

# NUCLEAR MEDICINE, PET PRODUCTS & CALIBRATORS

## LEAD CABINET FOR NUCLEAR MEDICINE



955-036



955-037



955-037 Shown with Optional Side Shield System

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)

#### 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	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)

# NUCLEAR MEDICINE, PET PRODUCTS & CALIBRATORS

## PET WORKSTATION



994-036

**L-Block sold separately**

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

W

## 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)

## STAINLESS STEEL COVERED LEAD CABINET



The cabinet is made of 0.25" (6.37 mm) sheet lead and covered on both sides with stainless steel. The doors are also 0.25" (6.37 mm) lead covered with stainless steel and have a locking 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

## 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/cm<sup>3</sup>. 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 Size:** 8" Sq. x 4" T (20.3 x 10.2 cm)

**Lead Glass Density:** 5.2 g/cm<sup>3</sup>

Tenth Value Thickness (Cesium<sup>137</sup>) = 4.8 cm leaded glass

4" T (10.2 cm) leaded glass = 4 cm lead equivalence

**Overall Size:** 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 unimpaird viewing of the work area. The leaded glass has a density of 5.2 g/cm<sup>3</sup> to give maximum eye and face protection.

#### Specifications

**Leaded Glass Size:** 12" W x 8" H x 2" T (30.5 x 20.3 x 5.08 cm)

**Lead Glass Density:** 5.2 g/cm<sup>3</sup>

**Lead Glass:** 2 cm lead equivalent (<sup>137</sup>Cs energy)

**Lead Thickness:** 1 1/2" (3.8 cm)

**Lead Density:** 11.35 g/cm<sup>3</sup>

**Overall Size:** 12 3/8" W x 13 1/2" D x 16 7/8" H (31.5 x 34.3 x 42.9 cm)

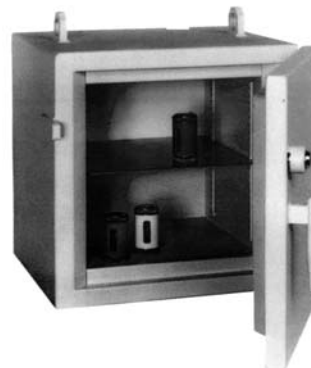
**Front Shield Size:** 12 3/8" W x 11 1/8" H (31.5 x 28.3 cm)

**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 Dimensions:** 17.4" W x 17" D x 19" H (44.2 x 43.2 x 48.3 cm)

**Inside Dimensions:** 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

## 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.

### 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.

**Note:** The Waste Well can be custom made to your specifications.

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 top door for container removal and a shielded, hinged cover 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:** 1" Thick (2.54 cm)

**Weight:** 175 lb (80 kg)

Item #	Description
994-412	Sharps Container Shield, PET
994-413	Sharps Container, Monoject, 12/Pkg

# NUCLEAR MEDICINE, PET PRODUCTS & CALIBRATORS

## INTERLOCKING RADIATION SHIELDS FOR PET

2" (5.08 cm) Thick Lead



964-940



Shown with optional shield interlock

These interlocking radiation shields for PET are made of 2" (5.08 cm) thick lead with lead-filled posts and an additional filled post for the interlock. 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. The shields can be made adjustable for height movement up and down.

### 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
964-245	Fixed Rolling Radiation Shield
964-345	Fixed Bed End Shield
964-930	Optional Lead-Filled Posts
964-940	Optional Shield Interlock

## RADIATION SHIELDS FOR PET

2" (5.08 cm) Thick Lead



The radiation shields for PET are made of 2" (5.08 cm) thick lead. The shield is mounted on a base that has four 6" (15.24 cm) diameter swivel locking ball bearing casters for easy mobility. The shield has handles on both sides.

### 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)
964-930	Optional Lead Filled Vertical Side Posts

Custom Size Shields Available

## 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)

# NUCLEAR MEDICINE, PET PRODUCTS & CALIBRATORS

## COMPACT PET SHIPPING SYSTEM FOR ONE TO THREE UNIT DOSE PIGS

For Shipping Syringes With or Without Needles Attached



### Single Unit Pet Shipping System 994-726

**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 of FDG F-18

### Double Unit PET Shipping System 994-727

**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 and 235 mCi of FDG F-18.

### Triple Unit PET Shipping System 994-728

**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, 160 and 140 mCi of FDG F-18.

### Unit Dose Pig 994-729

**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)

Meets IATA Dangerous Goods Regulations, 48th Edition Sections 5.0.4.3, 10.5 and 10.6.1 thru 10.6.3.5. Patent Pending.



