.08 cm) Thick Lead

These radiation shields for PET are made of 2" (5.08 cm) thick lead with lead-filled posts. The base of each shield has four 6" (15.24 cm) diameter swivel locking ball bearing casters. The base of the bed end shield is higher for placement over the base of the side shield. This allows the shields to abut to each other. Each shield has handles on both sides and both ends.

Specifications

Lead Size: 36" W x 24" H x 2" T (91 x 61 x 5.08 cm)
Overall Size: 40" W x 45" H x 24" D (102 x 114 x 61 cm)
Casters: Four 6" (15.24 cm) diameter swivel locking ball bearing
Finish: Durable tan textured polyurethane enamel paint
Approximate Weight: 850 lb (387 kg)

Item #	Description
964-340	Interlocking Bed End Shield 40" W x 40" H x 24" D (101.96 x 101.96 x 61.18 cm)
964-342	Interlocking Bed End Shield 40" W x 42" H x 24" D (101.96 x 107.06 x 61.18 cm)
964-345	Interlocking Bed End Shield 40" W x 45" H x 24" D (101.96 x 114.71 x 61.18 cm)
964-348	Interlocking Bed End Shield 40" W x 48" H x 24" D (101.96 x 122.35 x 61.18 cm)
964-355	Interlocking Bed End Shield 40" W x 55" H x 24" D (101.96 x 140.2 x 61.18 cm)
964-930	Optional Two Lead-Filled Posts
964-940	Optional Shield Interlock, 1.75" (4.5cm) Lead Thickness

W

RADIATION SHIELDS FOR PET

2" (5.08 cm) Thick Lead

These radiation shields for PET are made of 2" (5.08 cm) thick lead with lead-filled posts. The base of each shield has four 6" (15.24 cm) diameter swivel locking ball bearing casters.

Specifications

Lead Size: 36" W x 24" H x 2" T (91 x 61 x 5.08 cm)
Base Height: 10.5" (26.7 cm)
Casters: Four 6" (15.24 cm) dia. swivel locking ball bearing
Finish: Durable tan textured polyurethane enamel paint
Approximate Weight: 850 lb (387 kg)

Item #	Description
964-240	Fixed Rolling Radiation Shield 40" W x 40" H x 24" D (101.6 x 101.6 x 61 cm)
964-242	Fixed Rolling Radiation Shield 40" W x 42" H x 24" D (101.6 x 106.7 x 61 cm)
964-245	Fixed Rolling Radiation Shield 40" W x 45" H x 24" D (101.6 x 114.3 x 61 cm)
964-248	Fixed Rolling Radiation Shield 40" W x 48" H x 24" D (101.6 x 121.9 x 61 cm)
964-255	Fixed Rolling Radiation Shield 40" W x 55" H x 30" D (101.6 x 139.7 x 76 cm)
964-940	Optional Shield Interlock, 1.75" (4.5cm) Lead Thickness

Custom Size Shields Available

COMPACT PET SHIPPING SYSTEM FOR ONE TO THREE UNIT DOSE PIGS

For Shipping Syringes With or Without Needles Attached

994-726 994-727 994-728

These compact PET shipping systems transport one to three 3 cc or 5 cc syringes containing high-energy radionuclides such as FDG F-18. Syringes fit into the pigs with or without an attached needle. This system is designed to conserve space and minimize weight. An important feature is that the shipping container can be left at a convenient height while the pig (9 lb or 4.1 kg) can be easily removed from the container. The pig is then placed behind an L-Block for dose loading and unloading.

The Unit Dose Pig is encapsulated in high-impact lexan and polypropylene, making the pig durable, easy to clean and compatible with automatic washing systems. A single twist opens or closes the pig, reducing handling time.

Compact PET Shipping System Includes

- PET Unit Dose Pig (1 to 3)
- Absorbent Sheets, 100/Pkg
- Shipping Container with Lead Shielding

Specifications

Item 994-726 Single Unit Pet Shipping System
Container Size: 11.75" L x 11.75" W x 12.5" H (29.8 x 29.8 x 31.8 cm)
Cubic Feet: ~ 1 cu ft (.03 cu meters)
Weight (Combined): 38.3 lb (17.5 kg)
Regulations: Meets DOT II Type A packaging requirements when shipping up to 500 mCi (18.5 GBq) of FDG F-18

Item 994-727 Double Unit PET Shipping System
Container Size: 11.75" L x 11.75" W x 12.5" H (29.8 x 29.8 x 31.8 cm)
Cubic Feet: ~1 cu ft (.03 cu meters)
Weight (Combined): 55.2 lb (25.2 kg)
Regulations: Meets DOT II Type A packaging requirements when shipping up to 160 (5.92 GBq) and 235 (8.70 GBq) mCi of FDG F-18.

Item 994-728 Triple Unit PET Shipping System
Container Size: 11.75" L x 11.75" W x 12.5" H (29.8 x 29.8 x 31.8 cm)
Cubic Feet: ~1 cu ft (.03 cu meters)
Weight (Combined): 95 lb (43.1 kg)
Regulations: Meets DOT II Type A packaging requirements when shipping up to 235 (8.70 GBq), 160 (5.92 GBq) and 140 mCi (5.18 GBq) of FDG F-18.

Item 994-729 Unit Dose Pig
Size: 10.2" H x 2.4" Dia. (26 x 6 cm)
Lead Shielding:
Body: 0.5" thick (1.3 cm)
Ends: 1.2" thick, bottom; 1.44" thick, top (3 cm and 3.6 cm)
Weight: 8.7 lb (4 kg)
Regulations: Meets IATA Dangerous Goods Regulations, 53rd Edition Sections 5.0.4.3, 10.5 and 10.6.1 thru 10.6.3.5.

Item #	Description
994-726	PET Shipping System, Single PIG
994-727	PET Shipping System, Double PIG
994-728	PET Shipping System, Triple PIG
994-729	Unit Dose Pig, 3/5 cc, 0.5" (1.3 cm) Lead
994-730	Transport Cart for PET Shipping System
994-732	Absorbent Sheets, 100/Pkg
994-733	Tags, Wire Security, 25/Pkg

COMPACT PET SHIPPING SYSTEM FOR VIAL PIG

994-750 994-205

The Compact PET Shipping System for Vial Pigs is designed to transport a 10 ml or 30 ml vial containing high energy radionuclides. Designed to conserve space and minimize weight, the entire system weighs only 50 lb (22.7 kg). An important feature is that the shipping container can be placed at a convenient height while the pig is easily removed from the shipping case. For added safety and convenience, the vial pig can then be placed in the Dose Drawing System (Item 994-465) for drawing doses from the vial.

Item 994-750 PET Shipping System for Vial Pig Includes
- PET Vial Pig (Item 994-205 and 994-206)
- Absorbent Sheets (Item 994-732)
- Shipping Container with Lead Shielding (Item

The Vial Pig Adapter (Item 994-206) allows the 30 ml Vial Pig (Item 994-205) to accommodate 10 ml vials, one Vial Pig Adapter is included with the Vial Pig.

Specifications

Item 994-205 10/30 ml Vial Pig, 1" (2.54 cm) Lead
Outside Dimensions: 6.63" H x 4.15" dia. (16.8 x 10.5 cm)
Inside Dimensions: 2.76" H x 1.51" dia (7 x 3.8 cm)
Lead Shielding Sides and Bottom: 1" thick (2.5 cm)
Lead Shielding Top: 1.75" (4.4 cm)
Weight: 21.3 lb (9.7 kg)

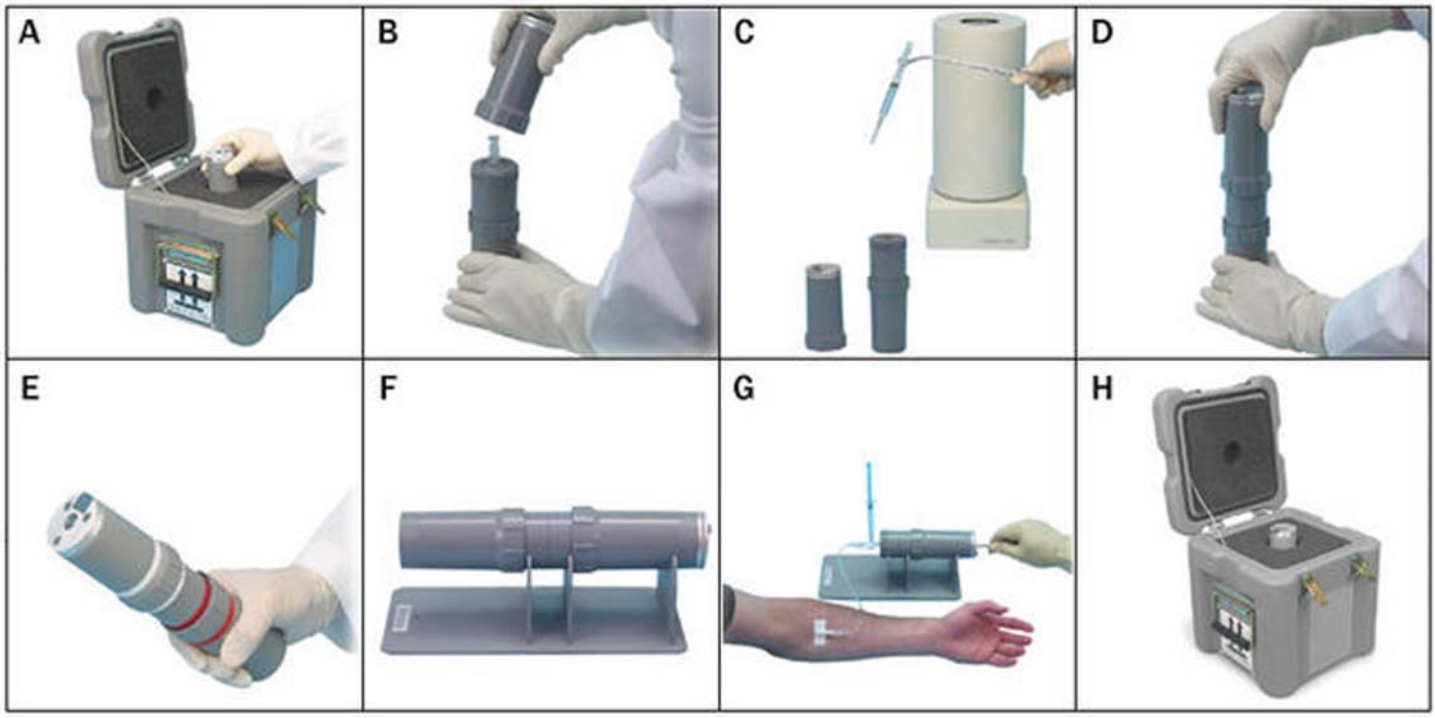
Item 994-750 PET Shipping System, Vial and Pig
Container Size: 11.75" L x 11.75" W x 12.5" H (29.8 x 29.8 x 31.8 cm)
Cubic Feet: 1.0 cu ft (.03 cu meters)
Weight (Combined): 49.7 lb (22.5 kg)

Regulations: Meets DOT II Type A packaging requirements when shipping up to 2.5 Ci FDG F-18. Meets IATA Dangerous Goods Regulations, 53rd Edition Sections 5.0.4.3, 10.5, and 10.6.1 thru 10.6.3.5.

Note: System requires Absorbent Sheet to meet required DOT and IATA standards.

Item #	Description
994-750	Compact PET Shipping System for Vial Pig
994-205	10/30 ml Vial Pig, 1" (2.54 cm) Lead
994-206	Vial Pig Adapter - 10 ml
994-730	Transport Cart, PET Shipping System
994-732	Absorbent Sheets, 100/Pkg
994-733	Tag, Wire Security, 25/Pkg

PET SHIPPING SYSTEM FOR DOUBLE-ENDED PET PIG



- **One system for shipping and injecting FDG F-18**
- **Pig accommodates 5cc syringes with or without needle**

The Double-Ended PET Pig is an all-in-one solution for the safe transport and administration of 511 keV radionuclides, such as FDG F-18. The pig is constructed in three sections of 0.6" (1.5 cm) lead enclosed in durable Lexan. Depending on the stage of the injection process, only one section of the pig is removed. The injection itself is accomplished without removing the syringe from the pig. Simply open the administration port and push the tungsten plunger against the syringe plunger. During injection the pig is positioned on a stand. The Double-Ended Pig accommodates a 5 cc syringe and fits into its own compact shipping container. The system employs a unique design that decreases the weight and size of the container.

How it Works

1. Remove the Double-Ended Pig from the compact shipping container. (Fig A)
2. Place behind an L-Block Shield.
3. Unscrew the top. (Fig B)
4. Remove the syringe and place into a dose calibrator. (Fig C)
5. Return the syringe to the pig and put the top back on. (Fig D)
6. Transport the pig to the patient injection area. (Fig E)
7. Place the pig into the Pig Cradle so the top section of the pig is over the long section of the cradle. (Fig F)
8. Remove the bottom of the pig and connect to your preferred injection device, butterfly, etc. (Fig G)
9. Open the plunger lock located on the top section by pulling the slide toward the edge of the pig. With a pen-like device, push the tungsten plunger to administer the dose. (Fig G)
10. Recap the syringe.
11. Put the bottom back on the pig.
12. Return the pig to the compact shipping container. (Fig H)

PET Shipping System for Double-Ended PET Pig Includes

- Double-Ended PET Pig
- Shipping Container with Lead Shielding

Specifications

Item 994-762 Double-Ended PET Pig
Size: 9.5” H x 2.3” Dia at the maximum point (24 x 5.8 cm)
Lead Shielding Sides: 0.6” thick (1.5 cm) lead
Lead Shielding Bottom: 1.44” thick (3.7 cm) lead
Lead Shielding Top: 0.875” thick (2.2 cm) tungsten
Weight: 9 lb (4 kg)

Item 994-760 Shipping System Container for Double-Ended Pig
Container Size: 11.75” L x 11.75 W x 12.5” H(29.8 x 29.8 x 31.8 cm)
Cubic Feet: ~1 cu ft (0.3 cu meters)
Weight: 36 lb (16.3 kg)
Regulations: Meets DOT II Type A packaging requirements when shipping up to 475mCi (17.58 GBq) of FDG F-18. Meets IATA Dangerous Goods Regulations 53rd Edition Sections 5.0.4.3, 10.5, and 10.6.1 through 10.6.3.5.

Item #	Description
994-760	PET Shipping System for Double-Ended PET Pig
994-762	Double-Ended PET Pig
994-764	Pig Cradle for Double-Ended PET Pig
994-732	Absorbent Sheets, 100/Pkg

LEAD LINED STORAGE CONTAINER

The Lead Lined Storage Container can be used to store radioactive materials that require lead shielding of 1/8" (0.3 cm) or less. The container is made of steel and has 1/8" (0.3 cm) thick lead on all sides, top and bottom. Two latches secure the lid shut and allow for the use of locks for security. The container has a bail handle on the lid for lifting the lid and two bail handles on the sides to carry the container.

Specifications

Material: Steel and 1/8" (0.3 cm) thick lead
Inside Dimension: 9.5" L x 9.5" W x 9.5" H (24.1 x 24.1 x 24.1 cm)
Finish: Durable tan textured polyurethane enamel paint
Weight: 44 lb (20 kg)

Item #	Description
929-200	Lead Lined Storage Container

UNIVERSAL 511 T-VIAL SHIELD

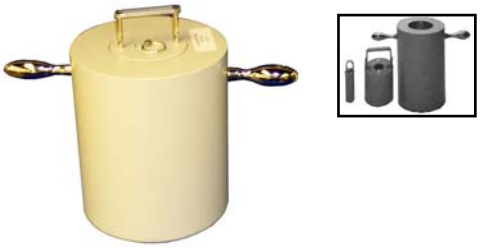
The Universal 511 "T" Vial Shield is made entirely of Tungsten to provide the best protection for the user. The shield offers 1" (2.54 cm) lead equivalent on all sides. "T" lifting handle is removable. The Universal 511 "T" Vial Shield holds 10, 20 and 30 cc vials.

Specifications

Dimenstions: 3.1" Dia. x 4.7" H (8 x 12 cm)
Weight: 16 lb (7 kg)

Item #	Description
994-041	Universal 511 "T" Vial Shield - 10, 20 and 30 cc Vials

PIG - 30 AND PIG - 50



Pig 30 inside Pig 50

These lead Pigs for PET store vials of radiotracers for daily use, ensuring staff safety and reducing background levels. Built with 2.38" (60 mm) lead shielding. Pig-30 holds vials up to 30 ml; PIG-50 holds vials up to 50 ml.

Specifications

Item 994-066 PIG-30
O.D.: 6.4" dia x 8" H (16 x 20 cm)
I.D.: 1.65" dia x 3" H (4.2 x 7.6 cm)
Weight: 109 lb (50 kg)

Item 994-068 PIG-50
O.D.: 6.75" dia x 9.75" H (17 x 25 cm)
I.D.: 2.0" dia x 5" H (5.08 x 12.7 cm)
Weight: 148 lb (68 kg)

Item #	Description
994-066	PIG - 30
994-068	PIG - 50

ROTUND LEAD CONTAINER

1" (2.54 cm) Lead Wall

The Rotund Container with 1" thick (2.54 cm) Lead Wall, can be used to store syringes or vials that contain or have residue radiopharmaceuticals. This container is for use in nuclear medicine and PET departments. The container has a 1" (2.54 cm) lead wall with a 4" (10.16 cm) inside diameter. The lid has a 1 1/16" x 4" dia. (2.7 x 10.2 cm) center that protrudes into the container which prevents the lid from sliding and firmly seats the lid on the container.

Specifications

Inside Dimensions: 4" dia. x 5.5" D (10.2 x 14 cm)
Outside Dimensions: 6" dia. x 7.5" H (15 x 19 cm), not including handle
Lead Wall: 1" thick (2.54 cm)
Finish: Durable tan textured polyurethane enamel paint
Weight: 60 lb (27.3 kg)

Note: The Rotund container can be custom made to any size per customer's specifications. Please call Radiation Products Design for more information on custom sizes.

Item #	Description
994-070	Rotund Lead Container

SPATIAL REGISTRATION SOURCE HOLDERS

994-248 - Top View

994-248 - Bottom View

994-2481

The Spatial Registration Source Holders are designed to hold a 10 cc or 3 cc vial of radionuclide to test the spatial registration of a nuclear medicine camera. The holders are made of lead and have a 5mm diameter hole at the bottom of each holder. Two thumb screws tighten the cover.

Specifications

Item 994-248 for 10cc Vial
Overall Size: 5.3 cm diameter x 9.5 cm H
Cavity Size: 2.8 cm diameter x 5.7 cm D
Cover thickness: 1.27 cm
Bottom thickness: 2.54 cm
Material: Lead
Finish: Tan textured polyurethene paint

Item 994-2481 for 3cc Vial
Overall Size: 4.5 cm diameter x 7.9 cm H
Cavity Size: 1.8 cm diameter x 4.0 cm D
Cover thickness: 1.27 cm
Bottom thickness: 2.54 cm
Material: Lead
Finish: Tan textured polyurethene paint

Item	Description
994-248	Spatial Registration Source Holder for 10cc Vial
994-2481	Spatial Registration Source Holder for 3cc Vial

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COUNT RATE CALIBRATOR SOURCE HOLDER

Shown with Optional Handle
(Item 994-249-5)

This is a source holder for multiple spatial window registration measurements. The holder and cover are made of 1" lead painted with a smooth tan polyurethane. Three (3) copper plates are included with the source holder. One copper plate is 1.59 mm thick and two(2) plates are 2.38 mm thick. Two (2) Pan head screws hold the copper plates and cover on the holder. An allen wrench is also included.

The handle is optional and ordered separately.

Specifications

Overall Dimensions: 3.14" Diameter x 4.2" H
(7.98 cm diameter x 10.67 cm H)
Inside Hole dimesions: 1.075" Diameter x 2.2" H
(2.73 cm diameter x 5.59 cm H)
Lead Thickness: 1" Lead
Finish: Tan polyurethene paint
Copper Plates:
One (1) Plate: 7.98 cm diameter x 1.59 mm T
Two (2) Plates: 7.98 cm diameter x 2.38 mm T
Weight: 12.8 lb (6 kg)

Item	Description
994-249	Count Rate Calibrator - Source Holder
994-249-5	Optional Handle

LEAD STORAGE CONTAINER

1" (2.54 cm) Lead Walls

994-073

Precision Ge-68 Phantom

Optional 950-020

The Lead Storage container was designed as a storage holder for the Precision Ge-68 Phantom for PET camera quality assurance.

