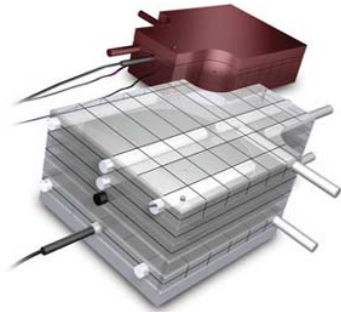
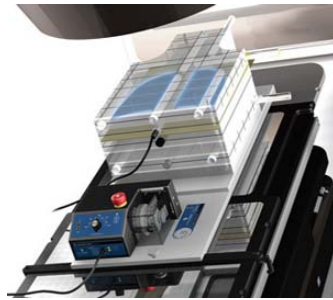


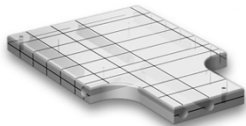
IMRT DOSE VERIFICATION PHANTOM



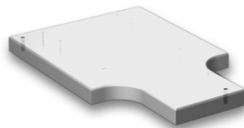
Shown with Acrylic and Virtual Water™ Configurations



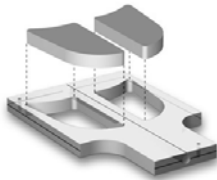
Shown with Respiratory Gating Platform



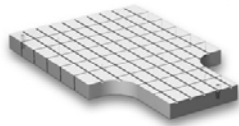
Ion Chamber Slab



Blank Slab



Lung Phantom Slab



MOSFET Diode / TLD Slab

- **Ion Chamber Slab** has six cavities for thimble ion chamber measurement. The diameter of each cavity is 19 mm. Solid acrylic (Virtual Water™) plugs are included to fill the cavities for simulated patient thickness. One solid plug is drilled for the ion chamber of choice. A bone equivalent plug is included for bone simulation of heterogeneity measurements.
- **Blank Slab** is a solid slab to provide simulated patient build-up material. Four 2 mm steel balls are imbedded in the slab as reference markers for 3D orientation of film on TPS.
- **Lung Slab** has two cavities for simulated lung inserts, two cylindrical cavities for thimble ion chamber placement and a set of two tissue equivalent lung inserts for lung simulation. Optional Acrylic inserts convert the Lung Slab into a solid slab

Versatile and Comprehensive

Gain confidence in the accuracy of your treatment plans and help improve patient outcomes

Verify Patient IMRT Treatment Plans

The anthropomorphic design of the IMRT Dose Verification Phantom mimics human anatomy which assists in set up and treatment for patient dose verification. It is ideal for prostate and head and neck regions, as well as for commissioning respiratory gated protocols because the accuracy of prescribed dose is evaluated and confirmed in simulated patient conditions. The IMRT Dose Verification Phantom is available in Acrylic (Item 682-700) or Virtual Water™ (Item 682-702).

Item	Description
682-700	Acrylic IMRT Dose Verification Phantom
682-702	Virtual Water™ IMRT Dose Verification Phantom
682-705	TLD / Diode / MOSFET Acrylic Slab
682-706	TLD / Diode / MOSFET Virtual Water™ Slab
682-708	Optional Acrylic Lung Plug Set (4 Plugs)
682-709	Optional Virtual Water™ Lung Plug Set (4 Plugs)

Fast and Versatile Set-Up Helps Complete Dose Verification Quickly and Easily

The IMRT Dose Verification Phantom can combine absolute, relative and point dose measurements, with up to 16 chamber positions, 5 film positions and up to 9 diodes or TLDs. By using a fast coronal film orientation, the IMRT Dose Verification Phantom captures the dose contribution of all fields and segments, as well as showing hot and cold spots on the film, for comparison to the treatment plan. The IMRT Dose Verification Phantom effectively evaluates head and neck junction issues of upper neck and half beam superclav fields. It also incorporates inhomogeneity structures with bone and lung equivalents.

Assure Accuracy in Respiratory Gating with the Optional Respiratory Gating Platform

The unique Respiratory Gating Platform (Item 682-713) simulates breathing providing the means to create a comprehensive program for commissioning, training, quality assurance, and dose verification of gated IMRT treatments.

Optional Accessories

Item 682-705 TLD / Diode / MOSFET Acrylic Slab

Item 682-706 TLD / Diode / MOSFET Virtual Water™ Slab

have nine channels for MOSFET diodes or TLD chips which can be placed at any point in a field for point dose measurements. The small channel size was designed not to perturb other measurements allowing these slabs to be used as solid slabs for increased patient thickness. MOSFET diodes are isotropic for dose measurements from any angle.

