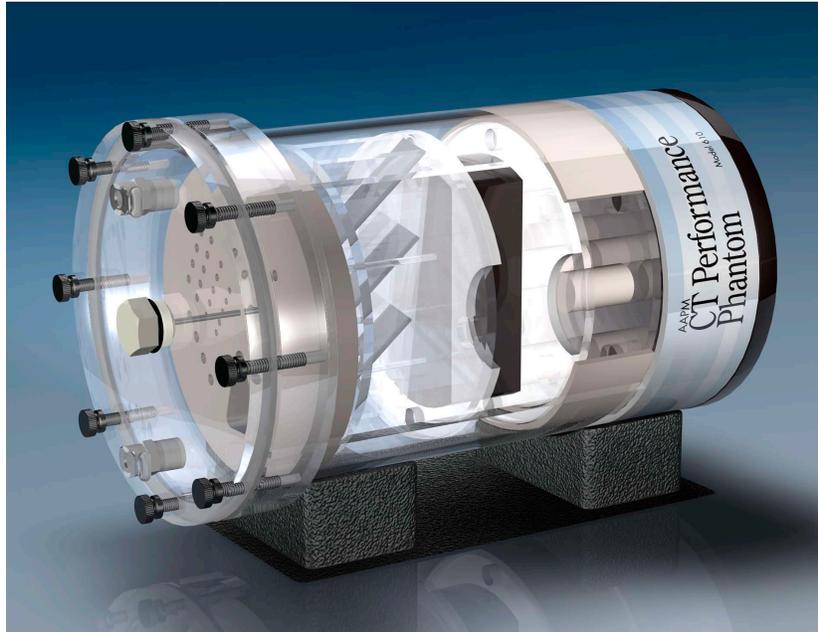


# AAPM CT Performance Phantom

Model 610



Shown with optional low contrast insert (Model 610-06)

## **MEETS GUIDELINES IN AAPM REPORT #1 "PERFORMANCE EVALUATION AND QUALITY ASSURANCE OF CT SCANNERS"**

The CIRS Model 610 AAPM CT Performance Phantom offers the user a single test object that measures ten distinct CT performance parameters. The phantom design is based on the guidelines presented in Report #1 of the American Association of Physicists in Medicine Task Force on CT Scanner Phantoms. The goals of report #1 were to "(1) define 'performance' of a CT scanner and (2) describe methods of performance testing through utilization of particular phantoms."

A CT number linearity insert, high contrast resolution insert and slice width insert are housed in an 8.5 " diameter PMMA water tank with quick disconnect valves for ease of filling and draining between use. Also included is a 0.25" bone equivalent ring that can be fit over the inserts to evaluate the effects of beam hardening. A contrast test object is adhered to the bottom of the tank that includes two rows of cavities from 1 to 0.125" diameter. The cavities can be filled with various solutions for contrast evaluation.

An aluminum alignment insert is incorporated in the lid of the tank and can be interchanged with a polystyrene TLD insert for dose measurements. A user's manual, holding cradle, filling tubes and other accessories are included.

### **Measurement Capability**

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

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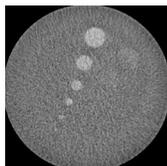
# CIRS

Tissue Simulation & Phantom Technology

## SPECIFICATIONS

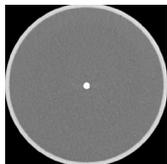
<b>OVERALL DIMENSIONS:</b>	21.6 cm x 39.4 cm (8.5" OD x 15.5" L)
<b>EMPTY WEIGHT:</b>	7.8 kg (17.25 lbs.)
<b>MATERIALS:</b>	PMMA cast tubing 21.6 cm OD, 20.3 cm ID x 32.4 cm L (8.5" OD, 8" ID x 12.75" L) with removable lid

### MODEL 610 INCLUDES



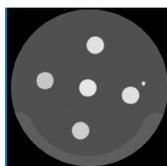
#### CONTRAST TEST OBJECT PART NO. 610-01-02

(This option is only available with the purchase of a phantom body) 8.5" OD x 2.5" L solid acrylic equivalent disk block with 12 fillable cavities 2.25" deep. Two of each cavity with diameters: 1, 0.75, 0.50, 0.375, 0.25, and 0.125 inches, spaced twice their diameter apart from a centerline. Cavities can be easily filled from the outside with dextrose or sodium chloride solutions of various concentration.



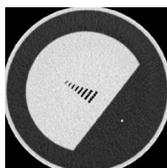
#### ALIGNMENT PIN PART NO. 610-01-05

0.25" Ø x 3" L aluminum pin with threaded attachment to housing cover plate.



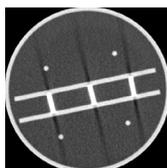
#### CT NUMBER LINEARITY INSERT PART NO. 610-02

7.5" OD x 2.5" L includes 1" Ø. Rods of polyethylene, PMMA (acrylic), polycarbonate, polystyrene and nylon. Density values (g/cc): polyethylene - 0.95, polystyrene - 1.05, nylon - 1.1, acrylic, - 1.19, polycarbonate, - 1.20.



#### RESOLUTION INSERT PART NO. 610-03

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



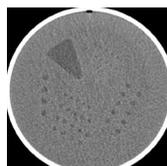
#### SLICE THICKNESS INSERT PART NO. 610-04

7.5" OD x 3.5" L Contains three 0.02" x 1.00" aluminum strips angled at 45°, positioned on center and aligned vertically.

#### BONE RING PART NO. 610-05

7.65" ID x 0.2" wall thickness x 2.8" long cortical bone ring. Fits over linearity, resolution and slice thickness insert to harden the beam.

### MODEL 610 OPTIONAL ACCESSORIES



#### LOW CONTRAST INSERT PART NO. 610-06

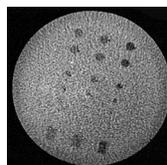
8" OD x 1.18" L proprietary epoxy with CT density 6-10 HU above water. The test object contains a series of water-filled holes from 2.5 to 7.5 mm in Ø, in 0.5 mm steps. For each target size, the center-to-center distance between holes is twice the hole diameter.

#### WHOLE BODY RESOLUTION AND NOISE RING PART NO. 610-07

12" OD x 8.5" ID x 2.5" L Fits over phantom housing and contains the same test object as the Resolution Insert, at two locations 90° apart.

#### TLD INSERT PART NO. 610-08

0.5" Ø x 3.5" L PMMA rod drilled 3 inch deep to accept TLD's. Can be swapped with Alignment pin in housing cover without removing the cover.



#### LOW CONTRAST INSERT SPHERICAL TARGETS PART NO. 610-10

8" OD x 1.18" Plastic Water® LR equivalent background. The test object contains spheres 5, 10 & 20 CTU above background and 3 reference plugs for each material used as spheres.

