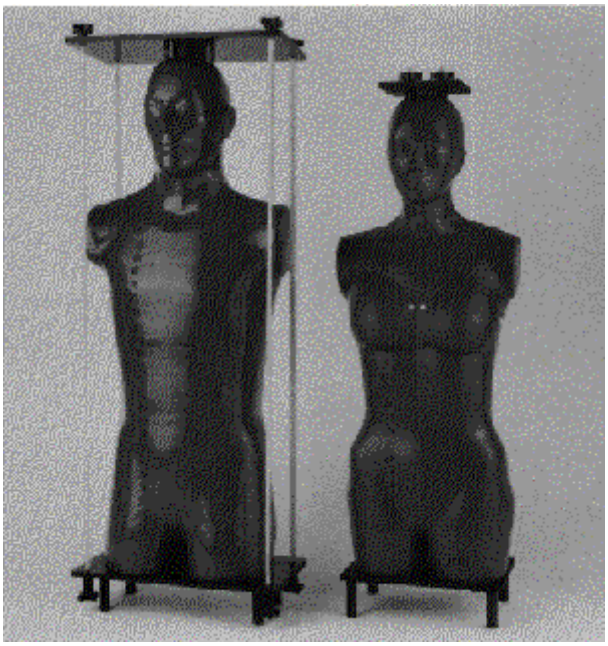
ART PHANTOMS



The worldwide standard for treatment planning and plan verification·

Facilitates both TLD and film dosimetry

- Sophisticated breast adapters
- Accurate, repeatable, tissue-equivalent materials
- Alderson Radiation Therapy phantoms have been in world-wide use for over 30 years.

They have been continuously refined and improved in both design and materials, and are considered indispensable quality assurance tools.

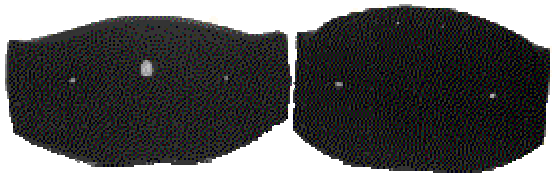
ART Phantoms provide integrated tests of the entire chain of treatment planning, positioning devices and most other parameters of radiation treatments.

The ART Phantoms can be used to check specific treatment plans and because their tissue equivalency does not change, they are ideal for testing equipment.

Because the ART phantom is so widely used, it has become an international radiotherapy reference standard. Today's ART phantoms are constructed of consistent tissue equivalent material, are designed within highly sophisticated technological constraints, and follow ICRU-44 standards. They are designed for accuracy and ease of use. An average sized male and a small-sized female are available.

Anatomy:

Complete phantoms or phantom sections may be conveniently assembled externally, for film dosimetry, or internally, for TLD dosimetry. Plates and tie rods for both assembly methods are included with every phantom. The ART phantom is transected horizontally and each slice has holes which are plugged with soft tissue-equivalent and lung tissue-equivalent pins which can be replaced by TLD holders.



ART Phantom Slices

With so many hole locations, the ART phantom's mapping of dose distribution is detailed and precise. Soft-tissue-equivalent coatings give each slice a 2.5 cm thickness with glass-smooth interfaces. These coatings are cut away over the air spaces of the oro-nasal pharynges, trachea and stem bronchi.

Breasts can be ordered in various sizes. They can be drilled in the AP direction for TLD dosimetry or sliced in frontal planes (drilled or

undrilled) for film dosimetry. Breasts of male and female ART phantoms are contoured to blend realistically to the sides of the thorax. Breasts are mounted with nylon screws. The male chest with breasts. attached serves as a large female. The male ART represents a 175 cm (5'9") tall, 73.5 kg (162 lb.) male, and the female ART represents l55cm (5'1") tall, 50kg (110 lb.) female.

Materials:

ART has constant size, shape, calcium content and the tissue simulating materials are designed to have the same energy absorption as human tissue.

Soft Tissues:

Soft-tissue composition, a variable in every radiation therapy plan, can never be realistically standardized among natural bone phantoms or patients, yet is consistent in the ART phantom. ART soft-tissue materials are matched to muscle in specific gravity, mass density and absorption coefficients.