Item 682-708 Optional Acrylic Lung Plug Set (4 Plugs)

Item 682-709 Optional Virtual Water™ Lung Plug Set (4 Plugs)

These optional inserts convert the Lung Phantom Slab into a solid slab.

Item 682-715 Carrying Case for IMRT Phantom

has extendable handles and wheels for easy transport.

Item 682-712 Lung Tumor Insert for IMRT Phantom

simulates tumor movement.

IMRT Dose Verification Phantom Includes

- (2) Chamber Phantom Slabs with 6 cavities each for ion chamber placement (Cavity diameter is 3/4")
- (2) Phantom Slabs for build-up thickness
- (2) Lung Phantom Slabs with 2 cavities for simulated lungs
- (16) Plugs to fill unused ion chamber cavities
- (1) Plug with cavity drilled for ion chamber of your choice
- (1) Bone Equivalent Plug
- (1) Lung Equivalent Set with four (4) inserts for lung phantom voids
- (12) Location Pins

Specifications

Height (six slabs): 7.09" (18 cm)

Width (each slab): 11.81" (30 cm)

Length (each slab): 17.72" (45 cm)

Weight (six slabs): 50 lb (22.7 kg)



Item	Description
682-710	Acrylic Slab for Large Volume Patients
682-711	Additional Virtual Water™ Slab
682-712	Lung Tumor Insert for IMRT Phantom
682-713	Respiratory Gating Platform for IMRT Phantom
682-714	Securing Kit for Respiratory Gating Platform
682-715	Carrying Case for IMRT Phantom

C

IMRT PHANTOMS

CIRS IMRT PHANTOMS

Complete QA from CT Imaging to Dose Verification

The CIRS IMRT phantoms are designed to address the complex issues surrounding commissioning and comparison of treatment planning systems and verification of individual patient plans and delivery.

All CIRS IMRT Phantoms

- Approximate the human body in size, structure and tissue properties using known and fairly simple geometrics.
- Allow for verification of the most common treatments such as lung, head and neck, breast, and prostate.
- Accommodate the wide variety of dosimeters necessary to perform thorough verification of the IMRT process.
- Enable easy upgrades and custom configurations through a modular design system.
- Provide a cost effective, user friendly and better designed alternative to existing phantoms.
- Are constructed of proprietary tissue equivalent epoxy materials. Linear attenuations of the simulated tissues are within 1% of actual attenuation for water and bone and within 3% for lung. These unique materials eliminate the need for correction factors, thus improving accuracy and saving time.

- Accommodate standard Ready Pack™ films in a transverse orientation (other orientations available upon request.)
- Incorporate a unique interchangeable rod design that enables chambers, diodes, MOSFET's and TLD's to be positioned in the same locations within the phantom for inter comparison of detectors. Depending on the model selected, your phantom may allow measurements to be taken inside or adjacent to semi-anthropomorphic lung and bone structures.
- Enable acquisition through planning process to treatment delivery.
- Include CT to film fiducial markers allowing easy film registration supported by RIT 113.
- Include an alignment base and holding device that enables quick and easy set-up of multiple phantom sections while still allowing easy access and relocation of detectors.

Additional Features (Optional in some models)

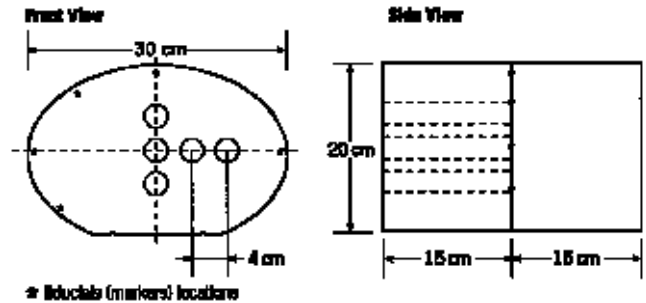
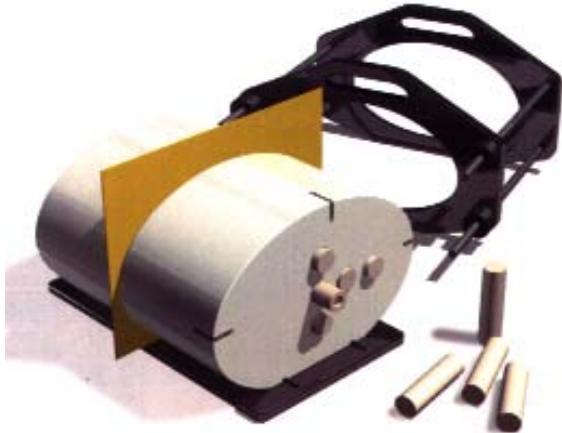
- Electron density reference plugs
- Radiochromic film stack for small volume distributions
- BANG™ gel cassette
- Carrying case

Ratios of CIRS IMRT Phantom Material ⁽²⁾⁽³⁾
linear attenuation coefficients to reference tissues.