The container has an outside wall of ¼" (.64 cm) steel with 1" (2.54 cm) lead shielding on the inside and the chamfer top allows for the cover to sit snuggly on top. Two (2) U-handles welded to the side of the container allow for easy movement. The cover is 1" (2.54 cm) lead with a chamfer bottom to fit into the container. Two (2) U-handles welded to the cover allow for easy removal. The container is welded to the 16" (40.6 cm) diameter steel base plate. Easy mobility is achieved by the five (5) 3" (7.6 cm) non-locking swivel casters that are bolted to the base plate.

Optional: An optional "Stay Anywhere " Handle can be welded to the the base plate of Item 994-073. The "Stay Anywhere Handle" is friction held in any position and allows for easy steering and pulling.

Specifications

Overall Dimensions: 16" Dia. x 19 1/4" H (49 x 40.6 cm)
Container Dimensions
Outside: 12" Dia. x 13" H (30.5 x 33 cm)
Inside: 9 5/16" Dia. x 11 1/2" Deep (23.6 x 29.2 cm)
Container Wall Material: 1" Thick Lead (2.54 cm) and 1/4" Steel (.64 cm)
Container Cover: 1" Thick Lead (2.54 cm)
Container Bottom: 1" Thick Lead (2.54 cm)
Base Plate: 16" Dia. x 1/4" Thick Steel (40.6 x .64 cm)
Casters: Five (5) 3" (7.6 cm) Swivel casters, non-locking
Finish: Outside-Tan Textured Polyurethane
Inside-Tan Smooth Polyurethane
Weight: 288 lb (131 kg)

Item #	Description
994-073	Lead Storage Container
950-020	Optional "Stay Anywhere" Handle System

LEAD SHIELDED CART WITH COVER FOR PET VIALS

Shown with Optional
10/30 Vial Pig Item 994-205

The shielded cart with cover is designed to transport vial pigs used with PET radionuclides.

The container is constructed of 0.25" (0.6 cm) thick steel and shielded with 1" (2.54 cm) lead. The cover is also steel and has a 1" (2.54 cm) thickness of lead with a bayonet latch to hold the cover tight on the container. The container and cover can be locked using the provided pad lock. The cart has two 8" (20 cm) diameter, roller bearing rear wheels and a 5" (13 cm) diameter, swivel, locking ball bearing front caster. The 36" (91.5 cm) long 'Stay Anywhere Handle' is friction held at any position.

An optional removable paper and forceps holder (Item 349-312) attaches to the cart on the rear axle.

This cart will accommodate Item 994-205, the 10/30 ml Vial Pig

Specifications

Inside Container Size: 4.25" dia. x 8.0" H (10.8 x 20.3 cm)
Outside Container Size: 7.0" dia. x 9.32" H (17.8 x 23.7 cm)
Finish: Durable tan textured polyurethane enamel paint
Weight: 133 lb (61 kg)

Item #	Description
949-320	Lead Shielded Cart With Cover
949-312	Optional Paper Forceps Holder for Item 949-320
994-205	10/30ml Vial Pig, 1" (2.54 cm) Lead

511 TRANSPORT CONTAINER AND CART

994-060

994-059

Item 994-060 511 Transport Container

- **Fits into box on Transport Cart, Item 994-059**
- **Designed with over 1.5" (3.8 cm) of safety shielding**
- **Lift rings for easy removal of lid**
- **Holds up to 30 cc vial**
- **Ball handle fastens to secure top**
- **6.5" H x 5" Dia. (16.5 x 13 cm)**

The 511 Transport Container is designed to fit into the Transport Cart and holds vials of 511 emitters.

Item 994-059 Transport Cart

- **Long, self-standing handle**
- **Low center of gravity for stability**
- **Removable insert included to subdivide box into two smaller sections**
- **Locking front wheels**

The High Radiation Transport Cart is a safe way to transport heavy lead containers within your facility without risk of the cart turning over or struggling with a container too heavy to carry safely. The cart has a single box measuring 12 5/8" x 9 3/8" square and 3 3/8" (12.6 x 24 x 8.6 cm) high to hold lead canisters up to 6.75" (17 cm) in diameter safely, close to the floor. To handle weighty loads the unit has heavy duty roller bearing rear wheels and a locking front caster. The self-standing handle is held by friction in any position. Weighing only 25 pounds (11 kg) and with a small footprint, the unit is easily lifted in and out of a vehicle and stored in a small space.

Item #	Description
994-060	511 Transport Container
994-059	Transport Cart for Radiation Container 994-060

NIPTONGS

These low-cost tongs are used to handle small radioactive or otherwise dangerous objects. The tongs have a 45° v cut groove on each jaw. The compression spring maintains a strong grip on the object until the tension is released by squeezing the finger bar. Chrome-plated, high carbon steel with hardwood handles, the “tongs” are easily disassembled for decontamination and cleaning.

Niptongs can hold objects up to 1" diameter (2.54 cm).

Item #	Description	Length
994-120	Niptongs	12" (30 cm)
994-122	Niptongs	36" (91 cm)

511 C-TEC™ SYRINGE SHIELDS

This special Syringe Shield is manufactured to provide shielding for 511 keV nuclides. The 511 Syringe Shield is made of Tungsten with a 0.5" (12.7 mm) lead equivalency.

It has a viewing area of 0.75" (19 mm) thick lead glass surrounded by a rubber grommet to prevent damage to the glass. Fluorescent gold gloss covers the interior of the syringe shield for exceptional visibility of the syringe contents.

Item #	Description
994-045	511 C-Tec™ Syringe Shields, 5 cc
994-046	511 C-Tec™ Syringe Shields, 10 cc
994-047	511 C-Tec™ Syringe Shields, 20 cc

511 DOSE-DRAWING SYRINGE SHIELDS

The 511 Dose Drawing Syringe Shields are constructed with the same featured shielding as the 511 C-Tec™ Syringe Shields. The needle end of the syringe shield has a Tungsten disc that protects the user’s hands during the dose drawing procedure.

There are 2 pins in the end disc that secure the shield to the Drawing Station. This allows the user to withdraw a dose using only one hand.

Item #	Description
994-050	511 Dose Drawing Syringe Shield - 5 cc
994-051	511 Dose Drawing Syringe Shield - 10 cc
994-052	511 Dose Drawing Syringe Shield - 20 cc

Z-PET SYRINGE SHIELD

Extra thick wall for extra protection

- **Constructed of 0.55" thick (14 mm) tungsten, attenuates FDG F-18 by 97%**
- **Easily sanitized with alcohol wipes**

The Z-PET Syringe Shield greatly reduces hand exposure from syringes containing 511 KeV radionuclides. The barrel of the shield is constructed of 0.55" thick (14 mm) tungsten that attenuates FDG F-18 by 97%. The shield accommodates standard 5 cc syringes. The Z-PET Syringe Shield fits the Manual Dose Injector (Item 994-997).

Specifications

Z-PET Syringe Shield*, 5 cc
Dimensions: 2.75" L x 1.7" dia. (7 x 4.3 cm)
Shielding: 0.55" thick (14 mm) tungsten
Weight: 3.7 lb (1.7 kg)

**Z-PET Syringe Shield was conceived by Michael Zimmer, Ph.D.

Item #	Description
994-270	Z-PET Syringe Shield, 5 cc

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PRO-TEC® PET SYRINGE SHIELDS

- **Constructed of 0.34" thick (9 mm) tungsten, attenuates FDG F-18 by 88%**
- **Available with or without a high density lead glass window**
- **Fits most disposable syringes**
- **Easily sanitized with alcohol wipes**

The Pro-Tec® PET Syringe Shield reduces hand exposure from syringes containing 511 KeV radionuclides. The barrel of the shield is constructed of 0.34" thick (9 mm) tungsten that attenuates FDG F-18 by 88%.

The syringe shield is offered with or without a high density (5.6) flush mounted lead glass window that provides protection and visibility. A white reflective surface on the shield interior improves viewing of the syringe's markings and fluid content. A thumbscrew holds syringes firmly in place.

Pro-Tec® PET Syringe Shields accommodate standard sized 3 cc, 5 cc and 10 cc syringes. The Pro-Tec® Syringe Shield fits the Manual Dose Injector (Item 994-997).

Shipping Weights

994-228 and 994-258: 1.4 lb (0.64 kg)
994-229 and 994-259: 1.7 lb (0.83 kg)
994-230 and 994-260: 2.3 lb (1.05 kg)

Item #	Description
994-228	Syringe Shield, 3 cc with Lead Glass Window
994-229	Syringe Shield, 5 cc with Lead Glass Window
994-230	Syringe Shield, 10 cc with Lead Glass Window
994-258	Syringe Shield, 3 cc without Lead Glass Window
994-259	Syringe Shield, 5 cc without Lead Glass Window
994-260	Syringe Shield, 10 cc without Lead Glass Window

PET DOSE DRAWING SYSTEM

For drawing FDG F-18 from a vial into a syringe

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The Dose Drawing System is used to draw FDG F-18 doses from a vial. It consists of a specially designed Dose Drawing Syringe Shield, Vial Shield and stand.

When drawing FDG F-18, the Vial Shield and Syringe Shield remain on the stand. The stand allows the Vial Shield to rotate and has a fixed stop at the 45° downward angle. The Vial Shield is constructed of 1" (2.54 cm) lead encased in steel. The shield's top is threaded to allow quick insertion and removal of vials. The top cover incorporates a pivoting shield for septum access that allows the use of a vent needle, if desired, along with the needle from a 5 cc syringe.

The Syringe Shield mounts on a stainless steel rotating platform that slides the syringe into the vial and locks in position. The dose can then be drawn with forceps to minimize hand exposure. The Syringe Shield is constructed of 0.55" (1.3 cm) tungsten. A high-density lead glass window allows viewing up to the 5 cc mark on a 5 cc syringe.

The PET Dose Drawing System provides a safe and shielded environment while making it easy to draw a FDG F-18 dose.

How it Works

If transported in a PET Vial Shipping System, the Vial shield is placed in the stand and secured with the tightening knob.

Vial Shield shipping cover is replaced with the drawing shield cover.

Syringe is placed in the Dose Drawing Syringe Shield. The Vial Shield rotates to 45° downward angle. Swing open the cover for Vial Septum access.

Syringe Shield slides upward, allowing the syringe to puncture the Vial Septum. Dose is drawn.

Item 994-465 PET Dose Drawing System Includes

- Item 994-466 - Dose Drawing Syringe Shield
- Item 994-467 - Dose Drawing Vial Shield
- Item 994-468 - Dose Preparation Stand
- Item 994-206 - Vial adapter to accommodate 10 ml vials

Specifications

Dose Drawing Syringe Shield
Size: 1.7" Dia x 5.5" L (4.3 x 14 cm)
Shielding: 0.55" Thick tungsten (1.3 cm)
Lead Glass Window: 0.25" Thick (0.64 cm), 5.6 density

Construction
Exterior: Tungsten
End Cap Mechanism: Stainless Steel
Finish: Powder coat
Weight: 4 lb (1.8 kg)

Dose Drawing Vial Shield
Outside Dimensions: 6.1" H x 4" Dia. (15.5 x 10.2 cm)
Inside Dimensions: 2.76" H x 1.51" Dia. (7 x 3.8 cm)

Lead Shielding
Cylinder: 1" Thick (2.54 cm)
Top End Cap: 1" Thick (2.54 cm)
Cover: 0.75" Thick (1.9 cm)

Construction
Outside: Steel
Inside: Molded lead
Top End Cap: Aluminum
Bottom End Cap: Plastic
Finish: Powder coat
Weight: 20 lb (9 kg)

Dose Preparation Stand
Dimensions: 12.6" W x 10.6" D x 12.6" H (32 x 26.9 x 32 cm)
Construction: Stainless Steel and Steel
Finish: Stainless Steel and Powder coat
Weight: 21 lb (9.5 kg)

Item #	Description
994-465	Dose Drawing System, PET
994-466	Syringe Shield, Dose Drawing, PET, 5 cc
994-467	Vial Shield, Dose Drawing, PET, 30 ml
994-468	Dose Preparation Stand

PET STAINLESS STEEL SYRINGE CARRIER

Lead Lined With Handle

- **Constructed of Stainless Steel Inside and Out**
- **All Lead is Enclosed by Stainless Steel, Not Painted**

The PET Syringe Carrier is designed to store and transport syringes or vials of PET radionuclides. The top, bottom and sides are 1/4" thick (0.64 cm) lead. The ends are 1/2" thick (1.27 cm) lead. This unit is constructed of stainless steel **inside** and **out**, with **ALL** lead enclosed, not painted. The double thickness shielding at the ends provides increased protection during transport of a filled syringe with a syringe shield. The lid opens 180° for easy access. There are four (4) rubber feet attached to the bottom of the carrier.

Note: Some Manufacturers just paint the lead.

Specifications

Overall Size with Handle:
10.9" L x 3.4" W x 6.7" H (27.7 x 8.6 x 17 cm)
Carrier Size: 10.35" L x 2.9" W x 2.76" H (26.3 x 7.4 x 7 cm)
Inside Dim: 9" L x 2" W x 2" H (22.9 x 5.1 x 5.1 cm)
Material: Lead Enclosed with Stainless Steel
Lead Shielding Top, Bottom and Sides: 1/4" T (0.64 cm)
Lead Shielding Ends: 1/2" T (1.3 cm)
Weight: 16 lb (7.3 kg)

Item #	Description
994-065	PET Stainless Steel Syringe Carrier

SHIELDED SYRINGE CARRIER

The Shielded Syringe Carriers reduce exposure while storing or transporting radioactive material. The overlapping lid design with snap-latch closure prevents streaming. The ends of the carrier are double thick to reduce the exposure from the ends of the syringes.

Specifications

994-225
Inside Dim: 2.6" W x 7.7" L x 2.7" H (6.6 x 19.6 x 6.9 cm)
Outside Dim: 4.4" W x 9.5" L x 3.5" H (11.2 x 24.1 x 8.9 cm)
Lead Shielding Sides, top and bottom: 0.25" thick (.64 cm)
Lead Shielding Ends: 0.5" thick (1.3 cm)
Weight: 17 lb (7.7 kg)

994-226
Inside Dim: 1.7" W x 7.5" L x 1.7" H (4.3 x 19 x 4.3 cm)
Outside Dim: 3.4" W x 9.25" L x 2.6" H (8.6 x 23.5 x 6.6 cm)
Lead Shielding Sides, top and bottom: 0.25" thick (.64 cm)
Lead Shielding Ends: 0.5" thick (1.3 cm)
Weight: 11 lb (4.9 kg)

Item #	Description
994-225	Lead-Lined Syringe Carrier, Large
994-226	Lead-Lined Syringe Carrier, Small

MULTI-MODALITY MARKERS

462-029 462-030

Item 462-029 Multi-Modality Markers for CT/MRI
- Appears as bright object on CT, MRI and Diagnostic Imaging scans
- Inner center hole affords passage of needle through central hole
- 15 mm outer diameter and 3.5 mm thick
- 5 mm axial hole with 2 mm central hole
- Composed from hydrogel with medical grade adhesive

Item 462-030 Multi-Modality Markers for Nuc Med/PET
- Visible on Nuclear Medicine, CT and MRI scans
- Liquid-containing well suitable for injection of short-life radionuclide using a conventional hypodermic needle
- 15 mm outer diameter and 3.5 mm thick
- 5 mm axial hole
- Composed from hydrogel with medical grade adhesive

Item #	Description	Quantity
462-029	Multi-Modality Markers for CT/MRI	50
462-030	Multi-Modality Markers for Nuc Med/PET	50

MULTIMODAL SPOT MARKERS

Written Verification of Radioactive Materials License is Required When Placing an Order

The Multimodal Spot Markers are used for patient orientation and image registration in camera studies. The Co-57 is used for CT-SPECT and Ge-68 and Na-22 for CT-PET fusion imaging.

Specifications

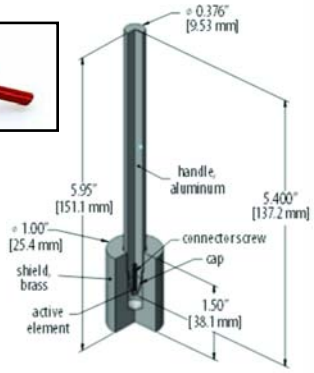
MMS02
Capsule: 1" dia. x 1/4" thick (2.54 x 0.64 cm) clear cast acrylic
Active Dimensions: 1.5 x 1.5 mm cylinder
CT Target: 1/4" (6.37 mm) OD bone-equivalent ring (surrounds active element)
Suggested Usage: Multimodal fiducial marker for image coregistration

MMS03
Capsule: 1" dia. x 1/4" thick (2.54 x 0.64 cm) clear cast acrylic with etched "crosshairs" centered on active element for laser alignment
Active Dimensions: 1 mm diameter sphere
CT Target: 2 mm OD bone-equivalent ring (surrounds active element)
Suggested Usage: Multimodal fiducial marker for image coregistration

	Nuclide	10 µCi .37 MBq	25 µCi .925 MBq	50 µCi 1.85 MBq	100 µCi 3.7 MBq
MMS02	Co-57	Item 680-200	Item 680-201	Item 680-202	Item 680-203
	Ge-68	Item 680-210	Item 680-211	Item 680-212	Item 680-213
	Na-22	Item 680-220	Item 680-221	Item 680-222	Item 680-223
MMS03	Co-57	Item 680-230	Item 680-231	Item 680-232	Item 680-233
	Ge-68	Item 680-240	Item 680-241	Item 680-242	Item 680-243
	Na-22	Item 680-250	Item 680-251	Item 680-252	Item 680-253

PEN POINT MARKERS

Written Verification of Radioactive Materials License is Required When Placing an Order



The Pen Point Marker is used to mark a point or region of interest during a camera study. The Pen Point Marker contains Co-57 in a resin matrix at the end of a 5.4" (13.7 cm) anodized aluminum rod. The pen-shaped rod screws into a brass cap which shields the active point. The Pen Point Marker is used in tracing the outlines of anatomical features on a patient. The trace appears almost instantly on the camera display. Contained activity is supplied as a nominal value ±15%.

Item #	Nuclide	Activity (µCi)	Activity (MBq)
680-260	C0-57	100	3.7
680-265	C0-57	200	7.4
680-268	C0-57	250	9.25

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PET PHANTOM

NEMA 2007 / IEC 2008

- **Complies with NEMA 2007 Standard**
- **Simulation of whole-body imaging using PET and camera-based coincidence imaging techniques**
- **Evaluation of reconstructed image quality in whole-body PET and camera-based coincidence imaging**
- **Determination of the coincidence count rate characteristics in brain and cardiac imaging**
- **Evaluation of the relationship between true coincidence count rate and radioactivity**
- **Determination of the address errors caused by address pile up**
- **Evaluation of the count loss correction scheme**

Performance Measurements of Positron Emission Tomographs, NEMA Standards Publication No. NU2, National Electrical Manufacturers Association (NEMA) Washington, DC, 2007.

International Standard: Radionuclide imaging devices - Characteristics and test conditions - Part 1: Positron Emission Tomographs, International Electrotechnical Commission (IEC), 61676-1, Geneva, Switzerland, 1998 and IEC 61675-1 1.1 (2008).

Specification

Dimensions: 9.5" H x 12" W x 9.5" D (24.01 x 30.5 x 24.1 cm)
Interior Length of Phantom: 180 mm
Fillable Spheres (six) Inner Diameter: 10 mm, 13 mm, 17 mm, 22 mm, 28 mm and 37 mm
Distance From Sphere Plane to Inside Wall: 70 mm
Volume of Empty D Shaped Cylinder: 9.7 L
Cylindrical Insert Dimension: O.D.: 51 mm dia x 180 mm L
Shipping Weight: 11 lb (4.9 kg)

Item #	Description
994-240	PET Phantom, NEMA 2007 / IEC 2008

PET SENSITIVITY PHANTOM™

NEMA 2007

- **Complies with NEMA 2007 Standard**
- **Ideal for PET camera sensitivity**

Performance Measurements of Positron Emission Tomographs, NEMA Standards Publication No. NU2, National Electrical Manufacturers Association (NEMA) Washington, DC, 2007.

