

Mammography Research Set

Designed to encompass the full range of size, glandularity and thickness encountered in clinical mammography.

The CIRS mammography research set includes tissue equivalent phantoms 4, 5 and 6 cm thick. Each phantom contains identical embedded details (see map 011A). The glandular content of each phantom is 50%, 30%, and 20% respectively. Also included are phototimer compensation plates enabling a range of thickness from 0.5 cm to 7 cm with a glandular content of 30%, 50% and 70%.

One compensation plate contains embedded details for evaluation of image quality. A 30 power hand held microscope and heavy duty foam lined carrying case are included.

CIRS resin material mimics the photon attenuation coefficients of a range of breast tissues. Average elemental composition of the human breast being mimicked is based



Model 012A

in the individual elemental composition of adipose and glandular tissue 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.

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

REFERENCES:

1. Skubic S.E., Fatouros P.P. Absorbed Breast Dose: Dependence on Radiographic Modality and Technique, and Breast Thickness. *RADIOLOGY*, 1986, 161:263-270.
2. Fatouros P.P., 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.

Features

- Enable evaluation of image quality under varying degrees of thickness and glandularity
- Provides accurate reliable test for radiation dose
- Assures consistent production of diagnostically useful images

Model 012A Specifications:

- **Line pair target**
1. 20 lp/mm

- **Ca CO₃ 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

- **Fibers** Nylon in wax inset
diameter size (mm)
19. 1.25
20. 0.83
21. 0.71
22. 0.53
23. 0.30

- **Hemispheric Masses**

Breast Thickness	Glandularity	
	Background	Mass
4 cm	50/50	75/25
5 cm	30/70	55/45
6 cm	20/80	55/45

- **Mass Thickness (mm)**

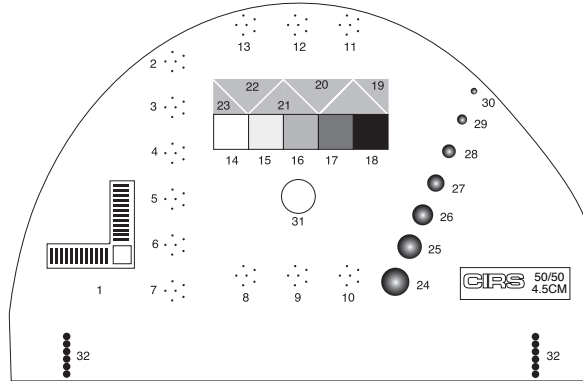
- 24. 4.76
- 25. 3.16
- 26. 2.38
- 27. 1.98
- 28. 1.59
- 29. 1.19
- 30. 0.90

- **Optical Density**

- 31. reference zone

- **Edge of Beam**

- 32. localization target



Embedded Detail For Phototimer Compensation Plate

- **Contrast Stepwedge**
(5 mm thickness)
1. Adipose tissue
2. Glandular tissue

- **Hemispheric Masses**
75% Glandular Tissue
Thickness (mm)
3. 3.16
4. 2.38
5. 1.98
6. 1.59
7. 1.19
8. 0.90

- **Line pair test target**
20 lp/mm

- **Specs**
Ca CO₃ (mm)
9. 0.39
10. 0.27
11. 0.23
12. 0.20
13. 0.16
14. 0.13
Alumina (mm)
15. 0.39
16. 0.27
17. 0.23
18. 0.20
19. 0.16
20. 0.13

- **Fibril**
21. Diameter=25 Microns
High Contrast
22. Line pair test target
20 lp/mm

