

Tissue-Equivalent Phantoms for Mammography

Models 010 & 011A



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

Model 010 and 011A are 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.

Model 010 phantoms are available in 4, 5 and 6 cm thickness with specified glandular tissue compositions. Model 011A is 4.5 cm thick and simulates an average glandular tissue composition. Both phantoms include a removable 0.5 cm adipose tissue-equivalent layer.

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.

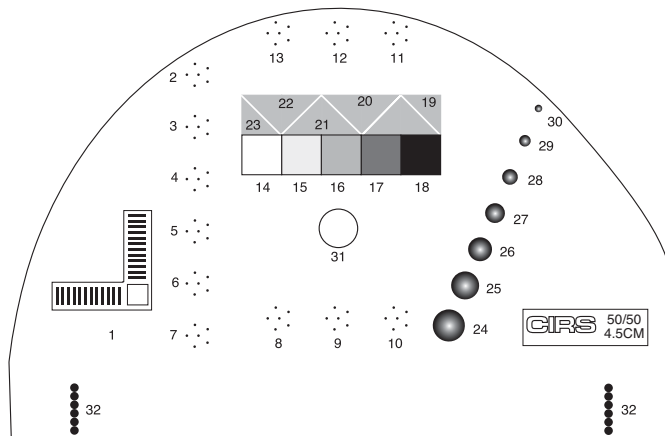
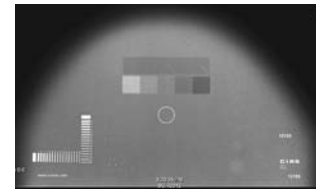
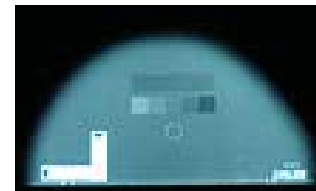
References:

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.


SCHEMATIC DRAWING

CT IMAGE

X-RAY IMAGE

SPECIFICATIONS

LINE PAIR TARGET

1. 20 lp/mm

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)
(MODEL 010B, 010D, 011A)

55% GLANDULAR / 45% ADIPOSE
THICKNESS (MM)
(MODEL 010A, 010C)

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: 2.5 cm x 18.5 cm
Weight: 2 lbs. (0.7 kg)

MATERIALS

Phantom: Epoxy Resin
Specs: Calcium Carbonate

MODELS 010 & 011A INCLUDE

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

MODELS 010 & 011A OPTIONS

MODEL NO.	DESCRIPTION
010A	Tissue-Equivalent Mammography Phantom, 5.0 cm thick 30% Glandular/70% Adipose
010B	Tissue-Equivalent Mammography Phantom, 4.0 cm thick 50% Glandular/50% Adipose
010C	Tissue-Equivalent Mammography Phantom, 6.0 cm thick 20% Glandular/80% Adipose
010D	Tissue-Equivalent Mammography Phantom, 5.0 cm thick 50% Glandular/50% Adipose
011A	Tissue-Equivalent Mammography Phantom, 4.5 cm thick 50% Glandular/50% Adipose