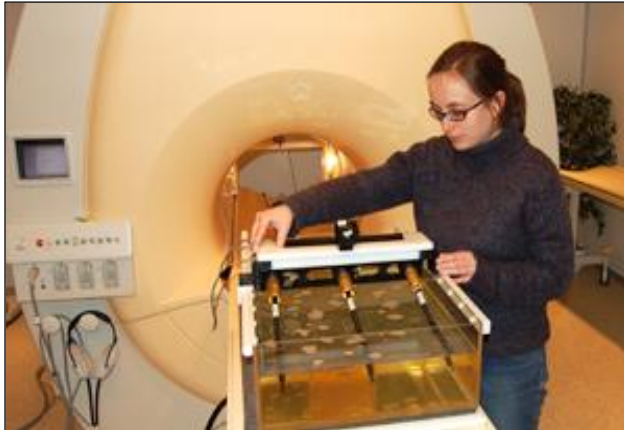


## ASTM-2002 Phantom for Testing Compliance of Implants within MRI Environments

### 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



**Sidewall thickness:**

$6 \pm 0.2\text{mm}$

**Bottom thickness:**

$12 \pm 0.2\text{mm}$

**Inside depth:**

$165.1 \pm 0.2\text{mm}$

**Outside height:**

$177.1 \pm 0.2\text{mm}$

**Empty weight:**

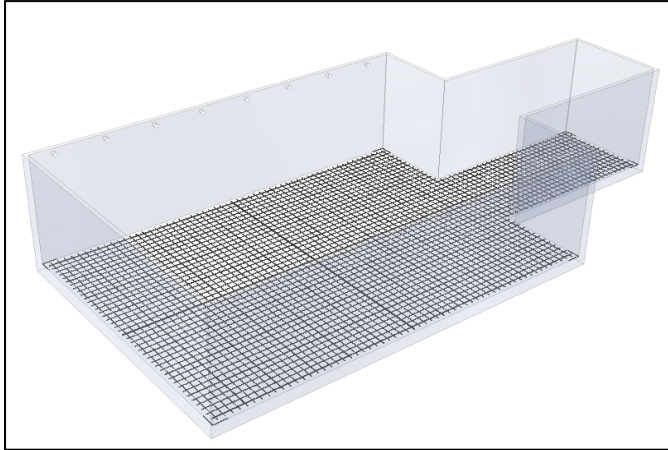
Approx. 7.2 kg

Top view ASTM Phantom



Note: Dimensions in mm

## Construction

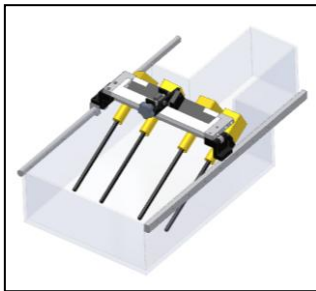


The ASTM Phantom is manufactured of transparent Plexiglas (PMMA). To increase the reproducibility of the evaluation, the bottom of the phantom has 0.25mm depth milled reference lines spaced at intervals of 10mm. All 50mm the reference lines depth is 0.5mm and the centerline depth is 1.0mm.

## 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  $\pm 2$ mm.

## References

- [1] Standard F2182-02a, "Standard Test Method for Measurement of Radio Frequency Induced Heating Near Passive Implants During Magnetic Resonance Imaging", ASTM International. For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org).
- [2] Standard F2213-06, "Standard Test Method for Measurement of Magnetically Induced Torque on Medical Devices in the Magnetic Resonance Environment", ASTM International. For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org).
- [3] Standard F2503-05, "Standard Practice for Marking Medical Devices and Other Items for Safety in the Magnetic Resonance Environment", ASTM International. For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org).
- [4] Standard F2119-01, "Standard Test Method for Evaluation of MR Image Artifacts from Passive Implants", ASTM International. For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org).
- [5] Standard F2052-06e1, "Standard Test Method for Measurement of Magnetically Induced Displacement Force on Medical Devices in the Magnetic Resonance Environment", ASTM International. For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org).