



Designation: F629 – 15

Standard Practice for Radiography of Cast Metallic Surgical Implants¹

This standard is issued under the fixed designation F629; 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 covers the procedure for radiographic testing of cast metallic surgical implants and related weldments.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *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](#)

[E192 Reference Radiographs of Investment Steel Castings for Aerospace Applications](#)

[E1030 Practice for Radiographic Examination of Metallic Castings](#)

[E1320 Reference Radiographs for Titanium Castings](#)

[E2660 Digital Reference Images for Investment Steel Castings for Aerospace Applications](#)

[E2669 Digital Reference Images for Titanium Castings](#)

[F2895 Practice for Digital Radiography of Cast Metallic Implants](#)

2.2 *ASNT Standard:*³

[SNT-TC-1A Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing](#)

2.3 *AIA/NAS Standard:*⁴

[NAS410 Certification and Qualification of Nondestructive Test Personnel](#)

2.4 *CEN Standard:*⁵

[EN 4179 Aerospace series – Qualification and approval of personnel for non-destructive testing](#)

3. Terminology

3.1 For definitions used in this practice, refer to the terms in Test Method [E1030](#) and Reference Radiographs [E192](#).

4. Significance and Use

4.1 The requirements in this practice are intended to control the quality of the radiographic image of cast metallic surgical implants and related weldments.

5. Radiographic Methods

5.1 The radiographic method shall be agreed upon between the purchaser and supplier but should be in accordance with Test Method [E1030](#) and Guide [E94](#).

5.1.1 Acceptance criteria should be derived from the reference radiographs presented in Reference Radiographs [E192](#), [E1320](#), or digital reference images [E2660](#) and [E2669](#).

5.1.2 Digital radiography when agreed upon between purchaser and supplier shall be performed in accordance with Practice [F2895](#).

5.2 Radiography of cobalt- or iron-base surgical implant castings may create radiographic images resulting from grain diffraction. Radiographic techniques shall be utilized to ensure differentiation between these images and actual indications.

5.2.1 Generally, cobalt- or iron-base surgical implant castings require radiation intensities higher than normal, facilitating reduced exposure times.

5.2.1.1 Energies between 250 and 400 kV may be required to radiograph surgical implants with a 1/2-in. (12.7-mm) material thickness.

5.2.2 In some instances, filters, at the tube head, and relatively thick lead intensifying screens may reduce grain diffraction while sustaining adequate radiographic sensitivity.

¹ This practice is under the jurisdiction of ASTM Committee F04 on Medical and Surgical Materials and Devices and is the direct responsibility of Subcommittee F04.12 on Metallurgical Materials.

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

⁴ Available from Aerospace Industries Association (AIA), 1000 Wilson Blvd., Suite 1700, Arlington, VA 22209, <http://www.aia-aerospace.org>.

⁵ Available from European Committee for Standardization (CEN), Avenue Marnix 17, B-1000, Brussels, Belgium, <http://www.cen.eu>.

*A Summary of Changes section appears at the end of this standard