Specifications

Five internally stacked concentric aluminum tubes, all 700 mm in length
1st Tube: Inside Dimension: 3.9mm and Outside Diemsion: 6.4 mm
2nd Tube: Inside Dimension: 7.0mm and Outside Diemsion: 9.5 mm
3rd Tube: Inside Dimension: 10.2mm and Outside Diemsion: 12.7 mm
4th Tube: Inside Dimension: 13.4mm and Outside Diemsion: 15.9 mm
5th Tube: Inside Dimension: 16.6mm and Outside Diemsion: 19.1 mm
6th Innermost Tube (a fillable polyethylene tube):
Inside Dimension: 1mm and Outside Diemsion: 3mm
Shipping Weight: 3 lb (1.3 kg)

Item #	Description
994-241	PET Sensitivity Phantom, NEMA 2007

NEMA PET SCATTER PHANTOM
NEMA-NU2-2007

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- **Designed to test scatter fraction, count losses and random measurements in accordance with NEMA-NU2-2007**
- **Three piece construction for easier handling**
- **Hard sided, foam lined carry case included**

The PET Scatter Phantom is a solid right circular polyethylene cylinder with a specific gravity of 0.96 ±0.01. A hole measuring 6.4 ±0.2 mm is drilled parallel to the central axis of the cylinder, at a radial distance of 45 ±1 mm.

For ease of handling the cylinder consists of three segments that are assembled during testing.

The test phantom line source insert is a clear polyethylene plastic tube 800 mm in length, with an inside diameter of 3.2 ±0.2 mm and outside diameter of 4.8 ±0.2 mm. The central tube can be filled with a known quantity of activity and threaded through the 6.4 mm hole in the test phantom.

NEMA PET Scatter Phantom Includes:

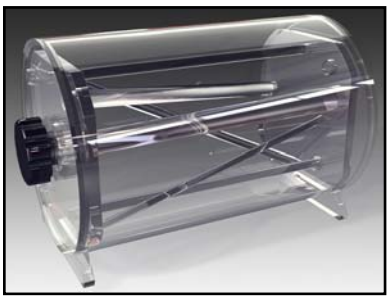
- (3) Polyethylene section drilled to accommodate assembly rod and line source
- (1) Line Source
- (1) Threaded rod for phantom assembly
- (2) Knurled knobs for phantom assembly
- (2) End plates for phantom assembly
- (1) Hard-sided, foam-lined carrying case
- (1) NEMA NU2-2007 Standard

Specifications

Total Length (3 pieces): 27.6" (70 cm)
Diameter: 8.0" (20.3 cm)
Phantom Weight: 80 lb (29.9 kg)
Material: Polyethylene
Density: 0.96 g/cc

Item #	Description
994-242	PET Scatter Phantom, NEMA-NU2-2007

GILLIAN QA PHANTOM
Evaluate Image Distortion and Alignment in SPECT/CT, PET/CT and MRI

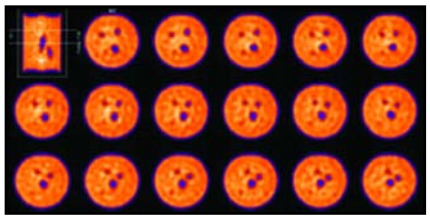


CT Image

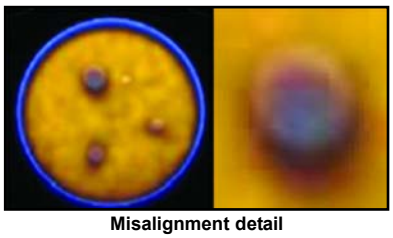
SPECT Image

Combined Image showing verticle misalignment

Combined Image showing more serious alignment problem



Transverse SPECT of Phantom



Misalignment detail

- **Compatible with SPECT/CT, PET/CT and MRI**
- **Check alignment and distortion across the entire imaging field**
- **Easy to fill and drain**
- **Allows for independent assessment of equipment function**
- **Simple geometry allows for quick visual interpretation**

Hybrid scanning systems such as SPECT/CT and PET/CT are increasingly being used to improve tumor identification, treatment delivery and monitor treatment effectiveness. By combining images from two different imaging modalities, hybrid scanning systems take advantage of the strengths of individual imaging modalities while minimizing their respective weaknesses. Proper alignment of the fused images is an ongoing concern.

The Gillian QA Phantom provides a simple and cost effective solution to verify image alignment and distortion. The phantom consists of a water tight acrylic cylinder that can be filled with a variety of fluids. Four non-parallel rods of varying diameter run the entire length of the cylinder. Images produced with the phantom can quickly and clearly show if there is any mismatch in the fused images.

Gillian QA Phantom Includes

(1) Phantom body with rods
(1) Plug
(1) Stand
(1) User Guide
48 Month Warranty

Specifications

Overall Dimensions: 10" x 10.75" x 16" (25.4 x 27.3 x 40.7 cm)
Weight: 14 lb (6.4 kg)
Materials: Acrylic
Rod Diameters: 0.5", 0.75", 0.87" and 1.26" (12.75, 19, 22 and 32 mm)

Item #	Description
682-850	Gillian QA Phantom

FEATHERLITE™ FLOOD SOURCE

NRC Radioactive Materials License Required

- FeatherLite Co-57 flood sources consist of cobalt chloride uniformly dispersed onto a thin substrate which is then placed in an ABS encapsulation and ultrasonically welded.
- FeatherLite weighs up to 60% less than other rigid flood sources, making it even easier to handle and reducing strain on your back.
- Available for all popular cameras.
- A return kit is included with each order to ensure safe return and disposal for your old flood source.
- Manufactured according to the following specifications: CV< 1.0% INU< 3.6%.
- Many circular and rectangular flood sources are in stock and ready for fast delivery.
- Each source is carefully measured for activity and analyzed to ensure a homogenous distribution with a standard deviation of less than 1%.
- Each new flood source is supplied with a fully shielded lead-lined storage case and is also shipped with a certificate of calibration that highlights specifications of the flood source.

Item	FeatherLite™ Co-57 Flood Source
680-500	16.5" x 24", For Millenium MPR, VG & MG, GE Hawkeye, Infinia, Myosite, Philips Argus, Forte, Skylight & Siemens E-Cam, **Specify Activity:** 5mCi, 10mCi, 15mCi, or 20mCi
680-505	14" x 18", For SMV-DST, Multispect 3, Millenium MPS & DSTi/Dsi, **Specify Activity:** 5mCi, 10mCi, 15mCi, or 20mCi
680-510	10" x 16", For CardioMD, Siemens C-Cam, GE Ventri & GE Optima, **Specify Activity:** 5mCi, 7.5mCi or 10mCi
680-515	10" x 10", For Digirad Cardius, Dilon & GVI Clear Vision **Specify Activity:** 5mCi or 10mCi
680-520	16.6" x 13.2", For Digirad Ergo **Activity:** 10mCi
680-525	18.5" Round, For GE Starcam XCT, ACT, Adac ARC 3000, Cirrus, Siemens Orbiter, **Specify Activity:** 5mCi or 10mCi
680-530	10" x 10", For GE Discovery GE530c, NM/CT570 **Activity:** 20mCi

W

PERFLEXION™ FLEXIBLE FLOOD SOURCES

NRC Radioactive Materials License Required

- Perflexion flood source eliminates bulk and weight with its unique flexible design and tungsten composite WolfGuard™ shield.
- Perflexion has superior source uniformity, low impurities, and excellent durability.
- Perflexion is the world's only flexible flood source.
- Perflexion lays flat for calibration use, but rolls into a compact cylinder for storage.
- Perflexion provides the most convenient, ergonomic flood source and case with optimum shielding protection.
- Perflexion can be folded, bent, crushed and pulled without the material deforming, damaging, creasing, cracking, flaking or tearing over time.
- Perflexion polymer "memory" ensures that the source will return to flatness even after being stored in a rolled configuration.
- Lightest weight—weighs less than 29 lbs including the tungsten shield and hard case.
- Smallest form factor—source rolls to fit in a 6"x6"x22" tube for convenient storage
- Best shielding—5-10x better than lead cases
- A return kit is included with each order to ensure safe return and disposal for your old flood source.

Item	Perflexion Co-57 Flood Source
680-540	9" x 9" Square, For Digirad Cardius, Dilon & GVI Clear Vision, **Activity:** 10mCi
680-545	10.5" x 16", For CardioMD, Siemens C-Cam, GE Ventri & GE Optima, **Specify Activity:** 5mCi, 7.5mCi or 10mCi
680-550	16.5" x 24", For Millenium MPR, VG & MG, GE Hawkeye, Infinia, Myosite, Philips Argus, Forte, Skylight & Siemens E-Cam, **Specify Activity:** 5mCi, 10mCi, 15mCi, or 20mCi
680-555	18.5" Round, For GE Starcam XCT, ACT, Adac ARC 3000, Cirrus, Siemens Orbiter, **Specify Activity:** 5mCi, 10mCi, 15mCi, or 20mCi

C-THRU™ FLOOD SOURCES

NRC Radioactive Materials License Required

- C-Thru source holder is made of transparent, durable plastic.
- The radioactive area is clearly visible, enabling the C-Thru source to be easily positioned on the camera head.
- The manufacturing process ensures that Nuclear Medicine customers will receive the highest quality flood source available to perform quality control on gamma cameras.
- Flood sources are scanned using a gamma camera. The camera images each flood source for parameters including differential and integral non-uniformity in accordance with ANSI N42.27.
- Visual checks are performed to detect any distortions of the active element and the outside capsule. A leak test is performed on all sources prior to shipment.
- A return kit is included with each order to ensure safe return and disposal for your old flood source.

Item	C-Thru Co-57 Flood Source
680-570	8.9" x 8.9" Square, For Digirad Cardius, Dilon & GVI Clear Vision, **Activity:** 10mCi
680-575	10" x 16", For CardioMD, Siemens C-Cam, GE Ventri & GE Optima, **Specify Activity:** 10mCi, 15mCi or 20mCi
680-580	16.5" x 24.4", For Millenium MPR, VG & MG, GE Hawkeye, Infinia, Myosite, Philips Argus, Forte, Skylight & Siemens E-Cam, **Specify Activity:** 5mCi, 10mCi, 15mCi, or 20mCi
680-585	18.5" Round, For GE Starcam XCT, ACT, Adac ARC 3000, Cirrus, Siemens Orbiter, **Specify Activity:** 5mCi, 10mCi, 15mCi, or20 mCi

ATOMLAB™ 400 DOSE CALIBRATOR

Designed for Facilities Receiving Unit Doses Including PET and Beta

- **Pre-programmed for 88 most commonly used radionuclides**
- **Large, easy-to-read backlit LCD**
- **Small footprint economizes workspace**
- **Ultra-fast response**
- **Automatic range selection; ranges up to 40 Curies of Tc-99m or 10 Curies of F-18**
- **Displays in Curies or Becquerels**
- **Remote Ionization Chamber**
- **Self-Diagnostic Software**
- **Desktop or wall mount display**
- **Two-year warranty**
- **RS-232 bi-directional serial communications port**

New low pressure chamber. Atomlab Dose Calibrators are shipped air or ground as standard goods.

The Atomlab™ 400 provides fast, accurate radionuclide activity measurements with performance that easily complies with the most stringent regulatory requirements.

The unit is simple to operate. There is a routine list of ten pre-programmed isotopes plus another seven that are user selected from the library. The library contains 88 isotopes listed alphabetically, including Y-90 and Sr-89. Four isotopes are displayed at a time.

Activity is displayed on a LCD panel in either Curie or Becquerel units. Background correction is performed at the touch of a button. Range selection is automatic.

Activity measurements are performed by a microprocessor-controlled electrometer located within the detector assembly of the ionization chamber. The chamber is shielded with .25" (6.3 mm) lead. It can be located up to eight feet (2.4 m) away from the display unit. Chamber bias is generated within the display unit by an electronic high voltage supply, eliminating the need for expensive battery changes.

The RS-232 port enables the Atomlab™ 400 Dose Calibrator to communicate with most commercially available nuclear medicine management systems.

Item 993-000 Atomlab™ 400 Dose Calibrator Includes

- Smart Display
- Ionization Chamber
- RS-232 Port
- Vial/Syringe Dipper
- Well Insert

Item #	Description
993-000	Atomlab™ 400 Dose Calibrator
993-050	Dose Calibrator Shielding Rings, Interlocking, 2.25" Lead
993-052	Moly Assay Shield for Syringe, 0.3" Lead
993-054	Moly Assay Shield for Vial, 0.3" Lead
993-056	Lineator for Atomlab™ Dose Calibrators

Specifications

Isotope Selection Keys: Ten pre-programmed – Tc-99m, Tl-201, Co-57, Cs-137, I-131, In-111, Ga-67, Xe-133, I-123, and Mo-99; seven additional keys for user-set isotopes; two new isotope keys and a full alphabetical list of 88 isotopes.
Activity Range: 0.01 µCi to 40Ci (.0004 MBq to 1500 GBq) of Tc-99m or 10 Ci of F-18
Energy Range: 25 keV to 3 MeV photons
Response Time: One to two seconds for doses greater than 200 uCi; three seconds for doses greater than 20 uCi; 50-100 seconds below 20 uCi of Tc-99m with default threshold, threshold adjustable to reduce counting time
Detector Linearity: ±1% or 0.2 µCi, whichever is greater
Electrometer Linearity: ±1% or 0.2 µCi, whichever is greater
Electrometer Accuracy: ±1% or 0.2 µCi, whichever is greater
Overall Accuracy: ±3% or 0.3 µCi, whichever is greater; overall accuracy is affected by such factors as the accuracy of the specific source calibration, geometric variations due to sample volume or configuration, detector linearity, electrometer accuracy and readout accuracy
Repeatability: ±0.3% above 1 mCi short term (24 hr); 1% long term (one yr); exclusive of background
Digital Calibration Dial: Four-digit LED dial display with increment/decrement keys to change the value; range is from 0.0 to 999.9
Detector: Well-type pressurized ionization chamber, with Argon fill gas; well opening 2.75" (7 cm), well depth 10.25" (26 cm)
Chamber Gas Pressure: 149KPa gauge (21.6 psig) at 20°C or 250KPa absolute (36.3 psia) at 20°C. IATA regulation 3.2.2.4 Exempts Gases of Division 2.2 from Dangerous Goods Regulations when transported at pressure less than 200KPa gauge (29 psig) at 20°C. Device is shipped standard goods.
Detector Shielding: .25" (6.3 mm) lead on all sides except top well opening; supplementary shielding available
Chamber Bias: 355 ±5 volts
Environmental Operating Conditions:
Temperature: 0-40°C
Humidity: 0-90% rh, non-condensing
Power Requirements: 100 to 240 VAC, 0.6 – 0.3 amps, auto switching; APS Power Supply (APS22ES-150160), for medical use.
Line Frequency: 50/60 Hz; detachable line cord; built-in EMI filter and transient suppression
Detector and Interface Cables: 8' (243 cm) long, six conductor cables (two carry power, two for chassis ground, two carry serial data for digital I/O)
Display Unit:
Dimensions: 6.75" W x 6" depth x 5" H (17.1 x 15.3 x 12.7 cm)
Weight: 3.6 lb (1.64 kg); desktop or wall mountable
Detector Unit:
Dimensions: 6" Dia x 15.5" H (15.24 x 39.37 cm)
Well I.D.: 2.75" Dia x 10.5" H (7 x 26.7 cm)
Well I.D. with Liner: 2.5" Dia x 10.25" H (6.35 x 26 cm)
Lead Shielding: .25" thick (6.3 mm)
Weight: 35 lb (16 kg)
Approvals: ETL to UL 60601-1 and cETL to CAN/CSA C22.2 No. 601-1-M90 IEC 60601-1, IEC 60601-1-4 and IEC 60601-1-2
Warranty: Two Year

CE ETL

Item #	Description
993-058	Syringe Reference Source Set for Atomlab™ Calibrators
993-060	Vial Reference Source Set for Atomlab™ Calibrators
993-062	Vial/Syringe Dipper, Replacement for Atomlab™ Calibrators
993-064	Well Insert, Replacement for Atomlab™ Calibrators

ATOMLAB™ 500 DOSE CALIBRATOR

W

An extensive selection of quality assurance applications streamlines and simplifies hot lab administration requirements

- Easy to use, large color touch screen display with intuitive menus
- Automatic range selection; ranges up to 100 Curies of Tc-99m or 25 Curies of F-18
- Pre-programmed for 88 most commonly used radionuclides; any 12 can be conveniently touch selected
- Displays in Curies or Becquerels
- Small footprint economizes workspace
- Ultra-fast response
- Robust software and extensive functionality
- Report and label printers available
- The USB ports also allow software upgrades via USB memory devices
- Desktop or wall mount display
- Communicates with most commercially available NM management systems via bi-directional serial communications port
- USB ports offer the ability to accommodate a USB mouse and printing devices
- Two-year warranty

Standard APPs for Atomlab 500 include:

- Automated Quality Assurance APPs
  -Constancy and Expanded Constancy
  -Linearity and Auto Linearity
  -Accuracy
  -Geometry
- Nuclear Pharmacy APPs:
  -Future dose computation
  -Volume determination
  -Inventory control of 25 samples, correcting volume, activity and moly concentration
- Multiple Detector APPs:
  -Manages multiple ionization chambers
- Wipe Test Counter APPs:
  -Upgradeable at any time to include a wipe test counter

New low pressure chamber. Atomlab Dose Calibrators are shipped air or ground as standard goods.

The Atomlab™ 500 provides fast, accurate radionuclide activity measurements with performance that easily complies with the most stringent regulatory requirements. The system consists of a new low pressure ionization chamber with redesigned seal, electrometer with extraordinary linearity and an autoranging touch screen color display. Now one dose calibrator can be used for a wide variety of nuclear medicine, PET and radioimmunotherapy applications. Additionally, there are advanced, but easy-to-use programs for nuclear pharmacy, radiochemistry and radiochromatography.

Activity measurements are performed by the microprocessor controlled electrometer located within the chamber assembly. The chamber is shielded with .25" (6.3 mm) lead. It can be located up to eight feet (2.4m) away from the display unit. Chamber bias is generated by an electronic high voltage supply, eliminating the need for expensive battery changes.

Every element of the design and technical development will increase dose accuracy, department productivity and regulation compliance. The attractive and intuitive human interface guides the user through each operation. Software can easily be updated via the Biodex website or by using a convenient memory card. The touch-screen display can rest on a bench or mount on the wall of a hot lab, hot cell or laminar flow hood.

In addition to powerful self diagnostics, the Atomlab™ 500 includes an exclusive chamber monitoring technology to assure longer life and accuracy. Integrated pressure and temperature sensors feedback data so that the influence of gas pressure change will not effect an accurate reading.

OPERATION
The system is easy to use. There are 12 isotope selection touch keys pre-programmed for the most commonly used radionuclides. Any of those keys can be reprogrammed by the user for a desired isotope. There are 88 isotope-specific dial values listed in the library. Dial values can easily be changed if required.

Activity is displayed on the touch screen color display in either curie or becquerel units. Background correction is performed at the touch of a button. Range selection is automatic, from .01 microcurie to 100 Curies of Tc-99m or 25 Curies of F-18.

ACCURACY
Atomlab Dose Calibrators have consistently proven to be highly accurate. Biodex and chamber manufacturer Sun Nuclear Corporation have participated in the isotope program sponsored by National Institute of Standards and Technology. Each month a certified isotope is received from National Institute of Standards and Technology and is measured in the Atomlab™ Dose Calibrator, producing direct traceability to National Institute of Standards and Technology.

QUALITY ASSURANCE
The Atomlab™ 500 has been designed to make life easier. The extensive selection of quality assurance applications streamlines and simplifies hot lab administration requirements. The system stores and decay corrects multiple reference sources and compares the measured activity to the calculated activity for the daily constancy test.

Linearity tests can be performed in the traditional manual method or by a fully automated program that allows for readings from a source to be taken, and automatically recorded at specified intervals. The system will graph the results.

The attenuation tube test for linearity can be performed using software that will guide the user through the procedure, store the values and make all calculations.

COMMUNICATIONS
The RS-232 port and two USB ports communicate in real time with most commercially available nuclear medicine management systems, connect to external monitor or upload software upgrades.

COMMERCIAL NUCLEAR PHARMACY
The Atomlab™ 500 Dose Calibrator features a nuclear pharmacy "Dose Calculation Screen" to meet the needs of a commercial nuclear pharmacy. All the information needed to draw doses efficiently is readily available on one screen. The feature easily performs pre- and post-decay calculations, volume calculations for specific times and isotope changes all with minimal screen touches. No calculators needed! Atomlab Dose Calibrators can read up to 100 Curies of Tc-99m, thereby eliminating the need for an aliquot preparation, a significant time saver every time a generator is milked.

