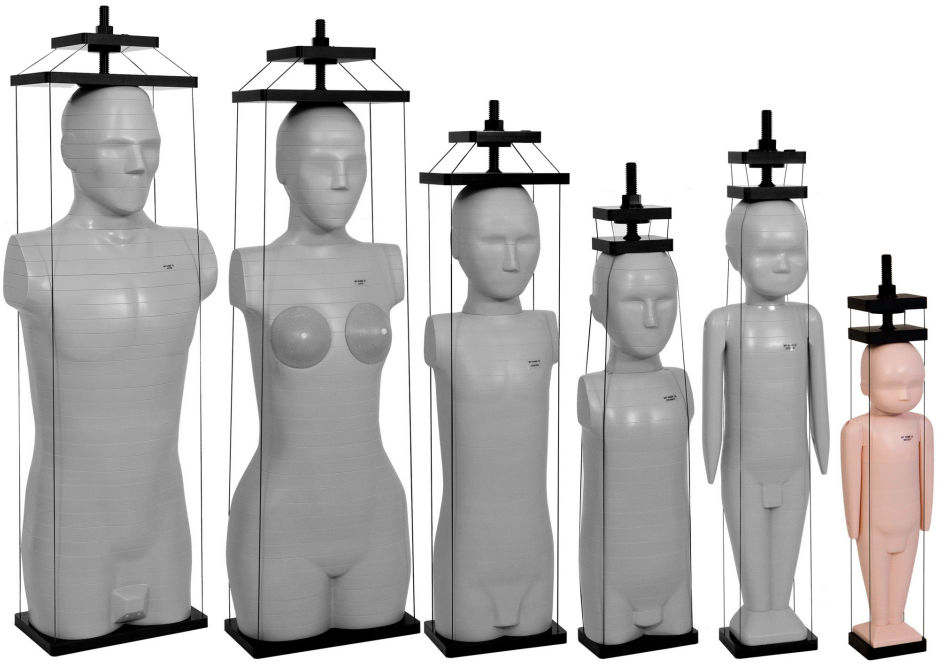
ATOM® Dosimetry Phantoms

Models 701 - 706



ATOM®
DOSIMETRY PHANTOMS

USER GUIDE

CIRS
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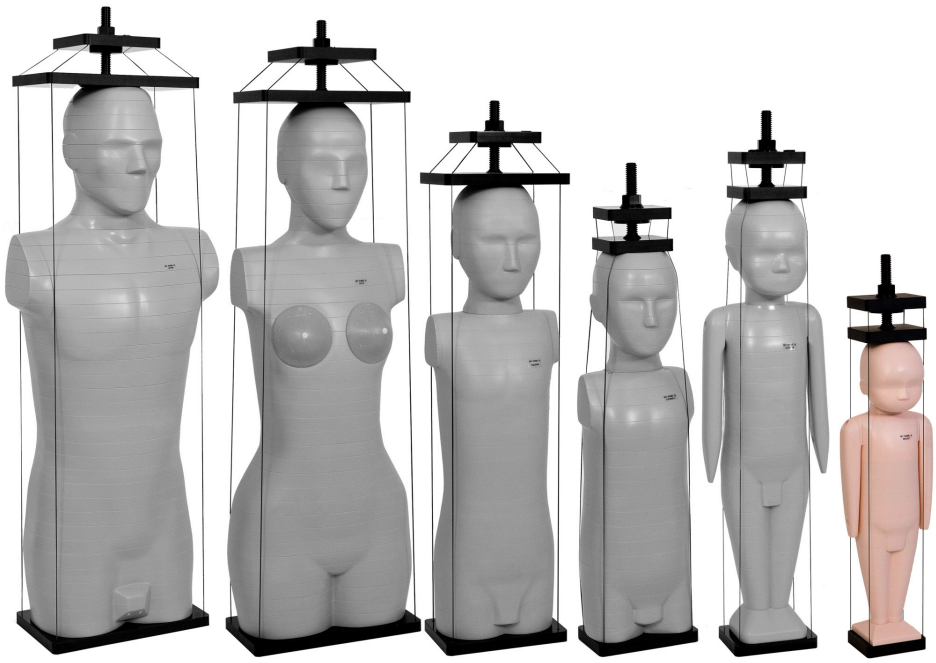
ATOM®

DOSIMETRY PHANTOMS



Adult Male | Adult Female (Breasts not included) | 10-year old | 5-year old | 1-year old | Newborn

Overview

CIRS ATOM® phantoms are a full line of anthropomorphic, cross sectional dosimetry phantoms designed to investigate organ dose and whole body effective dose in diagnostic radiology, including CT, as well as verification of delivery of therapeutic radiation doses using a variety of dosimeters.

ATOM is the only line of dosimetry phantoms to range in sizes from newborn to adult. Six models are available: newborn, 1-year, 5-year and 10-year old pediatric phantoms as well as adult male and female phantoms.

Each phantom is sectional in design with traditional 25 mm thick sections. The sectional surfaces are extremely flat and smooth and do not require any special coatings or treatment. This results in minimal interfaces between the slabs when viewed in a CT scout or projection X-ray. The ATOM line also differs from other dosimetry phantoms by providing optimized TLD locations specific to 22 internal organs.

Tissue-equivalent epoxy resins are used in all aspects of the phantom. CIRS technology offers superior tissue simulation by covering a wider range of energy levels from diagnostic to therapeutic. In addition, all bones are homogeneous and are formulated to represent age appropriate, average bone composition. CIRS bone formulations offer distinct advantages over natural skeletons and other types of simulated bone.