En, MeV	Plastic Water-DT to H ₂ O Ratio, %	Average Bone to Ref ¹ Ratio, %	Lung (inhale) to Ref ² Ratio, %
0.05	100.8	100.00	100.3
0.06	100.5	99.96	101.1
0.08	100.3	99.91	101.9
0.10	100.2	99.88	102.2
0.15	100.1	99.86	102.5
0.20	100.1	99.84	102.5
0.40	100.1	99.84	102.7
0.60	100.1	99.83	102.6
0.80	100.1	99.84	102.7
1.00	100.1	99.83	102.7
1.50	100.1	99.84	102.7
2.00	100.1	99.84	102.6
4.00	100.0	99.87	102.1
6.00	99.8	99.93	101.6
8.00	99.7	99.95	101.2
10.0	99.6	100.03	100.7
15.0	99.2	100.06	100.0
20.0	99.1	100.13	102.7
El. density	100.1	99.83	102.7
Density	1.039 g/cm ³	1.60 g/cm ³	0.21 g/cm ³

1. The CIRS line of IMRT phantoms is compatible with the RIT 113 Software for film to plan analysis.
 2. ICRP 23, Report of the Task Group on Reference Man (1975).
 3. Woodard, H.Q., White, D.R., The Composition of Body Tissues, The British Journal of Radiology (1986) 59; 1209-1219.

CIRS IMRT HOMOGENEOUS PHANTOM



- Check 2D dose distributions (3D distributions optional)
- Point dose measurements in multiple planes
- Calibrate film with ion chamber
- Quickly verify individual treatment plans
- Correlate CTU to electron density

The Homogeneous Phantom has five interchangeable rod locations and one set of CT film fiducial markers. The Homogeneous Phantom is elliptical in shape and properly represents human anatomy in size and proportion. It measures 30 cm long x 30 cm wide x 20 cm 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.

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.

Specifications

Size: 11.8" W x 11.8" L x 7.9" T (30 x 30 x 20 cm)

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 rod inserts
- (1) Water equivalent rod insert with ion chamber cavity - **Specify**
- (1) Alignment base
- (1) Holding Device

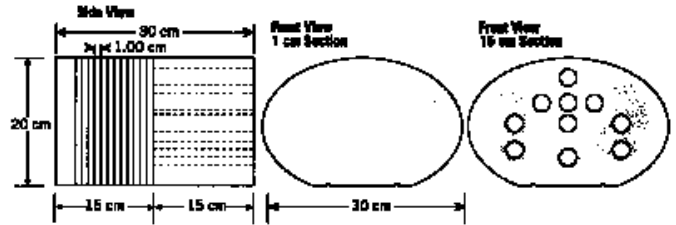
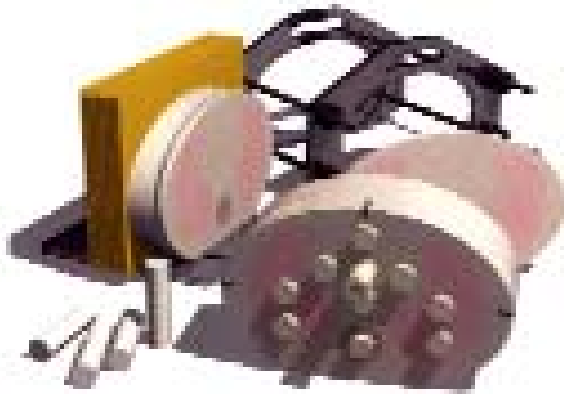
Item #	Description
682-500	IMRT Homogeneous Phantom Customer Must Specify Cavity Code: CV5_ _ _
Item #	Optional Accessories
682-525	Tissue Equivalent Rods for TLD's, Set of 5
682-526	Single Breast Attachment
682-527	Film Stack for Small Volume 3D Image Reconstruction
682-528	Gel Dosimetry Cassette
682-529	Thorax Region Section Accommodates 682-527 or 682-528
682-530	Homogeneous Section Accommodates 682-527 or 682-528
682-532	CT to Film Fiducial Markers
682-533	Water Equivalent Rod Insert with Ion Chamber Cavity - Specify
682-534	Bone Equivalent Insert with Ion Chamber Cavity - Specify
682-535	Lung Equivalent Insert with Ion Chamber Cavity - Specify
682-536	Foam Lined Carrying Case
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 for IMRT Phantom 1 cm Thick

Specify - Customer must specify ion chamber and/or cavity code.
CIRS IMRT Phantom ion chamber and cavity codes can be found on page C-8.