INDUSTRIAL NUCLEAR PHARMACY
The Atomlab™ 500 provides inventory control for 25 samples, storing and correcting the volume, activity, and moly concentration. The system will perform both volume and future dose calculations. In addition to inventory management, the Atomlab™ 500 provides quality assurance and record keeping functions. The inkjet printer allows hard copy records to be produced for all functions. The label printer allows the user to print labels for the syringe or vial.

RADIOCHROMATOGRAPHY
The radiopharmaceutical quality control program is exceptional. The Atomlab 500 performs all counting and calculations for paper chromatography tests, computing the percentages of free pertechnetate, hydrolyzed reduced Tc-99m and labeled radiopharmaceuticals.

RADIOCHEMISTRY
Up to seven ionization chambers, or six ionization chambers and a well counter can be connected via daisy chain to a single display. The activity in each detector can be selected and viewed from the single display.

DATA DOWNLOAD
The Atomlab™ Data Manager is available as an option. The Windows™ based utility allows wipe test and dose calibrator QA results to be downloaded using a USB/serial converter. The results can be viewed and printed from the data manager software as required. In addition, information stored in the data manager can be exported into Microsoft® Excel or to department management systems.

Item 993-010 Atomlab™ 500 Dose Calibrator Includes

- Smart Display
- Ionization Chamber
- RS-232 Port
- Vial/Syringe Dipper
- Well Insert

Specifications

Display: LCD Touch Panel 6.5" x 5" (16.5 cm x 12.7 cm), function keys are displayed for the operation being performed
Connectors: RJ-12 for well cable
Power: This system uses XP Power Supply for Medical Use, Model #PDM60US15
Line Voltage: 100 to 240 VAC, auto selectable by the power supply, 1.5-0.75 amps
Line Frequency: 50/60 Hz, detachable line cord, built-in EMI filter and transient suppression
Auxiliary Port: Two USB ports, one RS-232 port
Memory: Stores: Inventory and QA tests
Isotope Selection Keys: Twelve pre-programmed – Tc-99m, Tl-201, I-123, I-131, Cs-137, Co-57, Xe-133, Ga-67, In-111, F-18, Y-90, Mo-99; 25 user-defined isotopes and a full alphabetical list of 88 isotopes.
Activity Range: : 0.01 uCi to 100 Ci (.0004 MBq to 3700 GBq) of Tc-99m or 25Ci of F-18
Energy Range: 25 keV to 3 MeV photons
Response Time: One to two seconds for doses greater than 200 uCi; three seconds for doses greater than 20 uCi; 50-100 seconds below 20 uCi of Tc-99m with default threshold; threshold adjustable to reduce counting time
Detector Linearity: ± 1% or 0.2 µCi, whichever is greater
Electrometer Linearity: ± 1% or 0.2 µCi, whichever is greater, up to 40 curies of Tc-99m, ± 1.5% up to 100 curies of Tc-99m
Electrometer Accuracy: ± 1% or 0.2 µCi, whichever is greater
Overall Accuracy: ± 3% or 0.3 µCi, whichever is greater; overall accuracy is affected by such factors as the accuracy of the specific source calibration, geometric variations due to sample volume or configuration, detector linearity, electrometer accuracy and readout accuracy
Repeatability: ± 0.3% above 1 mCi short term (24 hr); 1% long term (one yr)
Digital Calibration Dial: Four-digit dial with increment/decrement keys to change the value; range is from 0.0 to 999.9
Detector: Well-type pressurized ionization chamber, with Argon fill gas; well opening 2.75" (7 cm), well depth 10.25" (26 cm). Up to seven chambers can be serially connected to one display.
Chamber Gas Pressure: 149KPa gauge (21.6 psig) at 20°C or 250KPa absolute (36.3 psia) at 20°C. IATA regulation 3.2.2.4 Exempts Gases of Division 2.2 from Dangerous Goods Regulations when transported at pressure less than 200KPa gauge (29 psig) at 20°C. Device is shipped standard goods.
Detector Shielding: .25" (6.3 mm) lead on all sides except top well opening; supplementary shielding available
Chamber Bias: 355 ± 5 volts
Environmental Operating Conditions: Temperature: 0-40°C; Humidity: 0-90% rH, non-condensing
Power Requirements: 100 to 240 VAC, 0.38 – 0.15 amps, auto switching; XP Power Supply (PDM60US15), for medical use.
Line Frequency: 50/60 Hz; detachable line cord; built-in EMI filter and transient suppression
Detector and Interface Cables: 8' (243 cm) long, six conductor cables (two carry power; two chassis ground; two carry serial data for digital I/O)
Display Unit:
Dimensions: 9.5" W x 12" depth x 12" H (24.1 x 30.5 x 30.5 cm)
Weight: 6.3 lb (2.9 kg); desktop or wall mountable
Detector Unit:
Dimensions: 6" dia x 15.5" H (15.24 x 39.37 cm)
Well I.D.: 2.75" dia x 10.5" H (7 x 26.7 cm)
Well I.D. with Liner: 2.5" dia x 10.25" H (6.35 x 26 cm)
Lead Shielding: 0.25" lead (6.3 mm)
Weight: 35 lb (16 kg)
Approvals: ETL to UL 60601-1 and cETL to CAN/CSA C22.2No. 601-1-M90 IEC 60601-1, IEC 60601-1-4 and IEC 60601-1-2 and CE marked
Warranty: Two-year

Item #	Description
993-010	Atomlab™ 500 Dose Calibrator
993-030	Data Manager Software for Atomlab™ 500
993-032	Copper Dipper for Atomlab™ 500
993-035	Printer, Dymo (Label) for Atomlab™ 500
993-036	Printer, Ink Jet (Report) for Atomlab™ 500
993-050	Dose Calibrator Shielding Rings, Interlocking, 2.25" Lead
993-052	Moly Assay Shield for Syringe, 0.3" Lead

Item #	Description
993-054	Moly Assay Shield for Vial, 0.3" Lead
993-056	Lineator for Atomlab™ Dose Calibrators
993-058	Syringe Reference Source Set for Atomlab™ Calibrators
993-060	Vial Reference Source Set for Atomlab™ Calibrators
993-062	Vial/Syringe Dipper, Replacement for Atomlab™ Calibrators
993-064	Well Insert, Replacement for Atomlab™ Calibrators

ATOMLAB™ 500*PLUS* - DOSE CALIBRATOR
and Wipe Test Counter

The Atomlab™ 500*Plus* combines the Atomlab™ 500 Dose Calibrator and Atomlab™ Wipe Test Counter, bringing it all together – science, technology and application. It's a complete Hot Lab Management System.

Combine the Atomlab 500™ Dose Calibrator with the Atomlab™ Wipe Test Counter and create a complete, efficient and cost effective radioactivity measurement system... the Atomlab™ 500*Plus.*

Consider the software that is supplied with the Atomlab™ 500*Plus*. It's comprehensive, easy-to-use and feature rich. The software mirrors the way you think and work. It guides when necessary, but does not burden the advanced user. The touch-screen and easy-to-follow on-screen prompts mean you won't need "cheat sheets."

When required, you can be confident that every operation is captured and documented. That documentation makes compliance a breeze.

Your Atomlab™ 500 Dose Calibrator is upgradable. You can easily install software updates via the Biodex website or by using a convenient memory card.

- **Easy-to-use, large, color touch-screen display with intuitive menus**
- **Automatic range selection; ranges up to 100 Curies of Tc-99m or 25 Curies of F-18**
- **Pre-programmed for 88 most commonly used radionuclides; any 12 can be conveniently touch selected**
- **Displays in Curies or Becquerels**
- **Small footprint economizes workspace**
- **Ultra-fast response**
- **Robust software and extensive functionality**
- **Report and label printers available**
- **USB ports offer the ability to accommodate a USB mouse and printing devices.**
- **The USB ports also allow software upgrades via USB memory devices**
- **Communicates with most commercially available NM management systems via bi-directional serial communications port**
- **64 Channel MCA**
- **Adjustable wide window and individual isotopes**
- **2x2 NaI drilled-well detector**
- **Remote shielded well**
- **Energy spectrums with individual ROI**
- **Ability to help identify isotopes causing contamination**
- **User-specific wipe locations and trigger levels**
- **Wipes that exceed trigger levels are immediately recognized: flashes on screen and prints in red**
- **Detailed wipe reports including cpm and dpm**
- **Wipe testing results stored**
- **Desktop or wall mount display**
- **Two-year warranty**

Standard APPs for Atomlab 500*Plus* include

- Automated Quality Assurance APPs
  Constancy and Expanded Constancy
  Linearity and Auto Linearity
  Accuracy
  Geometry
- Nuclear Pharmacy APPs:
  Future dose computation
  Volume determination
  Inventory control of 25 samples, correcting volume, activity and moly concentration
- Multiple Detector APPs
  Manages multiple ionization chambers
- Wipe Test Counter APPs
  Automated Quality Assurance Apps
  Full Width at Half Max (FWHM)
  Chi Square
  Minimum Detectable Activity (MDA)

New low pressure chamber. Atomlab Dose Calibrators are shipped air or ground as standard goods.

Item 993-015 Atomlab™ 500*Plus* - Dose Calibrator and Wipe Test Counter Includes

- Smart Display
- Ionization Chamber
- Well Counter
- RS-232 Port
- Vial/Syringe Dipper
- Well Insert

Specifications

DISPLAY (A single "Smart Display" controls both Dose Calibrator and Wipe applications)

Display: LCD Touch Panel 6.5" x 5", function keys are displayed for the operation being performed

Display Unit:

Dimensions: 9.5" W x 12" H x 12" depth (24.1 x 30.5 x 30.5 cm)

Weight: 4.2 lb (1.9 kg)

Connectors: RJ-12 for well cable

Power: This system uses XP Power Supply for Medical Use, Model #PDM60US15

Line Voltage: 100 to 240 VAC, auto selectable by the power supply, 1.5 – 0.75 amps

Line Frequency: 50/60 Hz, detachable line cord, built-in EMI filter and transient suppression

Auxiliary Port: Two USB ports and one RS-232 port

Memory: Stores for Wipe Test Counter: Calibration, background, high voltage, isotope specification, isotope efficiency, Chi-Square testing results, technologist list, wipe locations list and latest MDA calculation. Results can be displayed and printed.

Memory: Stores for Dose Calibrator: Inventory and QA tests

ATOMLAB™ 500 DOSE CALIBRATOR

Isotope Selection Keys: Twelve pre-programmed – Tc-99m, Tl-201, I-123, I-131, Cs-137, Co-57, Xe-133, Ga-67, In-111, F-18, Y-90, Mo-99; 25 user-defined isotopes and a full alphabetical list of 88 isotopes.

Activity Range: : 0.01 uCi to 100 Ci (.0004 MBq to 3700 GBq) of Tc-99m or 25Ci of F-18

Energy Range: 25 keV to 3 MeV photons

Response Time: One to two seconds for doses greater than 200 uCi; three seconds for doses greater than 20 uCi; 50-100 seconds below 20 uCi of Tc-99m with default threshold, threshold adjustable to reduce counting time

Detector Linearity: ± 1% or 0.2 µCi, whichever is greater

Electrometer Linearity: ± 1% or 0.2 µCi, whichever is greater, up to 40 curies of Tc-99m, ± 1.5% up to 100 curies of Tc-99m

Electrometer Accuracy: ± 1% or 0.2 µCi, whichever is greater

Overall Accuracy: ± 3%or 0.3 µCi, whichever is greater; overall accuracy is affected by such factors as the accuracy of the specific source calibration, geometric variations due to sample volume or configuration, detector linearity, electrometer accuracy and readout accuracy

Repeatability: ± 0.3% above 1 mCi short term (24 hr); 1% long term (one yr)

Digital Calibration Dial: Four-digit dial with increment/decrement keys to change the value; range is from 0.0 to 999.9

Detector: Well-type pressurized ionization chamber, with Argon fill gas; well opening 2.75" (7 cm), well depth 10.25" (26 cm). Up to seven chambers can be serially connected to one display.

Chamber Gas Pressure: 149KPa gauge (21.6 psig) at 20°C or 250KPa absolute (36.3 psia) at 20°C. IATA regulation 3.2.2.4 Exempts Gases of Division 2.2 from Dangerous Goods Regulations when transported at pressure less than 200KPa gauge (29 psig) at 20°C. Device is shipped standard goods.

Detector Shielding: .25" (6.3 mm) lead on all sides except top well opening; supplementary shielding available

Chamber Bias: 355 ±5 volts

Environmental Operating Conditions: Temperature: 0-40°C; Humidity: 0-90% rH, non-condensing

Power Requirements: 100 to 240 VAC, 0.38 – 0.15 amps, auto switching; XP Power Supply (PDM60US15), for medical use.

Line Frequency: 50/60Hz; detachable line cord; built-in EMI filter and transient suppression

Detector and Interface Cables: : 8' (243 cm) long, six conductor cables (two carry power; two chassis ground; two carry serial data for digital I/O)

Detector Unit:

Dimensions: 6" Dia x 15.5" H (15.24 x 39.37 cm)

Well I.D.: 2.75" Dia x 10.5" H (7 x 26.7 cm)

Well I.D. with Liner: 2.5" Dia x 10.25" H (6.35 x 26 cm)

Lead Shielding: 0.25" lead (6.3 mm)

Weight: 35 lb (16 kg)

Approvals: ETL to UL 60601-1 and cETL to CAN/CSA C22.2No. 601-1-M90, IEC 60601-1, IEC 60601-1-4 and IEC 60601-1-2 and CE Marked

Warranty: Two-year

ATOMLAB™ WIPE TEST COUNTER

Detector Cable

Length: Standard 8 ft. (243 cm); custom cable lengths available up to 20 meters

Conductors: Six total – 2 for power, two for chassis ground, two for serial data

Connectors: RJ-12

Well Counter

Detector: 2" x 2" NaI (Tl) integral line scintillation detector with a 0.75" dia. x 1.44 " depth well (1.9 x 3.7 cm)

Style: Remote Detector

Channels: 64

MCA: Integral to Well Counter

Spectral Resolution: FWHM 10%

Count Rate: (Maximum) 30,000 cps

Connectors: RJ-12 for power and signal

Lead Shielding: 0.5" (1.2 cm) integral lead shield

Optional Calibration Source: 0.1 µCi Cs-137 Rod Source

Optional Additional Shield: 0.5" (1.2 cm) lead shield, slides over integral shield for total of 1.0" of shielding – includes cover

Cover: Fits optional additional lead shield, has 0.25" (.6 cm) lead shielding

Physical Data

Display Unit

Size: 9.5" W x 12" H x 12" D (24.1 x 30.5 x 30.5 cm)

Weight: 4.2 lb (1.9 kg)

Well Counter

Size: 6" D x 11" H (15.24 x 27.9 cm)

Weight: 29 lb (3.2 kg)

Approvals: ETL listed to UL 60601-1 and CAN/CSA C22.2 No. 601-1M90, IEC 60601-1, IEC 60601-1-4 and IEC 60601-1-2 and CE marked

Item #	Description
993-015	Atomlab™ 500*Plus* - Dose Calibrator & Wipe Test Counter
993-030	Data Manager Software for Atomlab™ 500
993-032	Copper Dipper for Atomlab™ 500
993-035	Printer, Dymo (Label) for Atomlab™ 500
993-036	Printer, Ink Jet (Report) for Atomlab™ 500
993-040	Rod Source, Cs-137, for AtomLab™ Wipe Test Counter
993-042	Wipe Test Kit for Atomlab™ 500*Plus* Wipe Test Counter
993-050	Dose Calibrator Shielding Rings, Interlocking, 2.25" Lead

Item #	Description
993-052	Moly Assay Shield for Syringe, 0.3" Lead
993-054	Moly Assay Shield for Vial, 0.3" Lead
993-056	Lineator for Atomlab™ Dose Calibrators
993-058	Syringe Reference Source Set for Atomlab™ Calibrators
993-060	Vial Reference Source Set for Atomlab™ Calibrators
993-062	Vial/Syringe Dipper, Replacement for Atomlab™ Calibrators
993-064	Well Insert, Replacement for Atomlab™ Calibrators

ATOMLAB™ WIPE TEST COUNTER

Eliminate the tedium of wipe testing with the Atomlab™ Wipe Test Counter

- Easy-to-use, large touch screen display with intuitive menus
- 64 Channel MCA
- Adjustable wide window and individual isotopes
- 2x2 NaI drilled-well detector
- Remote shielded well
- Energy spectrums with individual ROI
- Ability to help identify isotopes causing contamination
- User-specific wipe locations and trigger levels
- Wipes that exceed trigger levels are immediately recognized: flashes on screen and prints in red
- Detailed wipe reports including cpm and dpm
- Wipe testing results stored
- Upgradable at any time to a dose calibrator by adding an ionization chamber
- Optional printer for hard-copy archives
- Two-year warranty
- Communicates with most commercially available NM management systems. USB Ports allow connection with external monitor and facilitate software upgrades

Standard APPs for Atomlab Wipe Test Counter include:

- Automated Quality Assurance APPs
  -Full Width at Half Max (FWHM)
  -Chi Square
  -Minimum Detectable Activity (MDA)

Finally, a wipe test counter that's easy to use, easy to understand, fast and dependable. A color touch-screen display utilizing intuitive software eliminates the tedium of wipe testing. Simply perform a daily calibration and background count, then count the wipe for each predetermined location. Trigger levels can be set for any isotope at any location including 200 dpm for iodine. In seconds the system will determine if the location is above or below the user defined trigger level.

When performing a wipe test, the full spectrum is displayed. A wide window that includes the isotope energies expected in a particular department is set by the user. The efficiencies of the isotopes selected for the window can be either factory defaults or user determined using an integrated detector efficiency program. Individual isotope ROIs along with the wide window can be set. This feature helps identify the isotope(s) causing contamination.

Up to 50 wipe locations can be entered as a restricted area, unrestricted area, sealed source or package. The results are displayed in dpm, cpm, µCi or kBq.

The system consists of a lead shielded 2" x 2" (5 x 5 cm) (sodium iodide (NaI) well detector and a 64 channel multi-channel analyzer. The displayed energy range (spectrum) is 0-800 KeV, which is typically found in nuclear medicine departments.

The wipe counter is designed to meet or exceed all NRC (10 CFR 35.70, 10 CFR 20.1906 and 10 CFR 35.2067) and state wipe test requirements. There are automated programs for the quality assurance functions: calibration, FWHM, chi-square and minimum detectable activity (MDA).

Wipe test results and QA test data can be stored in memory and printed at any time.

Item 993-020 Atomlab™ Wipe Test Counter Includes

- Smart Display
- Well Counter
- RS-232 Port

Specifications

DISPLAY

Display: LCD Touch Panel 6.5" x 5" (16.5 x 12.7 cm), function keys are displayed for the operation being performed
Connectors: RJ-12 for well cable
Power: This system uses XP Power Supply for medical use, Model #PDM60US15
Line Voltage: 100 to 240 VAC, auto selectable by the power supply, 1.5 – 0.75 amps
Line Frequency: 50/60 Hz, detachable line cord, built-in EMI filter and transient suppression
Auxiliary Port: Two USB ports, one RS-232 port
Memory: Stores wipe, calibration, background, high voltage, isotope specification, isotope efficiency, Chi-Square testing results, technologist list, wipe locations list and latest MDA calculation. Results can be displayed and printed.
Preset Radionuclides: 27 including Tc-99m, Co-57, Cs-137, Ga-67, Tl-201, I-123, I-125, I-131, In-111, F-18

DETECTOR CABLE

Length: Standard 8 ft. (243 cm); custom cable lengths available up to 20 meters
Conductors: Six total – 2 for power, two for chassis ground, two for serial data
Connectors: RJ-12

WELL COUNTER

Detector: 2" x 2" (5 x 5 cm) NaI (Tl) integral line scintillation detector with a 0.75" dia x 1.44 " depth well (1.9 x 3.7 cm)
Style: Remote Detector
Channels: 64
MCA: Integral to Well Counter
Spectral Resolution: FWHM 10%
Count Rate: (Maximum) 30,000 cps
Connectors: RJ-12 for power and signal
Lead Shielding: 0.5" (1.2 cm) integral lead shield
Optional Calibration Source: 0.1 µCi Cs-137 Rod Source
Optional Lead Shield: 0.5" (1.2 cm) lead shield, slides over integral shield for total of 1.0" of shielding - includes cover
Optional Additional Shield: 0.5" (1.2 cm) lead shield, slides over integral shield for total of 1.0" (2.5 cm) of shielding – includes cover
Cover: Fits optional additional lead shield, has 0.25" (.6 cm) lead shielding

PHYSICAL DATA

Display Unit
Size: 9.5" w x 12" h x 12" d (24.1 x 30.5 x 30.5 cm)
Weight: 4.2 lb (1.9 kg)

Well Counter
Size: 6" d x 11" h (15.24 x 27.9 cm)
Weight: 29 lb (3.2 kg)

Approvals: ETL listed to UL 60601-1 and CAN/CSA C22.2 No. 601-1M90, IEC 60601-1, IEC 60601-1-4 and IEC 60601-1-2 and CE marked
Warranty: Two Year

Item #	Description
993-020	Atomlab™ Wipe Test Counter
993-036	Printer, Ink Jet (Report) for Atomlab™ 500
993-040	Rod Source, Cs-137, for AtomLab™ Wipe Test Counter
993-042	Wipe Test Kit for Atomlab™ 500Plus Wipe Test Counter
993-044	Lead Shield for Wipe Test Chamber
993-046	Well Liners, Disposable, 100/Pkg

COPPER SYRINGE DIPPER

- For use with I-123 and In-111
- Eliminate variations

Designed for use with I-123 and In-111, the Copper Dipper removes variation in readings caused by attenuation differences from different materials and thicknesses used in syringes and vials.

