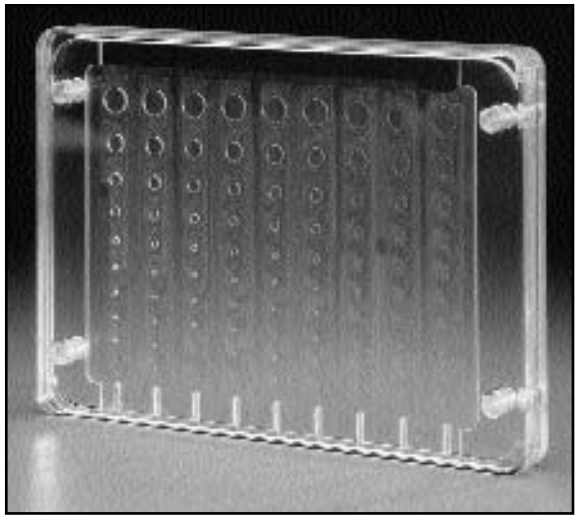
Quality Control in
Mammography

RMI 180

GAMMEX RMI®

Mammographic Contrast-Detail Phantom

RMI 180



A User's Guide

Product Warranty

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The Products are covered by the warranty set forth in the following paragraphs. The warranty is extended only to the purchaser of the Products directly from Seller (or an authorized dealer of Seller) as new merchandise. For a period of twelve (12) months from the date of original delivery to Buyer, the Products are warranted to be free from functional defects in materials and workmanship, provided they are operated under condition of normal use, and that repairs and replacements are made in accordance herewith. Seller does not warrant bulbs. The foregoing warranty shall not apply to Products that have been disassembled, altered or repaired (other than proper replacement bulbs) other than by Seller or if the Product has been subject to abuse, misuse, negligence or accident.
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Product Overview

The Mammographic Contrast-Detail Phantom RMI 180 provides a useful method of objectively assessing the overall low contrast image quality of a mammographic system.

The RMI 180 allows the user to identify the theshold contrast when the mammographic system is operating optimally and then continue to monitor the threshold contrast routinely.

The phantom also provides a useful comparison when evaluating different mammographic systems, screen-film combinations, and processing conditions.

Specifications

Construction .....Acrylic

Disk Diameter .....0.312 to 7.071 mm

Disk Height .....0.062 to 1.000 mm

Size .....1.5 x 15 x 11 cm
(0.6 x 5.9 x 4.3 in.)

Weight .....278 g (10 oz.)

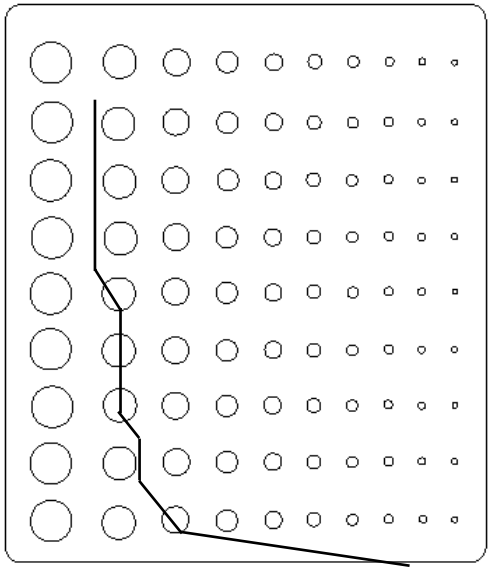

Figure 3: Example of a contrast-detail curve.

Sales and Service

GAMMEX RMI is committed to satisfying our customers needs. If you have any questions, comments, or suggestions regarding our products and service, please call or fax us.

Our Sales and Service Department is open Monday through Friday, 8:00 am to 6:30 pm Central Time.

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Evaluating the Test Results

When the mammographic system is working at its optimum performance level, obtain a baseline contrast-detail curve which will provide a standard for evaluations that follow.

1. View images in a dark room with a properly masked mammographic viewbox.
2. For each row of the image, mark on the score sheet the smallest disk which appears, in your opinion, to be reliably distinguishable.
3. Stop counting at this point, i.e., if the next smaller disk is not visible, but additional disks of smaller size are, do not count them.
4. Plot a graph of disk depth versus the disk diameter for the disks which are just distinguishable. This is the contrast-detail curve.
5. Compare this curve against the baseline contrast-detail curve.
6. The background density of the Contrast-Detail phantom should be approximately the same for all images, approximately 1.50 to 1.70. Variations in this density will produce different results.