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Care and Handling

It is important to read these instructions in their entirety before attempting to assemble the phantom. Improper assembly and disassembly can result in damage to the phantom.

Upon initial receipt of the phantom and before removing the phantom, perform a parts inventory to ensure that all required components have been received before attempting to assemble the unit (see page 10 for a list of items included with each phantom).

After completing an inventory, begin removing the phantom for assembly. Inspect each component upon removal of the phantom from the case. If there is a discrepancy with the inventory or you observe damage, this must be reported with 30 days of receipt to ensure your warranty is intact. Some transport carriers require transit damage notification within 15 days. If there are any signs of damage, please keep all packaging and notify CIRS immediately.

You may observe variations in color of phantom body and within the phantom. Color dyes are added to distinguish various tissue substitutes. Variation in color from batch to batch may be visible in a phantom of this size. Discoloration due to aging is also possible. This aging characteristic is common in most epoxies. Color variation, whether from aging or batch dye variation has no impact on the attenuation properties of the material.

ATOM phantoms are manufactured from epoxy based tissue substitutes. They are durable but can still be damaged if mishandled. Take special care not to scratch the surfaces of each section by keeping them clean of dirt and debris, especially prior to assembly and compression of the sections. Do not use solvents or abrasive cleaners on any part of the phantom. If the phantom must be cleaned, use mild soapy water and dry with a soft towel.

During assembly and dismantling of the phantom, be extremely careful. An assembled phantom can be very unstable until tension has been applied via the reinforcement device or strap.

Please note: Each phantom is individually hand crafted

Sequence of Assembly

WHOLE PHANTOMS

1. ATOM sectional phantoms are sequentially numbered starting at the top of the head. Once all desired detectors have been placed in each section, start by placing the bottom most section on the base plate of the reinforcement device. Alignment pins will ensure proper location.
2. Assemble the pelvis, torso and head separately on a flat, even surface. Compile the entire phantom in the same order, and place the top plate of the reinforcement device on the top section.
3. Turning the top nut counter clockwise will apply tension to the four strings and a downward pressure on the phantom. Optimal tension is reached when the strings give off a high-pitched tone when plucked with a finger.

   NOTE : Should the threaded string break during phantom assembly, please use the extra string provided and follow restringing instructions.

PARTIAL PHANTOMS

1. Place the bottom most section on the base plate of the reinforcement device. Alignment pins will ensure proper location.
2. Compile the entire phantom, then secure with the strap provided.

Partial Phantoms with Straps

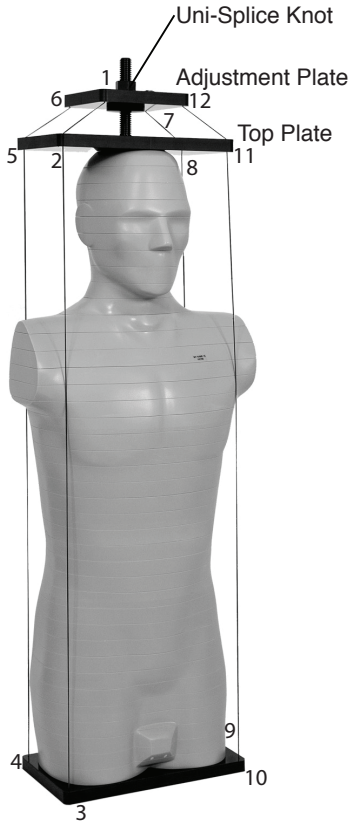
BREASTS AND EXTREMITIES

Once the body is assembled the breasts, or upper and lower extremities can be attached using the screws provided. Arrows on the breasts or attachments should be directed upward. The left and right are marked “L” and “R”. Do not over tighten the screws and take care not to cross thread the screws when assembling.

DISMANTLING

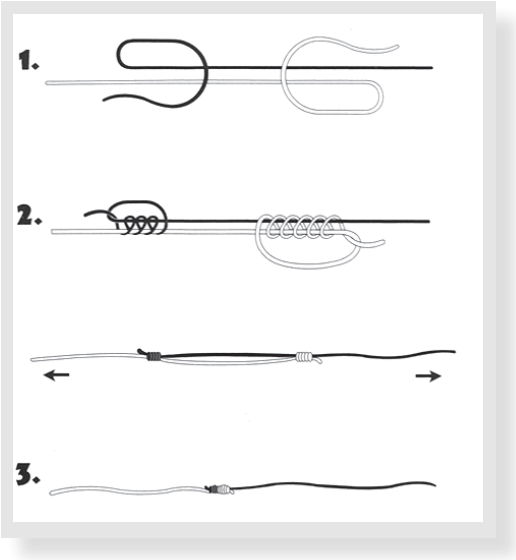
To dismantle the phantom simply work backwards in the same manner used to assemble the unit. If the phantom is stored assembled for extended periods, it may be necessary to re-tension the strings or strap periodically.

Restringing ATOM Phantom Holder



1. Remove string from packaging and straighten.
2. Assemble the phantom on the bottom plate, then place top plate on head and slide adjusting plate over screw and down onto flange on nut.
3. Start stringing phantom by pushing string through hole 1 from top. Continue through holes 2,3,4, and so on, until you reach hole 12. Be sure to pull all excess string through as you go, leaving a minimum of 12” sticking out of hole 1 (see illustration). If you are stringing phantom Model 703, 704, 705 or 706 continue to Step 5.
4. If you are stringing phantom Model 701or 702, start at Hole 1 and repeat Step 3.
5. Lower the adjuster plate to its lowest position and remove all slack from string, pulling excess out from Holes 1 and 12.
6. Tie uni-splice knot in string between hole 1 and 12 as close to the plate as possible (see "Tying a Uni-Splice Knot"). Trim off excess string with razor blade or nail clipper.
7. Raise adjustment plate and add tension to string by turning the top bolt counter- clockwise using included open-end wrench. Optimal tension is reached when the strings give off a high-pitched tone when plucked with a finger. Check strings for equal tension.