Specifications

Dimensions: 10.25" H x 1.63" Dia (26 x 4.1 cm)
Weight: 0.75 lb (.34 kg)

Item #	Description
993-032	Copper Syringe Dipper

ROD SOURCES

To calibrate well type scintillation crystals, Biodex offers a variety of Rod Sources to meet department needs. You can count on consistent accuracy. Rod Sources are calibrated as NIST traceable with an accuracy of ±5% at the 95% confidence level.

Specifications

Dimensions: 2.96" L x .47" dia (76 x 11.9 mm)
Nominal Total Activity: 0.1 µCi

Item #	Description
993-040	Rod Source, Cs-137 for Atomlab™ Wipe Test Counter

Radioactive Material License is required

WIPE TEST KIT

Wipe Test Kits may be used to perform wipe tests as indicated in NRC and Agreement State Regulations. They provide an efficient, convenient means of sampling contaminated areas with radioactivity on either wet or dry surfaces.

Each box of wipes includes 500 record folders which may be used to
- identify each sample wipe
- prevent cross-contamination of smears
- transfer the wipe to the counting facility
- store the wipe until discarded

Specifications

Size: 1.75" (4.4 cm) Dia.
Quantity: 500/Box

Item #	Description
993-042	Wipe Test Kit for Atomlab™ 500 Plus Wipe Test Counter

DOSE CALIBRATOR SHIELDING RINGS

Especially Suited for PET and Applications

The Dose Calibrator Shielding Rings offer an additional 2.25" (5.7 cm) of lead shielding around the remote chamber for working with 511 keV radionuclides, such as FDG F-18.

Specifications

Dimensions: 10.6" dia x 14.9" h (27 cm x 37.9 cm)
I.D.: 6.1" dia (15.5 cm)
Lead Shielding: 2.25" thick (5.7 cm)
Weight: 359 lb (162.5 kg)
Shipping Weight: 388 lb (175.7 kg)

Item #	Description
993-050	Dose Calibrator Shielding Rings

MOLY ASSAY SHIELD

Moly Assay Shields are a convenient method to a unit dose. Whether working with syringes or vials, either unit will fit into the well chamber of any Atomlab™ Dose Calibrator.

The leaded shields are cradled by a metal holder for easy handling to ensure proper placement inside the chamber.

Specifications

Moly Assay Shield for Syringe, Item 993-052
Dimensions: 9.125" H x 2.125" Dia (23.2 x 5.4 cm)
Lead Shielding: .3" Thick (7.6 mm)

Moly Assay Shield for Vial, Item 993-054
Dimensions: 3.5" H x 2" Dia (8.9 x 5.1 cm)
Lead Shielding: .3" Thick (7.6 mm)

Item #	Description
993-052	Moly Assay Shield for Syringe
993-054	Moly Assay Shield for Vial

LINEATOR

Simulates eight different source strengths - using only one source!

- Simplifies compliance with NRC and state requirements
- Checks linearity without sample decay or fractioning
- Covers diagnostic or therapeutic quantities in a single pass

The Lineator is a simple device to accurately and reliably verify the linearity of your dose calibrator. Test results are available in minutes, without waiting days for decay, making it feasible to perform a linearity test more often. Early identification can prevent problems before they occur.

The Lineator is a set of five tubes. Four tubes are used to perform the test and an interchangeable tube is used depending on the dynamic range needed to cover.

To perform a linearity test, insert a source of Tc-99m of the maximum activity to be measured into the central tube, then place the tube into the chamber of your dose calibrator and count. The remaining lead-lined tubes are placed, one at a time, concentrically over the central tube and counted individually or in combination. The readings are then normalized with predetermined factors, and the degree of linearity can be seen virtually at a glance.

Using only one source, the Lineator can simulate up to eight different source strengths. Each outer tube absorbs a portion of the source radiation and reduces the effective source activity seen by the dose calibrator.

Item #	Description	Weight
993-056	Lineator	6 lb (3 kg)

SYRINGE REFERENCE SOURCE SET

The daily calibration of your dose calibrator is recommended to ensure accurate and reproducible instrument response. Calibration, using long-lived standards, should be performed in a manner that most closely represents how you use your dose calibrator. The Syringe Dose Calibrator Source was designed for imaging facilities that obtain their radiopharmaceuticals in unit dose syringes.

The sources are solid cast epoxy, 3 ml active volume in a 5 cc “mock” syringe. They are calibrated within ± 5% accuracy at 99% confidence level, NIST traceable.

Each source includes a certificate of calibration, leak test certificate, and radiation safety and handling sheet. The source is packaged in an individual lead shield that is color coded to the source. Syringe Dose Calibrator Sources are available individually or as an economical set.

Syringe Dose Calibrator Reference Sources:
All sources calibrated to ±5%.

Item 993-058 Syringe Reference Source Set Includes

- Ba-133, 250 µCi
- Cs-137, 200 µCi
- Co-57, 5 mCi

Note: A photocopy of your NRC or Agreement State License must accompany orders for radioactive sources and must clearly indicate your authority to possess the source being ordered.

Item #	Description
993-058	Syringe Reference Source Set for Atomlab™ Calibrators

VIAL REFERENCE SOURCE SET

The daily calibration of dose calibrators is recommended to ensure accurate and reproducible instrument response. Calibration is easily achieved and maintained by the use of long-lived reference sources.

These sources are solid cast epoxy, 20 ml active volume in the 27 ml Vial E. They are calibrated with ±5% accuracy at the 99% confidence level, NIST traceable. Dose Calibrator Reference Sources are registered with the U.S. Food and Drug Administration Center for Devices and Radiological Health and the U.S. Nuclear Regulatory Commission.

Each source includes a certificate of calibration, a leak test certificate, and a radiation safety and handling sheet. The source is packaged in an individual lead shield that is color coded and vinyl covered to eliminate exposure to the lead. Dose Calibrator Reference Sources are available individually or as an economical set.

Vial Dose Calibrator Reference Sources:
All sources calibrated to ±5%.

Item 993-058 Syringe Reference Source Set Includes

- Ba-133, 250 µCi
- Cs-137, 200 µCi
- Co-57, 5 mCi

Note: A photocopy of your NRC or Agreement State License must accompany orders for radioactive sources and must clearly indicate your authority to possess the source being ordered.

Item #	Description
993-060	Vial Reference Source Set for Atomlab™ Calibrators

VIAL/SYRINGE DIPPER

This rugged,Vial/Syringe Dipper has a comfortable handle and it will hold 1 cc to 10 cc syringes or up to a 30 ml vial. Included with every Atomlab™ Dose Calibrator, the Vial/Syringe Dipper will also fit any well chamber with 2.5" x 10" interior dimension. The material used will not cause attenuation problems and is very resistant to breaking.

Item #	Description
993-062	Vial/Syringe Dipper, Replacement for Atomlab™ Calibrators

WELL INSERT

The Well Insert is included with the purchase of any Atomlab™ Dose Calibrator. The durable, clear Plexiglas insert is designed to protect the chamber from contamination and can be easily removed for cleaning. The insert will fit any well chamber with 2.5" x 10" (6.35 x 25.4 cm) interior dimension.

Keep a spare on hand for use while the other insert is being decontaminated.

Item #	Description
993-064	Well Insert, Replacement for Atomlab™ Calibrators

DECONTAMINATION KIT

The Atomlab Decontamination Kit contains all the equipment needed to cope with a radioactive spill or routine decontamination problem in the laboratory. The drum serves as a container for the kit components and as a waste transfer/storage vessel.

Kit Includes

(1) 30 gallon fiber drum
(2) Coverall, Disposable, Pair
(2) Shoe Covers, Disposable, Pair
(2) Respirators
(4) Filters
(2) Gloves, Reusable, Pair
(1) Radiacwash™, 1 Gallon
(1) Radiacwash™ Towelettes, 100/Box
(1) Radiacwash™ Spray Mist, 1 Liter
(10) Poly Bags
(1) 12" Niptong
(1) Sponge
(1) Mop
(1) Scrub Brush
(1) Pail
(1) Rope
Assorted Signs

Specifications

Shipping Weight: 40 lb (18.5 kg)
Drum Dimensions: 20" d x 29.5" h (50.8 x 74.9 cm)

Item #	Description
995-500	Decontamination Kit

RADIACWASH™

995-520

995-525

995-530

Radiacwash™ has been used extensively in hospitals, universities, laboratories and reactor facilities since 1951. It is the first and most popular general purpose decontamination solution specifically created for the fast and safe removal of the entire spectrum of nuclidic radioactivity.

Radiacwash™ is a concentrated solution designed to rapidly control radioactive contamination and remove radioactive particles from surfaces by a two-way action. First, it will sequester metallic ions which contaminate surfaces. Second, it lifts up and firmly suspends the contaminating particles, allowing contamination to be rinsed away with hard, soft or salt water.

Radiacwash™ will remove general laboratory contaminants such as soil, grease, oil, blood, resides, resins, and tissue and can be used safely on all surfaces, either straight or diluted, including skin, cloth, all metals, glass, floors, walls, leather, rubber, porcelain, plastic, laboratory instruments, utensils and equipment.

Radiacwash™ is a synergic liquid compound that optimally combines a number of different chemical and physical principles causing it to act as a surface-wetting sequestering agent, chelater, carrier, ion-exchanger, emulsifier, solvent, complexer, peptizer and detergent.

Radiacwash™ has a pH of 5, less than .008% Halides, contains no phosphates, chromates, silicates, enzymes, borates, aluminates, carbonates, and inert fillers that can interfere with sensitive analytical procedures.

Radiacwash™ is non-alkaline, non-corrosive, and biodegradable.

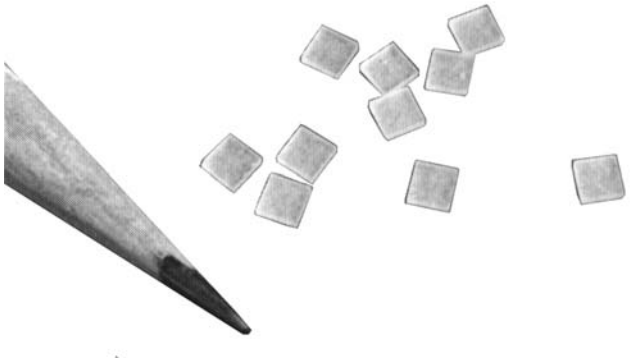
Item 995-520
The Radiacwash™ compound is formulated to decontaminate the widest possible range of contamination from radioisotopes and fission products, without affecting surfaces as acids and reagents do.

Item 995-525
Radiacwash™ Spray Mist combines the power and economy of Radiacwash™ with the convenience of aerosols. Radiacwash™ Spray Mist is a Radiacwash™ Solution packed into a special high pressure mist applicator. When the activator is depressed, over 200 lb of pressure is created at the nozzle. The pressure misting effect allows Radiacwash™ to penetrate around and under contaminants and lift them off the surface into solution to be wiped up and disposed.

Item 995-530
Radiacwash™ Towelettes are the most efficient and safest way to remove radiocontamination from hands and small objects. Radiacwash™ Towelettes are individually packaged paper towels saturated in a special Radiacwash™ solution. Simply remove the towelette from the foil packet, scrub hands thoroughly and wash the contamination away with running water.

Item #	Description
995-520	Radiacwash™, 1 Gallon
995-525	Radiacwash™ Spray Mist, 1 Liter Bottle
995-530	Radiacwash™ Towelettes, 100/Pkg

TLD-100 CHIPS



- **Optically transparent chips**
- **Simulate "point detector" in medical physics applications**
- **Reusable hundreds of times**
- **Independent of dose rate up to 100 MGy/s**
- **Long term response retention**
- **Nearly tissue-equivalent**
- **±15% sample-to-sample uniformity**
- **Repeatability to within 2% or better.**

Approximate tissue equivalence

- Z - 8.14 (LiF)
- Z - 7.64 (AIR)
- Z - 7 .42 (TISSUE)

Consistent, well-controlled and repeatable procedures are key to successful TLD. Variations in annealing temperature will affect dosimeter sensitivity.

When using TLDs, vacuum tweezers should always be used. Mechanical tweezers and fingers should not be used.

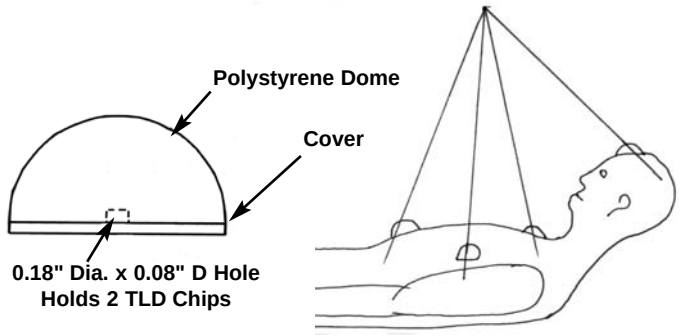
Specifications

Radiations Measured: Photon - energies >5 keV,
Neutron - thermal to 100 MeV
Electron/beta - energies >70 keV
Range: 10 µGy to 1 Gy (1 mrad to 100 rad) linear
1 Gy to 20 Gy (100 rad to 2000 rad) supralinear
Tissue Equivalence: Nearly tissue equivalent
Fading: <20% in 3 months without thermal treatment and <5% in 3 months using preheat or glow curve deconvolution
Batch uniformity: ±15% STD DEV from the batch mean, tighter on special request
Residual TL Signal: <0.2% of reading, over the range, without annealing
Repeatability: for 1 mGy (100 mrad) ^{137}Cs doses, <2% STD DEV of 10 sequential measurements
Reuse: More than 500 per dosimeter with <10% sensitivity change
Threshold: <10 µGy (1 mrad) based on 2.26 STD DEV of 10 repeat readings of an unexposed dosimeter
Material: Lithium Fluoride LiF:MgTi
Density: 2.64 gm/cc
Size: 0.125" sq. x 0.035" (3.2 mm^2 x 0.9 mm)
Temperature of Main TLD Glow Peak: 195° C
Sensitivity at Cobalt 60 Relative to LiF: 1.0
Energy Response 30 keV/Cobalt 60: 1.25

Item #	Description	Quantity
155-000-1	TLD-100 Chips	1
155-000-10	TLD-100 Chips	10
155-000-50	TLD-100 Chips	50
155-000-100	TLD-100 Chips	100
155-005	Tolerance Sorting ± 5% per TLD Chip	

POLYSTYRENE DOME TLD CHIP HOLDER

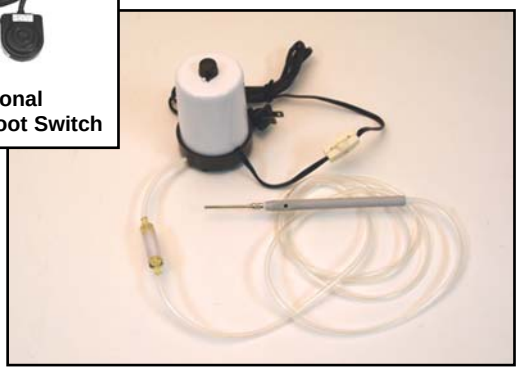
The Polystyrene Dome TLD Chip Holders can be positioned at any angle on the patient during treatment, allowing the radiation to pass through the same amount of thickness. Each TLD Holder holds two 0.125" square x 0.035" TLDs. The TLD Holder includes a 0.8 mm cover.



Item #	Description	Dome Diameter	Build-Up
155-010	TLD Holder	1.2 cm	6 mm
155-020	TLD Holder	2.0 cm	10 mm
155-030	TLD Holder	3.0 cm	15 mm
155-040	TLD Holder	4.0 cm	20 mm

VACUUM TWEEZERS SYSTEM

Optional Remote Foot Switch



The Vacuum Tweezers System allows the handling of TLDs of varying sizes without risk of damage or contamination. This system eliminates defects caused by pinching, scratching or handling when using a mechanical tweezers. An optional Remote Foot Switch (Item 906-002) is available.

Item 162-000 Vacuum Tweezers System Includes

- Compact vacuum generator with a line switch
- 4 feet of clear tubing
- Vacuum line filter
- Vacuum pen
- 3 needle tips (small, medium and large)

Specifications

Vacuum: 14" Hg.
Air Flow: 125 $in.^3$/min.
Power: 115 VAC, 60Hz, 2 watts or 220VAC, 50Hz

Item #	Description
162-000	Vacuum Tweezer System, 115V
162-002	Vacuum Tweezer System, 220V
906-002	Remote Foot Switch for Vacuum Tweezer System

TLD PLASTIC BAGS AND BAG SEALERS

161-001

The TLD Plastic Bags are used with the Bag Sealer for sealing individual TLDs in plastic. The bags can then be placed in or on the patients by taping. Identification of TLD is accomplished by labeling or trimming the corner of the plastic bag.

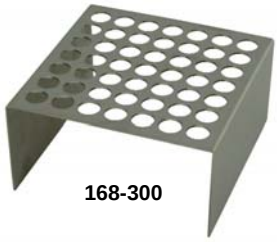
Plastic Bag Sealers are ready to use instantly - no warm up time is needed. The adjustable timer settings ensure a perfect seal for all thicknesses of bags.

Item #	Description	Size	Quantity
156-000	Black TLD Plastic Bags	1" x 3" x 0.015" (2.54 x 7.62 x 0.04 cm)	500
158-100	Clear TLD Plastic Bags	2" x 3" x 0.015" (5.08 x 7.62 x 0.04 cm)	500
161-001	Plastic Bag Sealer, 110V	4" (10.2 cm) Wide	
161-001-220V	Plastic Bag Sealer, 220V	8" (20.3 cm) Wide	

TLD ANNEALING FURNACE
80°, 100° and 400° C

Shown with Optional Shelf (Item 168-300)

Face of Furnace



168-300

- **No over temperatures at set points of 80°, 100° or 400°C**
- **Large inside volume for even heat distribution**
- **Furnace will reach 375-425° C in less than 15 minutes**
- **Independent pyrometer with type K thermocouple**
- **Control stability of ±1° C**
- **Cold junction compensation**
- **Long-life type J thermocouple**
- **If thermocouple opens, unit shuts down automatically**
- **Heater indicator**
- **Power indicator, switch and fuse**
- **No line interference with triac zero switching**
- **Hospital grade plug**
- **Ceramic tray protects fiber floor from gouging or scratching**
- **Non-skid rubber feet**
- **Fiber hardening agent included**

Utilization of this solid state, closed-loop, automatic controlling system provides faster heat-up rates to a temperature setpoint in less than thirty minutes.

A rugged 18 gauge steel cabinet has an easy access side opening door hinged on nylon with a positive latching mechanism. The stepped fiber door insulation panel is spring mounted for optimum sealing when closed. A large interior chamber provides an even temperature distribution for the aluminum planchet. All steel cabinet surfaces are electrostatically coated with high-temperature baked-on enamel.