C

IMRT PHANTOMS

CIRS IMRT THORAX PHANTOM



C

- 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 Thorax Phantom has the same outside dimensions as the IMRT Homogeneous Phantom but includes lung and cylindrical spine. It also allows measurements in mediastinum, lungs and spine.

The IMRT Thorax Phantom is elliptical in shape and properly represents an average human torso in proportion, density, and two-dimensional structure. 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.

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.

Specifications

Size: 11.8" W x 11.8" L x 7.9" T (30 x 30 x 20 cm)

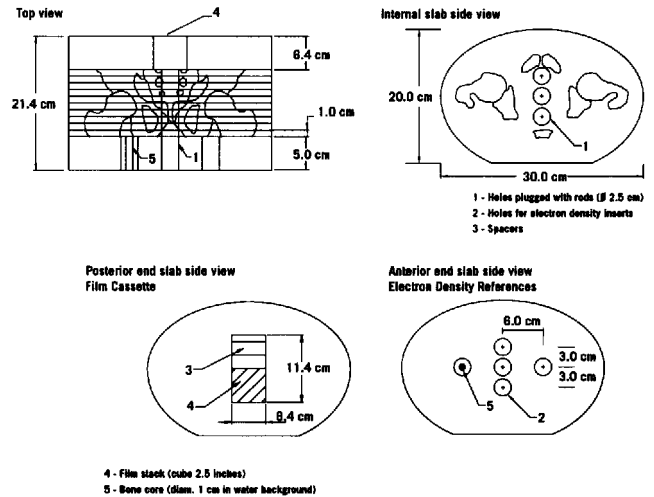
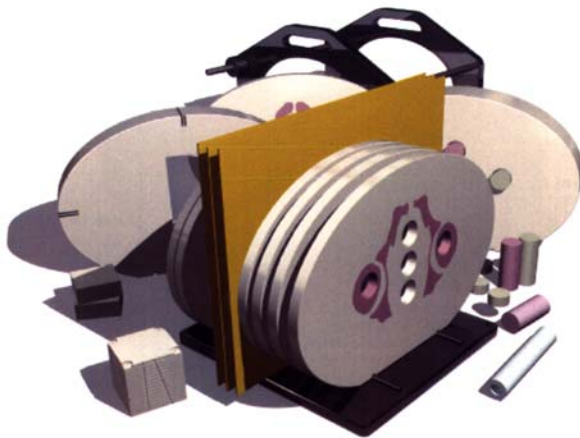
682-510 Includes the Following:

- (1) Thorax section drilled to accommodate rod inserts
- (12) 1 cm thorax sections
- (1) 3 cm end section
- (1) Alignment base
- (1) Holding Device
- (1) Water equivalent insert with ion chamber cavity - **Specify**
- (1) Bone equivalent insert with ion chamber cavity - **Specify**
- (1) Lung equivalent insert with ion chamber cavity - **Specify**
- (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

Item #	Description
682-510	IMRT Thorax Phantom
Item #	Optional Accessories
682-525	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	CT to Film Fiducial Markers
682-533	Water Equivalent Rod Insert with Ion Chamber Cavity - Specify
682-534	Bone Equivalent Insert with Ion Chamber Cavity - Specify
682-535	Lung Equivalent Insert with Ion Chamber Cavity - Specify
682-536	Foam Lined Carrying Case
682-537	Electron Density Ref Plugs Set of 4: lung, bone, muscle, adipose
682-540	Thorax Region Spacer Slab for IMRT Phantom 1 cm Thick

Specify - Customer must specify ion chamber and/or cavity code.
CIRS IMRT Phantom ion chamber and cavity codes can be found on page C-8.

CIRS IMRT PELVIC 3D PHANTOM



- 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 with a tissue equivalent, three-dimensional skeleton. The phantom is elliptical in shape.

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.