TYING A UNI-SPLICE KNOT



1. Position the ends of the strings so that they run parallel with each other for 12” to 18”.
2. Make a loop with the string and pass the tag end through the loop
3. and around both lines 5 or 6 times. Pull the tag end and secure the knot making sure that the loops snug down in an orderly fashion.Repeat with the other end of the line, except with 8 to 10 wraps through the loop.
4. Pull on the standing lines, and you will see the two knots jam, forming the connection.
5. Trim the line about 1/8” past the knot.

All ATOM phantoms are drilled with 5 mm diameter thru holes unless otherwise noted. Thru drilled holes of 3mm, 7mm,10mm and 14mm diameters are available via custom request.

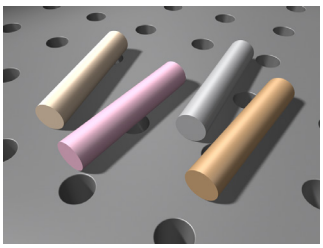
Holes are filled with 5mm diameter x 25 mm long, solid plugs of corresponding tissue including soft tissue, bone, lung and brain. Extra plugs of each tissue are provided with every unit.

Plugs specifically designed to receive TLD chips, TLD rods, TLD bars, TLD cubes, glass detectors, MOSFET detectors, and OSL Landauer nanoDot dosimeters are also available as optional accessories.

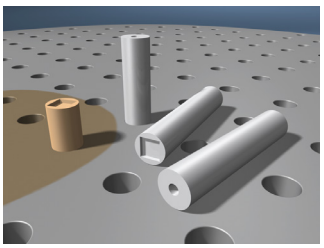
Thermoluminescent Dosimetry (TLD)

Sectioned and drilled phantoms readily accept TLDs. The tissue equivalent solid plugs may be cut so the TLD can be sandwiched between the cut plug and positioned at the appropriate depth within each section.

Tissue equivalent plugs are cast to precisely receive TLD chips, rods, bars or cubes are an available accessory. These rods are provided either in brain, bone, lung or soft tissue formulations and can be cut to length in order to position the TLD at the appropriate depth within the section. TLD disks use the standard TE plug provided with the phantom.



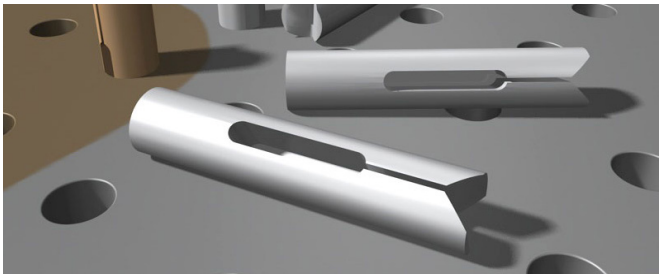
Standard Solid TE Plugs



TLD and Chip Rod Holders

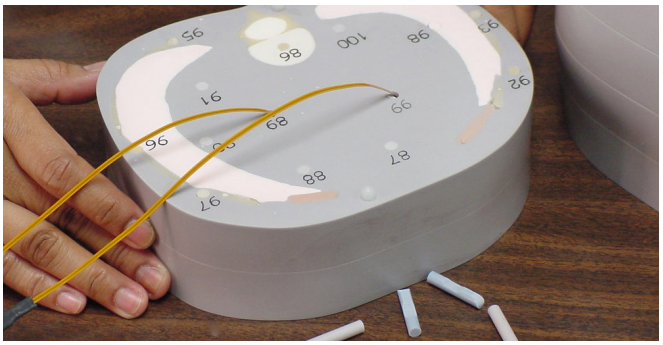
MOSFET Dosimetry

MOSFETs are accommodated using the ATOM MOSFET Cartridge, available in soft tissue, lung and bone formulations (See Table 7). The plug has a recessed area that fits the MOSFET detector along the side of the plug while still allowing the plug to fit into the 5 mm diameter hole within the section. A radius on the end of the cartridge allows a safe 90 degree bend in the cable. Black tape (included) can be placed on either side of the cable on the slab to prevent damage to the cable when the phantom is assembled.

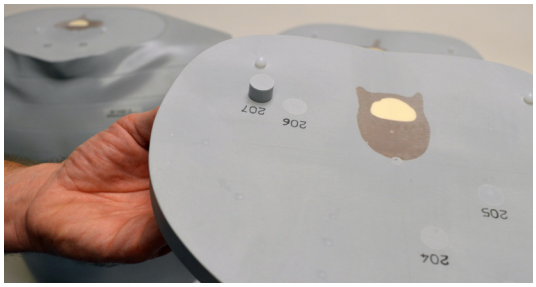


PLACEMENT AND REMOVAL OF TLD & MOSFET DETECTORS

It is recommended that detectors be placed and removed in sequence according to their numeric order. Through holes are Ø 5 mm x 25 mm L, and run completely through the section. Each through hole comes with a tissue equivalent plug which is inserted at the factory. These plugs can be removed using the plastic push rod provided. (Push through from down side of slab). For best fit, it is advised to replace each plug to its original hole as supplied by the manufacturer. Through hole plugs can be cut to length to achieve appropriate depth to detector placement within each section. They are not cut in advance to enable the user to account for the variance in thickness of different detectors on the market. Additional replacement plugs are also provided with the phantom.



