



Standard Practice for Examination of Seamless, Gas-Filled, Pressure Vessels Using Acoustic Emission¹

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1. Scope*

1.1 This practice provides guidelines for acoustic emission (AE) examinations of seamless pressure vessels (tubes) of the type used for distribution or storage of industrial gases.

1.2 This practice requires pressurization to a level greater than normal use. Pressurization medium may be gas or liquid.

1.3 This practice does not apply to vessels in cryogenic service.

1.4 The AE measurements are used to detect and locate emission sources. Other nondestructive test (NDT) methods must be used to evaluate the significance of AE sources. Procedures for other NDT techniques are beyond the scope of this practice. See [Note 1](#).

NOTE 1—Shear wave, angle beam ultrasonic examination is commonly used to establish circumferential position and dimensions of flaws that produce AE. Time of Flight Diffraction (TOFD), ultrasonic examination is also commonly used for flaw sizing.

1.5 The values stated in either SI units or inch-pound 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 non-conformance with the standard.

1.6 *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. Specific precautionary statements are given in Section 7.*

¹ This practice is under the jurisdiction of ASTM Committee E07 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.04 on Acoustic Emission Method.

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2. Referenced Documents

2.1 ASTM Standards:²

[E543 Specification for Agencies Performing Nondestructive Testing](#)

[E650 Guide for Mounting Piezoelectric Acoustic Emission Sensors](#)

[E976 Guide for Determining the Reproducibility of Acoustic Emission Sensor Response](#)

[E1316 Terminology for Nondestructive Examinations](#)

[E2223 Practice for Examination of Seamless, Gas-Filled, Steel Pressure Vessels Using Angle Beam Ultrasonics](#)

[E2075 Practice for Verifying the Consistency of AE-Sensor Response Using an Acrylic Rod](#)

[E2374 Guide for Acoustic Emission System Performance Verification](#)

2.2 ASNT Standards:³

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

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

2.3 Code of Federal Regulations:

[Section 49, Code of Federal Regulations, Hazardous Materials Regulations of the Department of Transportation, Paragraphs 173.34, 173.301, 178.36, 178.37, and 178.45⁴](#)

2.4 Compressed Gas Association Standard:⁵

[Pamphlet C-5 Service Life, Seamless High Pressure Cylinders](#)

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 U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.

⁵ Available from Compressed Gas Association (CGA), 4221 Walney Rd., 5th Floor, Chantilly, VA 20151-2923, <http://www.cganet.com>.