This document is not an ASTM standard and is intended only to provide the user of an ASTM standard an indication of what changes have been made to the previous version. Because it may not be technically possible to adequately depict all changes accurately, ASTM recommends that users consult prior editions as appropriate. In all cases only the current version of the standard as published by ASTM is to be considered the official document.

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Standard Practice for Electromagnetic (Eddy-Current) Examination of Seamless and Welded Tubular Products, Titanium, Austenitic Stainless Steel and Similar Alloys[1]

This standard is issued under the fixed designation E426; 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.

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

1. Scope*

1.1 This practice[2] covers procedures ~~that may be followed~~ for eddy-current examination of seamless and welded tubular products made of relatively low conductivity materials such as titanium, stainless steel, and similar alloys, such as nickel alloys. Austenitic chromium-nickel stainless steels, which are generally considered to be nonmagnetic, are specifically covered as distinguished from the martensitic and ferritic straight chromium stainless steels which are magnetic.

1.2 This practice is intended as a guide for eddy-current examination of both seamless and welded tubular products using either an encircling coil or a probe-coil technique. Coils and probes are available that can be used inside the tubular product; however, their use is not specifically covered in this document. This type of examination is usually employed only to examine tubing which has been installed such as in a heat exchanger.

1.3 This practice covers the examination of tubular products ranging in diameter from 0.125 to 5 in. (3.2 to 127.0 mm) and wall thicknesses from 0.005 to 0.250 in. (0.127 to 6.4 mm).

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

1.4 For examination of aluminum alloy tubular products, see standard Practice E215.

1.5 ~~*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.*~~

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[1] This practice is under the jurisdiction of ASTM Committee E07 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.07 on Electromagnetic Method.

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[2] For ASME Boiler and Pressure Vessel Code applications see related Practice SE-426 in Section II of that Code.

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

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Units—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.

1.6 *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.*

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2. Referenced Documents

2.1 *ASTM Standards:*[3]

E215 Practice for Standardizing Equipment for Electromagnetic Testing of Seamless Aluminum-Alloy Tube

E543 Specification for Agencies Performing Nondestructive Testing

E1316 Terminology for Nondestructive Examinations

2.2 *Other Documents:*

SNT-TC-1A Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing[4]

ANSI/ASNT CP-189 ASNT Standard for Qualification and Certification of Nondestructive Testing Personnel[4]

NAS-410 NAS Certification and Qualification of Nondestructive Personnel (Quality Assurance Committee)[5]

3. Terminology

3.1 Standard terminology relating to electromagnetic ~~examination~~testing may be found in Terminology E1316, Section C, Electromagnetic Testing.

4. Summary of Practice

4.1 The examination is conducted using one of two general techniques shown in Fig. 1. One of these techniques employs one or more exciter and sensor coils which encircle the pipe or tube and through which the tubular product to be examined is passed. Some circuit configurations employ separate exciter and sensor coils; whereas other configurations employ one or more coils that concurrently function as both exciters and sensors. Alternating current passes through the exciting coil which by reason of its proximity induces current in the tubular product. The sensor coil detects the resultant electromagnetic flux related to these currents.

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

[5] Available from Aerospace Industries Association of America, Inc. (AIA), 1000 Wilson Blvd., Suite 1700, Arlington, VA 22209-3928, http://www.aia-aerospace.org.

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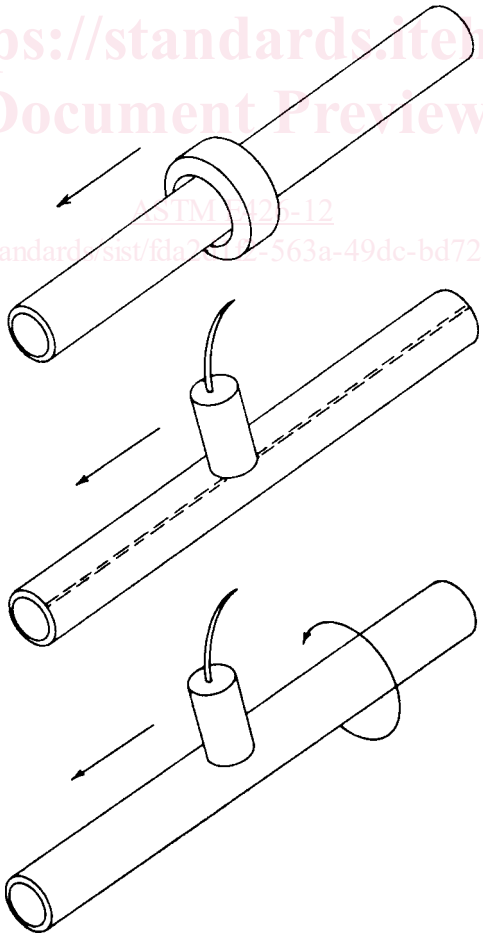

FIG. 1 Sketch Showing Encircling-Coil and Probe-Coil Techniques for Electromagnetic Examination of Tubular Products