

National Bureau of Standards

Certificate

Standard Reference Material 1844

Radiographic Image Quality

Indicator System Performance Standard

This Standard Reference Material (SRM) is intended for use in the determination of the radiographic image quality of x-ray radiographic systems, or x-ray system components such as film. The SRM has been designed for use in conjunction with ASTM Standard E-746. The SRM is used in testing the threshold visibility of the image of small holes of low contrast on x-ray film. If all parameters are kept constant, except film type, the relative image quality of different types or lots of radiographic film may be assessed. Alternatively, if all parameters are kept constant, including film, the performance of the x-ray system may be evaluated. Periodic performance checks will indicate system degradation, should it occur.

SRM 1844 consists of four steel plates from 0.13 to 0.38 mm in thickness, each having a large number of holes of prescribed diameters ranging from 0.50 to 0.81 millimeters. The nominal lengths and widths of the plates are 3 by 10 centimeters for three, and 4.6 by 10 centimeters for one. In addition, SRM 1844 contains a steel plate (absorber) 1.9 centimeters thick with a nominal length and width of 20 by 25 centimeters (8x10 inches). In use, the four thin plates are placed on the steel absorber and radiographed as prescribed in the standard. All dimensions are certified to be within the tolerances specified in ASTM Standard E-746.

A diagram of the small plates and the certified dimensions are given in Figure 1.

Certification of hole diameters is based on measurement of twenty percent (20%) of the holes of a given diameter. There are thirty holes of the same size for each sensitivity level; six (6) holes of each set of thirty (30) were measured. Two holes were measured at the beginning, two at the center, and two at the end of each series of thirty holes as indicated in Figure 2.

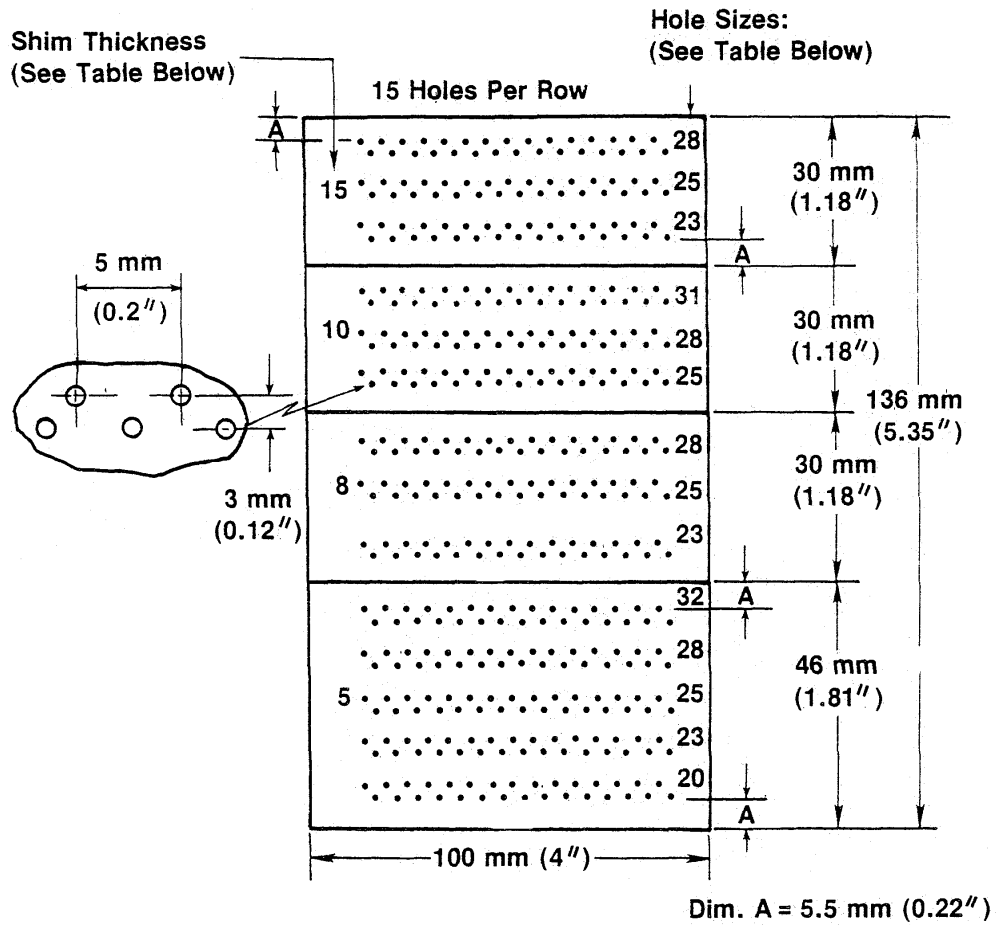
The measurements for certification of this SRM were made in the Automated Production Technology Division, NBS Center for Manufacturing Engineering, under the supervision of John Beers.

The technical coordination and overall direction for the development of this SRM were provided by R.C. Placious and D. Polansky of the Radiation Physics Division, NBS Center for Radiation Research. Partial support for this SRM was furnished by the NBS Office of Nondestructive Evaluation.

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Stanley D. Rasberry, Chief
Office of Standard Reference Materials



Step Identification	Shim Thickness, mm (in.)	Hole Identification	Hole Size, mm (in.)
15	0.38 ± 0.012 (0.015 ± 0.0005)	32	0.81 ± 0.025 (0.032 ± 0.001)
10	0.25 ± 0.012 (0.010 ± 0.0005)	31	0.79 ± 0.025 (0.031 ± 0.001)
8	0.20 ± 0.012 (0.008 ± 0.0005)	28	0.71 ± 0.025 (0.028 ± 0.001)
5	0.13 ± 0.012 (0.005 ± 0.0005)	25	0.64 ± 0.025 (0.025 ± 0.001)
		23	0.58 ± 0.025 (0.023 ± 0.001)
		20	0.50 ± 0.025 (0.020 ± 0.001)

Hole Spring (horizontal): 5 ± 0.1 mm (0.2 ± 0.004 in.) Nonaccumulative

Row Spacing: 3 ± 0.1 mm (0.12 ± 0.004 in.)

Spacing between hole sets: 5 ± 0.1 mm (0.2 ± 0.004 in.)

All other dimensions shall be in accordance with standard engineering practice

FIG. 1 Image Quality Indicator

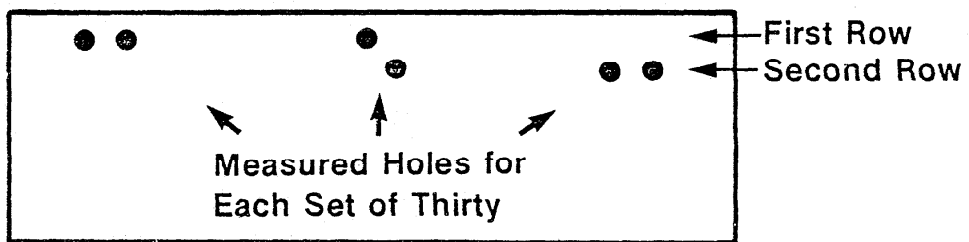


Fig. 2 Measured Holes in Each Row