

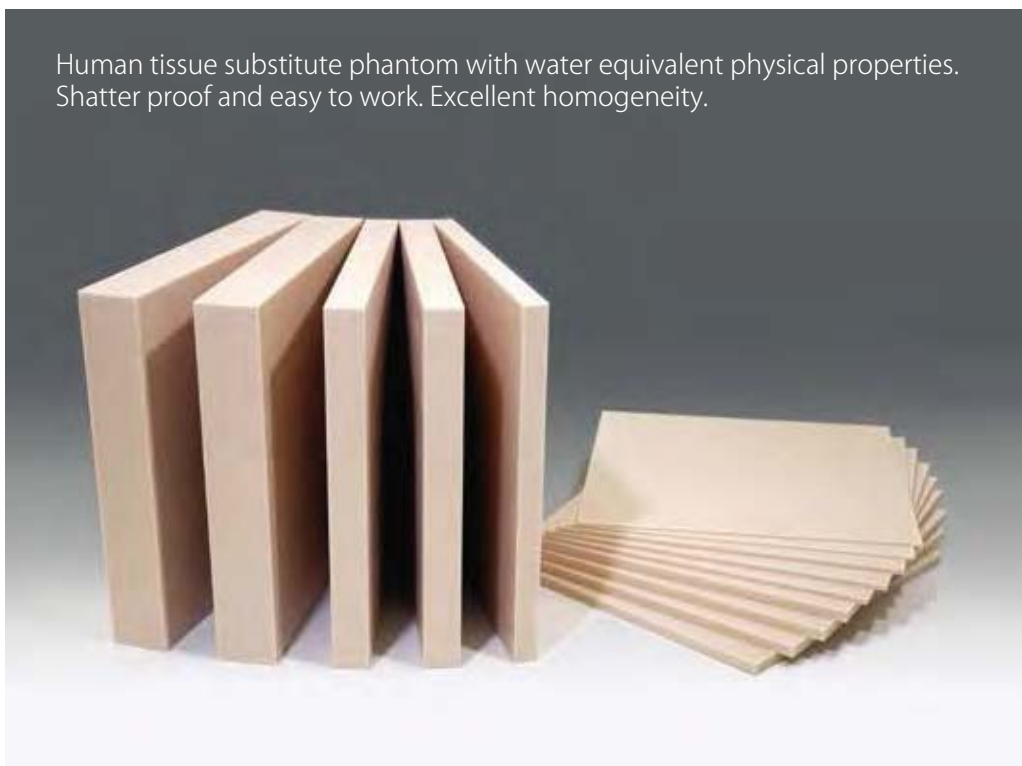
Tough Phantom Series

A stable, high quality and shatter-free phantom for radiotherapy.

Tough Phantom Series, co-developed with the Japanese National Institute of Radiological Sciences, is designed for dosimetry in radiotherapy planning. The phantom is shatter-proof and easy to work with. The phantoms can also be customized to various forms at your request.

PH-40 Tough Water Phantom WD

Human tissue substitute phantom with water equivalent physical properties. Shatter proof and easy to work. Excellent homogeneity.



WD-3002	300 x 300 x 2mm 12 x 12 x 0.08 inch
WD-3003	300 x 300 x 3mm 12 x 12 x 0.12 inch
WD-3005	300 x 300 x 5mm 12 x 12 x 0.2 inch
WD-3010	300 x 300 x 10mm 12 x 12 x 0.4 inch
WD-3015	300 x 300 x 15mm 12 x 12 x 0.6 inch
WD-3020	300 x 300 x 20mm 12 x 12 x 0.8 inch
WD-3025	300 x 300 x 25mm 12 x 12 x 1.0 inch
WD-3030	300 x 300 x 30mm 12 x 12 x 1.2 inch
WD-3040	300 x 300 x 40mm 12 x 12 x 1.6 inch
WD-3050	300 x 300 x 50mm 12 x 12 x 2.0 inch
WD-4002	400 x 400 x 2mm 16 x 16 x 0.08 inch
WD-4003	400 x 400 x 3mm 16 x 16 x 0.12 inch
WD-4005	400 x 400 x 5mm 16 x 16 x 0.2 inch
WD-4010	400 x 400 x 10mm 16 x 16 x 0.4 inch
WD-4015	400 x 400 x 15mm 16 x 16 x 0.6 inch
WD-4020	400 x 400 x 20mm 16 x 16 x 0.8 inch
WD-4025	400 x 400 x 25mm 16 x 16 x 1.0 inch
WD-4030	400 x 400 x 30mm 16 x 16 x 1.2 inch
WD-4040	400 x 400 x 40mm 16 x 16 x 1.6 inch
WD-4050	400 x 400 x 50 mm 16 x 16 x 2.0 inch

Easy-to-Work

Pits or channels to accommodate ion chamber may be ordered. Orders may be received for various sizes, shapes, and thickness.



Stable Quality

Excellent homogeneity is realized by high standard of production and quality inspection.



PH-41 Tough Bone Phantom BE-T, BE-H, BE-N



Human bone substitute phantoms to simulate body structure in combination with Tough Water and Tough Lung. Shatter proof and easy to work.

Three types available: compact bone, cortical bone and inner bone.