When loading detectors in through holes place the bottom half of the plugs into their appropriate positions first. Pushing from top side of slab, check to make sure that all the plugs are flush to the bottom surface. Gently place each detector in its appropriate hole. Check to make sure each detector is positioned correctly within the hole before inserting the top-covering plug. Be sure the length of the top plug takes into account the thickness of the detector before pushing the plug flush to the top surface. Failure to do so may result in damage to the detector.

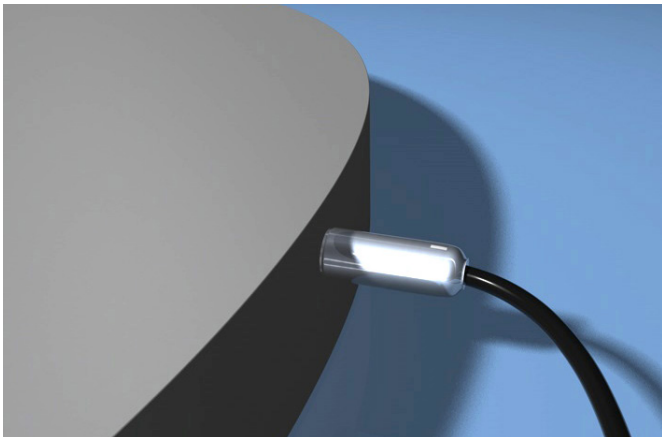


Film Dosimetry

Radiochormic or radiographic film can be placed between any two contiguous sections of the phantom. For obvious reasons this must be performed in a dark room. Use one of the two contiguous sections as a template to trace the proper shape of the phantom onto the film. After cutting the film to shape, place it between the two sections and seal the interfaces with lightproof tape.

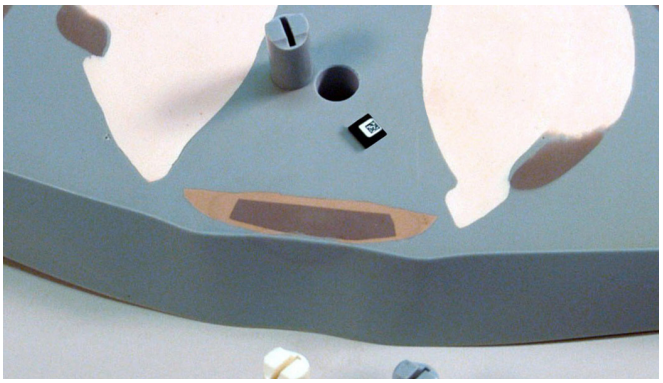
Ionization Chamber Dosimetry

Most ATOM phantom sections can be machined to accept ion chambers. Contact customer service with desired location to check availablility and obtain a quotation. After placing the phantom body on the CT/ LINAC couch, insert the ion chamber in the matching drill cavity. Use the provided light proof electrical tape or a masking tape to tape the ion chamber cable onto the phantom body so that it does not affect measurements of gantry rotation. Use the provided CV plug to fill the ion chamber cavities when they are not used so that the phantom background is reconstituted.



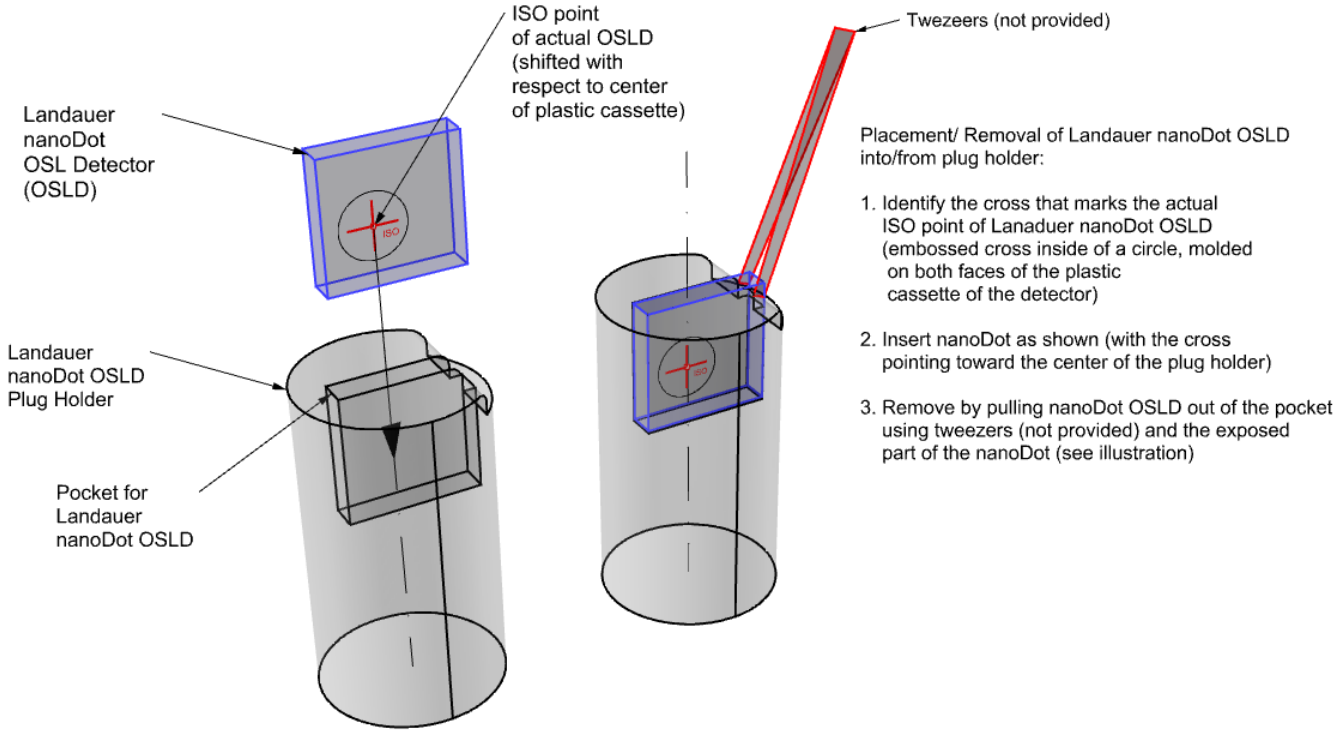
Opitically Stimulated Luminescence (OSL) Dosimetry

