

# Mammography Research Set

Model 012A



## ***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%.

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 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.

One compensation plate contains embedded details for evaluation of image quality. A heavy duty foam lined carrying case is included.

### ***Features***

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

### **References:**

<sup>1</sup> Hammerstein R., Miller D., White D., et al; Absorbed Dose in Mammography; Radiology;130:485-491.

<sup>2</sup> Hubbell J.H.; International Journal of Radiation ISOT; Vol. 33:1269-1290; 1982.

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# **CIRS**

Tissue Simulation & Phantom Technology

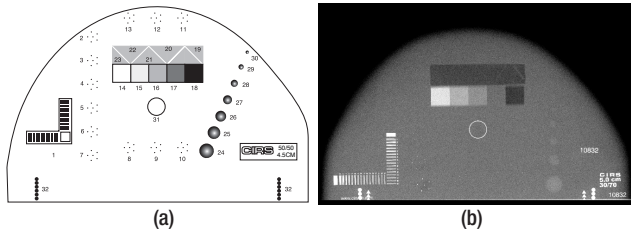


Figure 1. (a) Model 010A, 010B & 010C Target Map & (b) Model 010A Mammographic image

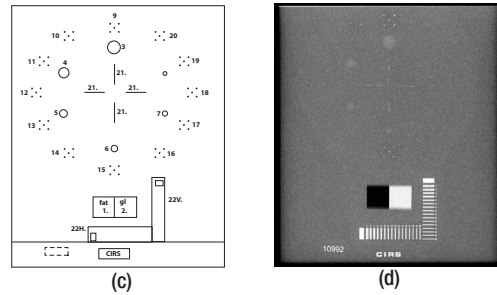


Figure 2. (a) Model 014F Target Map and (b) Model 014F Mammographic image

**TEST OBJECTS**

(MODEL 010A, 010B, 010C)

<b>1 LINE PAIR TEST TARGET</b> 20 LP/MM	<b>CACO, SPECKS GRAIN SIZE (MM)</b> 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	<b>STEP WEDGE 1 CM THICK</b> 14. 100% gland 15. 70% gland 16. 50% gland 17. 30% gland 18. 100% adipose  <b>NYLON FIBERS DIAMETER SIZE (MM)</b> 19. 1.25 20. 0.83 21. 0.71 22. 0.53 23. 0.30	<b>HEMISPHERIC MASSES 75% GLANDULAR/ 25% ADIPOSE THICKNESS (MM)</b> (Model 010B)  <b>55% GLANDULAR/ 45% ADIPOSE THICKNESS (MM)</b> (Model 010A, 010C) 24. 4.76 25. 3.16 26. 2.38 27. 1.98 28. 1.59 29. 1.19 30. 0.90
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**EMBEDDED DETAIL FOR PHOTOTIMER COMPENSATION PLATE (MODEL 014F)**

<b>CONTRAST STEP WEDGE (5 MM THICKNESS)</b> 1. Adipose tissue 2. Glandular tissue	<b>CACO, SPECKS GRAIN SIZE (MM)</b> 9. 0.39 10. 0.27 11. 0.23 12. 0.20 13. 0.16 14. 0.13  <b>ALUMINA (MM)</b> 15. 0.39 16. 0.27 17. 0.23 18. 0.20 19. 0.16 20. 0.13	<b>FIBRIL</b> 21. Ø 25 Microns High Contrast 22. Line pair test Target 20 lp/mm
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**MODEL 012A INCLUDES**

QTY	PART NO.	COMPONENT DESCRIPTION
1	010A	Tissue-Equivalent Mammography Phantom, 5 cm thick 30% Gland/70% Adipose
1	010B	Tissue-Equivalent Mammography Phantom, 4 cm thick 50% Gland/50% Adipose
1	010C	Tissue-Equivalent Mammography Phantom, 6 cm thick 20% Gland/80% Adipose
2	ST10125-05-BR3070	10 x 12.5 x 0.5 cm Soft Tissue Equivalent Slab, 30% Gland/70% Adipose
2	ST10125-10-BR3070	10 x 12.5 x 1 cm Soft Tissue Equivalent Slab, 30% Gland/70% Adipose
2	ST10125-20-BR3070	10 x 12.5 x 2 cm Soft Tissue Equivalent Slab, 30% Gland/70% Adipose
2	ST10125-05-BR7030	10 x 12.5 x 0.5 cm Soft Tissue Equivalent Slab, 70% Gland/30% Adipose
2	ST10125-10-BR7030	10 x 12.5 x 1 cm Soft Tissue Equivalent Slab, 70% Gland/30% Adipose
2	ST10125-20-BR7030	10 x 12.5 x 2 cm Soft Tissue Equivalent Slab, 70% Gland/30% Adipose
2	ST10125-05-BR5050	10 x 12.5 x 0.5 cm Soft Tissue Equivalent Slab, 50% Gland/50% Adipose
2	ST10125-10-BR5050	10 x 12.5 x 1 cm Soft Tissue Equivalent Slab, 50% Gland/50% Adipose
1	ST10125-20-BR5050	10 x 12.5 x 2 cm Soft Tissue Equivalent Slab, 50% Gland/50% Adipose
1	014F	12.5 x 10 x 2 cm Mammographic Slab w/ Embedded Detail Plate, 50% Gland/50% Adipose
1	-	User Guide
1	-	48 Month Warranty

<b>DIMENSIONS:</b>	50.8 cm x 45.7 cm x 20.3 cm (20" x 18" x 8")
<b>PHANTOM WEIGHT:</b>	11 kg (24.15 lb)
<b>MATERIALS:</b>	Epoxy Resin