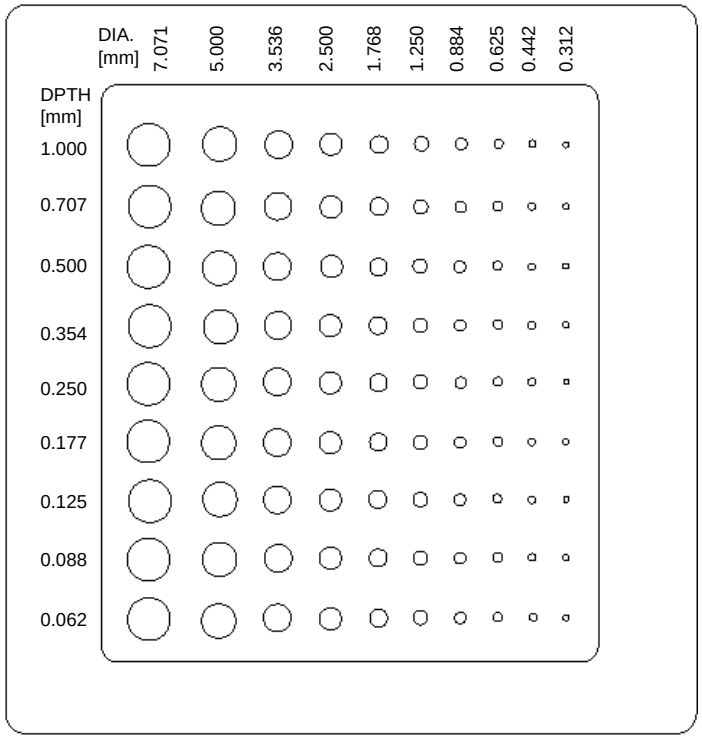

Figure 1: Matrix of hole depths and diameters.

Using the Phantom

1. Load the film in the cassette.
2. Place the cassette in the cassette holder.
3. Place the Contrast-Detail phantom on the cassette holder and position it so the edge of the phantom with the smallest disk diameters is aligned with the chest wall edge of the image receptor.

   On digital stereotactic systems with smaller fields of view, specific portions of the phantom can easily be imaged as well.
4. Place an acrylic block on top of the phantom, covering it completely. Orientation is not critical, but should be consistent.

   This additional uniform thickness of acrylic should be used when imaging the phantom. Total attenuation thickness should be approximately that of an average breast, e.g., 4.5 cm. Hence, additional acrylic thickness should be approximately 35-50 mm. (More acrylic plates may be used to mimic various breast sizes. The markings on the acrylic plates should be aligned as well at the chest wall edge side of the cassette holder.)
5. Bring the compression device into contact with the phantom.

6. Verify the location of the phototimer sensor, i.e. it should be in the same location used for previous phantom images and completely covered by the phantom.

   OR

   Select the appropriate exposure time and mA for manually timed systems.
7. Make an exposure using 26 kVp, or the kilovoltage most commonly used clinically.
8. Plot the exposure time or mAs on the control chart if it is displayed after making the exposure.
9. Process the film in the processor used for mammographic films.

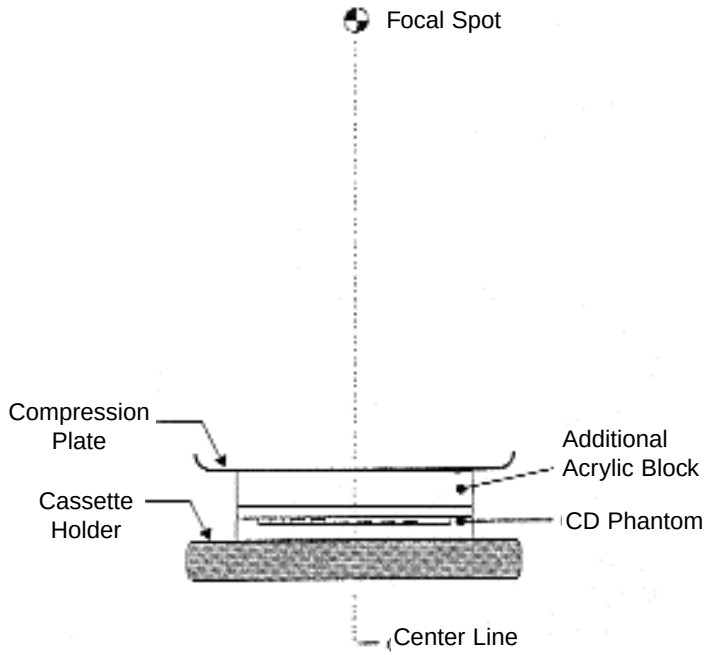

Figure 2: Setup for the Mammographic Contrast-Detail phantom.