



Standard Practice for In Situ Examination of Ferromagnetic Heat-Exchanger Tubes Using Remote Field Testing¹

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1. Scope*

1.1 This practice describes procedures to be followed during remote field examination of installed ferromagnetic heat-exchanger tubing for baseline and service-induced discontinuities.

1.2 This practice is intended for use on ferromagnetic tubes with outside diameters from 0.500 to 2.000 in. [12.70 to 50.80 mm], with wall thicknesses in the range from 0.028 to 0.134 in. [0.71 to 3.40 mm].

1.3 This practice does not establish tube acceptance criteria; the tube acceptance criteria must be specified by the using parties.

1.4 *Units*—The values stated in either inch-pound units or SI units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the standard.

1.5 *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 practice 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

E543 Specification for Agencies Performing Nondestructive Testing

E1316 Terminology for Nondestructive Examinations

2.2 ASNT Documents:³

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

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

2.3 Other Documents:

Can CGSB-48.9712-95 Qualification of Nondestructive Testing Personnel, Natural Resources Canada⁴

ISO 9712 Nondestructive Testing—Qualification and Certification of Nondestructive Testing Personnel⁵

NAS-410 Certification and Qualification of Nondestructive Testing Personnel⁶

3. Terminology

3.1 *General*—Definitions of terms used in this practice can be found in Terminology **E1316**, Section A, “Common NDT Terms,” and Section C, “Electromagnetic Testing.”

3.2 Definitions:

3.2.1 *detector, n*—one or more coils or elements used to sense or measure magnetic field; also known as a receiver.

3.2.2 *exciter, n*—a device that generates a time-varying electromagnetic field, usually a coil energized with alternating current (ac); also known as a transmitter.

3.2.3 *nominal tube, n*—a tube or tube section meeting the tubing manufacturer’s specifications, with relevant properties typical of a tube being examined, used for reference in interpretation and evaluation.

3.2.4 *remote field, n*—as applied to nondestructive testing, the electromagnetic field which has been transmitted through the test object and is observable beyond the direct coupling field of the exciter.

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 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 CGSB Sales Centre; Place du Portage, Phase 3, 6B1; 11 Laurier Street, Hull QC, Canada K1A 1G6.

⁵ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.

⁶ Available from Aerospace Industries Association (AIA), 1000 Wilson Blvd., Suite 1700, Arlington, VA 22209, <http://www.aia-aerospace.org>.