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.

Item 682-515 includes the following:

- (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 rods inserts (2.5 cm x 5 cm long)
 - (20) Bone equivalent solid disks (2.5 cm x 1 cm thick)
 - (30) Water equivalent solid disks (2.5 cm x 1 cm thick)
 - (1) Bone equivalent insert with ion chamber cavity
 - (1) Water equivalent rod insert with ion chamber cavity
 - (1) Electron density reference plugs, (set of 4: lung, bone, muscle, adipose)
 - (1) Alignment base
 - (1) Holding device
 - (1) Set of CT to film fiducial markers

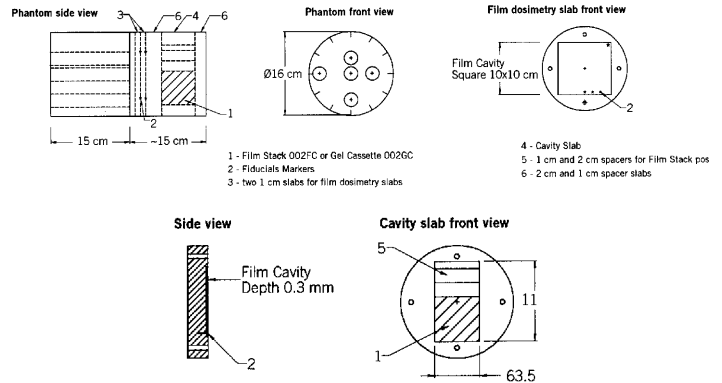
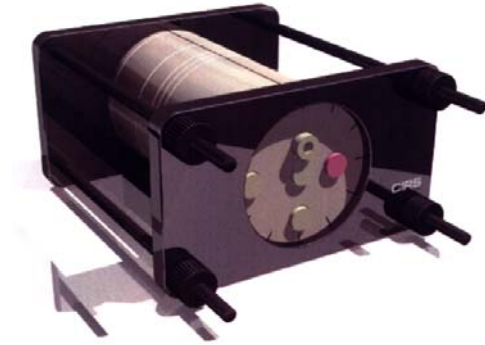
Item #	Description
682-515	IMRT Pelvic 3D Phantom Customer Must Specify Cavity Code: CV5_ _ _

Specify - Customer must specify ion chamber and/or cavity code.
CIRS IMRT Phantom ion chamber and cavity codes can be found on page C-8.

C

IMRT PHANTOMS

CIRS IMRT HEAD AND NECK PHANTOM



C

- 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 Head and Neck Phantom is circular in shape and approximates the average cranial diameter of 16cm. A bone equivalent rod can simulate the c-spine and an empty hole can simulate the trachea. 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.

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 pre-cut to 63.5 x 63.5 mm in three different orientations.

The IMRT Head and Neck Phantom has four optional 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.

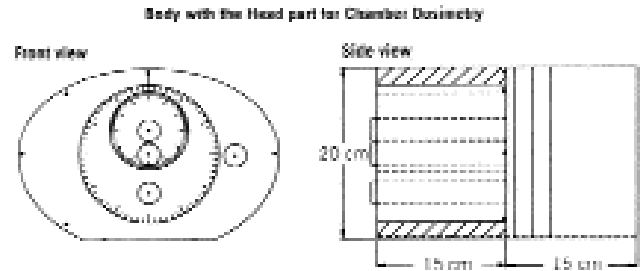
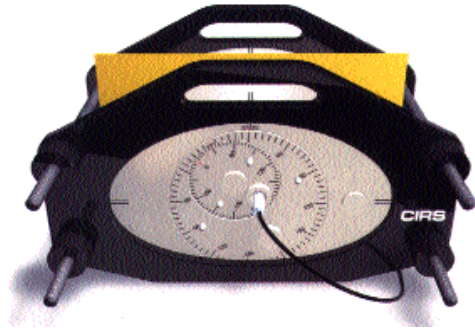
Item 682-520 Include the following items:

- (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) Cavity slab, 6.4 cm, to accommodate Film Stack or Gel Cassette
- (1) Film Stack for small volume 3D image reconstruction
- (2) Spacer slabs, 1 cm
- (1) Spacer slab, 2 cm
- (2) End slabs - 1 cm and 1.6 cm
- (1) Water equivalent rod insert with ion chamber cavity
- (1) Bone equivalent rod insert with ion chamber cavity
- (5) Water equivalent solid rod inserts
- (1) Bone equivalent solid rod insert
- (1) Alignment base
- (1) Holding device

Item #	Description
682-520	IMRT Phantom Head and Neck Customer Must Specify Cavity Code: CV5_ _ _
Item #	Optional Accessories
682-525	Tissue Equivalent Rods for TLD's, Set of 5
682-528	Gel Dosimetry Cassette
682-532	CT to Film Fiducial Markers
682-537	Electron Density Ref Plugs Set of 4: lung, bone, muscle, adipose

Specify - Customer must specify ion chamber and/or cavity code.
CIRS IMRT Phantom ion chamber and cavity codes can be found on page C-8.

