MODEL L-656
RD/FL TEST TOOL

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Overview

The RD/FL Test Tool was designed to give the diagnostic medical physicist, radiologic technologist, and/or service engineer an easy method for a quick evaluation of the image quality and performance of the departmental diagnostic radiographic and fluoroscopic imaging systems.

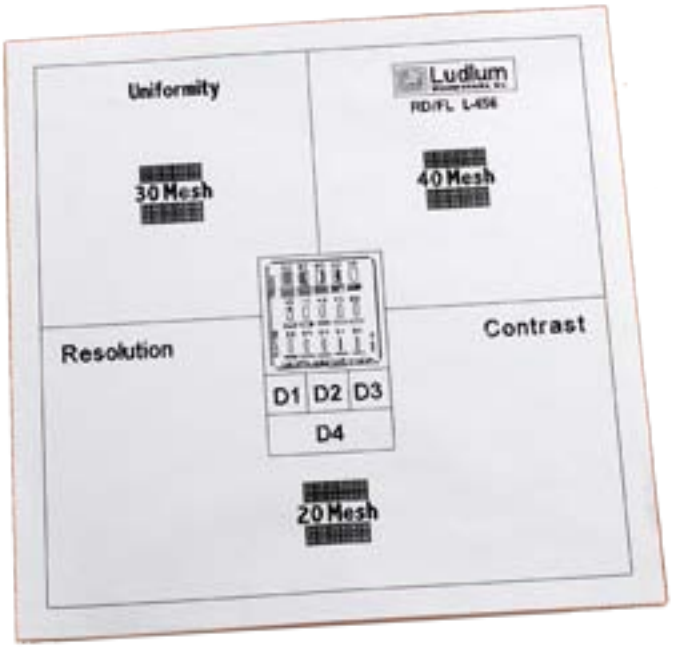
The RD/FL Test Tool provides and easy-to-use method for a quick overview of the constancy of the imaging system. For a standard R/F system, no more than 5-10 minutes should be required to complete the suggested protocol.

It is generally recommended that the test tool be utilized on all of the departmental radiographic and fluoroscopic equipment on at least a monthly basis.

At the center of the test tool is a line pair resolution pattern and a short contrast scale that allows simultaneous evaluation of the general resolution, contrast, and density uniformity of the imaging chain.

General Procedure

It is preferred that an imaging (chain) evaluation be performed at least monthly. More frequent evaluations are suggested to prevent any unexpected imaging problems before actual clinical procedures are performed with the equipment. For more sensitive procedures, like C-arm studies in the OR, consideration should be given to utilizing the test tool before each use of the equipment.



Radiographic Systems

1. When utilizing the automatic exposure control mode, the techniques typical for a small abdomen usually work best to properly image the test tool (e.g., 70 kVp, center cell). Manual techniques may also be used.
2. It is critical that the test tool be positioned the same for every exposure and for each (daily or monthly) evaluation. Specific location on the table or imaging surface should be noted for future reference.
3. Visually inspect the image on a standard view box and determine the smallest mesh pattern that is clearly visible. This value should also be recorded on the film. Also make note of the smallest pair that is clearly visible within the line pair resolution pattern. (It is useful to circle these areas on the film with a wax pencil or marker.
4. Measure the density of the four contrast squares and plot these values on a graph. Subtract the density of the #4 block from the #2 block and note this "contrast index value" on the graph as well.
5. Place the film in the appropriate QA file.

Fluoroscopic Systems

1. Place the test tool on the table.
2. Position the image intensifier tower approximately 30.5 cm (12 in.) above the table. The same image intensifier height should be used for every evaluation.
3. During fluoroscopy, while utilizing radiation safety methods (lead gloves, apron), center the test tool under the image intensifier. For proper visualization of the various targets, 70 kVp is recommended for the fluoro kV.
4. Evaluate the fluoroscopic image and determine the smallest mesh pattern that is clearly visible. Also make note of the smallest line pair that is clearly visible within the line pair resolution pattern. (It is useful to circle these areas on the film with a wax pencil or marker.)
5. Make a spot film image of the test tool. Process the film then visually inspect the image on a standard view box and determine the smallest mesh pattern and low-contrast target that is clearly visible. Also make note of the smallest line pair that is clearly visible within the line pair resolution pattern. Measure the density of the four contrast squares and plot these values on a graph. Subtract the density of the #4 block from the #2 block and note this "contrast index value" on the graph as well. Also make note of the kV and mAs utilized to create the film. If the image is acceptable, this should become the standard to measure future films against.

Results

Again, the results of the evaluation may be plotted on a graph rather than just recorded on the film or log sheet. Graphed results will make it easier to detect any trends that could adversely affect the performance of the system.

A properly functioning fluoroscopy system should be able to resolve at least the 20 mesh at the center of the image in the smallest mode. From image to image, the smallest mesh available should not decrease by more than one step. Changes in resolution on a film should be 2.8 lp/mm in 15.2 cm (6 in.) mode; and 2.5 lp/mm in 22.9 cm (9 in.) mode. The resolution should not decrease from a five-day average value by more than the smallest visible pair on the pattern.

The mAs for radiographic systems and the kVp and mA for fluoro systems should remain constant to within 10%. No increasing trends should be observed. However, it is possible to observe trends that do not move consistently in the same direction, but instead move either upward or downward over a longer period of time. In either case, any inconsistencies should be noted, and corrective action should be scheduled.