The heart of the furnace is a rugged, lightweight molded heating unit. The insulation material is space-age alumina-silica fiber. It's molded into a tough, one piece structure with a heavy duty (14 gauge) heating element embedded in the top and three sides giving increased heat transfer. This provides even temperature distribution inside.

An integrated circuit temperature controller switches power on and off through a triac to the furnace heater. This temperature controller allows you to adjust the desired "Set" temperature. The red digital LED temperature display will indicate the furnace temperature within ±1° C.

Input to the controller is provided by a thermocouple (located in the furnace), which produces a millivolt signal representing furnace temperature. This signal is compared to a reference signal which is adjusted by the "Set" temperature. Any resultant error is amplified and conditioned to provide a switched DC logic signal to an optical coupled solid state relay using zero-cross-over firing pulses to a triac semi-conductor. This proportions power to the furnace heating unit with no line interference.

Operating Instructions

Turn the power switch to "ON". After an initial adjustment of the "Set" temperature, a red heater indicator lamp will illuminate, indicating power is being applied to the "Heater" in the furnace. A digital display indicates the furnace temperature. After the furnace heats up to the appropriate temperature, open furnace door and place TLD aluminum planchet on shelf then close door. Wait 30 seconds for thermocouple sensor to heat up to furnace temperature then turn furnace on. Leave TLD's in furnace for about 1 hour or until temperature is reached. Allow 20 minutes soaking time for aluminum planchet. Turn power off and remove planchet from furnace. Place planchet between two brass cooling plates to cool down rapidly.

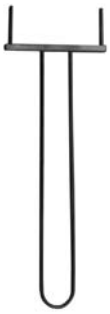
Specifications

Maximum Operating Temperature: 1100° C
Oven Dimensions: 9" W x 9" D x 6.5" H and Tapered 1/4"
(22.86 x 22.86 x 16.51 cm and tapered 0.64 cm)
Overall Dimensions: 15.5" W x 15.5" D x 16.5" H
(39.37 x 39.37 x 41.91 cm)
Color: Black
Power: 110-120 VAC, 50/60 Hz, 13 amps, 1460 watts
Shipping Weight: 46 lb (20.9 kg)
Optional Stainless Steel Shelf: 6" W x 6" D x 3" H
(15.24 x 15.24 x 7.62 cm)

Item #	Description
168-001	TLD Annealing Furnace - 120 Vac
168-002	TLD Annealing Furnace - 220 Vac
168-300	Stainless Steel Shelf

TLD ROD AND CHIP ANNEALING PLANCHET

159-000



163-002

163-000

The TLD Annealing Planchets are engraved with numbers 1 to 10 across the top. The rod planchet is engraved with numbers 11, 21, 31, and 41 on the side, and the chip planchet is engraved with numbers 11, 21, 31, 41, 51, 61, 71, 81 and 91 on the side, indicating chip locations.

The specially machined holes (3/16" diameter) allow good thermal contact of the rods and chips providing rapid cooling when placed between the brass cooling plate set (Item 164-000), as required by the Cameron Annealing Technique.

They are furnished with two holes on one end for the Planchet Handle (Item 163-002). An acrylic storage cover with two thumb screws provides a secure way to retain the chips or rods in their locations after cool down.

TLD Procedure

- Bake TLD chips at 400° C for 1 hour, then quench between Brass Cooling Plates (Item 164-000)
- Bake TLD chips at 80° C for 16 to 24 hours or 100° C for 2 hours
- Expose to radiation
- The TLD reader preheat cycle is set at 100° C
- The TLD's should be read under a low amount of nitrogen, either 1.88 SLPM (Standard Liters Per Minute) or 4 SCFH (Standard Cubic Feet Per Hour).

Specifications

Material: Anodized Aluminum
Size: 10 cm x 12 cm x 6.3 mm

Note

To clean the holes, use Q-tip® swabs. Bake the planchet for 4 hours at 400° C before using. The aluminum planchet will not deposit aluminum on the TLD chips or rods.

Item #	Description	Holds
159-000	TLD Rod Annealing Planchet with Acrylic Cover	50 (1 mm x 6 mm) Square or Round TLD Rods
163-000	TLD Chip Annealing Planchet with Acrylic Cover	100 1/8" Square Chips or 100 4.7 mm Diameter Round TLDs
163-002	Stainless Steel Planchet Handle	

BRASS COOLING PLATE SET

The Brass Cooling Plate Set is used to rapidly cool down the TLD planchet containing the TLD's. After 400° C annealing the Brass Cooling Plate Set can cool the TLD planchet to 95° in 25 seconds. The top cooling plate has a large heavy duty handle.

Specifications

Size: 6" L x 6" W x 1" T (15.24 x 15.24 2.54 cm)

Item #	Description
164-000	Brass Cooling Plate Set

TLD EASY TRANSFER STORAGE HOLDER

The TLD Easy Transfer Storage Holder provides for an easy transfer to the annealing planchet. The Storage Holder measures 10 x 12cm and is compatible with TLD Rod Annealing Planchet (Item 159-000) and TLD Chip Annealing Planchet (Item 163-000). The numbers on the storage holder are opposite of the planchet numbers. The TLD Easy Transfer Storage Holder also has an acrylic cover to protect TLDs from dust.

To transfer TLD's to the storage holder, line up the numbers on the planchet and storage holder, fasten storage holder to annealing planchet and turn over. Remove annealing planchet and fasten storage holder cover.

Item #	Description	Material	Holds
163-010	TLD Easy Transfer Storage Holder	Polystyrene	100 - 1/8" (3.175 mm) square chips or 4.7 mm diameter round chips
163-013	TLD Easy Transfer Storage Holder	Acrylic	50 - 1 mm x 6 mm square or round rods or 13 mm diameter disks

X

TLD IRRADIATION PHANTOMS

Polystyrene Phantoms

The TLD Polystyrene Irradiation Phantom consists of 2 plates. The TLD phantom is numbered 10 to to 1 across the top. The left side of the TLD phantom is numbered 11 to 91 for TLD chips or 11 to 41 for TLD rods. This numbering matches the annealing planchet when the irradiation phantom is flipped. The area that holds the chips or rods is 8.5 cm x 10.5 cm centered on the polystyrene plate.

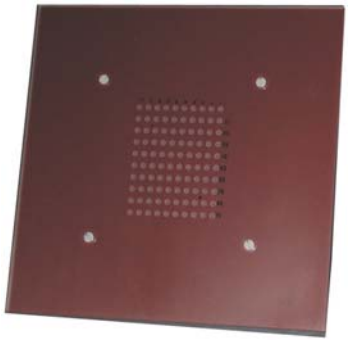
The 6 mm polystyrene cover is secured to the bottom plate which holds TLDs in the individual holes. The plates can be separated for easy cleaning.

Specifications

Size: 1.43 cm x 25 cm sq. (9/16" x 9.8" sq)

Item #	Description
165-000	Polystyrene Phantom for TLD Chips
167-000	Polystyrene Phantom for Rods

Plastic or Solid Water Phantom



The Plastic or Solid Water TLD irradiation phantoms consist of a 5 mm phantom plate and a 1/4" acrylic cover. These are numbered the same as the Polystyrene Irradiation Phantom and will hold 100 TLD chips or 50 TLD Rods.

Specifications

Size: 5 mm x 30 cm sq.

Item #	Description
165-005	Plastic Water Phantom for Chips
165-010	Solid Water Phantom for Chips
167-005	Plastic Water Phantom for Rods
167-010	Solid Water Phantom for Rods

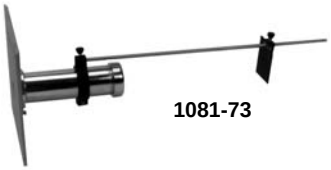
Custom Units Available

STEREOTACTIC COLLIMATOR SYSTEM

1080-20
with long barrel

1080-21
with short barrel

1080-08



1081-73

X

The Stereotactic Collimator System is custom made for each customer. The customer must select the options wanted.

The tray is made to be placed in the wedge tray slot. An X-Y translation stage tray allows for adjustment of the collimator barrel in the X-Y directions. The collimator barrel attaches to either the wedge tray or the X-Y translation stage tray.

The collimator barrel has an outside diameter of 7 cm with an inside diameter of 6.3 cm. The length of the barrel is specified by the customer. With short collimator barrels the lead collimators insert from the top of the barrel (the barrel unscrews from the tray). Long collimator barrels have a screw on bottom which is taken off to insert the lead collimator from the bottom. A test collimator will be sent to determine divergence prior to manufacturing.

Optional Accessories
X-Y pointer system (Item 1080-06), or a stereotactic front pointer (Item 1080-08). The stereotactic front pointer has a magnetic base that will attach to the collimator barrel or Item 1081-73 Stereotactic Film Holder.

The Stereotactic Film Holder has a ring clamp that mounts to the collimator barrel of the Stereotactic Collimator System. The removable rod extends past isocenter. A film holder plate slides onto the rod and is adjustable to the proper distance, a tightening screw will hold the film holder plate in place. Two spring clips on the film holder plate holds the film.

Stereotactic Collimator System Includes
- Tray
- Translation Stage Tray
- Barrel

When placing an order, please provide the following information:
- Item 1080-_ _
- Machine
- Machine Type
- Target to Bottom of Wedge Tray Slot in centimeters
- Target to End of Collimator Barrel in centimeters
- Contact Information

The contact person will have to verify all information prior to manufacturing.

Item #	Description
1080-20	Varian Type II, Screw Coded with X-Y Stage, Wedge Slot
1080-21	Varian Type III, Digital Coded with X-Y Stage, Wedge Slot
1080-30	Siemens Screw Coded with X-Y Stage, Wedge Slot
1080-32	Siemens Digital Coded with X-Y Stage, Wedge Slot
1080-06	X-Y Pointer System
1080-08	Stereotactic Front Pointer
1081-73	Stereotactic Film Holder

Other Manufacturers Available
Items are Custom Made and Nonreturnable

LEAD COLLIMATORS

The lead collimators have a lip at the bottom which fits into the barrel to insure proper placement of the lead collimator.

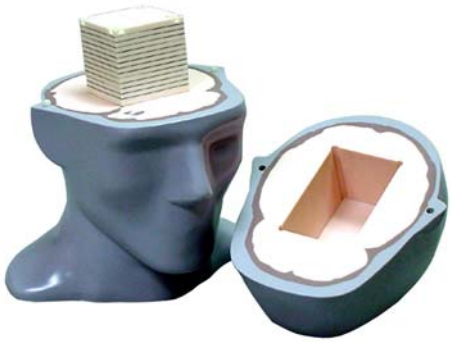
The lead collimators are custom designed for each machine based on field size, flatness, and the slope angle of the radiation penumbra edge.

Item #	Stereotactic Lead Collimator
1081-05	Diameter at Isocenter 5 mm
1081-08	Diameter at Isocenter 8 mm
1081-10	Diameter at Isocenter 10 mm
1081-15	Diameter at Isocenter 15 mm
1081-20	Diameter at Isocenter 20 mm
1081-25	Diameter at Isocenter 25 mm
1081-30	Diameter at Isocenter 30 mm
1081-35	Diameter at Isocenter 35 mm
1081-40	Diameter at Isocenter 40 mm

Items are Custom Made and Nonreturnable

RADIOSURGERY HEAD PHANTOM

For Evaluation of Treatment Accuracy



- **Verification of intracranial dose distribution**
- **3D isodose verification**
- **Commissioning and comparison of Treatment Planning Systems**
- **Verification of individual patient treatment plan**
- **Teaching tool for Gamma Knife and Radiosurgery**

The Radiosurgery Head Phantom was designed to improve the accuracy of treatment plan verification in radiosurgery. It allows for 3D dose verification in a large cranial volume.

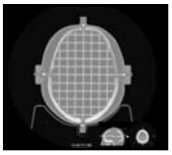
The Phantom contains average brain, bone spinal cord, vertebral disks and soft tissues. Linear attenuations of the tissues are within 1% of actual attenuations from 50 keV - 25 MeV.

The 2.5" x 2.5" x 2.5" (6.4 x 6.4 x 6.4 cm) Film Cassette contains 13 levels of X-Ray or Gafchromic® Film to increase accuracy of 3D dose distribution. It can be interchanged with an equivalent Gel Dosimetry Cassette or TLD holder. Two brain-equivalent spacers allow the user to locate the cassette in one of four different positions without breaking the consistency of the intracranial anatomy.

Item	Description
682-800	Radiosurgery Head Phantom

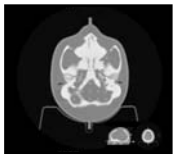
MRI DISTORTION PHANTOM FOR SRS

For Assessment of Image Distortion in Treatment Planning Systems



CT

MRI



CT Showing Ear Canals

- **Provides a realistic anthropomorphic scenario for CT and MR imaging**
- **Unique inter-cranial 3D grid design allows assessment of spatial distortion**
- **Special pads enable use with all fixation frames**
- **CT/MR markers facilitate positioning and image regisration**

CIRS Model 603A was designed for assessment of MR image distortion in Stereotactic Radiosurgery Planning. It is also a useful tool for verifying image fusion and deformable image registration algorithms used in various treatment planning systems. The tissue equivalent, anthropomorphic design provides the closest conditions to a clinical imaging scenario. The phantom can be imaged using X-ray, Computed Tomography and Magnetic Resonance Imaging. It images well with all MRI sequences tested to date, including T1 weighted, T2 weighted, 3D Time of Flight, MPRAGE and CISS sequences.

The skull is manufactured from a plastic-based tissue substitute, and the interstitial and surrounding soft tissues are made from a proprietary signal generating water-based polymer. The entire phantom is encased in a clear plastic shell to protect gel from desiccation. The phantom is supplied with specially designed pads that allow fixation with any stereotactic frame or mounting for end-to-end testing. The phantom is also suitable for frameless SRS QA.

The entire inter-cranial portion of the skull volume is filled with an orthogonal 3D grid of 3 mm diameter rods spaced 15 mm apart. Five extended axis-rods intersect at the reference origin of the grid. The end of each extended axis is fitted with CT/MR markers allowing for accurate positioning with lasers and co-registration of CT and MR image sets.

The phantom includes right and left air voids, 3 mm in diameter by 17 mm long to simulate each ear canal for evaluation of potential distortions commonly found in clinical settings.

682-825 Includes

(1) 3D Anthropomorphic Skull Phantom
(1) ABS Cradle
(5) Stereotactic Frame Pads
(1) Custom Carry Case
(1) User Guide
(1) 48-Month Warranty

Specifications

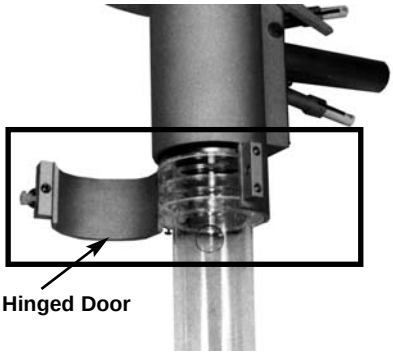
Overall Dimensions: 32 cm x 24 cm x 18 cm
Weight: 12 lbs (5.5 kg)
Materials
Skull: Plastic-based bone substitute
Interstitial/Soft Tissues: Water-base polymer
Grid: Reinforced nylon

Item	Description
682-825	MRI Distortion Phantom for SRS

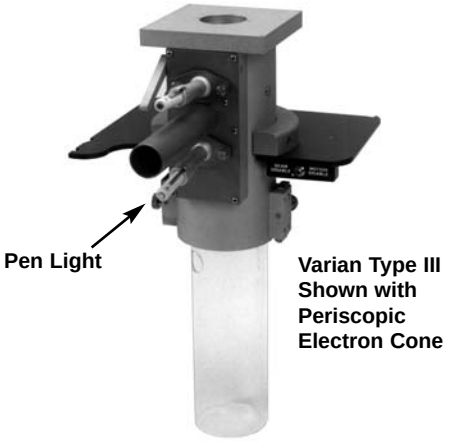
PERISCOPIC ELECTRON CONE SYSTEM

For Intraoperative or Intracavitary

1100-05



Hinged Door



Pen Light

Varian Type III Shown with Periscopic Electron Cone

X

- **Lateral docking**
- **Upward movement of periscopic electron cone**
- **For electron beam energies up to 18MeV**

The periscopic viewer is used with the periscopic electron cones (Item 1100EC-1.9 to 1100EC-9.5) for intraoperative or intracavitary treatment. The periscopic viewer is made of stainless steel and clear anodized aluminum parts.

The most important feature of the periscopic viewer is the lateral docking. The bottom part of the barrel has a hinged door which opens to allow for the lateral docking of the periscopic electron cone into the viewer. The door has to be closed and secured to keep the periscopic electron cone in alignment with the beam. The periscopic electron cone can be held in place by the stainless steel locking knob.

If necessary the periscopic electron cone can slide approximately 8" into the barrel of the periscopic viewer. If the periscopic electron cone is being held in place by the locking knob this will have to be loosened to allow the retraction of the periscopic electron cone into the barrel.

Centering washers, four screws and beveled washers are used to attach the periscopic viewer to the plate that slides into the electron slot of the treatment machine. To adjust the periscopic viewer to the central axis of the beam, remove centering washers, position the periscopic viewer to central axis and using the beveled washers, tighten the screws. The centering washers keep the periscopic viewer centered to the plate.

Inside the periscopic viewer is a highly polished stainless steel mirror. The mirror is held and retracted by two independent springs. This prevents the possibility of the mirror remaining in the field if a spring should fail. A lever on the outside of the viewer adjusts the angle of the mirror for viewing through the periscopic electron cone.

At the top of the barrel of the periscopic viewer a sheet of 0.002" thick mylar® is secured to prevent any foreign matter from entering the treatment field.

On the outside of the periscopic viewer are two pen light holders which are mounted on swivel sockets. The pen lights can be adjusted to allow maximum light into the periscopic viewer and electron cone. The pen light holders can be removed to allow for a fiber optics light source. A light source can also be inserted into the 2.5 cm hole in the side of periscopic electron cones that are 3.8 cm in diameter or larger. Ceiling spotlights or flashlights can be aimed at the periscopic electron cone to transmit light to the treatment area. Located between the pen holders is the periscopic viewer tube for viewing.

Custom electronics may need to be supplied by the accelerator manufacturer. RPD will assist the customer in determining what is needed for electronics.

As a safety precaution the gantry rotation power and couch vertical drive power should be disabled or turned off just before the lateral docking into the periscopic viewer. This prevents any accidental movement of the gantry or couch.

Optional: Color Camera System includes camera with zoom lens and video monitor. Call RPD for more information.

Sterilization: Gas

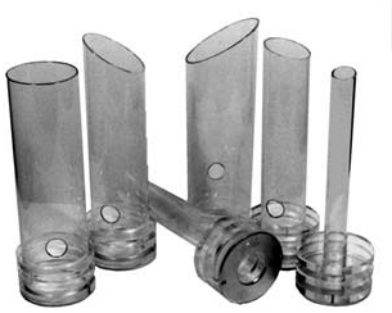
When placing an order, please provide the following information:
- Item 1100-05-_ _
- Manufacturer
- Model
- Serial Number
- Target to Bottom of Wedge Tray Slot in centimeters
- Does the machine have a MLC
- Software Version
- Does the Machine have "Reserve E" in Physics Mode
- Contact Information

The contact person will have to verify all information prior to manufacturing.

Item #	Description
1100-05-_ _	Periscopic Viewer
1100-02	Replacement Mylar Window, 0.002" T (0.005 cm)
1006-00	6 Pen Lights

Items are Custom Made and Nonreturnable

PERISCOPIC ELECTRON CONES



The periscopic electron cones are clear acrylic cylinders which are 3.1 mm thick and 30.5 cm long. The top of each cone has three acrylic spacer rings which slide into the barrel of the periscopic viewer. When the bottom of the periscopic electron cone is flush with the end of the periscopic viewer barrel the distance from the bottom of the periscope to the center of the cone angle is 25 cm.

A 4.8 mm thick brass plate with a center hole is attached to the top of each periscopic electron cone. The brass plate collimates and prevents electrons from the penetrating the acrylic spacer rings.

Periscopic electron cones that are larger than 3.8 cm I.D. diameter have a 2.5 cm diameter hole in the side of the cone. This hole allows easy access for TLD placement or a fiber optic light source.

The periscopic electron cones are available in angles of 15°, 30°, 45° and 90° or no angle. The inside diameters range from 1.9 cm to 9.5 cm.