CIRS IMRT HEAD AND TORSO FREEPOINT PHANTOM



- Ionization chambers, TLD, MOSFET and Diodes easily positioned using interchangeable rods
- Choose any point dose location by rotating the cylinders
- Use radiographic Ready Pack® film 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 Freepoint Phantom allows any point dose location to be selected 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.

The IMRT Head and Torso Freepoint Phantom was designed in collaboration with David D. Loshek PhD.

Item 682-522 Includes the following items:

- (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
- (1) Water equivalent rod insert with ion chamber cavity
- (1) Bone equivalent rod insert with ion chamber cavity
- (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

Specify - Customer must specify ion chamber and/or cavity code.
CIRS IMRT Phantom ion chamber and cavity codes can be found on page C-8.

Item #	Description
682-522	IMRT Head & Torso Freepoint Phantom Customer Must Specify Cavity Code: CV5_ _ _
Item #	Optional Accessories
682-525	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	CT to Film Fiducial Markers
682-535	Lung Equivalent Insert with Ion Chamber Cavity - Specify
682-536	Foam Lined Carrying Case
682-537	Electron Density Ref Plugs Set of 4: lung, bone, muscle, adipose
682-538	Lung Equivalent Solid Rod Insert

C

IMRT PHANTOMS

ION CHAMBER CAVITY CODES FOR CIRS IMRT PHANTOMS

Mfg's Model #	CIRS CV#
Applied Engineering	
C110	CV510
C134	CV503
Attix	
449	CV516
Capintec	
PR05	CV535
PR-06C	CV507
PR-06G (0.65ml probe with b-up cap)	CV506
PR-06G w/o cap	CV526
PRO5P	CV535
PS-033	CV508
Exradin	
01	CV545
01SL	CV531
02	CV539
10	CV549
10 w/waterproof cap	CV529
11	CV512
11-S/N> XB013151 XD013151 XE013151 XI013151 XJ013151 XK013151	CV512A
11-S/N> XAJ032301 XAK032301 XAL032301 XAM032301 XAN032301 XAO032301	CV512B
12	CV513
12S	CV553
14	CV544
14P	CV546
14SL	CV528
16	CV540
18	CV511E
Fluke	
30-344	CV511C
Multidata	
233643	CV511C
Nuclear Enterprises	
2505-3A	CV501
2515-3A	CV517
2533	CV511A
2533A	CV511A

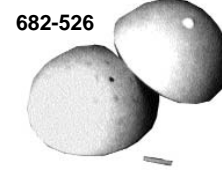
Mfg's Model #	CIRS CV#
Nuclear Enterprises (Continued)	
2571	CV501
2571A	CV501
2577	CV517
2581	CV501
2581A	CV501
2611A	CV522
Phillips	
60003	CV537
Diamond Detector Type	CV537
PTW	
0.35cc Roos	CV504
23323	CV511D
23331 w/o Cap	CV520
23332	CV548
23333	CV501
23342	CV519
23343	CV503
233633	CV501
233641	CV511B
233642	CV511C
30000	CV501
30001	CV501
30001 w/cap	CV502
30002	CV501
30002 w/cap	CV502
30004	CV501
30004 w/cap	CV502
30006	CV501
30010	CV501
30011	CV501
30012	CV501
30013	CV501
31002	CV511C
31003	CV511B
31005	CV511C
31006	CV518
31009	CV550
31010	CV511C
31011	CV511C
31013	CV511B
31014	CV518
31015	CV550
31016	CV551
34001	CV504
34013	CV555
34045	CV503

