



Designation: E1000 – 16

Standard Guide for Radioscopy¹

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1. Scope

1.1 This guide is for tutorial purposes only and to outline the general principles of radioscopy imaging.

1.2 This guide describes practices and image quality measuring systems for real-time, and near real-time, nonfilm detection, display, and recording of radioscopy images. These images, used in materials examination, are generated by penetrating radiation passing through the subject material and producing an image on the detecting medium. Although the described radiation sources are specifically X-ray and gamma-ray, the general concepts can be used for other radiation sources such as neutrons. The image detection and display techniques are nonfilm, but the use of photographic film as a means for permanent recording of the image is not precluded.

NOTE 1—For information purposes, refer to Terminology E1316.

1.3 This guide summarizes the state of radioscopy technology prior to the advent of Digital Detector Arrays (DDAs), which may also be used for radioscopy imaging. For a summary of DDAs, see E2736, Standard Guide for Digital Detector Array Radiology. It should be noted that some detector configurations listed herein have similar foundations to those described in Guide E2736.

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.* For specific safety precautionary statements, see Section 6.

2. Referenced Documents

2.1 ASTM Standards:²

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

E1742 Practice for Radiographic Examination

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

E2736 Guide for Digital Detector Array Radiology

2.2 National Council on Radiation Protection and Measurement (NCRP) Standards:

NCRP 49 Structural Shielding Design and Evaluation for Medical Use of X-rays and Gamma Rays of Energies up to 10 MeV³

NCRP 51 Radiation Protection Design Guidelines for 0.1–100 MeV Particle Accelerator Facilities³

NCRP 91, (supercedes NCRP 39) Recommendations on Limits for Exposure to Ionizing Radiation³

2.3 Federal Standard:

Fed. Std. No. 21-CFR 1020.40 Safety Requirements for Cabinet X-Ray Machines⁴

2.4 Aerospace Industries Association Document:

NAS 410 Certification & Qualification of Nondestructive Test Personnel⁵

2.5 ASNT Documents:⁶

SNT-TC-1A Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing

ANSI/ASNT-CP-189 ASNT Standard for Qualification and Certification of Nondestructive Testing Personnel

2.6 CEN Documents:⁷

EN 4179 Aerospace Series—Qualification and Approval of Personnel for Non-Destructive Testing

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.

³ Available from NCRP Publications, 7010 Woodmont Ave., Suite 1016, Bethesda, MD 20814.

⁴ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

⁵ Available from Aerospace Industries Association of America, Inc. (AIA), 1000 Wilson Blvd., Suite 1700, Arlington, VA 22209-3928, <http://www.aia-aerospace.org>.

⁶ Available from American Society for Nondestructive Testing (ASNT), P.O. Box 28518, 1711 Arlington Ln., Columbus, OH 43228-0518, <http://www.asnt.org>.

⁷ Available from CEN-European Committee for Standardization, Rue De Stassart 36, Bruxelles, Belgium B-1050, <http://www.cen.eu>