

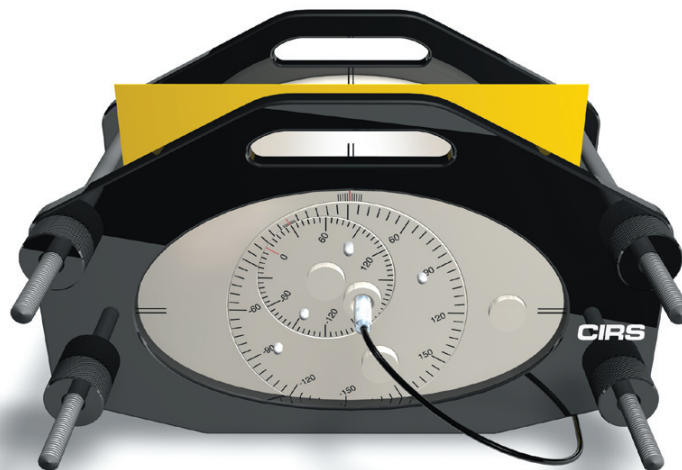
IMRT Head & Torso Freepoint Phantom

Complete QA from CT imaging to dose verification

CIRS offers a variety of IMRT phantoms to match the most common IMRT treatment areas such as prostate, head and neck, breast and lung.

The phantom is constructed of proprietary tissue equivalent epoxy materials. Linear attenuations of the simulated tissues are within 1% of actual attenuation for bone and water from 50 keV to 25 MeV. These unique materials eliminate the need for correction factors, thus improving accuracy and saving time. The phantoms simulate the patient through the entire process from CT data acquisition and planning to delivery and dose verification.

The Model 002H9K was designed in collaboration with David D. Loshek PhD. With the H9K, choose any point dose location within a circular area with diameter of 11.2 cm by simply adjusting the two rotating cylinders. Lung and bone equivalent rods can be positioned at any location within the circular area for assessment of heterogeneity correction. Remove the center cylinder from the phantom body to simulate head and neck set-ups.



Model 002H9K

Features

- Ionization chambers, TLD, MOSFET and Diodes easily positioned using interchangeable rods*
- Choose any point dose location by rotating the cylinders
- Use radiographic film dosimetry¹ - Ready Pack[®] and/or GafChromic[®] film
- Close placement of detectors to film improves film calibration
- CT - film markers ensure accurate film to plan registration
- Surfaces are etched with indices for precise alignment
- Configure with or without heterogeneities



Tissue Simulation &
Phantom Technology

CIRS

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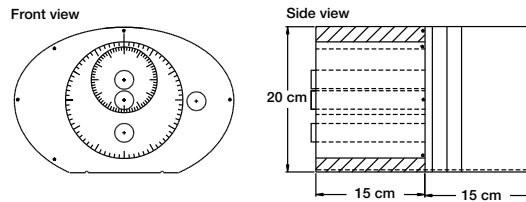
IMRT Phantom Specifications:

Model 002H9K

Model 002H9K Includes

Qty	Description
1	Water equivalent homogeneous torso section with cylindrical inserts (15 cm)
2	Spacer slabs, 2 cm
1	Spacer slab, 1 cm
1	Spacer slab, 10 cm
1	Water equivalent rod insert with ion chamber cavity
1	Bone equivalent rod insert with ion chamber cavity
4	Water equivalent solid rod inserts
1	Bone equivalent solid rod insert
1	Set of CT to film fiducial markers
1	Alignment base
1	Holding device

Body with the Head part for Chamber Dosimetry



Ratios of IMRT Phantom Material⁽²⁾⁽³⁾

linear attenuation coefficients to reference tissues.

	Plastic Water-DT to H ₂ O	Average Bone to Ref ²	Lung (inhale) to Ref ³
En, MeV	Ratio, %	Ratio, %	Ratio, %
0.05	100.8	100.00	100.3
0.06	100.5	99.96	101.1
0.08	100.3	99.91	101.9
0.10	100.2	99.88	102.2
0.15	100.1	99.86	102.5
0.20	100.1	99.84	102.5
0.40	100.1	99.84	102.7
0.60	100.1	99.83	102.6
0.80	100.1	99.84	102.7
1.00	100.1	99.83	102.7
1.50	100.1	99.84	102.7
2.00	100.1	99.84	102.6
4.00	100.0	99.87	102.1
6.00	99.8	99.93	101.6
8.00	99.7	99.95	101.2
10.0	99.6	100.03	100.7
15.0	99.2	100.06	100.0
20.0	99.1	100.13	102.7
El. density	100.1	99.83	102.7
Density	1.039 g/cm ³	1.60 g/cm ³	0.21 g/cm ³

Optional Accessories

Model	Description
002BR	Single breast attachment
002FC	Film Stack for small volume 3D image reconstruction
002GC	Gel dosimetry cassette
002HCV	Homogeneous section that accommodates 002FC or 002GC cassettes
002LCV	Thorax region section that accommodates 002FC or 002GC cassettes
002SPH	Tissue equivalent rods for TLD's (set of 5)
002CTF	Set of CT to film fiducial markers for additional intrerfaces
002ED	Electron density reference plugs, set of 4 (lung, bone, muscle, adipose)
002SPH	Tissue equivalent rods for TLD's (set of 5)
002RL CV5XX	Lung equivalent rod insert with ion chamber cavity
002RLS	Lung equivalent solid rod insert
002CS	Foam lined carrying case

Electron Density Reference Insert

	Density	Electron Density per cc x 10 ²³	Electron Density Relative to H ₂ O
Lung	0.21	0.69	0.207
Bone	1.60	5.03	1.506
Muscle	1.06	3.48	1.042
Adipose	0.96	3.17	0.949

1. The CIRS line of IMRT phantoms is compatible with the RIT 113 software for film to plan analysis
2. ICRP 23, Report of the Task Group on Reference Man (1975).
3. Woodard, H.Q., White, D.R., The Composition of Body Tissues, The British Journal of Radiology (1986) 59: 1209-1219

***Refer to separate CIRS cavity and plug code list for available chamber cavities.**