



Standard Test Method for Examination of Liquid-Filled Atmospheric and Low-Pressure Metal Storage Tanks Using Acoustic Emission¹

This standard is issued under the fixed designation E 1930; 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.

1. Scope

1.1 This test method covers guidelines for acoustic emission (AE) examinations of new and in-service aboveground storage tanks of the type used for storage of liquids.

1.2 This test method will detect acoustic emission in areas of sensor coverage that are stressed during the course of the examination. For flat-bottom tanks these areas will generally include the sidewalls (and roof if pressure is applied above the liquid level). The examination may not detect flaws on the bottom of flat-bottom tanks unless sensors are located on the bottom.

1.3 This test method may require that the tank experience a load that is greater than that encountered in normal use. The normal contents of the tank can usually be used for applying this load.

1.4 This test method is not valid for tanks that will be operated at a pressure greater than the examination pressure.

1.5 It is not necessary to drain or clean the tank before performing this examination.

1.6 This test method applies to tanks made of carbon steel, stainless steel, aluminum and other metals.

1.7 This test method may also detect defects in tank linings (for example, high-bulk, phenolics and other brittle materials).

1.8 AE measurements are used to detect and localize emission sources. Other NDT methods may be used to confirm the nature and significance of the AE indications (s). Procedures for other NDT techniques are beyond the scope of this test method.

1.9 Examination liquid must be above its freezing temperature and below its boiling temperature.

1.10 Superimposed internal or external pressures must not exceed design pressure.

1.11 Leaks may be found during the course of this examination but their detection is not the intention of this test method.

1.12 The values stated in inch-pound units are to be regarded as the standard. The SI units given in parentheses are for information only.

1.13 *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 8.

2. Referenced Documents

2.1 ASTM Standards:

E 543 Practice for Evaluating Agencies that Perform Non-destructive Evaluation²

E 650 Guide to Mounting Piezoelectric AE Sensors²

E 976 Guide for Determining Reproducibility of AE Sensor Response²

E 1316 Terminology for Nondestructive Examinations²

2.2 ANSI/ASNT Standard:

Recommended Practice ASNT SNT-TC-1A for Qualification and Certification of Nondestructive Testing Personnel³

ANSI/ASNT CP-189 Standard for Qualification and Certification of NDT Personnel³

2.3 ASME Standard:

Section V, Article 12, Boiler & Pressure Vessel Code⁴

2.4 AIA Document:

NAS-410 Certification and Qualification of Nondestructive Testing Personnel⁵

3. Terminology

3.1 Definitions:

3.1.1 This test method makes use of definitions provided in Terminology E 1316. Definitions for terms that do not appear in Terminology E 1316 are given below.

² Annual Book of ASTM Standards, Vol 03.03.

³ Available from American Society for Nondestructive Testing, 1711 Arlington Plaza, P.O. Box 28518, Columbus, OH 43228-0518.

⁴ Available from American Society of Mechanical Engineers, 345 E. 47th Street, New York, NY 10017.

⁵ Available from Aerospace Industries Association of America, Inc., 1250 Eye St., NW, Washington, DC 20005.

¹ This test method 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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