Skeletons:

Because of variations in human bone, RSD has conceptualized "Superhuman Engineering" - the design and construction of bones that are both realistic and consistent. Molds for both the cortical bone and the medullary cavities were made using natural skeletons. "Superhuman" bones are uniformly positioned within the soft tissues, eliminating the need to make positioning compromises, as must be done with variable natural bones which are frequently modified to fit within fixed molds. Our "Superhuman" skeletons closely conform to the International Commission on Radiation Units and Measurements (ICRU Report No.44), but density is reduced slightly to take into account a small decline in calcium content. By contrast, natural human skeletons have unknown calcium loss-approaching osteoporosis in some cases, and they may be contaminated by bleaches and other chemical agents used in their preparation.

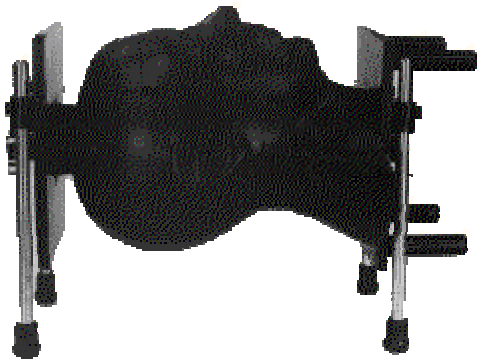
Lungs:

Lungs are molded from syntactic foam, with a specific gravity of .32

Assembly:

The ART phantom's slices are held between aluminum plates by nylon tie rods. Knobs at the ends of the rods clamp the slices tightly evenly and in proper alignment. Plates can accommodate both internal and external rods and can hold any number of slices. Nylon rods for internal assembly pass through registration holes.

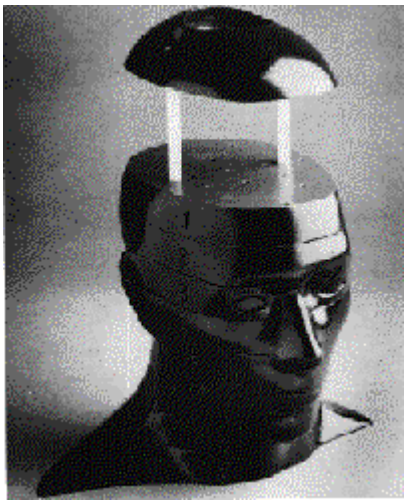
maintaining alignment of the slices. Using the external assembly facilitates film dosimetry. The aluminum plates are larger, allowing the rods to remain external to the larger phantom contours.



The ART-210 Head and Neck Phantom

Although these rods can assemble the entire phantom, usually smaller assemblies - head and neck, thorax, and pelvis - are used.

To duplicate patient alignment in various positions, assembly plates are drilled to receive clamps which may be swiveled. Adjustable rods pass through these clamps to the table, providing positioning to match the patient.



The ART-210 detail

ART Phantom Architecture For Dosimetry

ART slices are analogous to CT slices, although the ART slices are 2.5 cm thick, while CT slices are variable. Each slice has holes - 5,

6 or 7 mm in diameter - drilled in 1.5 or 3 cm^2 grids.

Optional tissue-equivalent pins, designed to hold TLD chips and rods, are available. If the ART phantom is to be used only for film dosimetry, the hole grid can be omitted.

