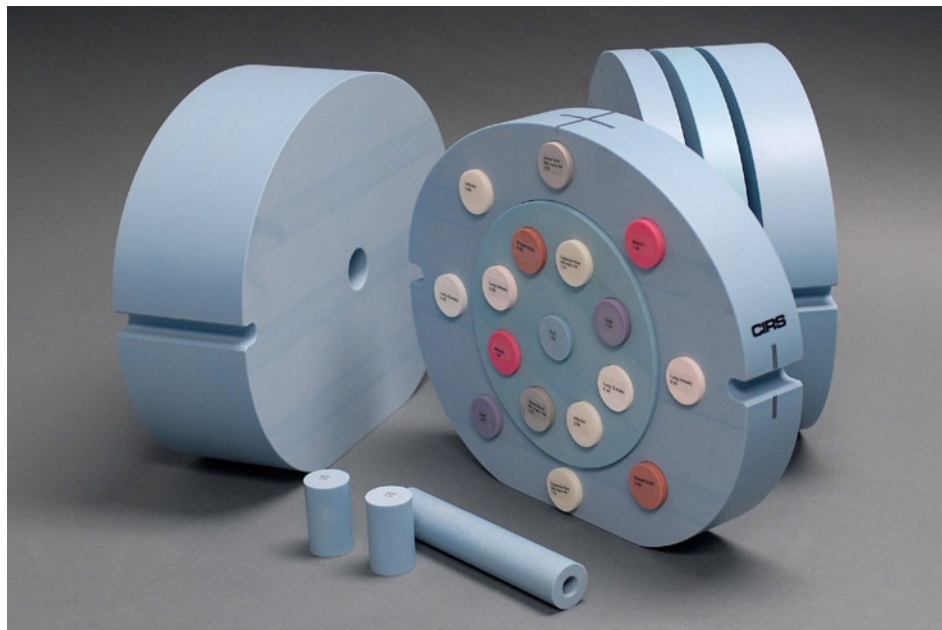


# CBCT Electron Density Phantom

Model 062A



## *INCREASE HU VALUE CONFIDENCE FOR ADAPTIVE RT*

The Cone Beam (CBCT) Electron Density Phantom is an extended version of the CIRS Model 062 Electron Density Phantom and specifically designed for Cone Beam CT Imaging systems. Preliminary data shows that there may be differences between the HU readings for Diagnostic CT and Cone Beam CT. The geometry of the Cone Beam CT requires additional material and suggests that off central axis measurements should be taken.

The phantom was designed in collaboration with Dr. Peter H. Cossmann, PhD to provide a reliable tool for CT number to electron density calibration in volumetric imaging. Reliable CT calibration curves help enable treatment plan adaptation directly from Cone Beam CT data. Additionally, the phantom can accommodate any ion chamber for dose measurements and validation of heterogeneity correction based on the corrected CT calibration curve.

The Model 062A CBCT Electron Density Phantom's size covers geometries for imagers with dimensions of up to 40 cm x 40 cm. It is made of Plastic Water® and contains the

same set of tissue equivalent electron density inserts as the standard Model 062. Additional interchangeable slabs allow for repositioning of the electron density section with an increment of 2.5 cm.

### *Features*

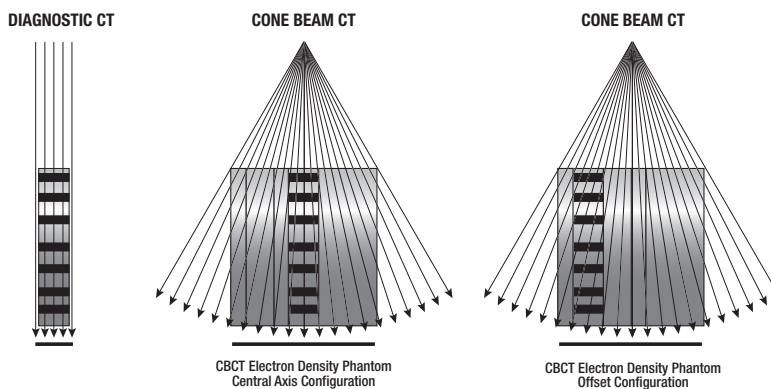
- Can be used for multi-slice CT and Cone Beam CT
- Can be configured for central axis and off-set measurements
- Manufactured from durable epoxy
- Tissue equivalent inserts can be positioned at 17 different locations
- Special marker inserts enable quick assessment of distance registration
- All materials accurately simulate indicated tissue within CT and Cone beam CT energy range

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A large number of HU readings can be obtained by placing the electron density plugs in different positions both in central axis and offset configurations. Using the equation of curve fitting for collected values, a CBCT to electron density calibration curve can be calculated.