OSL Landauer nanoDot holders require 14mm diameter drilled thru holes and plugs configured to receive the holder.
NOTE: This option is only available with the organ dosimetry option and is not available with all models.



PLACEMENT AND REMOVAL OF LANDAUER OSL NANODOT DETECTORS

It is recommended that detectors be placed and removed in sequence according to their numeric order.



Each through hole comes with a tissue equivalent plug which is inserted at the factory. The plugs can be easily removed by pushing then up from the bottom side of the slab with the push rod provided. The sensitive part of the nanoDot is encapsulated, so as it's ISO point is shifted with respect to the center of the plastic cassette. Therefore, in order to perform measurements that are not affected by this shift, CIRS recommends that the nanoDot be inserted so as the ISO point matches the central axis of the nanoDot plug holder (see illustration).

Phantom Material Specifications

TABLE 1

	C	O	H	N	Ca	Mg	Cl	Physical Density, g/cc	Electron Density, g/cc
Adult Bone	0.3705	0.3567	0.0483	0.0097	0.1524	0.0619	0.0005	1.597	$5.030 \cdot 10^{23}$
Pediatric Newborn Bone	0.4563	0.3065	0.0647	0.0111	0.0909	0.0695	0.0005	1.407	$4.498 \cdot 10^{23}$
Pediatric 1 Yr Bone	0.4505	0.3160	0.0577	0.0123	0.1286	0.0340	0.0006	1.450	$4.606 \cdot 10^{23}$
Pediatric 5 yr Bone	0.4163	0.3331	0.0523	0.0111	0.1509	0.0354	0.0005	1.518	$4.801 \cdot 10^{23}$
Pediatric 10 yr Bone	0.4015	0.3406	0.0507	0.0106	0.1545	0.0413	0.0005	1.545	$4.878 \cdot 10^{23}$
Soft Tissue	0.5747	0.2460	0.0847	0.0165	0.0000	0.0762	0.0019	1.055	$3.434 \cdot 10^{23}$
Newborn Soft Tissue	0.5880	0.2286	0.0833	0.0184	0.0000	0.0800	0.0015	1.055	$3.433 \cdot 10^{23}$
Spinal Cord	0.5429	0.2659	0.0736	0.0217	0.0000	0.0937	0.0022	1.070	$3.448 \cdot 10^{23}$
Spinal Discs	0.4577	0.3107	0.0671	0.0188	0.0000	0.1436	0.0021	1.131	$3.624 \cdot 10^{23}$
Cartilage	0.4576	0.3106	0.0671	0.0188	0.0000	0.1436	0.0021	1.131	$3.624 \cdot 10^{23}$
Lung, inhale	0.6590	0.1929	0.0859	0.0352	0.0101	0.0000	0.0169	0.205	$0.668 \cdot 10^{23}$
Brain	0.5363	0.2651	0.0816	0.0153	0.0000	0.0998	0.0019	1.069	$3.470 \cdot 10^{23}$
Breast 50/50 (Gland/ Adipose)	0.7026	0.1700	0.0960	0.0193	0.0940	0.0000	0.0020	0.991	$3.262 \cdot 10^{23}$

Linear Attenuation Coefficients, Physical and Electron Densities of ATOM Materials

ATOM DOSIMETRY PHANTOMS (ADULT) - RECALCULATED LINEAR ATTENUATION COEFFICIENTS (CM-1)

