



Designation: F792 – 17

Standard Practice for Evaluating the Imaging Performance of Security X-Ray Systems¹

This standard is issued under the fixed designation F792; 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 applies to all X-ray-based screening systems with tunnel apertures up to 1 m wide × 1 m high, whether they are conventional X-ray systems or explosives detection systems, that provide a projection or projection/scatter image.

1.2 This practice applies to X-ray systems used for the screening for prohibited items such as weapons, explosives, and explosive devices in baggage, packages, cargo, or mail.

1.3 This practice establishes quantitative and qualitative methods for evaluating the systems. This practice does not establish minimum performance requirements for any particular application.

1.4 This practice relies upon the use of three different standard test objects: ASTM X-ray test object – HP, for evaluating human perception based performance parameters; ASTM X-ray test object – RT, for routine testing to assess operation; and ASTM X-ray test object – OE, for objective evaluation and scoring of the technical capability of the system. The specific test objects are subsequently described and referred to in this practice as the HP test object, RT test object, and OE test object.

1.4.1 *Part RT*—This part considers only the methods for routine and periodic verification of system operation and function, and therefore requires use of ASTM X-ray test object – RT.

1.4.2 *Part HP*—This part considers only the methods for, and use of, the ASTM X-ray test object – HP.

1.4.3 *Part OE*—This part considers only the methods for objective evaluation of the technical capabilities of a system, and therefore requires use of the ASTM X-ray test object – OE.

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.6 *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, health and environmental practices and determine the applicability of regulatory limitations prior to use.

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards*:²

B258 Specification for Standard Nominal Diameters and Cross-Sectional Areas of AWG Sizes of Solid Round Wires Used as Electrical Conductors

D6100 Specification for Extruded, Compression Molded and Injection Molded Polyoxymethylene Shapes (POM)

2.2 *ASTM Adjuncts*:

Adjunct to F0792 Drawings for Test Piece³

2.3 *Other Documents*:

IEC 60317-1:2010-03 Specification for Particular Types of Winding Wires – Part 1: Polyvinyl Acetal Enamelled Round Copper Wire, Class 105⁴

ANSI/NEMA MW 1000-2014 American National Standard, Magnet Wire (MW 80-C)⁵

ISO 12233-2000 Photography – Electronic Still-Picture Cameras – Resolution Measurements, Section 6.3 and Annex C

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

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 ASTM International Headquarters. Order Adjunct No. ADJF079217. Original adjunct produced in 2017.

⁴ Available from International Electrotechnical Commission (IEC), 3, rue de Varembe, 1st Floor, P.O. Box 131, CH-1211, Geneva 20, Switzerland, <http://www.iec.ch>.

⁵ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

¹ This practice is under the jurisdiction of ASTM Committee F12 on Security Systems and Equipment and is the direct responsibility of Subcommittee F12.60 on Controlled Access Security, Search, and Screening Equipment.

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