



Standard Guide for Computed Radiography¹

This standard is issued under the fixed designation E2007; 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 guide provides general tutorial information regarding the fundamental and physical principles of computed radiography (CR), definitions and terminology required to understand the basic CR process. An introduction to some of the limitations that are typically encountered during the establishment of techniques and basic image processing methods are also provided. This guide does not provide specific techniques or acceptance criteria for specific end-user inspection applications. Information presented within this guide may be useful in conjunction with those standards of 1.2.

1.2 CR techniques for general inspection applications may be found in Practice E2033. Technical qualification attributes for CR systems may be found in Practice E2445. Criteria for classification of CR system technical performance levels may be found in Practice E2446. Reference Images Standards E2422, E2660, and E2669 contain digital reference acceptance illustrations.

1.3 The values stated in SI units are to be regarded as the standard. The inch-pound units given in parentheses are for information only.

1.4 *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.*

2. Referenced Documents

2.1 ASTM Standards:²

- E94 Guide for Radiographic Examination
- E746 Practice for Determining Relative Image Quality Response of Industrial Radiographic Imaging Systems
- E747 Practice for Design, Manufacture and Material Group-

ing Classification of Wire Image Quality Indicators (IQI) Used for Radiology

E1025 Practice for Design, Manufacture, and Material Grouping Classification of Hole-Type Image Quality Indicators (IQI) Used for Radiology

E1316 Terminology for Nondestructive Examinations

E1453 Guide for Storage of Magnetic Tape Media that Contains Analog or Digital Radioscopic Data

E2002 Practice for Determining Total Image Unsharpness and Basic Spatial Resolution in Radiography and Radioscopy

E2033 Practice for Computed Radiology (Photostimulable Luminescence Method)

E2339 Practice for Digital Imaging and Communication in Nondestructive Evaluation (DICONDE)

E2422 Digital Reference Images for Inspection of Aluminum Castings

E2445 Practice for Performance Evaluation and Long-Term Stability of Computed Radiography Systems

E2446 Practice for Manufacturing Characterization of Computed Radiography Systems

E2660 Digital Reference Images for Investment Steel Castings for Aerospace Applications

E2669 Digital Reference Images for Titanium Castings

2.2 SMPTE Standard:

RP-133 Specifications for Medical Diagnostic Imaging Test Pattern for Television Monitors and Hard-Copy Recording Cameras³

3. Terminology

3.1 Unless otherwise provided within this guide, terminology is in accordance with Terminology E1316.

3.2 Definitions:

3.2.1 *aliasing*—artifacts that appear in an image when the spatial frequency of the input is higher than the output is capable of reproducing. This will often appear as jagged or stepped sections in a line or as moiré patterns.

3.2.2 *basic spatial resolution* (SR_b)—terminology used to describe the smallest degree of visible detail within a digital image that is considered the effective pixel size.

³ Available from Society of Motion Picture and Television Engineers (SMPTE), 3 Barker Ave, 5th Floor, White Plains, NY 10601.

¹ This guide 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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² 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.