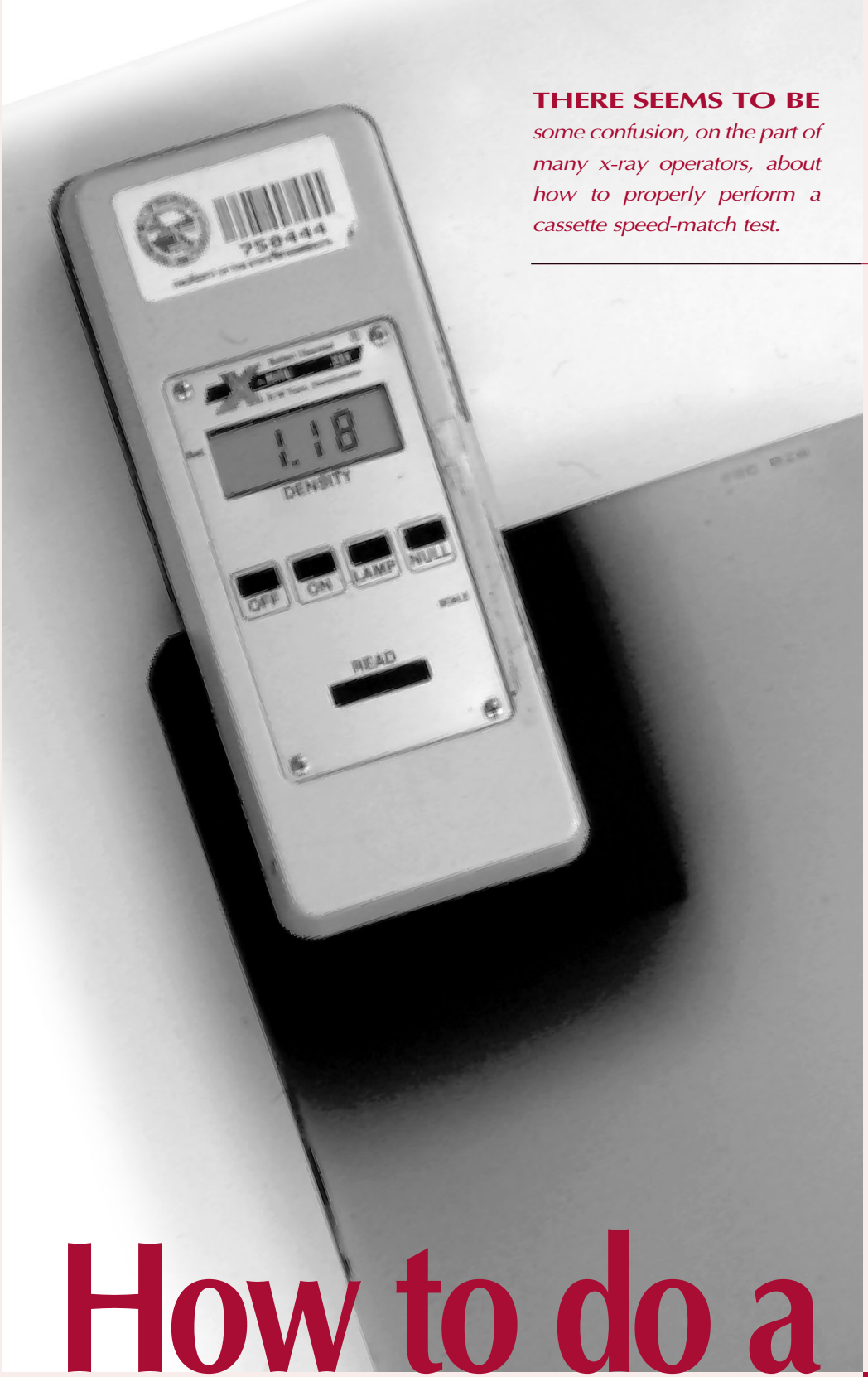


THERE SEEMS TO BE *some confusion, on the part of many x-ray operators, about how to properly perform a cassette speed-match test.*

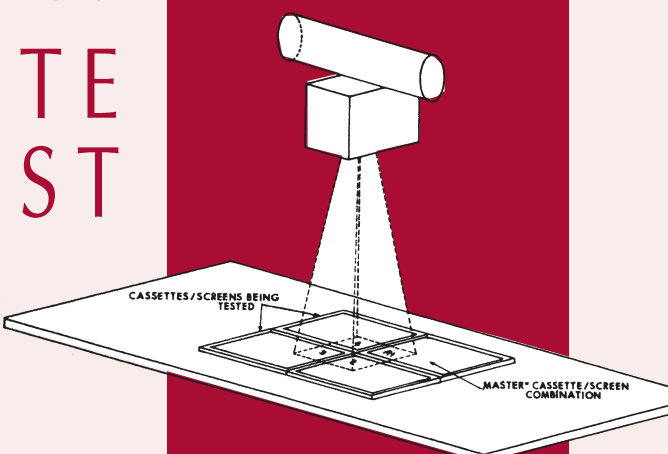
How to do a CASSETTE SPEED-MATCH TEST

Cassette speed is determined by three factors – the type of film used, the type of screen used, and the material used in the cassette. The cassette speed number is comparable to the ASA or ISO number used to designate film speed for conventional photographic film.

