ASTM-2002 Phantom for Testing Compliance of Implants within MRI Environments

Introduction

The ASTM phantom has been designed for evaluation of induced heating near a passive medical implant and its surroundings during Magnetic Resonance Imaging (MRI). Its shape is a strong simplification of the human torso and filled with liquid or gel material approximating human tissue [1].

Dimensions

**Side view ASTM Phantom**

- Side wall thickness: 6 ± 0.2mm
- Bottom thickness: 12 ± 0.2mm
- Inside depth: 165.1 ± 0.2mm
- Outside height: 177.1 ± 0.2mm
- Empty weight: Approx. 7.2 kg

**Top view ASTM Phantom**

Note: Dimensions in mm
Construction

The ASTM Phantom is manufactured of transparent Plexiglas (PMMA). To increase the reproducibility of the evaluation, the bottom of the phantom has 0.25mm depth milled reference lines spaced at intervals of 10mm. All 50mm the reference lines depth is 0.5mm and the centerline depth is 1.0mm.

Liquid Compatibility

The phantom material is compatible with sugar- and oil-based tissue simulating liquids. It is not compatible with Triton or DGBE based liquids.

Probe Positioner

A probe positioner made of PMMA has been developed for the phantom. This positioner can be adjusted along 3 axes, allowing accurate positioning of all SPEAG probes. The compatible field probes include E-field, H-field, dosimetry (SAR) and temperature probes and can be used inside a clinical MRI scanner. The positioner enables repeatable measurements in the empty and liquid filled phantom of ±2mm.

References