Mfg's Model #	CIRS CV#
PTW (Continued)	
Advanced Markus	CV549
N23343	CV549
N34045	CV549
60003	CV555
NACP	CV599
Radcal	
10x5-0.6	CV552
10x5-3CT	CV552
Scanditronix/Wellhofer	
RK8304	CV509
999702 DEB012- XXX Diode	CV547
NACP	CV599
CC01	CV533
CC04	CV536
CC08	CV554
CC13	CV532
DS31 Roos	CV530
FC23	CV542
FC23-C	CV542
FC65	CV527
FC65-G	CV501
FC65-P	CV501
IC04	CV536
IC10	CV532
IC15	CV525
IC28	CV542
IC3	CV521
IC69	CV502
IC70 w/cap	CV527
IC70	CV501
PPC-05	CV549
PPC-40 Roos	CV530
PS-31	CV530
TN MOSFET	
MOSFET Cavity in Plug (Plug to be specified)	CV543
MOSFET Cavity in Rod	CV538
Victoreen (Innovision)	
107325	CV501
550-6A	CV524
580-006	CV501
580-006WP	CV501
X-10	CV523

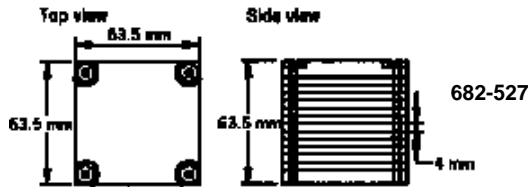
CIRS IMRT PHANTOM ACCESSORIES For Homogenous, Thorax, Pelvis and Head and Neck



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 \varnothing 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 \varnothing 5 mm, 20 x 20 mm grid spacing with tissue equivalent plugs.



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 \varnothing 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 682-532 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/or cavity code found on page C-8).

Item 682-534 Bone equivalent rod with ion chamber cavity (Specify ion chamber and/or cavity code found on page C-8).

Item 682-535 Lung equivalent insert with ion chamber cavity (Specify ion chamber and/or cavity code found on page C-8).

Item 682-536 Carrying Case, foam lined with built in casters.

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

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

ELECTRON DENSITY REFERENCE INSERT

	Density	Electron Density per cc x 10 ²³	Electron Density Relative to H ₂ O
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 #	Optional Accessories
682-525	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	CT to Film Fiducial Markers
682-533	Water Equivalent Rod Insert with Ion Chamber Cavity - Specify

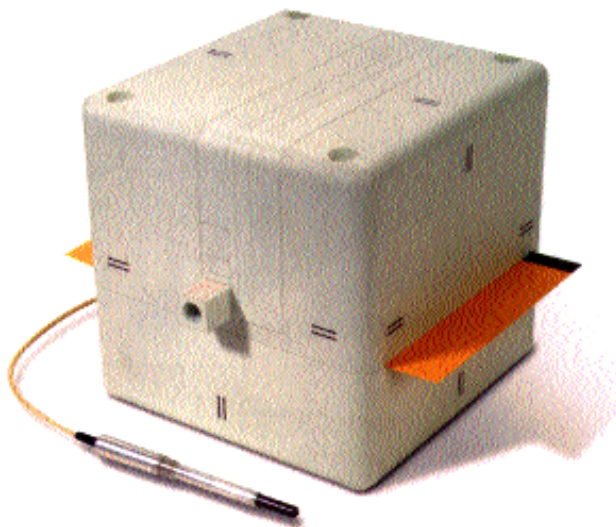
Item #	Optional Accessories
682-534	Bone Equivalent Insert with Ion Chamber Cavity - Specify
682-535	Lung Equivalent Insert with Ion Chamber Cavity - Specify
682-536	Foam Lined Carrying Case
682-537	Electron Density Ref Plugs Set of 4: lung, bone, muscle, adipose
682-538	Lung Equivalent Solid Rod Insert
682-539	Water Equivalent Spacer Slab for IMRT Phantom 1 cm Thick
682-540	Thorax Region Spacer Slab (1 cm)

C

IMRT PHANTOMS

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 fiducial points 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 - Plastic Water® Cavity Block
- 3 - Lateral Spacers
- 3 - Elevational Spacers

