

FLUKE®

Biomedical

Nuclear Associates

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EZ CR-DIN Phantoms

Users Manual

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Section 1

General Information

1.1 How to Use the Phantom

1. Place the EZ CR-DIN Phantom on the imaging surface of the x-ray table. (The standard is DIN V 6868-58.)
2. Select the proper SID.
3. Install the CR Plate in the Bucky.
4. Select the technical factors in the generator; usually 10 mAs, and set the kVp at 72.
5. The initial use of the phantom will require the user to find the correct mAs and kVp that will be used on each exposure.
6. After exposure of the phantom, take the CR Plate and select the anatomical region that will allow you to see the six-step wedge (test objects). Typically, this will be the Abdomen Processing, but may vary with manufacturer. No Image Processing or raw data can also be used to visualize the region with no edge enhancement.

1.2 CR System to Print Film Only

If you are using a CR system to print film only, you will want to evaluate the film for the following:

1. You should be able to visualize the contrast step wedges, LP resolution phantom and the four (4) linearity squares.
2. The line-pair number should be recorded and compared to future exposures.
3. The #30 copper mesh should be evaluated for uniformity and sharpness.
4. Densities should be taken and recorded on the step wedges and linearity squares.
5. A density reading should also be taken in the free area and recorded.

Record the technical factors used in this room in order to visualize the step wedges and linearity square, since they will be used again. You will want to use these same factors next time you expose the phantom.

1.3 CR Images to be Viewed

If you are using CR images to be viewed on a soft-copy display, the image will be evaluated in a similar manner:

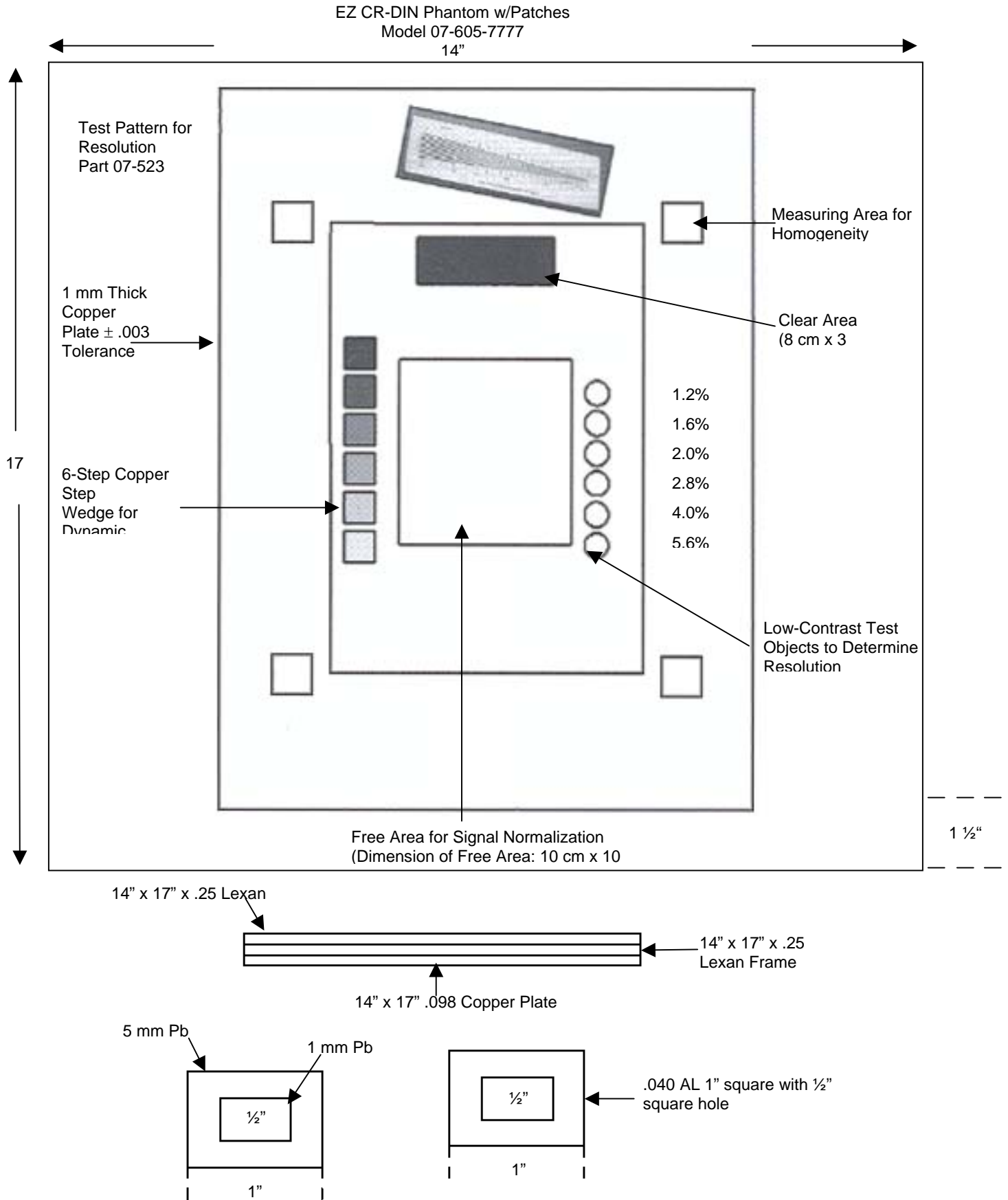
1. Slight adjustment of the window/level may be necessary to visualize the step wedge and low contrast objects on the monitor.
2. If the low contrast objects are not visualized, the mAs can be adjusted slightly to compensate. Be sure to stay within the manufacturer's recommended exposure range index.
3. The line-pair number should be recorded and compared to future exposure.
4. ROIs can be taken and recorded, and compared to future exposures.
5. The #30 copper mesh should be evaluated for uniformity and sharpness.
6. An ROI reading should also be taken in a region of the phantom free area and compared to future exposures.
7. You can now print a film of the phantom from the monitor. The printed image should be an exact image of what you see on the monitor. The patches should be visualized and the line-pair resolution should be the same, etc. If it is not, there is a problem somewhere.

Once the correct exposure factors and image processing are found to visualize the patches, and the system is displaying and/or printing these patches properly, as well as visualizing the other objects in the phantom, this process can be repeated on a regular basis (daily, weekly, etc.). This process is an effective way to monitor the output of CR readers, as well as evaluated network connectivity and filming outputs from soft-copy displays.

This process may also aid in making sure that x-ray room performance is also consistent. By alternating the acquisition of the CR image to a different room every day, you may find a problem in the room instead of the CR system.

Example

If your image doesn't look right, the first thing you should do is repeat it using the same room. If it still doesn't appear accurate, you may suspect the room or the CR system. You could isolate the problem by moving to another room and using the correct mAs and kVp you recorded on the initial image evaluation of that room. If the processed image turned out properly, one would suspect the first room is not working right. On the other hand, if the image still doesn't look correct, your CR system may not be functioning properly.



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