BE-T-05 Compact Bone	200 x 200 x 5mm 8 x 8 x 0.2 inch	BE-H-05 Cortical Bone	300 x 300 x 5mm 12 x 12 x 0.2 inch
BE-T-10 Compact Bone	200 x 200 x 10mm 8 x 8 x 0.4 inch	BE-H-10 Cortical Bone	300 x 300 x 10mm 12 x 12 x 0.4 inch
BE-T-20 Compact Bone	200 x 200 x 20mm 8 x 8 x 0.8 inch	BE-H-20 Cortical Bone	300 x 300 x 20mm 12 x 12 x 0.8 inch
BE-H-05 Cortical Bone	200 x 200 x 5mm 8 x 8 x 0.2 inch	BE-N-05 Inner Bone	300 x 300 x 5mm 12 x 12 x 0.2 inch
BE-H-10 Cortical Bone	200 x 200 x 10mm 8 x 8 x 0.4 inch	BE-N-10 Inner Bone	300 x 300 x 10mm 12 x 12 x 0.4 inch
BE-H-20 Cortical Bone	200 x 200 x 20mm 8 x 8 x 0.8 inch	BE-N-20 Inner Bone	300 x 300 x 20mm 12 x 12 x 0.8 inch
BE-N-05 Inner Bone	200 x 200 x 5mm 8 x 8 x 0.2 inch		
BE-N-10 Inner Bone	200 x 200 x 10mm 8 x 8 x 0.4 inch		
BE-N-20 Inner Bone	200 x 200 x 20mm 8 x 8 x 0.8 inch		

PH-42 Tough Lung Phantom LD



Human lung substitute phantoms to simulate body structure in combination with Tough Water and Tough Bone. Shatter proof and easy to work. Excellent homogeneity.

LP-3010	300 x 300 x 10mm / 12 x 12 x 0.4 inch
LP-3020	300 x 300 x 20mm / 12 x 12 x 0.8 inch
LP-3030	300 x 300 x 30mm / 12 x 12 x 1.2 inch
LP-3050	300 x 300 x 50mm / 12 x 12 x 2.0 inch

Comparison of Physical Properties

ICRU publication 23 (Reference man)

	human soft tissue	muscle	fat	cartilage	lung
electron density ($\times 10^{23}e/g$)	3.29	3.31	3.34	3.28	3.31
effective atomic number	7.03	7.45	6.33	7.89	7.49
specific gravity	1.00	1.05	0.95	1.10	0.26

	water	acryl	Tough Water Phantom WD	Tough Bone Phantom BE-T	Tough Bone Phantom BE-H	Tough Bone Phantom BE-N	Tough Lung Phantom LP
electron density ($\times 10^{23}e/g$)	3.343	3.248	3.265	3.108	3.154	3.213	3.211
effective atomic number	7.417	6.467	7.328	13.179	11.697	9.141	7.242
specific gravity	1.000	1.180	1.018	1.730	1.500	1.240	0.370

Elemental Composition (wt%)

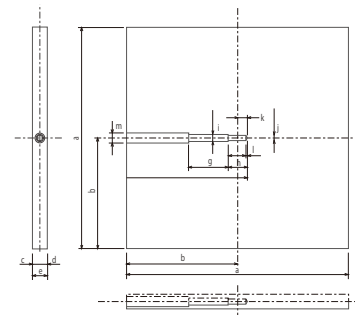
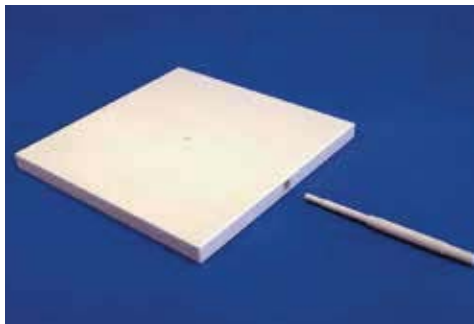
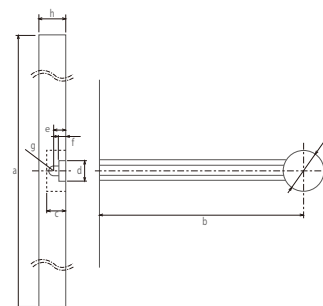
	Tough Water Phantom WD	Tough Bone Phantom BE-T	Tough Bone Phantom BE-H	Tough Bone Phantom BE-N	Tough Lung Phantom LP
H	8.63	3.69	5.11	6.97	7.00
C	68.89	29.22	42.45	60.03	50.20
N	2.18	1.19	1.73	2.45	—
O	17.88	32.66	28.13	21.79	35.10
P	—	10.24	7.00	2.30	0.10
Cl	0.15	0.06	0.09	0.13	1.00
Ca	2.27	22.92	15.49	6.33	—
Al	—	—	—	—	1.50
Si	—	—	—	—	5.00

Tough Phantom Series

Chamber cavities to accommodate dosimeters can be prepared according to your order.

Specify your chamber's manufacturer and model number.

Let us have dimensional drawings of the chambers you are using to estimate the cost.



Therapy Body Phantom THRA-1

The Therapy Body Phantom THRA is a therapy planning phantom made of Tough Series human tissue substitutes. Sizes and spacing of dosimeter cavities and slice thickness may be custom ordered.



Supecificantions

Size: 90cm / 35.5 inch height

Slice thickness: 30mm / 1.2 inch

Dosimeter holes:

On each cross section, holes for glass dosimeters are located in lattice-like pattern of 30 x 30mm / 1.2 x 1.2 inch.

In each hole, a nylon pin is embedded.

Accessories: supporting frame

Optional parts: carrying cases