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 polycarbonate 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)
- Shipping Container with Lead Shielding
- Absorbent Sheets, 100/Pkg

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

Item #	Description
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



### 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, 48th 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.



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

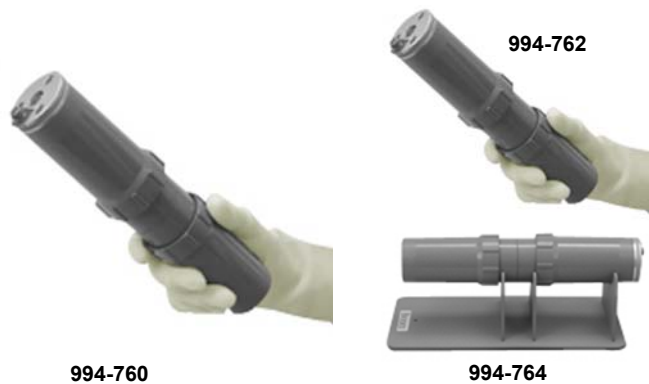
- PET Vial Pig (Item 994-205)
- Absorbent Sheets (Item 994-732)
- Shipping Container with Lead Shielding (Item 994-750)

The optional 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.

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	Sheets, Absorbent, 100/Pkg
994-733	Tag, Wire Security, 25/Pkg

# NUCLEAR MEDICINE, PET PRODUCTS & CALIBRATORS

## PET SHIPPING SYSTEM FOR DOUBLE-ENDED PET PIG



### 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 of FDG F-18. Meets IATA Dangerous Goods Regulations 48th 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

### 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 plastic. 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.

## 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

**Dimensions:** 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 are designed to 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

#### PIG-30 Item 994-066

**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)

#### PIG-50 Item 994-068

**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

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## 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

## 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 1/4" (.64 cm) steel with 1" (2.54 cm) lead shielding on the inside and the chamfer top allows for the cover to sit snugly 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 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 Item 949-312  
Optional Paper Forceps Holder



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 the Biodex (001-705) 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:** 160 lb (73 kg)

Item #	Description
949-320	Lead Shielded Cart With Cover
949-312	Optional Paper Forceps Holder for Item 949-320

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## 511 TRANSPORT CONTAINER AND CART

### Item 994-060 511 Transport Container

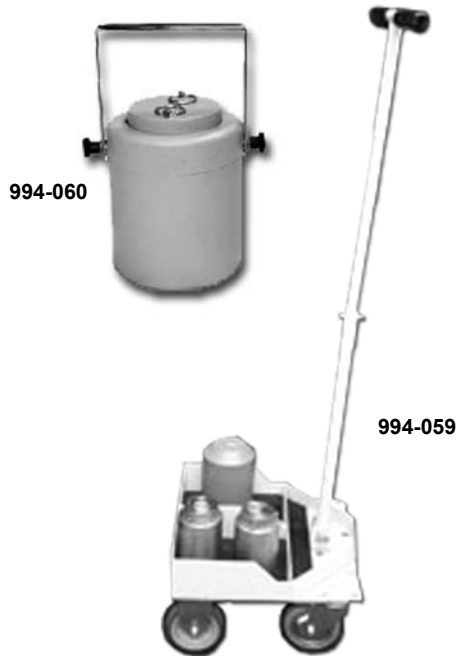
- Fits into box on Transport Cart, Item 994-059
- Designed with over 1.5" (3.8 cm) of safety shielding
- Lift rings for easy removal of lid
- Holds up to 30 cc vial
- Ball handle fastens to secure top
- 6.5" H x 5" Dia. (16.5 x 13 cm)

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 selfstanding 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 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).

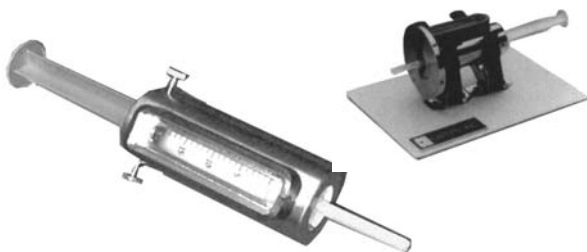
Item #	Description	Length
994-120	Niptongs	12" (30 cm)
994-122	Niptongs	36" (91 cm)

## 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.

After removal from the Dose Drawing Station, a "double clip" security holder serves as a holder for the syringe shield. The holder secures the shielded syringe allowing its use during transport and patient injection.



