

Model DTP-008 Dynamic Thorax 3D QA Phantom

The Model DTP-008 Dynamic Thorax Phantom is designed to investigate and minimize the impact of organ motion and patient positioning errors in radiation therapy. It is the first commercially-available dynamic QA phantom, developed for image acquisition, treatment planning and dose delivery.

The Dynamic Thorax Phantom is manufactured from materials that mimic tissues within 1% from 50 keV to 25 MeV. The phantom accurately represents average human thorax anatomy in shape, proportion and structure.

Tumors of various size, shape and density can be positioned within the lungs, and means are provided for placement of TLD and MOSFET detectors directly within the tumor volume.

A computer-controlled actuator applies complex three-dimensional motions to the tumors within the phantom body. Linear target motion in the superior/inferior direction can be isolated from lateral and anterior/posterior motion in both frequency and amplitude. Two motions can be synchronized to one another enabling sinusoidal and other complex motions to be achieved with sub-millimeter accuracy and reproducibility. The system includes 15 pre-set motion profiles. Upon special request the phantom body can be modified for cardiac, abdominal, pelvic or head and neck applications.

Features:

- ▶ Evaluate image acquisition and measure tumor dose of static and dynamic targets
- ▶ Assess temporarily-modulated beam deliveries
- ▶ Calibrate various real-time tumor localization and tracking devices
- ▶ IMRT and IGRT applications

Reference: P. Rassiah, J. Tanyi, C. Cheng, V. Varchena, M. Fuss, B. Salter: "Dosimetric Evaluation of Target Dose in Stereotactic Body Radiation Therapy (SBRT) of Lung Using a Dynamic Motion Anthropomorphic Phantom." 2004 APM PO-T-143 Poster



Model DTP-008 includes:

- ▶ Base plate
- ▶ Gating platform
- ▶ Tissue equivalent thorax section
- ▶ Chest plate with 4 tracker posts and reflective balls
- ▶ Motion actuator box
- ▶ Control unit with 15 programable motions
- ▶ Remote control with 60 ft cable
- ▶ CD-ROM with motion and profile programs

Interchangeable Dosimeter Rods

not included – specify as extra cost item

008-05	MOSFET rod
008-06	Microchamber rod – specify chamber type
008-08	Radiochromic film rod
008-011	Gel Dosimetry rod

Material	Density, g/cc	Electron Density x 10 ²³ , per cc	Ratio to H ₂ O
Plastic Water®-DT	1.04	3.35	1.003
Lung	0.21	0.89	0.207
Bone	1.60	5.03	1.506
Soft-tissue target	1.06	3.43	1.028

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Specifications

Cycle time:	minimum: 3.5 s maximum: unlimited
Motion type:	15 pre-set motion profiles
Maximum IS motion:	40 mm
Maximum AP/LR motion:	7 mm

865 Easthagan Drive, Nashville, Tennessee 37217 USA

phone 615 391 3076 800 635 2662 fax 615 885 0285 www.cnmcco.com

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