**SPECIFICATIONS**

**MODEL 062A INCLUDES**

QTY	DESCRIPTION
1	Holder
1	Carry Case
1	User Guide
-	48 Month Warranty

<b>OVERALL DIMENSIONS:</b>	25 cm x 33 cm x 27 cm (9.8" x 13" x 10.6")
<b>WEIGHT:</b>	40 lbs. (18 kg)
<b>MATERIALS:</b>	Water and Tissue Equivalent Epoxy Resin

QTY	MODEL NO.	DESCRIPTION
1	062A-01	CBCT Electron Density Head Insert
1	062A-02	CBCT Electron Density Body with Head Insert
1	062A-03	H <sub>2</sub> O Syringe Insert
2	062A-04	Lung (Inhale) Equivalent Insert
2	062A-05	Lung (Exhale) Equivalent Insert
2	062A-06	Breast (50% Gland / 50% Adipose) Equivalent - Replacement Insert
2	062A-07	Dense Bone (800 mg/cc HA) Equivalent Core Insert
2	062A-08	Trabecular Bone (200 mg/cc HA) Equivalent Insert
2	062A-09	Liver Equivalent Insert
2	062A-10	Muscle Equivalent Insert
2	062A-11	Adipose Equivalent Insert
2	062A-13	Distance Marker Insert
1	062A-14-CV501	Chamber Rod for CV501
1	062A-16	H <sub>2</sub> O Equivalent Insert

**MODEL 062A OPTIONAL ACCESSORIES**

MODEL NO.	DESCRIPTION
062A-12	*Titanium Rod Core Insert
062A-14-CV†	H <sub>2</sub> O Equivalent Insert With Cavity for Ion Chamber
062A-15	Dense Bone (800 mg/cc HA) Equivalent Insert
062A-17	*Dense Bone (1000 mg/cc HA) Equivalent Core Insert
062A-18	*Dense Bone (1250 mg/cc HA) Equivalent Core Insert
062A-19	*Cortical Bone Equivalent Core Insert
062A-20	*Dense Bone (1500 mg/cc HA) Equivalent Core Insert
062A-21	*Dense Bone (1750 mg/cc HA) Equivalent Core Insert
062A-26	Dense Bone (1000 mg/cc HA) Equivalent Insert
062A-27	Dense Bone (1250 mg/cc HA) Equivalent Insert
062A-28	Dense Bone (1500 mg/cc HA) Equivalent Insert
062A-29	Dense Bone (1750 mg/cc HA) Equivalent Insert

\* These inserts contain a 10 mm diameter core of indicated bone reference surrounded by H<sub>2</sub>O background. Hydroxyapatite (unit mg/cc) in H<sub>2</sub>O background Plugs to accommodate chambers, TLD's and film available upon special request.

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

Please refer to 062 Data sheet for physical density, electron density, and relative electron density of inserts listed above.

**References:**

P. Cossmann, A Stuessi, C von Briel, Characterisation of a Linac Cone-Beam-CT Option: What is the Future Potential for Treatment Planning? SU-GG-T-536, Medical Physics, Vol. 35, No. 6, June 2008

P. Cossmann, U Gneveckow, C von Briel Characterisation of a Linac Cone-Beam-CT Option: What is the Future Potential for Treatment Planning? SSK17-04, RSNA Scientific Assembly and Annual Meeting Program 2008, p. 546

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PH Cossmann, V. Varchena A novel phantom design for the electron density calibration of a linac CBCT option, Zeitschrift fuer Medizinische Physik, submitted