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
994-048	"Double Clip" Syringe Security Holder

## 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.

After removal from the Dose Drawing Station, a "double clip" security holder serves as a holder for the syringe shield. The holder secures the shielded syringe allowing its use during transport and patient injection.



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
994-048	"Double Clip" Syringe Security Holder

# NUCLEAR MEDICINE, PET PRODUCTS & CALIBRATORS

## 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**

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 (6.2) flush mounted lead glass window that provides protection and visibility. The interior of the barrel behind the glass has a white coating that improves the view of the syringe and contents. A thumb screw holds syringes firmly in place.

Pro-Tec® PET Syringe Shields accommodate standard sized 3 cc to 10 cc syringes. The Pro-Tec® Syringe Shield fits the Manual Dose Injector.

### Shipping Weight

**994-228 & 994-258:** 1.4 lb (0.64 kg)

**994-229 & 994-259:** 1.7 lb (0.83 kg)

**994-230 & 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

## Z-PET SYRINGE SHIELD

Extra thick wall for extra protection



- **Constructed of 0.55" thick (14 mm) tungsten, attenuates FDG F-18 by 97%**
- **Optional holder increases attenuation to 99.6%**

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%. Additional protection is offered by inserting the shield into the lead shielded syringe holder, further attenuating FDG F-18 to 99.6%. The shield accommodates standard 5 cc syringes. The Z-PET Syringe Shield fits the Manual Dose Injector.

### 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:** 2.5 lb (1.14 kg)

#### Syringe Shield Holder

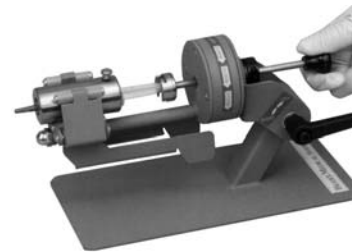
**Dimensions:** 2.9" L x 2.67" dia. (7.2 x 6.8 cm)

**Lead Shielding:** 0.5" thick (1.3 cm) lead

**Weight:** 2.5 lb (1.14 kg)

Item #	Description
994-270	Z-PET Syringe Shield, 5 cc

## MANUAL DOSE INJECTOR



The Manual Dose Injector is designed to reduce exposure when injecting radionuclides. The injector is also useful when the injection protocol is a slow infusion as with Zevalin™.

The Manual Dose Injector features a spring-loaded clamp to hold the syringe barrel firmly in place. There is a 1" thick (2.54 cm) lead base to protect hands. The syringe plunger is held by the injector plunger so that the syringe plunger can move forward or back. The Dose Injector can be easily transported or placed wherever administrations are performed. It can also be used in pharmacies to remove needles or recap.

### Here's how it works

- **Remove the needle** - Place a shielded syringe into the Manual Dose Injector. Use a forceps to hold the needle hub. Turn the lead base and the needle detaches.
- **Attach a butterfly, etc.** - Use a forceps to hold the butterfly hub. Place the hub onto the syringe luer lock. Turn the lead base and the butterfly is attached.
- **Inject** - Use the plunger on the Dose Injector to push the syringe plunger.

### Specifications

**Size:** 11.5" W x 5" D x 10.75" H (29 x 12.7 x 27 cm)

**Adjustable:** 0° to 45° angle

**Shielding Base:** 1" thick (2.54 cm) lead

**Shielding Plunger:** 0.5" thick (1.25 cm) tungsten

**Finish:** Durable power coat paint

**Weight:** 8.5 lb (3.8 kg)

Item #	Description
994-997	Dose Injector, Manual, 1" (2.54 cm) Lead

## DOSE DRAWING SYSTEM

For drawing FDG F-18 from a vial into a syringe



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.

### 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)

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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 #	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 Dimensions:** 9" L x 2" W x 2" H

**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. The unit is made of stainless steel with painted lead shielding.



