

# Brachytherapy QA Phantom

Model 045B



## Solution to AAPM TG128

A robust prostate brachytherapy QA program ensures accurate image-guidance and dosimetry calculations. The CIRS Model 045B offers a complete solution for implementing a QA program specific to transrectal ultrasound guidance of prostate brachytherapy, as recommended by AAPM Task Group 128.<sup>1</sup>

The phantom enables users to check key imaging parameters such as depth of penetration, axial and lateral resolution, distance, area, volume, and geometric consistency with the treatment planning system.

The phantom is supplied with a water tank for vertically coupling the transducer to the phantom scanning membrane. Brachytherapy needle grid QA can be accomplished using the space available inside the water tank as specified by Goldstein et al.<sup>2</sup>

The tank has two angled slots to allow the phantom to be positioned at a 30° angle which simplifies use with floor-

mounted TRUS systems. When testing table-mounted TRUS systems, the phantom membrane can be oriented vertically. (See back page for images.)

### Benefits:

- Geometric consistency with the treatment planning
- Water tank allows for phantom coupling and needle guidance measurements.

### References:

1. Pfeiffer, Douglas, et al., AAPM Task Group 128: Quality assurance tests for prostate brachytherapy ultrasound systems. *Med. Phys.*, vol. 35 (12), pgs. 5471-5489, December 2008.

2. Goldstein, A., Yudelev, M., Sharma, R.K. and Arterbery, E. (2002), Design of Quality Assurance for Sonographic Prostate Brachytherapy Needle Guides. *Journal of Ultrasound in Medicine*, 21: 947-954. doi:10.7863/jum.2002.21.9.947

US Patent #5196343.

**CIRS**

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Phantom rests inside the tank during imaging tests – ensures consistent acoustic coupling with no gel to clean up.

SPECIFICATIONS

|                           |                                 |
|---------------------------|---------------------------------|
| DIMENSIONS                | 14 x 11 x 7.5 cm                |
| PHANTOM WEIGHT            | 4 lbs. (1.5 kg)                 |
| HOUSING MATERIAL          | PVC Plastic                     |
| TANK MATERIAL             | ABS                             |
| MEMBRANE                  | Saran-based laminate            |
| TISSUE-MIMICKING MATERIAL | Zerdine® solid elastic hydrogel |

MODEL 045B INCLUDES

| QTY | DESCRIPTION               |
|-----|---------------------------|
| 1   | Brachytherapy QA Phantom  |
| 1   | Water Tank                |
| -   | User Guide                |
| -   | 48-Month Warranty         |
| -   | Certificate of Compliance |

ZERDINE® PROPERTIES

Freezing point: 0° C  
 Melting point: Above 100° C  
 Speed of Sound: 1540 m/s  
 Other: Compatible with harmonic imaging

INTERNAL "N" GRID

Number of targets: 13  
 Wire: 500-micron, nylon monofilament

PROBE RETRACTION GRID

Number of targets: 5  
 Wire: 100-micron, nylon monofilament  
 Spacing: 0.5 cm and 1 cm

VOLUME TARGETS

Material: Zerdine® gel-hyperechoic with respect to background  
 Size of target 1: ~4 cc  
 Size of target 2: ~9 cc  
 Size of target 3: ~20 cc

