



Designation: E3168 – 20a (Reapproved 2026)

Standard Practice for Determining Low-Contrast Visual Acuity of Radiographic Interpreters¹

This standard is issued under the fixed designation E3168; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice details the procedure for determining the low-contrast visual acuity of a radiographic interpreter by evaluating the ability of the individual to detect linear images of varying radiographic noise, contrast, and sharpness. No statement is made regarding the applicability of these images to evaluate the competence of a radiographic interpreter. There is no correlation between these images of slit phantoms and the ability to detect cracks or other linear features in an actual radiographic examination. The test procedure follows from work performed by the National Institute of Standards and Technology presented in NBS Technical Note 1143, issued June 1981.

1.2 The visual acuity test set consists of five individual plates, each containing a series of radiographic images of 0.5 in. (12.7 mm) long slits in thin metal shims. The original radiographs used to prepare the illustrations were generated using various absorbers, geometric parameters (unsharpness, slit widths), and source parameters (kV, mA, time) to produce images of varying noise, contrast, and sharpness. Each radiographic image has a background density of 1.8 ± 0.15 . The images are viewed in a radiographic interpretation environment as used for the evaluation of production radiographic films, for example, illuminators and background lighting as described in Guide E94/E94M and Specification E1390, and without optical magnification.

1.3 Each visual acuity test plate consists of 25 individual image areas. The images are arranged in five rows and five columns as shown in Fig. 1. Each image area is 2 in. by 2 in. (51 mm by 51 mm). All identification is on the back side of the plate. Each plate can be viewed from any of the four orientations (that is, it can be viewed with any of the four edges “up” on the illuminator). Since there are five different plates in the

set, this makes for a total of 20 different patterns that can be viewed. The identification of which of the five plates and which of the four orientations were viewed in any given test can be determined from the designation on the back side.

1.4 Within the image areas, the slit image may appear in any of five locations, that is, in any of the four corners of the image area, or near the center. No more than one slit image will appear in any one image area. The slit image may be horizontal, vertical, slant left, or slant right. Several of the plates include one or more image areas in which there is no slit image.

1.5 Use of this standard requires procurement of the adjunct test plates.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

E94/E94M Guide for Radiographic Examination Using Industrial Radiographic Film

E1316 Terminology for Nondestructive Examinations

E1390 Specification for Illuminators Used for Viewing Industrial Radiographs

2.2 ASTM Adjuncts:³

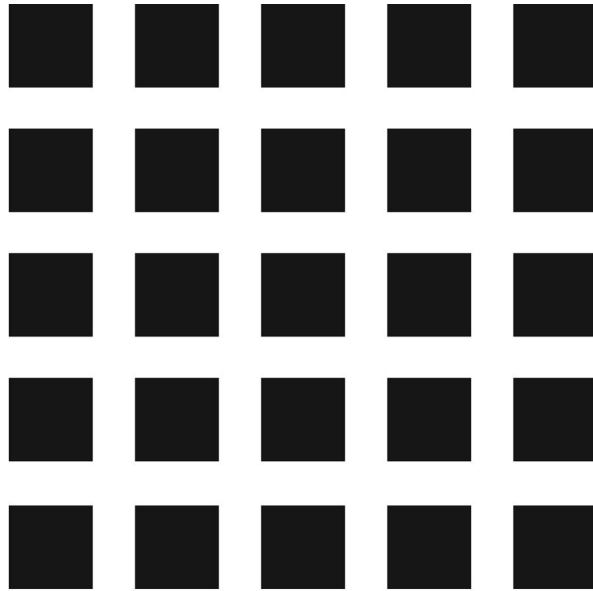
5 Visual Acuity Test Plates and Answer Key

¹ This practice is under the jurisdiction of ASTM Committee E07 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.02 on Reference Radiological Images.

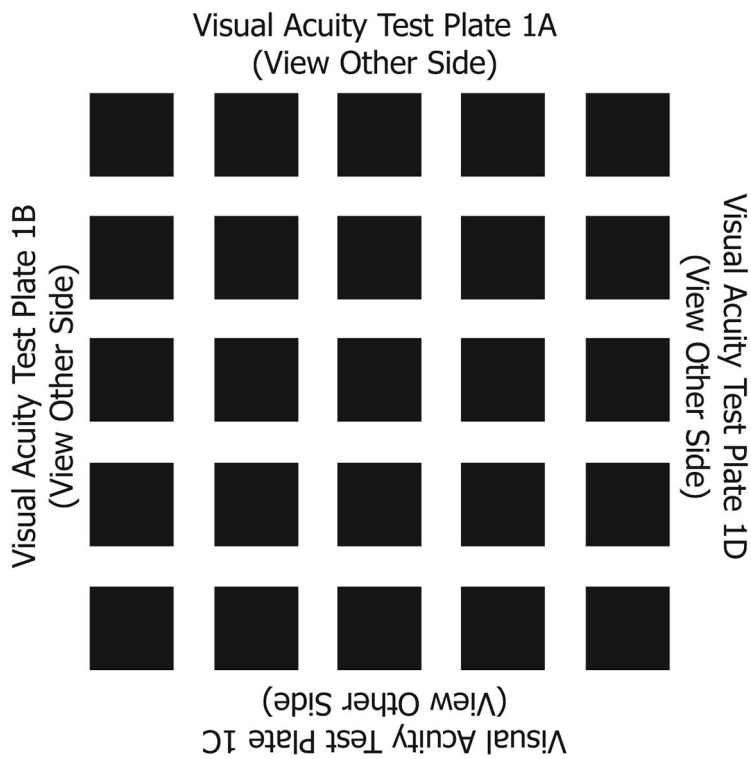
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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from ASTM International Headquarters. Order Reference Radiograph RRE3168.



a) Front of Visual Acuity Test Plate



b) Back of Visual Acuity Test Plate

FIG. 1 Layout of Visual Acuity Test Plate