#### Specifications

##### 994-225

**Inside Dimensions:** 7.7" L x 2.6" W x 2.7" H (19.6 x 6.6 x 6.9 cm)

**Outside Dimensions:** 9.5" L x 4.4" W x 3.5" H (24.1 x 11.2 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:** 18 lb (8.2 kg)

##### 994-226

**Inside Dimensions:** 7.5" L x 1.7" W x 1.7" H (19.1 x 4.3 x 4.3 cm)

**Outside Dimensions:** 9.25" L x 3.4" W x 2.6" H (23.5 x 8.6 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:** 8 lb (3.6 kg)

Item #	Description
994-225	Lead-Lined Syringe Carrier, Large
994-226	Lead-Lined Syringe Carrier, Small

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# NUCLEAR MEDICINE, PET PRODUCTS & CALIBRATORS

## 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



### 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)

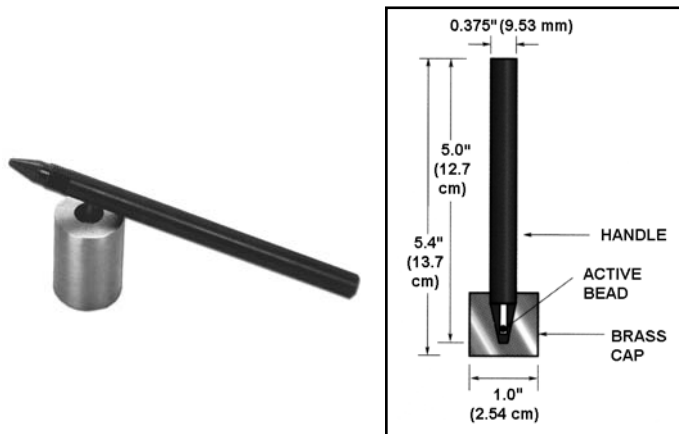
**Suggested Usage:** Multimodal fiducial marker for image coregistration

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.

	Nuclide	10 $\mu$ Ci .37 MBq	25 $\mu$ Ci .925 MBq	50 $\mu$ Ci 1.85 MBq	100 $\mu$ Ci 3.7 MBq
<b>MMS02</b>	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
<b>MMS03</b>	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 of interest during a camera study. The Pen Point Marker contains Co-57 in a ceramic matrix at the end of a 5.0" (12.7 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  $\pm 15\%$ .

Item #	Nuclide	Activity ( $\mu$ Ci)	Activity (MBq)
680-260	Co-57	100	3.7
680-265	Co-57	200	7.4

## PET PHANTOM NEMA 2007 / IEC 2008



- Ideal for whole-body PET
- 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

The phantom consists of six concentric tubes that slide into each other. The innermost tube is fillable. The outer tubes are placed over the filled inner tube and imaged, adding a tube for each image. The resulting images allow the user to determine the system's 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

Outside Dimension: 6.4 mm

#### 2nd Tube

Inside Dimension: 7.0mm

Outside Dimension: 9.5 mm

#### 3rd Tube

Inside Dimension: 10.2mm

Outside Dimension: 12.7 mm

#### 4th Tube

Inside Dimension: 13.4mm

Outside Dimension: 15.9 mm

#### 5th Tube

Inside Dimension: 16.6mm

Outside Dimension: 19.1 mm

#### 6th Innermost Tube (a fillable polyethylene tube)

Inside Dimension: 1mm

Outside Dimension: 3mm

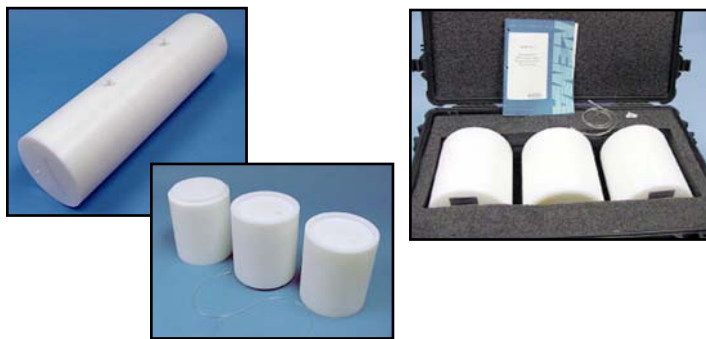
**Shipping Weight:** 3 lb (1.3 kg)

