



Designation: ~~E1079-05~~ Designation: E1079 - 10

# Standard Practice for Calibration of Transmission Densitometers<sup>1</sup>

This standard is issued under the fixed designation E1079; 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 reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

## 1. Scope

1.1 This practice<sup>2</sup> covers the calibration of transmission densitometers used to perform radiographic film density measurements (see Note 1).

1.2 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—For further information on the design and use of densitometers, the following literature is suggested as additional background information: ~~ISO 5-2:2004~~ ISO 5-1:2009, ~~ISO 5-1:2004~~ ISO 5-2:2009, and ISO 14807:2001.

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>3</sup>

E1316 Terminology for Nondestructive Examinations

### 2.2 ISO Standards:

~~ISO 5-2:2004~~ Photography—Density Measurements—Part 2: Geometric Conditions for Transmission Density—ISO Standards:<sup>4</sup>

~~ISO 5-1:2004~~ Photography—Density Measurements—Part 1: Terms, Symbols, and Notations—ISO 5-1:2009 Photography and graphic technology - Density measurements - Part 1: Geometry and functional notation

ISO 5-2:2009 Photography and graphic technology - Density measurements - Part 2: Geometric conditions for transmittance density

~~ISO 14807:2001~~ Photography—Transmission and Reflection Densitometers—Method for Determining Performance—Photography - Transmission and reflection densitometers - Method for determining performance

## 3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, see Terminology E1316.

## 4. Significance and Use

4.1 This practice provides a means for calibrating transmission densitometers used for the measurement of radiographic film density. A transmission densitometer calibrated in accordance with this practice provides the assurance that accurate density values of radiographs are obtained.

## 5. Apparatus

5.1 Apparatus should consist of the following:

5.1.1 ~~A calibrated step tablet shall be used. The step tablet may be a NIST X-ray Step Tablet (Standard Reference Material SRM 1001)~~ A calibrated step tablet shall be used. The step tablet may be a NIST X-ray Step Tablet (X-Ray Film Step Tablet Transmission Density Standard 38100C)<sup>5</sup> or alternately a step tablet from another supplier, which is traceable to the NIST SRM-1001 X-ray Step Tablet. ~~step tablet. The step tablet shall have at least five step densities ranging from 0.9 through 4.1. The step tablet may have additional step densities less than 0.9 and greater than 4.1.~~ densities, which cover the density range that is used for production

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee E07 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.01 on Radiology (X and Gamma) Method.

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<sup>2</sup> For ASME Boiler and Pressure Vessel Code applications see related Practice SE-1079 in Section II of that Code.

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>4</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

<sup>6</sup> Standard Reference Material 1001 is available from the National Institute of Standards and Technology, Gaithersburg, MD.

<sup>5</sup> Available from National Institute of Standards and Technology (NIST), 100 Bureau Dr., Stop 1070, Gaithersburg, MD 20899-1070, <http://www.nist.gov>.