Any of the periscopic electron cones will fit in any periscopic viewer made by Radiation Products Design, Inc.

Sterilization: Gas

Item #	Electron Cone Inside Dimension
1100EC-1.9-_ _*****	1.9 cm
1100EC-2.5-_ _*	2.5 cm
1100EC-3.2-_ _*	3.2 cm
1100EC-3.8-_ _*	3.8 cm
1100EC-4.5-_ _*	4.5 cm
1100EC-5.1-_ _*	5.1 cm
1100EC-5.7-_ _*	5.7 cm
1100EC-6.4-_ _*	6.4 cm
1100EC-7.0-_ _*	7.0 cm
1100EC-7.6-_ _*	7.6 cm
1100EC-8.3-_ _*	8.3 cm
1100EC-8.9-_ _*	8.9 cm
1100EC-9.5-_ _*	9.5 cm

*** Specify Angle (15°, 30°, 45° or 90°)**

SURGICAL DUMMY CONES

The Surgical Dummy Cones are used in surgery to select the cone diameter and angle needed for treatment.

The Surgical Dummy Cones are made of 3.1 mm thick clear acrylic and are 25.4 cm long. One end of the cone is flat and the other end is angled to 15°, 30° or 45°.

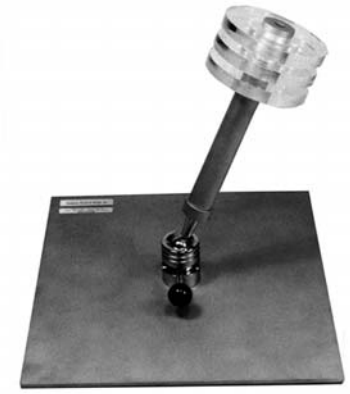
It is best not to use the Periscopic Electron Cones in surgery because they could be dropped, become non-sterile, or the cone may be become partially covered in blood and would obscure viewing of the field with the Periscopic Viewer.

Sterilization: Gas

Item #	Surgical Dummy Cone Inside Dimension
1100SC-1.9-_ _*****	1.9 cm
1100SC-2.5-_ _*	2.5 cm
1100SC-3.2-_ _*	3.2 cm
1100SC-3.8-_ _*	3.8 cm
1100SC-4.5-_ _*	4.5 cm
1100SC-5.1-_ _*	5.1 cm
1100SC-5.7-_ _*	5.7 cm
1100SC-6.4-_ _*	6.4 cm
1100SC-7.0-_ _*	7.0 cm
1100SC-7.6-_ _*	7.6 cm
1100SC-8.3-_ _*	8.3 cm
1100SC-8.9-_ _*	8.9 cm
1100SC-9.5-_ _*	9.5 cm

*** Specify Angle (15°, 30°, or 45°) - All Cones Have One Flat End**

PRACTICE UNIT FOR DOCKING PERISCOPIC ELECTRON CONES



The Practice Unit is placed on the treatment couch to simulate a periscopic electron cone that has been placed in a patient.

The lever allows for the movement and docking of the practice cone. The practice cone can rotate 360° and angle 35° from the vertical. The baseplate is 12 3/8" square x 1/4" thick (31.4 x 0.635 cm) aluminum with a rubber covered bottom to prevent movement on the treatment couch.

Item #	Description
1100-80	Practice Unit for Docking

OBTURATORS FOR PERISCOPIC ELECTRON CONES

The Obturators are used to make insertion of the Periscopic Electron Cones easier. The primary use for the obturators is for vaginal insertion.

The Obturators are made of solid clear acrylic with diameters of 1.9 to 5.1 cm. The reversible obturator cap/handle has a large and a small diameter. The 2 diameters of the cap/handle determine the insertion length of the obturator into the periscopic electron cone. This cap/handle design allows one obturator to fit all angles of the periscopic electron cones. The larger diameter end is used for the 0º and 15º angles and the smaller end is used for the 30º and 45º angles. The larger diameter end also has a groove around the side to facilitate ease in handling. A screw with a knob is used to attach the cap/handle to the obturator.

Procedure

The obturator is placed in the corresponding periscopic electron cone through the acrylic ring end, the obturator is then lubricated and inserted into the patient. The obturator is removed from the periscopic electron cone and the position is viewed through the periscopic electron cone using a flashlight. A groove the length of the obturator prevents suction when removing the obturator.

When viewing, if the position of the periscopic electron cone needs to be adjusted or changed the obturator can be reinserted to help reposition the periscopic electron cone.

Once the proper position of the periscopic electron cone is set docking to the periscopic viewer can be done. After docking the position of the periscopic electron cone should be verified using the periscopic viewer.

Sterilization: Gas

Item #	Obturator Cone Inside Dimension
1100-OB-1.9	1.9 cm
1100-OB-2.5	2.5 cm
1100-OB-3.2	3.2 cm
1100-OB-3.8	3.8 cm
1100-OB-4.5	4.5 cm
1100-OB-5.1	5.1 cm

ELECTRON MINI-CONES
AND ADAPTER PLATE FOR 14CM OR 15CM ELECTRON CONE

Picture shown with Adapter Plate and Electron Mini-Cone (sold separately).

895-402

895-41900

The Electon Cone Adapter Plates allow a 14 or 15cm electron cone to hold the Electron Mini-Cones, Items 895-41900 to 895-47045. The adapter plates are 1.88 cm thick steel with a nickle chrome plate finish. A 4" diameter opening in each adapter plate and three (3) spring plungers hold the brass ring base of each Electron Mini-Cone. If side or front pressure is presented, the spring plungers allow the Electron Mini-Cone to flip out.

The Electron Mini-Cones are made of 1/8" clear acrylic tubing and affixed to a 3/8" thick x 4" diameter nickel chrome brass ring base. The Electron Mini-Cones are available in diameters of 1.9 cm, 3.2 cm, 4.5 cm, 5.7 cm and 7.0 cm and can have angles of 0°, 15°, 30° and 45°on the bottom of the Electron Mini-Cone.

Isodose curves are available upon request.

Specifications

Energy Range: 6 MeV to 12 MeV, Transmission at 12 MeV is less than 5% outside of cone
Steel Density: 7.83 g/cm^3
Brass Density: 8.515 g/cm^3
Acrylic Density: 1.18 g/cm^3

Adapter Plate
Size: 14 x14 cm or 15 x15 cm (5.5 x 5.5" or 5.9 x 5.9")
Opening: 4" Diameter (10.2 cm)
Material: 1.88 cm Thick Steel (0.74")
Finish: Nickel Chrome Plated
Sterilization: Autoclave or Gas - Sterrad NX-100

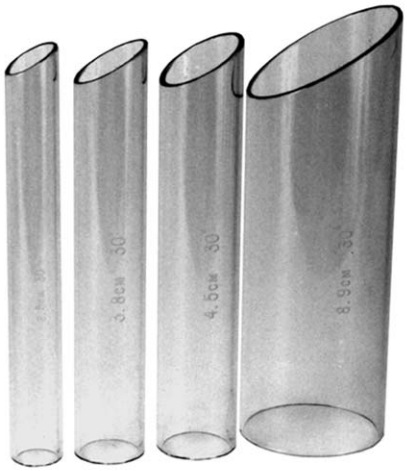
Electron Mini-Cone (Items 895-41915 to 895-47090)
Base: 3/8" Thick x 4" Diameter Brass Ring (0.96 x 10.2 cm)
Material: 1/8" (0.32 cm) Clear Acrylic
Sterilization: Gas - Sterrad NX-100

Item #	Electron Cone Adapter Plate
895-400	Varian Type III (with MLC) 15 cm
895-401	Varian Type II (no MLC) 15 cm
895-402	Elekta 14 cm

Item #	Electron Mini-Cone Inside Dimension
895-419_ _*	1.9 cm
895-432_ _*	3.2 cm
895-445_ _*	4.5 cm
895-457_ _*	5.7 cm
895-470_ _*	7.0 cm

***Specify Angle (0°, 15°, 30° or 45°)**

DUMMY MINI-CONES



The Dummy Mini-Cones are used to select the cone diameter and angle needed for treatment.

The Dummy Mini-Cones are made of 3.1 mm thick clear acrylic and are approximately 12 cm long. One end of the cone is flat and the other end is angled to 0°, 15°, 30° or 45°.

It is best not to use the Treatment Electron Mini-Cones in clinical setting because they could be dropped.

Specifications

Sterilization: Gas, Sterrad NX-100
Material: 1/8" Clear Acrylic

Item #	Dummy Mini-Cone Inside Dimension
895-519_ _*	1.9 cm
895-532_ _*	3.2 cm
895-545_ _*	4.5 cm
895-557_ _*	5.7 cm
895-570_ _*	7.0 cm

***Specify Angle (0°, 15°, 30° or 45°)**

ALRA® RADIATION THERAPY LOTION

- **Provides quick, reliable relief from acute radiation dermatitis**
- **Non-irritating, non-allergenic**
- **Does not interfere with ongoing treatment**
- **Excellent patient acceptance**

Alra® Radiation Therapy Lotion is specifically developed for the treatment of skin exposed to radiation therapy. It contains a highly concentrated emulsion of aloe vera gel, lanolin, vitamin E, soluble collagen, and allantoin. It does not contain water, glycerin, mineral oil, alcohol or added fragrance.

In patient studies conducted at the Cedars-Sinai Comprehensive Cancer Center in Los Angeles, none of the patients treated with Alra® Radiation Therapy Lotion showed irritation or allergic reactions.

This soothing lotion aids in the replacement of damaged tissue, helping the natural healing process to take place.

Item #	Description	Quantity
125-001	Alra® Radiation Therapy Lotion, 4 oz. Bottle	12
125-003	Alra® Radiation Therapy Lotion, 1 oz. Bottle	24

ALRA® NON-METALLIC DEODORANT

- **Free of metallic ingredients that can interfere with radiation therapy treatments**

Alra® Non-Metallic Deodorant is specifically formulated to eliminate perspiration odor and wetness without the use of metallic ingredients that may interfere with treatments. This gentle, non-irritating deodorant contains oil of cypress, a clean-smelling natural fragrance, and lichen extract which is a natural bactericide and fungicide.

Item #	Description	Quantity
125-006	Alra® Non-Metallic Deodorant	12

ALRA® MILD CONDITIONING SHAMPOO

- **Minimizes hair damage while cleansing and conditioning hair and scalp**

Oncology therapy can cause normal hair to become extremely dry and brittle, and the scalp to be very sensitive. While no shampoo can prevent hair loss caused by some chemotherapy drugs, Alra® Mild Conditioning Shampoo is an extra-gentle formula that is acid-balanced and specially-formulated to minimize hair damage.

Ingredients include: aloe vera gel, DL panthenol (pro-vitamin B-5) and aromatic oil of rosemary, to stimulate scalp circulation.

Item #	Description	Quantity
125-011	Alra® Mild Total Body Shampoo, 8 oz Bottle	12

DISPOSABLE NITRILE GLOVES

These patented gloves provide three times the puncture resistance of natural rubber and vinyl disposable gloves of comparable thickness. Gloves contain no natural rubber latex proteins. Disposable, 100% nitrile gloves are 4 mil thick with low-powder, 9 1/2" long, fits either hand. Sold in 100/box.

Item #	Gloves, Disposable Nitrile	Size
280-001	Powdered	Medium
280-002	Powdered	Large
280-003	Powdered	X-Large
280-004	Powder-Free	Medium
280-005	Powder-Free	Large
280-006	Powder-Free	X-Large

DISPOSABLE VINYL EXAM GLOVES

Tough 5-mil Vinyl Exam Gloves fit either hand. 11" length. Comes lightly powdered or powder free. Excellent general-purpose disposable gloves. Sold in 100/box.

Item #	Gloves, Disposable Vinyl	Size
280-010	Powdered	Medium
280-011	Powdered	Large
280-012	Powdered	X-Large
280-015	Powder-Free	Medium
280-016	Powder-Free	Large
280-017	Powder-Free	X-Large

BIOGEL LATEX SURGICAL GLOVES

Powder-Free

With patented Biogel coating. 100% physically inspected. Easy to don, even over damp hands. Curved finger design helps prevent hand fatigue. Beaded cuffs. Hand specific. Single-use. Natural color. Sterile. 10 1/2" length. 10 mil thick. Specially processed to ensure ≤50µg of water-extractable protein per gram of latex. Sold in 50 pairs/pack except for size 8 1/2" which is only available in a case of 200 pairs.

Item #	Gloves, Biogel Latex Surgical	Size
280-071	Powder-Free	6
280-072	Powder-Free	6 1/2
280-073	Powder-Free	7
280-074	Powder-Free	7 1/2
280-075	Powder-Free	8
280-076	Powder-Free	8 1/2

Blood Pressure Monitor

Item 288-200 Blodd Pressure Monitor Includes

- Gauge
- D-ring cotton cuff with chest piece
- Bladder
- Bulb and air release valve
- Binaural and eartips
- Y-tubing
- Vinyl storage case
- User manual
- Record chart
- 1 year warranty (limited, see manual for details)

The professional stethoscope can be used for other diagnostic procedures. The self-taking method is easily adapted with the D-Ring cuff. Arm size: 9" to 13".

Item #	Description
280-200	Blood Pressure Monitor

FLEXBAK®

Flexbak® helps reduce back stress and strain with a design so unique its patented. Its three-part support is the key to a system that provides maximum back support with ease of movement. The 9" medical-style truss uses two internal support panels above and below the waist surrounded by an elastic third panel. These combine to produce maximum bracing without pinching or riding up.

To determine size, measure around abdomen at the navel.

Item #	Description	Size
280-11501	Flexbak® - Small	26" - 36"

MAXRIST®

MaxRist® offers a restrictive metal spoon stay that fits in the palm to eliminate the symptoms of CTS and other repetitive strain injuries. The lightweight flexible material does not hinder finger movement.

To determine size, measure around the wrist for correct size.

Item #	Description	Size
280-10902	MaxRist® Right	Medium (6 1/2" to 7 1/2")
280-11002	MaxRist® Left	Medium (6 1/2" to 7 1/2")

Y

FLEXRIST®

FlexRist®, the comfortable all around support made of Neoprene is the best defense against Carpal Tunnel Syndrome. One design can be adapted to any wrist, right or left. It washes easily, is comfortable, extremely lightweight and versatile.

Item #	Description
280-11101	FlexRist® Regular

RIST RITE®

The Rist Rite® is a neoprene support that is reinforced with Cordura nylon across the palm for long wear. It has one strap that stops short of the hand.

To determine size, measure around the wrist.

Item #	Description	Size
280-11202	Rist Rite® Right	Medium (6 1/2" to 7 1/2")
280-11203	Rist Rite® Left	Medium (6 1/2" to 7 1/2")

SECA 216 WALL MOUNTED MECHANICAL MEASURING ROD

- **Two different measurement ranges**
- **Easy read-out**
- **Adjustable head positioner**
- **Choice of two units of measurement**
- **Simple assembly**

The seca 216 Wall-Mounted Mechanical Measuring Rod is equally suitable for measuring both children and adults. The plastic frame is simply mounted on the wall at the desired height. The seca 216 has a variable scale with a range of 1.4 to 90 inch that is inserted into a 55.3 inch frame. The head positioner, which can be easily locked into place, stays in exactly the right position when the measured person steps away from the measuring rod.

The results are clearly displayed in a window on the side of the rod and held in place by the locking screw on the head piece. Suitable for international use, the scale is printed in centimeters on one side of the tape and centimeters and inches on the other.

Specifications

Measuring Range: 1.4" to 90" (3.5 to 230 cm)
Graduations: 1/16" / 1mm
Dimensions: 4.7" W x 59.1" H x 8.5" D (12 x 150 x 21.7 cm)
Weight: 3.7 lb (1.7 kg)

CE 0123

Item #	Description
100-216	seca 216 Wall Mounted Mechanical Measuring Rod
100-217	Replacement Head Piece for Item 100-216

SECA 222 TELESCOPIC MEASURING ROD

Wall-mounted with extra wide slide

- **Telescopic measuring rod with large measuring range**
- **Specially developed for wall mounting**
- **Result easy to read-off even for tall patients**

Specially developed for wall mounting, these aluminum measuring rods are aligned to work exactly to the millimeter from head to toe. The broad measuring slide and heel positioner are professional prerequisites. The telescopic measuring rod ensures that the result can be easily read at eye level even for the tallest patient. When not in use, the measuring slide can be folded down for safety.

Specifications

Functions: Wall fastening essential/possible
Measuring Range: 2" - 90.5" (6 - 230 cm)
Graduation Length: 1/8" (1 mm)
Dimensions
Unfolded: 12.1" W x 91.3" H x 11.3" D (30.8 x 232 x 28.7 cm)
Folded: 12.1" W x 52" H x 11.3" D (30.8 x 132 x 28.7 cm)
Weight: 2.4 lb (1.1 kg)

CE 0123

Item #	Description
100-222	seca 222 Telescopic Measuring Rod, Inches
100-223	seca 222 Telescopic Measuring Rod, cm

SECA 700 MECHANICAL COLUMN SCALE

- **Extra high capacity of 500 lb (220 kg)**
- **Large, low platform**
- **Simple to operate and easy to read due to eye-level display**
- **Sturdy construction with cast-iron base**
- **Integrated Transport casters for mobile use**

With its capacity of 500 lb (220 kg), the seca 700 has been specially designed for weighing overweight and obese patients. To ensure durability, special attention was paid to the high-quality construction. The generously sized, low level platform makes the seca 700 easy to mount. The weight scale, has been affixed at eye level, is printed on both sides and has large numerals so that the result is easier to read. A special coating reliably prevents the scale from fading even after years of use. The base of the seca 700 is made of cast iron and has a special coating on the lever apparatus which protects the inner parts against corrosion. The scale can be moved easily and quickly on the integrated transport castors to wherever it is needed. Fitted with the included seca 220 Telescopic Measuring Rod (measuring range of 24" to 78"), the seca 700 makes time-saving weighing and measuring possible in one step.

Specifications

Items 100-250 and 100-251 seca 700 Mechanical Column Scale
Functions: Reset-to-zero function, seca 220 Telescopic Measuring Rod
Capacity: 500 lb (220 kg)
Graduation: 1/8 lb (50 g)
Dimensions: 20.5" W x 61.3" H x 20.5" D (52.1 x 155.7 x 52.1 cm)
Platform: 13.2" W x 3.1" H x 13.6" D (33.5 x 7.9 x 34.5 cm)
Weight: 35.7 lb (16.2 kg)

CE

Item #	Description
100-250	seca 700 Mechanical Column Scale, lbs
100-251	seca 700 Mechanical Column Scale, lbs/kg

SECA 769 DIGITAL COLUMN SCALE

- **Site-independent as battery operated**
- **Easy to transport**
- **Cost-effective and low-maintenance due to low power consumption**
- **Intelligent functions for versatile use**
- **seca 220 measuring rod included**

The seca 769 Digital Column Scale with BMI Function is equipped with several intelligent functions. The BMI function permits a reliable evaluation of the nutritional condition of the patient. The auto-HOLD function ensures that the result is still shown on the display after the patient has stepped down from the scale. Additional items which are not to be included in the weight result are simply deducted by means of the TARE function. The seca 769 is energy-saving, thus very cost-effective. The seca 769 is battery-operated, no wall outlet connection is necessary. The automatic switch-off function is another reason for the low energy consumption. The column scale is supplied with a seca 220 measuring rod so that both weight and height can be determined in just one time-saving step. With its smooth running transport casters, the column scale is also easy to move around.

Specifications

Item 100-261 seca 769 Digital Column Scale with BMI Function
Capacity: 450 lb (200 kg)
Graduation: 0.2 lb (100 g)
Dimensions: 11.6" W x 32.7" H x 16.4" D (29.4 X 83.1 X 41.7 cm)
Platform: 10.7" W x 3" H x 11" D (27.2 x 7.5 x 28 cm)
Measuring Range: 24 - 78" (60 - 200 cm)
Graduation Length: Measuring rod 1/8" (1 mm)
Weight: 13.7 lb (6.2 kg)
Power Supply: Batteries, power adapter optional
Functions/Accessories: TARE, auto-HOLD, BMI, lbs/kg switch-over, automatic switch-off, measuring rod
Optional: Switch-mode power adapter seca 400

Item 100-263 Optional A/C UL Adapter
Dimensions: 1.6" W x 1.4" H x 2.9" D (4.2 x 3.5 x 7.3 cm)
Cable length: 72.8 " (1.85 m)
Weight: 0.34 lb (0.15 kg)

CE 0123

Item #	Description
100-261	seca 769 Digital Column Scale with BMI Function
100-263	A/C UL Adapter for Item 100-261

EASY WRAP APRON

The Easy Wrap Apron is easy to put on, adjust and take off. The Easy Wrap Apron features two side velcro closures so you can adjust the fit more evenly and includes a breast pocket.