TABLE 2

	AVERAGE SOFT TISSUE (ADULT)		AVERAGE BONE TISSUE (ADULT)		AVERAGE LUNG TISSUE (INHALE)*		AVERAGE BRAIN TISSUE		BREAST TISSUE 50/50	
EN, MEV	REFERENCE[1]	ATOM	REFERENCE[1]	ATOM	REFERENCE[2]	ATOM	REFERENCE[2]	ATOM	REFERENCE[3]	ATOM
0.04	0.2679	0.2678	0.7884	0.7887	0.0537	0.0534	0.2791	0.2791	0.2428	0.2436
0.06	0.2087	0.2091	0.4244	0.4242	0.0410	0.0411	0.2135	0.2138	0.1954	0.1954
0.08	0.1871	0.1876	0.3251	0.3248	0.0365	0.0367	0.1902	0.1907	0.1770	0.1767
0.10	0.1742	0.1748	0.2822	0.2819	0.0339	0.0341	0.1767	0.1772	0.1655	0.1652
0.15	0.1538	0.1544	0.2344	0.2341	0.0299	0.0301	0.1557	0.1562	0.1466	0.1463
0.20	0.1401	0.1406	0.2098	0.2095	0.0272	0.0274	0.1418	0.1422	0.1337	0.1334
0.40	0.1086	0.1090	0.1605	0.1602	0.0211	0.0212	0.1098	0.1102	0.1037	0.1035
0.60	0.0917	0.0920	0.1351	0.1349	0.0178	0.0179	0.0927	0.0930	0.0875	0.0874
0.80	0.0805	0.0808	0.1186	0.1184	0.0156	0.0157	0.0814	0.0817	0.0769	0.0767
1.00	0.0724	0.0726	0.1066	0.1064	0.0140	0.0141	0.0731	0.0734	0.0691	0.0690
1.50	0.0589	0.0591	0.0868	0.0866	0.0114	0.0115	0.0595	0.0597	0.0562	0.0561
2.00	0.0505	0.0507	0.0746	0.0745	0.0098	0.0099	0.0511	0.0513	0.0482	0.0481
4.00	0.0347	0.0348	0.0521	0.0520	0.0068	0.0068	0.0352	0.0352	0.0331	0.0329
6.00	0.0282	0.0282	0.0431	0.0430	0.0055	0.0055	0.0286	0.0286	0.0268	0.0266
8.00	0.0247	0.0247	0.0383	0.0383	0.0048	0.0048	0.0251	0.0250	0.0234	0.0231
10.0	0.0225	0.0225	0.0355	0.0355	0.0044	0.0043	0.0229	0.0228	0.0212	0.0210
15.0	0.0196	0.0195	0.0319	0.0320	0.0038	0.0038	0.0200	0.0199	0.0184	0.0180
20.0	0.0182	0.0181	0.0305	0.0305	0.0036	0.0035	0.0186	0.0185	0.0170	0.0166
30.0	0.0171	0.0170	0.0296	0.0296	0.0034	0.0032	0.0176	0.0174	0.0159	0.0154
Density, gcm^{-3}	1.03	1.055	1.577	1.597	0.20	0.205	1.04	1.069	0.982	0.991
El. density, $*10^{23}$, cm^{-3}	3.421	3.434	5.035	5.030	0.663	0.668	3.458	3.470	3.267	3.262

* Exhale lung tissue (d=0.5) or average (d=0.26-0.30) also available.

1. ICRP 23, Report of the Task Group on Reference Man (1975).
2. Woodard, H.Q., White, D.R., The Composition of Body Tissues, The British Journal of Radiology (1986) 59: 1209-1219.
3. G. Richard Hammerstein, et al, “Absorbed Radiation Dos in Mammography”, RADIOLOGY, 130:485-491, February 1979

Phantom Configurations

TABLE 3

COMPLETE PHANTOMS		-B	-C	-D	-G
MODEL NUMBER	**DESCRIPTION**	**Ø 5 mm holes in a 3 x 3 cm grid spacing**	**Ø 5 mm holes in a 1.5 x 1.5 cm grid spacing**	**Ø 5 mm Hole placement for Organ Dosimetry**	**Ø 14mm Hole placement for Organ Dosimetry (nanoDot)**
701	Adult Male Phantom (Sections 1-39)	Available	Available	Available	Available
702*	Adult Female Phantom (Sections 1-38)	Available	Available	Available	Available
703	Newborn Phantom (Sections 1-20) (Includes left & right Arms and Legs)	Available	Not Available	Available	Not Available
704	1 Year Old Phantom (Sections 1-28) (Includes eft & right Arms and Legs)	Available	Available	Available	Available
705	5 Year Old Phantom (Sections 1-26)	Available	Available	Available	Available
706	10 Year Old Phantom (Sections 1-32)	Available	Available	Available	Available

*Adult female does not include breast attachments.

Items Included with Each Phantom

TABLE 4

Model Specific	Numbered Sectional Slabs (refer to table 3)
1	User Guide
1	Organ Dosimetry Map (D and G Configurations only)**
WHOLE PHANTOMS	
1	Custom fitted Storm® Transport/Storage case (703, 704 & 705)
2	Custom fitted Storm® Transport/Storage cases (701 & 702)
1	Reinforcement base
1	Reinforcement top with threaded assembly
1	Open end wrench
1 Bag	Reinforcement assembly cord

PHANTOMS WITH HOLES	
2	Push rod for plugs
1 Bag	Extra soft tissue equivalent solid hole plugs (700-09-S / 703-09-S)
1 Bag	Extra lung equivalent solid hole plugs (700-09-L)
1 Bag	Extra bone equivalent solid hole plugs (70X-09-BN)
1 Bag	Extra brain equivalent solid hole plugs (700-09-BT)
1 Bag	Extra spinal cord equivalent solid hole plugs (700-09-SC)
1 Roll	Black (light proof) electrical tape

**NOTE: Organ Dosimetry Maps for ATOM configurations D and G provided under separate cover.

Optional Attachments

TABLE 5

ARM AND LEG ATTACHMENTS		-B	-C	-D	-G
MODEL NUMBER	**DESCRIPTION**	**Ø 5 mm holes in a 3 x 3 cm grid spacing**	**Ø 5 mm holes in a 1.5 x 1.5 cm grid spacing**	**Ø 5 mm Hole placement for Organ Dosimetry**	**Ø 14mm Hole placement for Organ Dosimetry (nanoDot)**
701-10-R	Right Arm Attachment for Adult Male Phantom	Not Available	Not Available	Available	Available
701-10-L	Left Arm Attachment for Adult Male Phantom	Not Available	Not Available	Available	Available
701-11-R	Right Leg Attachment for Adult Male Phantom	Available	Not Available	Available	Available
701-11-L	Left Leg Attachment for Adult Male Phantom	Available	Not Available	Available	Available
702-10-R	Right Arm Attachment for Adult Female Phantom	Not Available	Not Available	Available	Available
702-10-L	Left Arm Attachment for Adult Female Phantom	Not Available	Not Available	Available	Available
702-11-R	Right Leg Attachment for Adult Female Phantom	Available	Not Available	Available	Available
702-11-L	Left Leg Attachment for Adult Female Phantom	Available	Not Available	Available	Available
705-10-R	Right Arm Attachment for 5 Year Old Phantom	Not Available	Not Available	Available	Available
705-10-L	Left Arm Attachment for 5 Year Old Phantom	Not Available	Not Available	Available	Available
705-11-R	Right Leg Attachment for 5 Year Old Phantom	Not Available	Not Available	Available	Available
705-11-L	Left Leg Attachment for 5 Year Old Phantom	Not Available	Not Available	Available	Available

