



## Standard Practice for Qualification of Radioscopic Systems<sup>1</sup>

This standard is issued under the fixed designation E 1411; 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 provides test and measurement details for measuring the performance of X-ray and Gamma ray radiosopic systems. Radioscopic examination applications are diverse. Therefore, system configurations are also diverse and constantly changing as the technology advances.

1.2 This practice is intended as a means of initially qualifying and requalifying a radiosopic system for a specified application by determining its performance level when operated in a static mode. System architecture including the means of radiosopic examination record archiving and the method for making the accept/reject decision are also unique system features and their effect upon system performance must be evaluated.

1.3 The general principles, as stated in this practice, apply broadly to transmitted-beam penetrating radiation radioscopy systems. Other radiosopic systems, such as those employing neutrons and Compton back-scattered X-ray imaging techniques, are not covered as they may involve equipment and application details unique to such systems.

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 information on safety requirements, refer to the applicable documents listed in Section 2.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

E 747 Practice for Design, Manufacture and Material Grouping Classification of Wire Image Quality Indicators (IQI) Used for Radiology<sup>2</sup>

E 1025 Practice for Design, Manufacture, and Material Grouping Classification of Hole-Type Image Quality Indicators (IQI) Used for Radiology<sup>2</sup>

E 1255 Practice for Radioscopy<sup>2</sup>

E 1316 Terminology for Nondestructive Examinations<sup>2</sup>

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee E-7 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> *Annual Book of ASTM Standards*, Vol 03.03.

E 1647 Practice for Determining Contrast Sensitivity in Radioscopy<sup>2</sup>

#### 2.2 Other Standard:

British Standard 3971—1980 Specification for Image Quality Indicators for Industrial Radiography (including guidance on their use)<sup>3</sup>

### 3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, see Terminology E 1316.

### 4. Summary of Practice

4.1 This practice provides a standardized procedure for the initial qualification and requalification of a radiosopic system to establish radiosopic examination capabilities for a specified range of applications.

4.2 This practice is intended for use in association with a standard practice governing the use of radiosopic examination, such as Practice E 1255.

4.3 This practice specifies the procedures to be used in determining the performance level of the radiosopic system. Unique system features, including component selection, system architecture, programmability and image archiving capabilities are important factors and are taken into account in this practice. The overall system performance level, as well as key system features, are to be recorded in a qualification document which shall qualify the performance level of the total radiosopic system. An example of the Radioscopic System Qualification document form is included in the Appendix. This document may be tailored to suit the specific application.

### 5. Significance and Use

5.1 As with conventional radiography, radiosopic examination is broadly applicable to the many materials and test object configurations which may be penetrated with X-rays or gamma rays. The high degree of variation in architecture and performance among radiosopic systems due to component selection, physical arrangement and test object variables, makes it necessary to establish the level of performance which the selected radiosopic system is capable of achieving in specific applications. The manufacturer of the radiosopic system, as well as the user, require a common basis for determining the performance level of the radiosopic system.

<sup>3</sup> Available from British Standards Institute, 2 Park Street, London, England W1A2B5.