ORDERING INFORMATION

MODEL	DESCRIPTION
	MALE ART PHANTOM
ART-200X	ART Phantom without hole grid. Includes: Internal & external assembly systems, permanent storage case
ART-200	ART Phantom with hole grid 3cm x 3cm spacings, either 5,6 or 7mm diameter holes (please specify), lung and tissue equivalent plugs. Internal and external assembly systems. Permanent storage case.
ART-200A	Same as ART-200 but with hole grid 1.5cm x 1.5cm spacing.
ART-210X	Head and Neck (Sections 0-9) without hole grid. Internal & external assembly systems.
ART-210	Head and Neck (Sections 0-9) with 3cm x 3cm hole spacing, either 5,6 or 7mm diameter holes (please specify) and tissue equivalent plugs. Assembly plates and all associated fittings.
ART-210A	Same as ART-210 but with 1.5cm x 1.5cm grid hole spacing.
ART-211X	Chest (Sections 10-25) without hole grid. Internal and external assembly systems.
ART-211	Chest (Sections 10-25) with 3cm x 3cm grid hole spacing, either 5,6 or 7mm diameter holes (please specify) and lung and tissue equivalent plugs. Assembly plates and all associated fittings.
ART-211A	Same as ART-211 but with 1.5cm x 1.5cm grid hole spacing.
ART-212X	Pelvis (Sections 26-35) without hole grid. Internal and external assembly systems.
ART-212	Pelvis (Sections 26-35) with 3cm x 3cm grid hole spacing, either 5,6 or 7mm diameter holes (please specify) and tissue equivalent plugs. Assembly plates and all associated fittings.
ART-212A	Same as ART-212 but with 1.5cm x 1.5cm grid hole spacing.
ART-250X	Breast Attachment without hole grid. Specify either B,C,D,DD,DDD

ART-250	Breast Attachment with 3cm x 3cm grid hole spacing and either 5,6 or 7mm diameter holes (please specify)
ART-250A	Breast Attachment with 1.5cm x 2.5cm grid hole spacing and either 5,6 or 7mm diameter holes (please specify)
ART-20	Solid Pin - 2.5cm length (50 pieces)
ART-30	Rod Holder - 1mm I.D. , 2.5cm length (50 pieces)
ART-31	Rod Holder - 2mm I.D. , 2.5cm length (50 pieces)
ART-50	Chip Holder - .32cm x 2cm x .08cm cross section depth, 2.5cm length (50 pieces)

MODEL	DESCRIPTION
	FEMALE ART PHANTOM
ART-300X	ART Phantom without hole grid. Includes: Internal & external assembly systems, permanent storage case
ART-300	ART Phantom with hole grid 3cm x 3cm spacings, either 5,6 or 7mm diameter holes (please specify), lung and tissue equivalent plugs. Internal and external assembly systems. Permanent storage case.
ART-300A	Same as ART-300 but with hole grid 1.5cm x 1.5cm spacing.
ART-310X	Head and Neck (Sections 0-9) without hole grid. Internal & external assembly systems.
ART-310	Head and Neck (Sections 0-9) with 3cm x 3cm hole spacing, either 5,6 or 7mm diameter holes (please specify) and tissue equivalent plugs. Assembly plates and all associated fittings.
ART-310A	Same as ART-310 but with 1.5cm x 1.5cm grid hole spacing.
ART-311X	Chest (Sections 10-25) without hole grid. Internal and external assembly systems.
ART-311	Chest (Sections 10-25) with 3cm x 3cm grid hole spacing, either 5,6 or 7mm diameter holes (please specify) and lung and tissue equivalent plugs. Assembly plates and all associated fittings.
ART-211A	Same as ART-311 but with 1.5cm x 1.5cm grid hole spacing.
ART-312X	Pelvis (Sections 26-35) without hole grid. Internal and external assembly systems.
ART-312	Pelvis (Sections 26-35) with 3cm x 3cm grid hole spacing, either 5,6 or 7mm diameter holes (please specify) and tissue equivalent plugs. Assembly plates and all associated fittings.
ART-	Same as ART-312 but with 1.5cm x 1.5cm grid hole

312A	spacing.
ART-350X	Breast Attachment without hole grid. Specify either B,C,D,DD,DDD
ART-350	Breast Attachment with 3cm x 3cm grid hole spacing and either 5,6 or 7mm diameter holes (please specify)
ART-350A	Breast Attachment with 1.5cm x 2.5cm grid hole spacing and either 5,6 or 7mm diameter holes (please specify)
ART-20	Solid Pin - 2.5cm length (50 pieces)
ART-30	Rod Holder - 1mm I.D. , 2.5cm length (50 pieces)
ART-31	Rod Holder - 2mm I.D. , 2.5cm length (50 pieces)
ART-50	Chip Holder - .32cm x 2cm x .08cm cross section depth, 2.5cm length (50 pieces)

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