Item #	Description
994-241	PET Sensitivity Phantom, NEMA 2007

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# NUCLEAR MEDICINE, PET PRODUCTS & CALIBRATORS

## NEMA PET SCATTER PHANTOM NEMA-NU2-2007



The test phantom line source insert is a clear polyethylene plastic tube 800 mm in length, with an inside diameter of  $3.2 \pm 0.2$  mm and outside diameter of  $4.8 \pm 0.2$  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

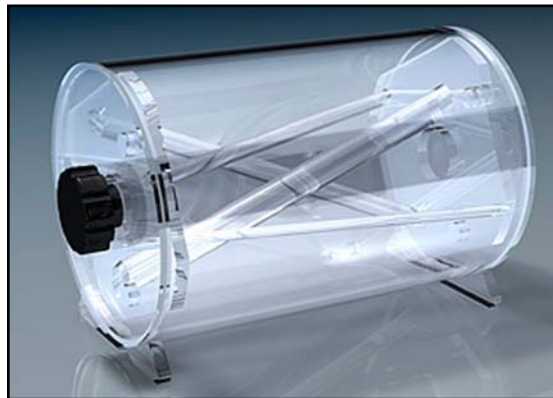
- **Designed to test scatter fraction, count losses and random measurements in accordance with NEMA-NU2-2007**
- **Three piece construction for easier handling**
- **Hard sided, foam lined carry case included**

The PET Scatter Phantom is a solid right circular polyethylene cylinder with a specific gravity of  $0.96 \pm 0.01$ . A hole measuring  $6.4 \pm 0.2$  mm is drilled parallel to the central axis of the cylinder, at a radial distance of  $45 \pm 1$  mm.

For ease of handling the cylinder consists of three segments that are assembled during testing.

## GILLIAN QA PHANTOM

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



Hybrid scanning systems such as SPECT/CT, PET/CT and CT/MRI 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.

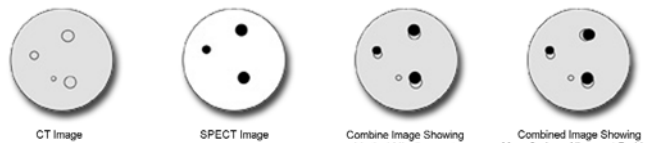
### Item 682-850 Gillian QA Phantom - SPECT/CT, PET/CT, CT/MRI

#### Includes:

- (1) Phantom body with rods
- (1) Plug
- (1) Stand

### Specifications

**Overall Dimensions:** 10" x 10.75" x 16" (25.4 x 27.3 x 40.7 cm)  
**Weight:** 8.3 lb (3.1 kg)  
**Materials:** Acrylic  
**Rod Diameters:** 9.72 mm, 16.26 mm, 20.80 mm and 28.75 mm



- Compatible with SPECT/CT, PET/CT and CT/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

Item #	Description
682-850	Gillian QA Phantom - SPECT/CT, PET/CT, CT/MRI

## ATOMLAB™ 400 DOSE CALIBRATOR

Designed for Facilities Receiving Unit Doses Including PET and Beta



### Item 993-000 Atomlab™ 400 Dose Calibrator Includes

- Smart Display
- Ionization Chamber
- RS-232 Port
- Vial/Syringe Dipper
- Well Insert

### 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  $\mu\text{Ci}$  to 40Ci (.001 MBq to 1500 GBq) of Tc-99m

**Energy Range:** 25 keV to 3 MeV photons

**Response Time:** One to two seconds for doses greater than 200  $\mu\text{Ci}$ ; three seconds for doses greater than 20  $\mu\text{Ci}$ ; 50-100 seconds below 20  $\mu\text{Ci}$  of Tc-99m with default threshold, threshold adjustable to reduce counting time

**Detector Linearity:**  $\pm 1\%$  or 0.2  $\mu\text{Ci}$ , whichever is greater

**Electrometer Linearity:**  $\pm 1\%$  or 0.2  $\mu\text{Ci}$ , whichever is greater

**Electrometer Accuracy:**  $\pm 1\%$  or 0.2  $\mu\text{Ci}$ , whichever is greater

**Overall Accuracy:**  $\pm 3\%$  or 0.3  $\mu\text{Ci}$ , 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:**  $\pm 0.3\%$  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  $\pm 5$  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

- 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 #	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

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

# NUCLEAR MEDICINE, PET PRODUCTS & CALIBRATORS

## ATOMLAB™ 500 DOSE CALIBRATOR



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 bi-directional serial port enables the Atomlab™ 500 Dose Calibrator to communicate in real time with most commercially available nuclear medicine management systems.

