

# CDMAM Phantom\*

Nuclear Associates Model 18-227

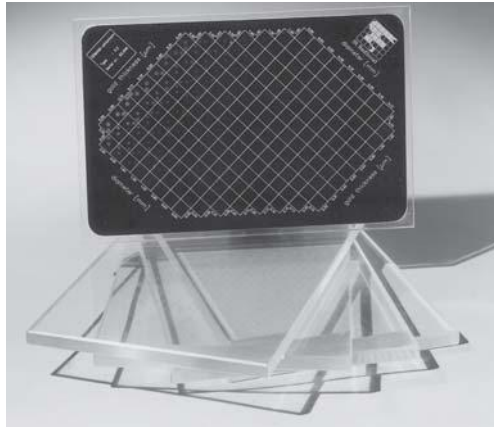
## Introduction

The CDMAM (Contrast Detail Mammography) Phantom was developed to evaluate conventional mammographic x-ray equipment, film, and cassettes. However, with the increase of digital imaging in mammography, especially when performing stereotactic breast needle biopsies and preoperative needle localizations, the phantom can aid in achieving improved image quality, processing, display quality, and speed in these new modalities.

### ***What makes the CDMAM Phantom so special?***

The CDMAM Phantom consists of an aluminum base with gold discs (99.99% pure gold) of varying thicknesses and diameters, which is attached to a Plexiglas® cover. The 5 mm thick Plexiglas cover (PMMA plate) has a 2 mm deep cavity which accommodates the aluminum base with gold discs. The assembly (PMMA and aluminum) has a Plexiglas-equivalent thickness of 10 mm, under standard mammography-exposure conditions.

The aluminum base is 0.05 mm thick Al 1050 (99.5% pure aluminum). The base has been polished and anodized black. Precisely measured gold discs of varying thickness (range = 0.05 to 1.60  $\mu\text{m}$ ) and diameter (range = 0.10 to 3.20  $\mu\text{m}$ ) have been attached to the base by means of evaporation. Finally, the base has been airbrushed to protect the gold discs.



- Specifically developed to determine if mammographic images are indicating objects with very low contrast and very small diameter
- For full-field analog and digital units
- Comparison of image quality with various screen-film combinations
- Evaluation of conventional, as well as digital and stereotactic modalities
- Determination of the optimum exposure technique, e.g., by variation of tube potential
- Comparison of image quality at various object thicknesses, by variation of the amount of Plexiglas® at a fixed density

## The “Gold Standard” of Mammographic Phantoms

The discs are arranged in 16 rows and 16 columns. Within a row, the disc diameter is constant, with logarithmically increasing diameter. The precision of the disc diameter and thickness makes the CDMAM Phantom an ideal tool for conducting contrast-detail and other image quality experiments.

A line pattern has been engraved onto the Plexiglas cover and treated with paint containing aluminum. The x-ray image will show a number of squares ordered in 16 columns and 16 rows, with the disc diameter shown for each row, and the disc thickness for each column.

### ***About the “Gold Standard” CDMAM Phantom***

The CDMAM Phantom includes a set of four Plexiglas plates, which are used for the simulation of different breast thicknesses. The plates are 10 mm thick and the same dimensions as the phantom. The plates are marked in one corner, for identification of the configuration of Plexiglas and phantom in an x-ray image. The phantom and Plexiglas plates match the standard mammography film size (18 x 24 cm).

Under standard mammography-exposure conditions (Mo-anode, 30  $\mu\text{m}$  Mo-filtration, 28 kVp), the phantom has a Plexiglas-equivalent thickness of 10 mm.

The actual attenuation of the CDMAM Phantom depends on the configuration of the phantom and Plexiglas plates. The effective energy of the phantom plane will be higher when more Plexiglas is added to the top and bottom of the phantom.

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### ***Using the CDMAM Phantom is easy***

To make an x-ray image, the CDMAM Phantom should be positioned on the bucky with the smallest disc diameters at the thorax side, in combination with one or more Plexiglas plates. The markings on the Plexiglas plates should be aligned at the thorax side of the bucky. On digital stereotactic systems with smaller fields of view, specific portions of the phantom can easily be imaged as well.

The density of the image has to be checked after the film has been processed. In a series of CD images, all images should approximately have the same densities in a reference-position on the film.

## Specifications

### **Dimensions**

**Plexiglas plates** 6.38 (w) x 9.45 (d) x 0.40 in (t) (162.5 x 240 x 10 mm)

**Aluminum base** 162.5 (w) x 240 (d) x 0.5 mm (t)

**Weight** 4.54 lb (2.06 kg)

### **Available model(s)**

**18-227** CDMAM Phantom, including four Plexiglas plates

For more information, receive our full product catalog, or order online, contact **Radiation Management Services** business of **Fluke Biomedical**: 440.248.9300 or [www.flukebiomedical.com/rms](http://www.flukebiomedical.com/rms).

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