The speed match test is used to ensure that the effective film speed remains consistent from one cassette to another, unless you are purposely varying the speed for some specific reason. If you have cassettes with different effective speeds, and you attempt to use them interchangeably, your radiographs may be improperly exposed – and the reason for the exposure problems may not be clear.

If you use a number of cassettes interchangeably, you need to be aware of the speed for the combination of film and screen that you're using – and you need to perform a proper speed match test, to make sure that each of the interchangeable cassettes has the same effective speed.

Continued on back side, page 2



Continued from page 1.

Follow these steps

TO PERFORM A PROPER TEST:

ONE

Sort all of your cassettes by screen/film type or by speed index – high-speed, par, detail or 800, 400, 100.

TWO

Select one cassette from each speed group to be the reference cassette, or "master." Make a note of the number or some other identifier for the master cassette, and record it.

THREE

Load the master cassette from a box of film that you've selected for use in doing the test. *You will need to load all cassettes in the same speed group from the same box of film.*

FOUR

Take the loaded master cassette into the x-ray room. (Be sure to use the *same* x-ray room for all cassette testing.) Place the cassette so that the distance from the focal spot to the surface of the cassette is approximately 72 inches, if possible. You may need to place the cassette on a stool, or on the floor, to achieve that distance. Using longer distances will generally reduce the heel effect, but some systems may not allow for distances greater than 40 inches. *Be sure to record the exact distance you're using.*

FIVE

Once you've established the distance you're going to be using, expose the master cassette. Expose at the kVp level that you would normally use for the film-screen combination being tested, and try to obtain an optical density (OD) between 1.3 and 1.8 in the processed master film. (If necessary, you can borrow a densitometer to measure the OD – the speed match test is normally done only once a year.) Repeat the process, using trial and error, until you obtain an OD in the desired range. Record the parameters for the technique that you used to obtained the desired OD – kVp, mA and exposure time (or mAs).

SIX

Reload the master cassette – and load three other cassettes from the same speed group – using film from the same box. If necessary, cut the film to fit the cassette – or place smaller-size film in the corner of the cassette that will be exposed during the test. Arrange the four cassettes so that they form a square, with one corner of each cassette touching in the center. Make sure that the cassettes have been placed at the predetermined distance from the focal spot that you established in step 4.

SEVEN

Cone down so that you are exposing an area of approximately 4 inches by 4 inches, with the intersection of the four cassettes located in the center of the exposed area.

EIGHT

Mark each cassette by placing lead numerals or some other identifiable object (pen, pin, paper clip, different sized coins, etc.) on the surface of the cassette, in the corner that you'll be exposing. Make an exposure, using the parameters that you established in step 5.

NINE

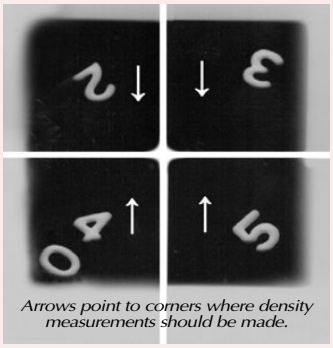
Process all four films.

TEN

Repeat steps 3-9, each time grouping three new cassettes from the same speed group with the original master cassette, until all of the cassettes in that speed group have been tested. Place the master cassette in the same location each time you expose a new group of cassettes.

ELEVEN

For each film that you made using the master cassette, measure the OD at the *outside corner* of the film – that is, the point closest to the intersection of the four films in each test group. Record the *average* OD for all of the master films.



Arrows point to corners where density measurements should be made.

TWELVE

Measure & record the OD for each of the "non-master" films. Again, measure the OD at the *outside corner* of each film.

THIRTEEN

Compare the average OD for the master films with the OD for each non-master film. The other films should fall within a range of ± 0.10 OD, when compared with the average OD for the master films. *If a film falls outside that range, the cassette that you used to produce it should be pulled from service.*

FOURTEEN

Repeat the process for each cassette "speed group" used in your facility.

HERE'S AN EXAMPLE of what the data chart might look like for a typical speed-match test:

X-RAY ROOM _____

DISTANCE USED _____

TECHNIQUE FACTORS USED (mA, kVp, time) _____

CASSETTE I.D.	TEST FILM I.D.	MEASURED O.D.	MASTER O.D.
#3 (Master)	#3	1.42	1.42
#2	#2	1.33	
#6	#6	1.60	
#1	#1	1.38	
#3 (Master)	#3	1.35	1.35
#5	#5	1.48	

Acceptable range of measured O.D. = ± 0.10 from the average of the masters or 1.285 - 1.485 Cassette #6 is out of range and should be pulled from service.