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
- Remote Ionization Chamber
- Report and label printers available
- Self-diagnostic software
- Desktop or wall mount display
- Two-year warranty
- RS-232 bi-directional serial communications port

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.

# NUCLEAR MEDICINE, PET PRODUCTS & CALIBRATORS

## 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, USB for printer

**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:** RS-232 connector, used for data export and firmware updates

Item #	Description
993-010	Atomlab™ 500 Dose Calibrator
993-030	Data Manager Software for Atomlab™ 500
993-032	Copper Dipper for Atomlab™ 500
993-034	Printer, Dot Matrix (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

**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 (.001 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

**Warranty:** Two-year

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

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## ATOMLAB™ 500 PLUS - DOSE CALIBRATOR and Wipe Test Counter



The Atomlab™ 500Plus 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.

The Atomlab™ 500 Dose Calibrator provides fast, accurate radionuclide activity measurements with performance that easily complies with the most stringent regulatory 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
- Remote Ionization Chamber
- One wipe counter and up to six ionization chambers can be connected
- Report and label printers available
- Self-diagnostic software Desktop or wall mount display
- Two-year warranty
- RS-232 bi-directional serial communications port

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™ 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.

- 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
- Upgradeable at any time to a dose calibrator by adding an ionization chamber
- Optional printer for hard-copy archives
- Two-year warranty
- RS-232 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)

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™ 500Plus.

Consider the software that is supplied with the Atomlab™ 500Plus. 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 upgradeable. You can easily install software updates via the Biodex website or by using a convenient memory card.

### 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

# NUCLEAR MEDICINE, PET PRODUCTS & CALIBRATORS

## 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, USB for printer

**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:** RS-232 connector, used for data export and firmware updates

**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 (.001 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.

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
993-034	Printer, Dot Matrix (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

**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

**Warranty:** Two-year

## ATOMLAB™ WIPE TEST COUNTER

**Detector Cable**

**Length:** Standard 8 ft. (2.43 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 (TI) 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

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

W

## 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
- RS-232 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)

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,  $\mu\text{Ci}$  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
- RS-232 Port
- Well Counter

### 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, USB for printer

**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:** RS-232 connector, used for data export and firmware updates

**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 (TI) 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  $\mu\text{Ci}$  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 60601-1-2 086-331

**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

# NUCLEAR MEDICINE, PET PRODUCTS & CALIBRATORS

## 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  $\pm 5\%$  at the 95% confidence level.

### Specifications

**Dimensions:** 2.96" L x .47" dia (76 x 11.9 mm)

**Nominal Total Activity:** 0.1  $\mu\text{Ci}$

Item #	Description
993-040	Rod Source, Cs-137 for Atomlab™ Wipe Test Counter

## 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)

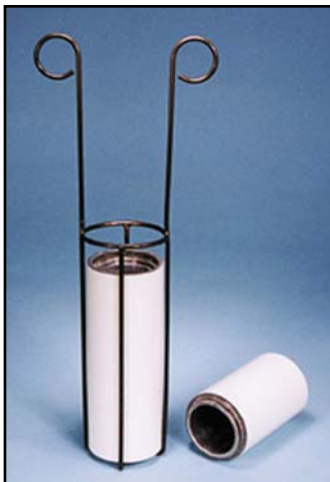
**Weight:** 359 lb (162.5 kg)

**Shipping Weight:** 388 lb (175.7 kg)

Item #	Description
993-050	Dose Calibrator Shielding Rings

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## 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)

# NUCLEAR MEDICINE, PET PRODUCTS & CALIBRATORS

## SYRINGE REFERENCE SOURCE SET



## VIAL 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  $\pm 5\%$  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  $\pm 5\%$ .

### Item 993-058 Syringe Reference Source Set Includes

- Ba-133, 250  $\mu\text{Ci}$
- Cs-137, 200  $\mu\text{Ci}$
- 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

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  $\pm 5\%$  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  $\pm 5\%$ .

### Item 993-058 Syringe Reference Source Set Includes

- Ba-133, 250  $\mu\text{Ci}$
- Cs-137, 200  $\mu\text{Ci}$
- 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