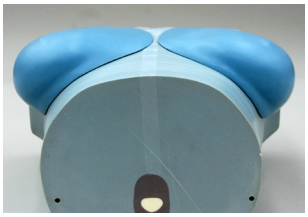
TABLE 6

BREAST ATTACHMENTS*						
MODEL NUMBER	DESCRIPTION	COMPATIBLE WITH	SIZE	SIDE	-D	-G
701-BR-01R	Single Supine Breast Attachment	Adult Male Phantom	Small	Right	Available	Available
701-BR-01L	Single Supine Breast Attachment	Adult Male Phantom	Small	Left	Available	Available
701-BR-02R	Single Supine Breast Attachment	Adult Male Phantom	Medium	Right	Available	Available
701-BR-02L	Single Supine Breast Attachment	Adult Male Phantom	Medium	Left	Available	Available
701-BR-03R	Single Supine Breast Attachment	Adult Male Phantom	Large	Right	Available	Available
701-BR-03L	Single Supine Breast Attachment	Adult Male Phantom	Large	Left	Available	Available
701-BR-350R	Single Breast Attachment	Adult Male Phantom	350cc	Right	Available	Available
701-BR-350L	Single Breast Attachment	Adult Male Phantom	350cc	Left	Available	Available
702-BR-01R	Single Supine Breast Attachment	Adult Female Phantom	Small	Right	Available	Available
702-BR-01L	Single Supine Breast Attachment	Adult Female Phantom	Small	Left	Available	Available
702-BR-02R	Single Supine Breast Attachment	Adult Female Phantom	Medium	Right	Available	Available
702-BR-02L	Single Supine Breast Attachment	Adult Female Phantom	Medium	Left	Available	Available
702-BR-190R	Single Breast Attachment	Adult Female Phantom	190cc	Right	Available	Available
702-BR-190L	Single Breast Attachment	Adult Female Phantom	190cc	Left	Available	Available
702-BR-350R	Single Breast Attachment	Adult Female Phantom	350cc	Right	Available	Available
702-BR-350L	Single Breast Attachment	Adult Female Phantom	350cc	Left	Available	Available

Adult Female and Adult Male Phantoms with Arm and Leg Attachments (full newborn phantom also shown)

*Must be purchased with the original phantom order. If ordered separately, parts of the phantom must be returned to CIRS for retrofitting.

