

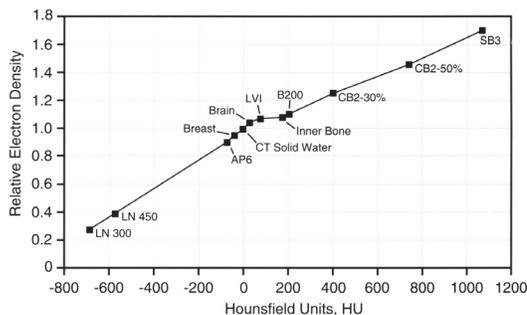
Model 467 Electron Density CT Phantom

Provides accurate corrections for tissue inhomogeneities

Accurate corrections for tissue inhomogeneities are a critical part of isodose treatment planning. Although most computerized treatment planning systems currently use CT image data, these systems frequently use empirical formulae in computing correction factors for tissue inhomogeneities. The Model 467 Electron Density CT Phantom can be used to calibrate the CT unit by establishing the relationship between the electron density of various tissues and their corresponding CT number (in Hounsfield Units, HU). This data can then be transferred to the computerized treatment planning system for more accurate corrections for tissue inhomogeneities.

The Electron Density CT Phantom consists of a Solid Water® disc approximating the size of an average pelvis. A matrix of sixteen holes in the disc hold interchangeable plugs made of various tissue- and water-simulating materials. The physical density (g/cm³) and electron density relative to water of the plug materials are listed in the user's manual. The phantom also has a pattern of small air holes with known spacings for checking the CT scanner's distance measurement accuracy. A carrying case is included.

Scanning this phantom on a periodic basis provides data useful for the Quality Assurance Program of both the CT scanner and the treatment planning system.



Relationship between relative electron density and CT number (in Hounsfield units, HU) of materials in the Electron Density CT Phantom as measured by GE CT/i scanner.



Specifications

DISK

Material Solid Water®, 451 type
Dimensions 33 cm (12.9 in) dia., 5 cm (2 in) high

PLUGS

Dimensions 2.8 cm (1.125 in) dia., 7 cm (2.75 in) high
Quantity 4 Solid Water® rods 1 container for true water
11 tissue substitute plugs of known elemental composition as below:

Electron density Plug material	Physical relative to water	Density, g/cm ³
CT Solid Water	.99	1.02
True water	1.00	1.00
Lung (LN300)	0.28	0.30
Lung (LN450)	0.40	0.45
Adipose (AP6)	0.90	0.92
Breast	0.96	0.99
Brain	1.05	1.05
Liver (LV1)	1.07	1.08
Inner bone	1.09	1.12
Bone (B200)	1.11	1.15
Bone (CB2-30% mineral)	1.28	1.34
Bone (CB2-50% mineral)	1.47	1.56
Cortical bone (SB3)	1.69	1.82

WEIGHT

Disk and plugs 4.85 kg (10.7 lbs)
Phantom with case 11 kg (24 lbs)

Solid Water® is a registered trademark of Gammex RMI.

