



Standard Reference Radiographs for Inspection of Aluminum and Magnesium Castings¹

This standard is issued under the fixed designation E 155; 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.

These Reference Radiographs have been developed in cooperation with the Quality Control Committee and Aerospace Research and Testing Committee of the Aerospace Industries Association.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 These reference radiographs illustrate the types and degrees of discontinuities that may be found in aluminum-alloy and magnesium-alloy castings. The castings illustrated are in thicknesses of ¼ in. (6.35 mm) and ¾ in. (19.1 mm).

1.2 This document may be used where no other applicable document exists, for other material thicknesses for which it has been found to be applicable and for which agreement has been reached between the purchaser and the manufacturer.

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

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.*

NOTE 1—Vol I: The set of reference radiographs consists of 13 plates covering discontinuities in aluminum-alloy castings and 10 plates covering discontinuities in magnesium-alloy castings. Each plate is held in an 8½ by 11-in. (216 by 279-mm) cardboard frame and each plate illustrates eight grades of severity for the discontinuity in approximately a 2 by 2-in. (51 by 51-mm) area. The cardboard frames are contained in a 10½ by 11½ -in. (267 by 292-mm) ring binder.

Vol. II: The set of reference radiographs consists of four plates covering discontinuities in magnesium-alloy castings only. Each plate is held in an 8½ by 11-in. (216 by 279-mm) cardboard frame and illustrates eight grades of severity for the discontinuity (with the exception of discrete discontinuities, where only one example of each discontinuity is given).

NOTE 2—Reference radiographs applicable to aluminum and magnesium die castings up to 1 in. (25 mm) in thickness are contained in Reference Radiographs E 505.

2. Referenced Documents

2.1 ASTM Standards:

E 94 Guide for Radiographic Examination²

E 142 Method for Controlling Quality of Radiographic Testing³

E 505 Reference Radiographs for Inspection of Aluminum and Magnesium Die Casting²

E 1316 Terminology for Nondestructive Examinations²

2.2 ASTM Adjuncts:⁴

Reference Radiographs for Inspection of Aluminum and Magnesium Castings:

Volume I, Aluminum and Magnesium Castings⁵

Volume II, Magnesium Castings⁶

3. Terminology

3.1 *Definitions*—Definitions of terms used in this standard may be found in Terminology E 1316.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 The terms relating to discontinuities used in these reference radiographs are described based upon radiographic appearance.

3.2.2 *foreign materials*—appear as isolated, irregular, or elongated variations of film density, not corresponding to variations in thickness of material, nor to cavities. They may be due to the presence of sand, slag, oxide or dross, or metal of different density.

3.2.3 *gas holes*—appear as round or elongated, smooth-edged dark spots, occurring individually, in clusters, or distributed throughout the casting.

3.2.4 *gas porosity*—represented by round or elongated dark spots corresponding to minute voids usually distributed through the entire casting.

3.2.5 *microshrinkage (feathery type)*—microshrinkage having an elongated appearance resembling feather-like streaks.

3.2.6 *microshrinkage (sponge type)*—microshrinkage having a spongelike appearance, and more massive and equiaxed than the feathery type.

¹ These reference radiographs are under the jurisdiction of ASTM Committee E07 on Nondestructive Testing and are the direct responsibility of Subcommittee E07.02 on Reference Radiographs.

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² *Annual Book of ASTM Standards*, Vol 03.03.

³ Discontinued; see 1999 *Annual Book of ASTM Standards*, Vol 03.03. Replaced by Guide E 94.

⁴ Available from ASTM Headquarters.

⁵ Order RRE015501.

⁶ Order RRE015502.