



Standard Practice for Leaks Using Bubble Emission Techniques¹

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1. Scope

1.1 This practice covers procedures for detecting or locating leaks, or both, by bubble emission techniques. A quantitative measure is not practical. The normal limit of sensitivity for this test method is 4.5×10^{-10} mol/s (1×10^{-5} Std cm³/s).²

1.2 Two techniques are described:

1.2.1 Immersion technique, and

1.2.2 Liquid application technique.

NOTE 1—Additional information is available in ASME Boiler and Pressure Vessel Code, Section V, Article 10-Leak Testing, and Guide E479.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *This standard does not purport to address 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.*

2. Referenced Documents

2.1 *ASTM Standards:*³

E479 Guide for Preparation of a Leak Testing Specification (Withdrawn 2014)⁴

E543 Specification for Agencies Performing Nondestructive Testing

E1316 Terminology for Nondestructive Examinations

¹ This test method is under the jurisdiction of ASTM Committee E07 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.08 on Leak Testing Method.

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² The gas temperature is referenced to 0°C. To convert to another gas reference temperature, T_{ref} , multiply the leak rate by $(T_{ref} + 273)/273$.

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 The last approved version of this historical standard is referenced on www.astm.org.

2.2 *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

ASME Boiler and Pressure Vessel Code, Section V, Article 10-Leak Testing⁶

NAS-410 Certification and Qualification of Nondestructive Test Personnel⁷

2.3 *Military Standard:*

MIL-L-25567D Leak Detection Compound Oxygen Systems⁸

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, see Terminology E1316, Section E.

4. Summary of Practice

4.1 The basic principle of this method consists of creating a pressure differential across a leak and observing for bubbles in a liquid medium located on the low pressure side. The sensitivity of the method is dependent on the pressure differential, the gas used to create the differential, and the liquid used for testing. As long as the pressure differential can be maintained across the area to be tested, this method can be used.

5. Basis of Application

5.1 The following items are subject to contractual agreement between the parties using or referencing this test method:

5.2 *Personnel Qualifications*

5.2.1 If specified in the contractual agreement. Personnel performing examinations to this test method shall be qualified in accordance with a nationally or internationally recognized

⁵ Available from American Society for Nondestructive Testing (ASNT), P.O. Box 28518, 1711 Arlingate Ln., Columbus, OH 43228-0518, <http://www.asnt.org>.

⁶ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5990, <http://www.asme.org>.

⁷ Available from Aerospace Industries Association of America, Inc. (AIA), 1000 Wilson Blvd., Suite 1700, Arlington, VA 22209-3928, <http://www.aia-aerospace.org>.

⁸ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://dodssp.daps.dla.mil>.