

CDRAD Contrast Detail Digital and Conventional Radiography Phantom Model 07-652

- Optimized for evaluation of digital systems
- Improves diagnostic accuracy
- Can also be used for conventional radiography systems

Used to evaluate loss of detail in:

- Film digitizers
- Computed Radiography (CR) systems
- Display monitors
- Laser printers

Used to adjust and optimize:

- Image processing parameters
- Viewing conditions

Introduction

Most definitions of image quality in radiology are based on characterizing the physical properties of the image chain. However, medical diagnosis is not made by the image alone; observer perception greatly affects the result.

Digital radiography

The CDRAD Phantom from Nuclear Associates is an excellent tool for evaluating the imaging characteristics of digital radiographic systems, including stimulable phosphor computed radiography systems and teleradiography systems.

One of the principle concerns with the use of digital radiography, is the potential reduction in the visibility of detail due to the blurring introduced at various places within the system, such as the film digitizers, display monitors, and the sampling of the image into discrete pixels. Loss of detail is the image characteristic which can have an adverse affect on diagnosis. Resolution (bar phantom) test objects which are used to evaluate conventional x-ray imaging systems are generally not appropriate for evaluating digital systems. The CDRAD Phantom provides a reliable and objective evaluation of the loss of detail from blurring at any point within the system.

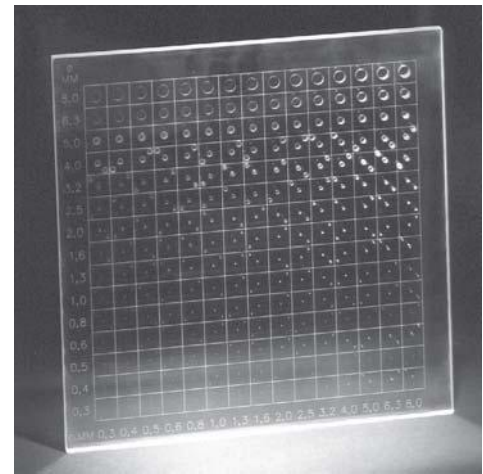
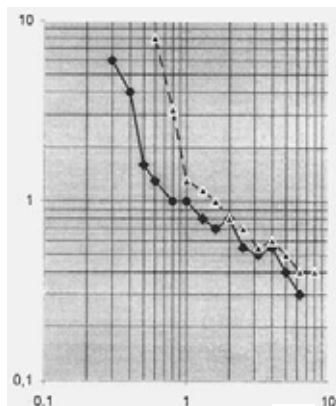


Image evaluation

- To evaluate the phantom image, the observer indicates the location of the second spot in each square. Correct indication proves that a contrast is actually seen
- At the transition from visible to invisible, it is difficult to decide in which corner the second spot is located, and the response equals pure chance
- The line connecting the central spots with the smallest visible diameter and contrast is called the Contrast Detail (CD) Curve
- For comparison of the imaging performance of different systems, phantom images are made under identical conditions and evaluated by the same observer at the same time. The better system will produce an image in which smaller contrasts and details are visible. This results in a shift of the CD curve to the lower left part of the image. (See graph)
- In the detail (vertical) direction, the diameter of the holes increases step-wise and logarithmically from 0.3 to 8.0 mm. The image shows 15 rows of spots with increasing detail



Contrast detail lines of monitor image (●) and the hard copy image (---) from the same digital equipment

Phantom specifications

- The CDRAD Phantom consists of a Plexiglas[®] tablet with cylindrical holes of exact diameter and depth (tolerances: 0.02 mm)
- The radiographic image of the phantom provides information about the imaging performance of the whole system
- The image shows 225 squares: 15 rows and 15 columns
- In each square, either one or two spots (the images of the holes) are present. The first three rows show only one spot, while the other rows have two identical spots; one in the middle and one in a randomly chosen corner. (See graph)
- The optical densities of the spots are higher than the uniform background
- In the contrast (horizontal) direction, the depth of the holes increases logarithmically, and the image shows 15 columns of spots with increasing contrast
- Comparison of the performance of several observers is also possible. The better performing observer produces a CD curve more to the lower left part of the image

Specifications

Dimensions 10.4 x 10.4 x 0.3 in thick (26.4 x 26.4 x 0.76 cm)

Weight 3 lb (1.34 kg)

Available model(s)

07-652 CDRAD Contrast Detail Digital and Conventional Radiography Phantom

See also CDMAMM Phantom (Model 18-227)

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.

Specifications are subject to change without notice.

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For additional information on the use of this phantom, see:

www.emory.edu/x-rays/sprawls/technology