

# Tissue-Equivalent Phantom for Mammography

Model 011A



## A REFINED QUALITY ASSURANCE TOOL FOR TODAY'S ADVANCED IMAGING SYSTEMS

Model 011A is a tissue-equivalent, anthropomorphic phantoms designed to test performance of any mammographic system. Simulated calcifications, fibrous ducts, and tumor masses are embedded into the phantom as test objects. Test objects range in size to allow system checks at varying levels of difficulty.

CIRS resin material mimics the photon attenuation coefficients of a range of breast tissues. The average elemental composition of the mimicked tissue is based on the individual elemental compositions of adipose and glandular tissues as reported by Hammerstein.

Attenuation coefficients are calculated by using the "mixture rule" and the Photon Mass Attenuation and Energy Absorption Coefficient Table of J.H. Hubbell.

### Features

- Realistically Shaped
- Tissue Equivalent
- Monitor Image Quality & Dose

The methodology and design of these phantoms was developed by Dr. Panos Fatouros and his associates at the Medical College of Virginia.

### References:

Hammerstein R., Miller D., White D., et al; Absorbed Dose in Mammography; *RADIOL- OGY*;130:485-491.

Hubbell J.H.; *INTERNATIONAL JOURNAL RADIATION ISOT*; Vol. 33:1269-1290; 1982.

Fatouros PP, Skubic S.E., Goodman H. The Development and Use of Realistically Shaped, Tissue- equivalent Phantoms for Assessing the Mammographic Process. *Radiology*, 1985 157(p):32.

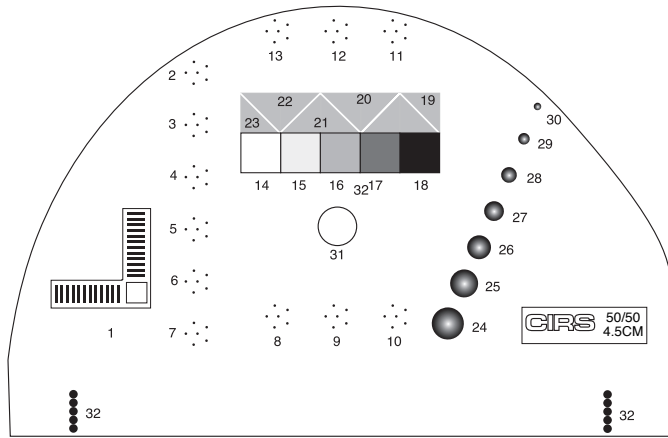
Skubic S.E., Fatouros PP. Absorbed Breast Dose: Dependence on Radiographic Modality and Technique, and Breast Thickness. *Radiology*,1986, 161:263-270.

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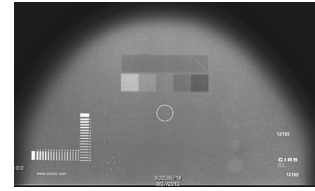
[WWW.CIRSINC.COM](http://WWW.CIRSINC.COM)

**CIRS**

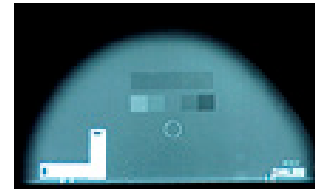
Tissue Simulation & Phantom Technology



**SCHEMATIC DRAWING**



**CT IMAGE**



**X-RAY IMAGE**

**SPECIFICATIONS**

**LINE PAIR TARGET**

- 1. 5 to 20lp/mm (17 segments with 5 lines each)

**CAC03 SPECS GRAIN SIZE (MM)**

- 2. 0.130
- 3. 0.165
- 4. 0.196
- 5. 0.230
- 6. 0.275
- 7. 0.400
- 8. 0.230
- 9. 0.196
- 10. 0.165
- 11. 0.230
- 12. 0.196
- 13. 0.165

**STEP WEDGE 1 CM THICK**

- 14. 100% gland
- 15. 70% gland
- 16. 50% gland
- 17. 30% gland
- 18. 100% adipose

**NYLON FIBERS DIAMETER SIZE (MM)**

- 19. 1.25
- 20. 0.83
- 21. 0.71
- 22. 0.53
- 23. 0.30

**HEMISPHERIC MASSES**

75% GLANDULAR / 25% ADIPOSE THICKNESS (MM)

- 24. 4.76
- 25. 3.16
- 26. 2.38
- 27. 1.98
- 28. 1.59
- 29. 1.19
- 30. 0.90

**OPTICAL DENSITY**

- 31. Reference zone

**EDGE OF BEAM**

- 32. Localization target

**PHANTOM SPECIFICATIONS**

Dimensions: 18.5 L x 12.5 H x 4.5cm W  
Weight: 2 lbs. (0.7 kg)

**MATERIALS**

Phantom: Epoxy Resin  
Background: BR5050  
Adipose layer: BRFAT  
Specs: Calcium Carbonate

**MODEL 011A INCLUDES**

Tissue-Equivalent Mammography Phantom  
Adipose Tissue-equivalent layer (0.5 cm thick)  
User Guide  
60-Month Warranty

