



Standard Practice for Standardizing Equipment for Electromagnetic Examination of Seamless Aluminum-Alloy Tube¹

This standard is issued under the fixed designation E 215; 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 (€) indicates an editorial change since the last revision or reapproval.

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

€¹ NOTE—Reapproved with editorial changes throughout in January 2004.

1. Scope

1.1 This practice² is intended as a guide for standardizing eddy-current equipment employed in the examination of seamless aluminum-alloy tube. Artificial discontinuities consisting of flat-bottomed or through holes, or both, are employed as the means of standardizing the eddy-current system. General requirements for eddy-current examination procedures are included.

1.2 Procedures for fabrication of reference standards are given in Appendixes X1.1 and X2.1.

1.3 This practice is intended for the examination of tubular products having nominal diameters up to 4 in. [101.6 mm] and wall thicknesses up to the standard depth of penetration (SDP) of eddy currents for the particular alloy (conductivity) being examined and the examination frequency being used.

NOTE 1—This practice may also be used for larger diameters or heavier walls up to the effective depth of penetration (EDP) of eddy currents as specified by the using party or parties.

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

1.5 This practice does not establish acceptance criteria. They must be established by the using party or parties.

1.6 *This standard does not purport to address all of the safety problems, 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

E 543 Practice for Agencies Performing Nondestructive Testing

E 1316 Terminology for Nondestructive Examinations

2.2 Federal Standard:

Fed Std. No. 245D Tolerance for Aluminum Alloy and Magnesium Alloy Wrought Products⁴

2.3 Other Documents:

SNT-TC-1A Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing⁵

ANSI/ASNT-CP-189 ASNT Standard for Qualification and Certification of Nondestructive Testing Personnel⁵

NAS-410 NAS Certification and Qualification of Nondestructive Personnel (Quality Assurance Committee)⁶

3. Terminology

3.1 Standard terminology relating to electromagnetic examination may be found in Terminology E 1316, Section C, Electromagnetic Testing.

4. Significance and Use

4.1 The examination is performed by passing the tube lengthwise through or near an eddy current sensor energized with alternating current of one or more frequencies. The electrical impedance of the eddy current sensor is modified by the proximity of the tube. The extent of this modification is determined by the distance between the eddy current sensor and the tube, the dimensions, and electrical conductivity of the

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² For ASME Boiler and Pressure Vessel Code applications see related Practice SE-215 in the 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 Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

⁵ Available from The American Society for Nondestructive Testing (ASNT), P.O. Box 28518, 1711 Arlington Ln., Columbus, OH 43228-0518.

⁶ Available from Aerospace Industries Association of America, Inc., 1250 Eye Street, N.W., Washington, DC 20005.