Insert Option

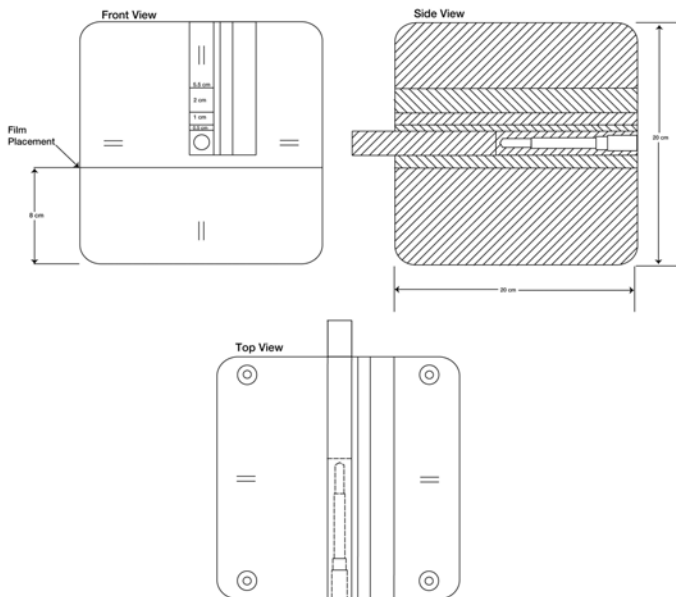
Customers are encouraged to complete their order with the purchase of the insert option listed below. Refer to separate CIRS cavity and plug code list for available chamber cavities (see Appendix A).

Specifications

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

Lateral Spacers: 0.2", 0.4", 0.8" (0.5 cm, 1 cm, 2 cm)

Elevational Spacers: 0.2", 0.4", 0.8" (0.5 cm, 1 cm, 2 cm)

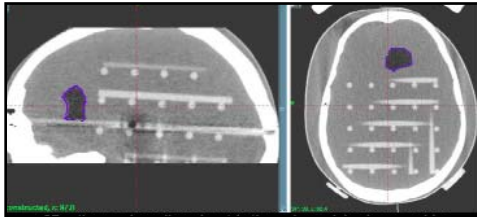


Item	Description
682-400	Cube 20 Phantom
682-402	Cube 20, Water Equivalent Ion Chamber Cavity Block

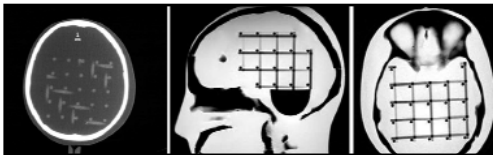
Specify Ion Chamber

3D ANTHROPOMORPHIC SKULL PHANTOM

For Rapid Assessment of Image Displacement in Gamma Knife and Other Treatment Planning Systems



Three dimensional orthogonal acrylic rod matrix through cranial volume enables assessment of image distortions



Axial CT Mid-Sagittal T1 Axial T1

- Images well on T1, T2 and 3DTOF MRI acquisitions
- Images well on CT scans
- Stereotactic frame can be applied to special reinforced pads
- Images can be imported into stereotactic localization program
- CT scans can be used to assess MRI accuracy

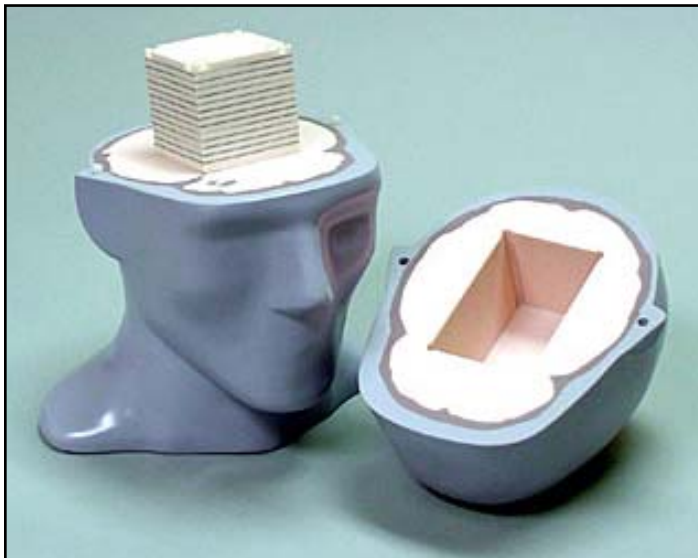
The skull phantom is made from materials which can be imaged using X-ray, CT and MR. The skull is manufactured from an epoxy-based tissue substitute. The interstitial and surrounding soft tissues are made from a proprietary water-based polymer. The gel can be formulated to accommodate specific requirements such as X-ray attenuation, contrast, and MR response. The entire phantom is encased in a vacuum formed plastic shell for ease of use and durability. The phantom includes wire or point targets in various locations and a simulated tumor.

Skull phantoms can be made to order. Contact RPDinc if you have a unique requirement.

Item	Description
682-820	3D Anthropomorphic skull Phantom

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 mimicked with 1% accuracy for both CT and Therapy energy ranges (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 reconstruction. 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