



Standard Practice for Design, Manufacture and Material Grouping Classification of Wire Image Quality Indicators (IQI) Used for Radiology¹

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1. Scope

1.1 This practice² covers the design, material grouping classification, and manufacture of wire image quality indicators (IQI) used to indicate the quality of radiologic images.

1.2 This practice is applicable to X-ray and gamma-ray radiology.

1.3 This practice covers the use of wire penetrameters as the controlling image quality indicator for the material thickness range from 6.4 to 152 mm [0.25 to 6.0 in.].

1.4 The values stated in inch-pound units are to be regarded as standard.

1.5 *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:³

B 139 Specification for Phosphor Bronze Rod, Bar, and Shapes

B 150 Specification for Aluminum Bronze Rod, Bar, and Shapes

B 161 Specification for Nickel Seamless Pipe and Tube

B 164 Specification for Nickel-Copper Alloy Rod, Bar, and Wire

B 166 Specification for Nickel-Chromium-Iron Alloys (UNS N06600, N06601, and N06690) and Nickel-Chromium-Cobalt-Molybdenum Alloy (UNS N06617) Rod, Bar, and Wire

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

E 1316 Terminology for Nondestructive Examinations

2.2 Other Standards:⁴

EN 426–1 Non-Destructive Testing—Image Quality of Radiographs-Part 1: Image Quality Indicators (Wire-Type)-Determination of Image Quality Value

3. Terminology

3.1 *Definitions*—The definitions of terms in Terminology E 1316, Section D, relating to gamma and X-radiology, shall apply to the terms used in this practice.

4. Wire IQI Requirements

4.1 The quality of all levels of examination shall be determined by a set of wires conforming to the following requirements:

4.1.1 Wires shall be fabricated from materials or alloys identified or listed in accordance with 7.2. Other materials may be used in accordance with 7.3.

4.1.2 The IQI consists of sets of wires arranged in order of increasing diameter. The diameter sizes specified in Table 1 are established from a consecutive series of numbers taken in general from the ISO/R 10 series. The IQI shall be fabricated in accordance with the requirements specified in Figs. 1-8 and Tables 1-3. IQIs previously manufactured to the requirements of Annex A1 may be used as an alternate provided all other requirements of this practice are met.

4.1.3 Image quality indicator (IQI) designs other than those shown in Figs. 1-8 and Annex A1 are permitted by contractual agreement. If an IQI set as listed in Table 1 or Annex A1 is modified in size, it must contain the grade number, set identity, and essential wire. It must also contain two additional wires that are the next size larger and the next size smaller as specified in the applicable set listed in Table 1.

4.1.4 Each set must be identified using letters and numbers made of industrial grade lead or of a material of similar

¹ This practice is under the jurisdiction of ASTM Committee E07 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.01 on Radiographic Practice and Penetrameters.

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² For ASME Boiler and Pressure Vessel Code applications see related Practice SE-747 in Section II of that Code.

³ 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.

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