Specifications

Size: 24" x 42" (61 x 107 cm)
Protection: 0.5 mm
Colors: 11 - Rose, 12 - Purple, 14 - Teal, 16 - Medium Blue, 18 - Burgundy, 19 - Grey, 20 - Royal Blue, 22 - Navy Blue

Item	Description
120-002-_ _	Easy Wrap Apron

Specify Color # When Ordering

RADIOACTIVE MATERIAL TAGS

Sturdy cardboard tags have a string for attachment to sources of radioactivity, such as bottles, vials and containers. Each tag has a writing space for isotope, date, amount, etc. String holes are double-reinforced.

Specifications

Size: 2 5/8" x 5 1/4" (6.6 cm x 13.4 cm)
Quantity: 100/Pkg
Weight: 0.52 lb (0.24 kg)

Item	Description	Quantity
009-100	Radioactive Material Tag	100/Pkg

RADIATION CAUTION SIGNS

Signs follow the NRC and Agreement States recommended wording, symbols, size and colors.

Specifications

Fireproof
Material: 18 ga. Steel
Mounting: 4 Holes
Weight: 1.12 lbs (0.51 kg)

Item	Description	Size
009-637	“Caution: Radioactive Materials”	8” x 10”

Specifications

Material: Plastic, Expanded PVC
Size: 8" W x 10" H (20.3 x 25.4 cm)
Thickness: 3 mm Thick
Mounting: Four 0.25" (0.64 cm) Diameter Holes

Item	Description	Size
009-673	“Caution: Radioactive Material”	8" x 10"
009-675	“Caution: Radiation Area”	8" x 10"
009-677	“Caution: High Radiation Area”	8" x 10"
009-679	“Grave Danger: Very High Radiation Area”	8" x 10"
009-680	“Caution: Radiation Area” Spanish/English	8" x 10"
009-682	“Danger: Very High Radiation Area”	8" x 10"
009-683	“Danger: High Radiation Area”	8" x 10"

CHEESECLOTH MINI-WIPES

Reagent-grade quality
New wipes are certified to be 100% pure cotton of reagent-grade quality and purity. They meet all lab requirements for cleanliness, softness, absorbency, and strength.

Lint-free
Cheesecloth Wipes absorb six times their own weight of both solvents and aqueous solutions. Soft and pliable cloth is lint-free. It never scratches surfaces or falls apart like paper towels.

Excellent filtering material
Because they are inert to even harsh solvents, they are ideal as a filtering material. Certified cheesecloth wipes meet cleanliness specifications of USP. (United States Pharmacopoeia) and Federal Specification (CC-G-101c).

Specifications

Size: 4" x 4" (10 x 10 cm) 8 ply pad unfolds to approximately 12" x 12" (30.5 x 30.5 cm)
Color: White

Item	Description	Quantity
119-100	Cheesecloth Mini-Wipes	200

TEXWIPE® ALL-PURPOSE COTTON WIPERS

Strong, highly absorbent, 100% cotton wipers woven from high-quality, long-staple cotton fibers and finished using a proprietary process that greatly reduces lint, particles, and extractables.

Twill patterned surface on both sides of the cloth traps and removes contaminant's from the cleaned surface. Wiper is cut at 45° angle to ensure that edges will resist generation and release of fibers. Its uniform surface texture, strength, heat resistance, absorbency, and inherent anti-static characteristics at 40 to 60% relative humidity makes it suitable for a wide range of critical applications. Basis weight: 175g/cm^2.

Item	TexWipes® Cotton Wipers	Quantity
119-610	6" x 6" (15.25 x 15.25 cm)	600
119-612	9" x 9" (22.86 x 22.86 cm)	300
119-614	12" x 12" (30.5 x 30.5 cm)	150

ALCOHOL PREP PADS

Alcohol Prep Pads have a sheet Size 1 x 2 In. The formula is 70% Isopropyl Alcohol and 30% Water. Pads are individually sealed. These are single use wipes.

Item	Description	Quantity
119-700	Curity® Alcohol Prep Pads	200

ONE TOUCH PUMP SOLVENT DISPENSERS

Eliminate evaporation, dripping and spilling! Dish-type pump dispensers allow one hand operation. Stainless steel pumps are attached to square, high-density polyethylene (HDPE) bottles. A set of chemical labels comes with each bottle. One touch pump handles aqueous or alcohol-based liquids that require cotton or pad application.

Item	One Touch
119-720	Pump Dispenser, 6 oz.
119-721	Pump Dispenser with Locking Top, 6 oz.

MEDI-AIRE®

Rejuvenates The Air

Medi-aire® is an air freshener that chemically combines with foul smelling odors to eliminate them. Even the worst biological odors associated with incontinence and ostomy appliances, dirty linen, bathrooms, and stale cigarette smoke disappear.

Item	Medi-Aire®
466-200	Fresh Air, 1 oz. Spray Bottle
466-200-1	Fresh Air, 1 oz. Spray Bottle, 24 per box
466-201	Fresh Air, 8 oz. Refill Bottle

PDI® SANI-CLOTH® PLUS DISINFECTANT

Bactericidal, Tuberculocidal and Virucidal

- Pre-measured and pre-moistened
- Accurate strength every time

Kills Influenza A2/HK, Herpes Simplex Type II and HIV-1 in just 30 seconds. Effective against Staphylococcus aureus, Salmonella choleraesuis and Pseudomonas aeruginosa in five minutes. Kills Myobacterium bovus (TB) in five minutes. Effective against E coli. Safe on most hard, non-porous surfaces. 15% alcohol.

Compliance: EPA registered and approved

Item	Sani-Cloth Plus Wipes
466-320	Large 6" x 6.75" (15 x 17 cm), 160 Wipes
466-321	X-Large 8" x 14" (20 x 35.5 cm), 65 Wipes

CAVICIDE™ DISINFECTANT AND CLEANER

No Residue

Cavicide™ Disinfectant and Cleaner is biodegradable and contains no phenols. Cavicide™ Disinfectant and Cleaner cleans manual and ultrasonic instruments and acts as a decontaminates for medical instruments. Safe on all inanimate surfaces.

Use Cavicide™ wherever environmental infection control is needed. Non caustic formula is tuberculocidal, virucidal, fungicidal, bacteriocidal and kills HIV/HBV. Also effective against MRSA and VRE. Contains no dangerous phenols that would require the use of skin, eye or respiratory protection. Strong enough to kill on contact, yet fully biodegradable.

Compliance: EPA registered. Exceeds OSHA standard.

Item	Description
466-330	Cavicide Spray, 8 oz. Bottle
466-332	Cavicide Spray, 24 oz. Bottle
466-334	Cavicide Wipes, 6” x 6.75”, Canister of 160

CIDEX® OPA

Proven Efficacy
CIDEX® OPA Solution has been tested and cleared as a high-level disinfectant for use with the most widely used endoscopes.
- Designed for either manual or automatic reprocessing
- Manufactured to the highest standards for purity
- Effective against a wide array of microorganisms

Proven Safety
CIDEX® OPA Solution protects both patients and technicians, with a demonstrated safety profile that is backed by the heritage of Advanced Sterilization Products (ASP).*
- Safe to use for patients, healthcare professionals and instruments
- Low vapor pressure for minimal inhalation exposure risk
- No need for special ventilation
- Near-neutral pH level ensures compatibility with endoscopic instruments

Proven Value
CIDEX® OPA Solution is the number-one1 product in high-level disinfection, offering more ways to make the most of your budget.
- Rapid disinfection improves productivity, allowing more endoscopes to be processed in less time[2]
- Noncorrosive formula protects your investment in instrumentation[2, 3]
- Long-lasting efficacy allows reprocessing of more devices per gallon than with glutaraldehyde[2]

**Please read and follow the Instructions For Use prior to using CIDEX® OPA Solution for important information, including contraindications, warnings and proper directions for use.*

Rapid Action, Reliable Disinfection
Multiple studies have shown the efficacy of CIDEX® OPA Solution against bacteria, fungi, and viruses.[4, 5] CIDEX® OPA Solution works within minutes and provides broad spectrum killing power-even in the presence of human serum.[2]

CIDEX® OPA Solution can be used straight from the bottle for extra efficiency.
- Requires no activation or mixing
- 5-minute soak time at 25°C in automatic endoscope reprocessors*
- 12-minute soak time at 20°C for manual reprocessing

Long Life, Lasting Power
A long shelf life and high reusability make CIDEX® OPA Solution a great value.
- 2-year unopened shelf life
- 75-day shelf life after opening the bottle

Using CIDEX® OPA Solution in an automatic reprocessor can mean 20% more cycles in a 14-day reuse cycle, compared with other solutions.[5]
- Sensitive test strips make it easy for you to test the minimum effective concentration (MEC) of ortho-phthalaldehyde, the active ingredient in CIDEX® OPA Solution

**When used or reused in a legally marketed automatic endoscope reprocessor that can be set to a minimum of 25° C.*

Microbicidal Activity
The following table indicates the spectrum of activity as demonstrated by testing of CIDEX® OPA Solution using prescribed test methods.

Viruses Non-Enveloped		
Poliovirus Type 1	Rhinovirus Type 42	Adenovirus Type 2
Vaccinia (Wyeth)	Coxsackievirus Type B-3	
Viruses Enveloped		
Coronavirus	Cytomegalovirus	Influenza Virus [Hong Kong]
HIV-1	Herpes simplex Types 1,2	
Vegetative Organisms		
Staphylococcus aureus	*Salmonella choleraesuis*	*Pseudomonas aeruginosa*
Mycobacterium bovis		
Fungi		
Trichophyton mentagrophytes		

Materials Compatibility

Metals		
Aluminum	Anodized aluminum	Brass
Carbon steel	Chrome-plated brass	Chrome-plated steel
Copper	Nickel-plated brass	Nickel-silver alloy
Stainless steel	Titanium	Tungsten carbide
Vanadium steel		
Plastics		
Acetal	Acrylonitrile-butadiene-styrene (ABS)	Nylon
Polyamide	Polycarbonate	Polyethylene
Polyethylene terephthalate (polyester)	Polymethylmethacrylate (acrylic)	Polypropylene
Polystyrene	Polysulfone	Polyvinylchloride (PVC)
PTFE		
Elastomers		
Kraton G	Natural rubber latex	Polychloroprene (Neoprene)
Polyurethane	Silicone rubber	
Adhesives		
Cyanoacrylate	EPO-TEK 301 epoxy	EPO-TEK 353 epoxy
Polyether Polysulfide		

Testing CIDEX® OPA Solution
To verify the efficacy of CIDEX® OPA Solution, ASP recommends testing for the minimum effective concentration (MEC) prior to each use. ASP offers test strips designed specifically for use with CIDEX® OPA Solution. Easy to use and read, CIDEX® OPA Test Strips are the most reliable means to verify that CIDEX® OPA Solution will effectively destroy microorganisms, including the highly resistant Mycobacterium.

References
1. 2008 Healthcare Products Information Services (HPIS) data, HLD Market Assessment. 2. Hession SM. Endoscope disinfection by ortho-phthalaldehyde in a clinical setting: an evaluation of processing time and costs compared with glutaraldehyde. Poster presented at: Society of Gastroenterology Nurses and Associates; May 18-23, 2001; Tampa, FL. 3. Vollmer C. New high-level disinfectant reduces equipment-repair costs. Infect Control Today. August 2002. 4. Akamatsu T, Minemoto M, Uyeda M. Evaluation of the antimicrobial activity and materials compatibility of orthophthalaldehyde as a high-level disinfectant. J Int Med Res. 2005;33:178-187. 5. Rutala WA, Weber DJ. New disinfection and sterilization methods. Emerg Infect Dis. 2001;7:348-353.

Item	Description
466-401	Cidex OPA, 1 gal
466-403	Cidex OPA Solution Test Strips, 60 strips/bottle

DRY HEAT STERILIZER

- **Precision thermostat, signal light, thermometer**
- **Rapid heat-up time with safety limit control**
- **Heating elements cannot burn out**
- **Two hour timer with "HOLD" position**
- **Finest hospital grade stainless steel**
- **Glass wool insulation for minimum heat loss**
- **Convenient instrument tray handle**
- **Accommodates most instrument trays**
- **Meets all electrical standards**
- **FDA registered**

The Dry Heat Sterilizer is a fine precision instrument utilizing all the improved techniques developed in the designing, engineering and manufacturing of dry heat sterilizers. Only the best hospital grade material and scientifically proven components are used and rigid quality control during manufacture assures you of an instrument that will perform satisfactorily for many years.

This sterilizer operates at 320 - 360°F (160 - 180°C) automatically. Simply place unsterile items in the trays (plus small needle tray), and set the timer.

Specifications

Operating Temperatures: 320 - 360°F (160 - 182°C)
Outside Dimensions: 15.5" W x 10.5" H x 9.5" D (39.4 x 26.7 x 24.1 cm)
Inside Dimensions: 11.5" W x 5" H x 7.5" D (11.5 x 12.7 x 19 cm)
Weight: 17 lb (7.8 kg)

Nylon Dry Heat Sterilizing Pouches

Dry Heat Indicator Strips

Spore Test Kits

Nylon Dry Heat Sterilizing Pouches
These self-sealing pouches are available in three sizes. For use in dry heat sterilization process only.

Dry Heat Indicator Strips
These 4" (10.16 cm) strips are for use in dry heat processes up to 420°F. The indicator turns from green to brown. Insert in package or outside of package.

Spore Test Kits
Testing kits are for use in steam, chemical vapor, dry heat and EO gas sterilization processes. CDC states that sterilizers should be biologically monitored with a spore test at least weekly, and every load that contains an implant.

Item	Description
936-700	Sterilizer, Dry Heat, 320 to 360°F, 115VAC
936-700-230	Sterilizer, Dry Heat, 160 to 182°C, 230VAC

Item	Accessories	Quantity
936-701	Nylon Dry Heat Sterilizing Pouch 2" x 10" (5.08 x 25.4 cm)	100
936-702	Nylon Dry Heat Sterilizing Pouch 4" x 10" (10.16 x 25.4 cm)	100
936-703	Nylon Dry Heat Sterilizing Pouch 7" x 10.5" (17.78 x 26.67 cm)	100
936-708	Dry Heat Indicator Strips, 4" (10.16 cm)	100
936-710	Sterilizer Spore Test Kit	12
936-711	Sterilizer Spore Test Kit	52

ALUMINUM HALF VALUE LAYER ATTENUATOR SET

- **Easy to use and customize in thicknesses for specific tasks**
- **Easy to store**
- **Economical**
- **Compact**

Determining the Half Value Layer (HVL) of the x-ray beam is the standard method for specifying the quality of the x-ray beam. For a given kVp, a measurement of the HVL gives information on the total filtration in the x-ray beam. Too little filtration results in unnecessary radiation to the patient and too high of a HVL may require increased kVp and mAs, increasing tube loading and reducing tube life.

Half Value Layer Attenuator Set contains nine (9) sheets of 1100 Aluminum Alloy ranging in thicknesses from 0.1 to 2.0 mm. For your convenience these sheets come in a plastic storage case to help maintain flatness and for ease of storage and transportation.

Specifications

Construction: 1100 Aluminum Alloy (99.0% Pure)
Size: 4" x 4" (10x10 cm)
Weight: 0.4 lb (0.2 kg)
Nine (9) Individual Aluminum Sheets: (3) 0.1 mm, (1) 0.2 mm, (2) 0.5 mm, (2) 1.0 mm and (1) 2.0 mm

Item	Description
115-500	Aluminum Half Value Layer Attenuator Set

COPPER HALF VALUE LAYER ATTENUATOR SET

- **Copper attenuators to simulate heavier patients**
- **Wide range of thicknesses for different testing conditions**
- **Satisfy regulatory requirements for fluoroscopic systems**

Regulatory test protocols for fluoroscopic systems increasingly specify copper attenuators to simulate heavier patients. When doing these tests, it is often useful to apply additional copper to drive the systems to maximum output. Copper filters are still used for specifying the Half Value Layer (HVL) of x-ray beams generated between 140 and 400 kVp.

The Pure Copper Half Value Layer Attenuator Set is comprised of nine sheets, 10x10 cm
in thicknesses ranging from 0.1 mm to 2.0 mm. A plastic storage case is provided to protect and to help maintain flatness of the filters.

Specifications

Construction: Pure copper
Size: 4" x 4" (10x10 cm)
Weight: 1.1 lb (0.55 kg)
Nine (9) Individual Aluminum Sheets: (4) 0.1 mm, (1) 0.25 mm, (1) 0.5 mm, (2) 1.0 mm and (1) 2.0 mm

Item	Description
116-000	Copper Half Value Layer Attenuator Set

BLOOD IRRADIATION BOX

The blood irradiation box is made of acrylic and has a latch on the front of the box. A 12" (30.5 cm) piano hinge runs along the back of the box. A cable is attached to the cover and box to allow the cover to go past vertical so it will not fall backward. The bottom and cover are each 1.9 cm thick and the sides are 5.5 cm thick. Three central axis markers are centered on the top and sides of the box.

Optional filler pieces are available. These are custom made per customer specifications.

Specifications

Material: Acrylic
Inside Dimensions: 25 x 25 x 5.5 cm H
Outside Dimensions: 36 x 36 x 9.3 cm H

Item	Description
005-001	Blood Irradiation Box

IRRADIATION PHANTOM FOR 8 - 6 ML VIALS

Shown with a 6 ml vial on top and in a cavity

The irradiation phantom is octangular shaped and has eight (8) cavities for 6 ml vials in the center of each side of the octangle. The cavities are centered at midplane of the phantom.

The base serves as a holder for the phantom and also prevents a vial from falling out if phantom is tipped. The base consists of 0.635 cm plate attached to the 2.5 cm slab that has been cut for the phantom.

Specifications

Material: Polystyrene
Base Size: 30 cm² x 3.17 cm Thick
Insert Size: 26.2 cm across the flat sides x 2.5 cm Thick

Item	Description
005-020	Irradiation Phantom for 8-6ml Vials

Other Vial Sizes and Vial Quantities Available

MOBILE WORKSTATIONS

750-019

750-021

750-022

750-024

- **Double-Jointed Extendable Arms**
- **Track-Slide Height Adjustment**
- **Extension Monitor Arms**

Components can be easily relocated along support post. The Mobile Workstations have an all-steel mobile base. An extension arm keyboard tray and 75 mm/100 mm VESA swivel mount are standard on all workstations. Workstations with a CPU Holder also have an additional 31 1/2" track (for 63" total) and CPU holder that is adaptable for standard or thin CPU casements.

Includes
1 - Integrated Workstation
1- Steel Post (Total Height 67" (170.75 cm)
1 - Stabilizer H-Base
1 - Cable Channel
4 - Locking Casters
1 - Optional Filler Panel

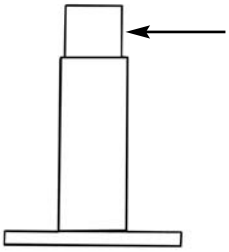
Item	Description
750-019	Single View Workstation
750-021	Dual View Workstation
750-022	Single View Workstation with CPU Holder
750-024	Dual View Workstation with CPU Holder

Components not compatible with other series.
Electronic equipment shown is not included.

PEN LIGHT

Item	Description	Quantity
1006-00	Pen Light	6

SUPERFICIAL CONE REPAIR



Cone repair consists of replacing the glass or acrylic end of the superficial cone with polished acrylic. Call for more information.

Item	Description
201-000	Picker Superficial Cone Repair
201-200	General Electric Superficial Cone Repair

Repair of Other Manufacturer's Cones Available

Z

ARTICULATING ARM

The Articulating Arm has two arms that can rotate 360°. The end of each arm has a cutout swivel that houses a ball stud and allows for another 360° of rotation. A 1.5" (3.8 cm) diameter knob in the center of the arms locks the positon of both arms and ends of arm swivel ball stud. The stud is a 1/4" - 20 thread x 1/4" long for connection.

Specification

Arm length: 10.5 cm
Overall Size: 24 cm diameter x 6 cm H
Material: Stainless Steel

Item	Description
978-600-9	Articulating Arm