Male Small Single Supine Breast Attachment (400cc) 701-BR-01



Male Medium Single Supine Breast Attachment (800cc) 701-BR-02

Male Large Single Supine Breast Attachment (1200cc) 701-BR-03

Female Single Breast Attachments (190cc & 350cc) 702-BR-190 & -350

Additional Accessories

TABLE 7

PLUG OPTIONS			
MODEL NUMBER	**DESCRIPTION**	**DIAMETER**	**MATERIAL**
700-01-S	ATOM TLD Chip Holder	Ø 5mm x 25mm L	Soft Tissue Equivalent
700-01-L	ATOM TLD Chip Holder	Ø 5mm x 25mm L	Lung Tissue Equivalent
700-01-BT	ATOM TLD Chip Holder	Ø 5mm x 25mm L	Brain Tissue Equivalent
70X-01-BN	ATOM TLD Chip Holder (X=ATOM Model#)	Ø 5mm x 25mm L	Bone Tissue Equivalent
700-04-S	ATOM MOSFET Cartridge	Ø 5mm x 25mm L	Soft Tissue Equivalent
700-04-L	ATOM MOSFET Cartridge	Ø 5mm x 25mm L	Lung-Tissue Equivalent
700-04-BT	ATOM MOSFET Cartridge	Ø 5mm x 25mm L	Brain Tissue Equivalent
70X-04-BN	ATOM MOSFET Cartridge (X=ATOM Model#)	Ø 5mm x 25mm L	Bone Tissue Equivalent
700-05-S	ATOM nanoDot Single Dosimeter Holder	Ø 14mm x 25mm L	Soft Tissue-Equivalent
700-05-L	ATOM nanoDot Single Dosimeter Holder	Ø 14mm x 25mm L	Lung Tissue Equivalent
700-05-BT	ATOM nanoDot Single Dosimeter Holder	Ø 14mm x 25mm L	Brain Tissue Equivalent
70X-05-BN	ATOM nanoDot Single Dosimeter Holder, (X=ATOM Model#)	Ø 14mm x 25mm L	Bone Tissue Equivalent
700-09-S	ATOM SOLID TE PLUG	Ø 5mm x 25mm L	Soft Tissue Equivalent
700-09-L	ATOM SOLID TE PLUG	Ø 5mm x 25mm L	Lung Tissue Equivalent
700-09-BT	ATOM SOLID TE PLUG	Ø 5mm x 25mm L	Brain Tissue Equivalent
700-09-SC	ATOM SOLID TE PLUG	Ø 5mm x 25mm L	Spinal Cord Tissue Equivalent
70X-09-BN	ATOM SOLID TE PLUG (X=ATOM Model#)	Ø 5mm x 25mm L	Bone Tissue Equivalent
700-13-S	ATOM SOLID TE PLUG	Ø 5mm x 25mm L	Soft Tissue Equivalent
700-13-L	ATOM SOLID TE PLUG	Ø 5mm x 25mm L	Lung Tissue Equivalent
700-13-BT	ATOM SOLID TE PLUG	Ø 5mm x 25mm L	Brain Tissue Equivalent
70X-13-BN	ATOM SOLID TE PLUG (X=ATOM Model#)	Ø 5mm x 12 mm L	Bone Tissue Equivalent
700-14-S	TLD/ GLASS ROD HOLDER KIT	Ø 5mm	Soft Tissue Equivalent
700-14-L	TLD/ GLASS ROD HOLDER KIT	Ø 5mm	Lung Tissue Equivalent
700-14-BT	TLD/ GLASS ROD HOLDER KIT	Ø 5mm	Brain Tissue Equivalent
70X-14-BN	TLD/ GLASS ROD HOLDER KIT	Ø 5mm	Bone Tissue Equivalent
700-16-S	ATOM SOLID TE PLUG	Ø 14mm x 25mm L	Soft Tissue Equivalent
700-16-L	ATOM SOLID TE PLUG	Ø 14mm x 25mm L	Lung Tissue Equivalent
700-16-BT	ATOM SOLID TE PLUG	Ø 14mm x 25mm L	Brain Tissue Equivalent
70X-16-BN	ATOM SOLID TE PLUG (X=ATOM Model#)	Ø 14mm x 25mm L	Bone Tissue Equivalent
700-17-S	ATOM SOLID TE PLUG WITH Ø 5 MM HOLE	Ø 14 mm x 25mm L	Soft Tissue Equivalent
700-17-L	ATOM SOLID TE PLUG WITH Ø 5 MM HOLE	Ø 14 mm x 25mm L	Lung Tissue Equivalent
700-17-BT	ATOM SOLID TE PLUG WITH Ø 5 MM HOLE	Ø 14 mm x 25mm L	Brain Tissue Equivalent
70X-17-BN	ATOM SOLID TE PLUG WITH Ø 5 MM HOLE (	Ø 14 mm x 25mm L	Bone Tissue Equivalent

ION CHAMBER OPTIONS*	
700-08-CV	Positioning Fee To Accommodate Ion Chamber Positioned Midplane In One Sectional Slab Of Atom Phantom (CV=Cirs Cavity Code, Specify Ion Chamber And Isocenter Location) Includes Soft Tissue Plug

ADDITIONAL OPTIONS	
038-20	SRS Frame Support Cups, Set of 4 (Compatible with all head neck phantoms)

*Must be purchased with the original phantom order. If ordered separately, parts of the phantom must be returned to CIRS for retrofitting.
**Drilling and corresponding solid inserts ordered separately.

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All standard CIRS products and accessories are warranted by CIRS against defects in material and workmanship for a period as specified below. During the warranty period, the manufacturer will repair or, at its option, replace, at no charge, a product containing such defect provided it is returned, transportation prepaid, to the manufacturer. Products repaired in warranty will be returned transportation prepaid.

There are no warranties, expressed or implied, including without limitation any implied warranty of merchantability or fitness, which extend beyond the description on the face hereof. This expressed warranty excludes coverage of, and does not provide relief for, incidental or consequential damages of any kind or nature, including but not limited to loss of use, loss of sales or inconvenience. The exclusive remedy of the purchaser is limited to repair, recalibration, or replacement of the product at manufacturer's option.

This warranty does not apply if the product, as determined by the manufacturer,
is defective because of normal wear, accident, misuse, or modification.

NON-WARRANTY SERVICE
If repairs or replacement not covered by this warranty are required, a repair estimate will be submitted for approval before proceeding with said repair or replacement.

PRODUCT	WARRANTY PERIOD
Models 701-706 - ATOM Dosimetric Phantoms	60 Months

RETURNS
If you are not satisfied with your purchase for any reason, please contact Customer Service or your local distributor prior to returning the product. Visit https://www.cirsinc.com/distributors/ to find your local distributor. Call 800-617-1177, email rma@cirsinc.com, or fax an RMA request form to 757-857-0523. CIRS staff will attempt to remedy the issue via phone or email as soon as possible. If unable to correct the problem, a return material authorization (RMA) number will be issued. Non-standard or "customized" products may not be returned for refund or exchange unless such product is deemed by CIRS not to comply with documented order specifications. You must return the product to CIRS within 30 calendar days of the issuance of the RMA.

All returns should be packed in the original cases and or packaging and must include any accessories, manuals and documentation that shipped with the product. The RMA number must be clearly indicated on the outside of each returned package. CIRS recommends that you use a carrier that offers shipment tracking for all returns and insure the full value of your package so that you are completely protected if the shipment is lost or damaged in transit. If you choose not to use a carrier that offers tracking or insure the product, you will be responsible for any loss or damage to the product during shipping. CIRS will not be responsible for lost or damaged return shipments. Return freight and insurance is to be pre-paid.

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Receiving
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Norfolk, Virginia, 23513 USA

COMPUTERIZED IMAGING REFERENCE SYSTEMS, INC.
900 Asbury Ave
Norfolk, Virginia 23513 USA

Toll Free: 800.617.1177
Tel: 757.855.2765
Fax: 757.857.0523
E-mail admin@cirsinc.com

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Technical Assistance
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