



Standard Test Method for Leaks Using Ultrasonics¹

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1. Scope

1.1 *Test Method A, Pressurization*—This test method covers procedures for calibration of ultrasonic instruments, location, and estimated measurements of gas leakage to atmosphere by the airborne ultrasonic technique.²

1.2 In general practice this should be limited to leaks producing leakage of 4.5×10^{-7} mol/s (1×10^{-2} std. cm³/s at 0°C) or more for the pressure method of gas leakage to atmosphere. Refer to Guide E 432 for additional information.

1.3 *Test Method B, Ultrasonic Transmitter*—For object under test not capable of being pressurized but capable of having ultrasonic tone placed/injected into the test area to act as an ultrasonic leak trace source.

1.3.1 This test method is limited to leaks producing leakage of 4.5×10^{-6} mol/s (1×10^{-1} std. cm³/s at 0°C) or greater.

1.4 The values stated in SI units are to be regarded as 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 standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

E 432 Guide for Selection of a Leak Testing Method³

E 1316 Terminology for Nondestructive Examinations³

2.2 Other Documents:

SNT-TC-1A Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing⁴

ANSI/ASNT CP-189 ASNT Standard for Qualification and Certification of Nondestructive Testing Personnel⁴

¹ This test method is under the jurisdiction of ASTM Committee E-7 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.08 on Leak Testing Method.

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² This technique is sometimes called “ultrasonic translation.”

³ *Annual Book of ASTM Standards*, Vol 03.03.

⁴ Available from American Society for Nondestructive Testing, 1711 Arlington Plaza, P.O. Box 28518, Columbus, OH 43228 – 0518.

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, see Terminology E 1316, Section E.

4. Summary of Test Method

4.1 *Test Method A*—This test method sets minimum requirements for an ultrasonic detector. It provides for calibration of the detector and gives procedures for pressurizing the test object, locating leaks, and estimating the leakage rates.

4.2 *Test Method B*—This test method sets minimum requirements for an ultrasonic detector used in conjunction with an ultrasonic transmitter. It gives procedures for locating leaks using an electronically generated ultrasonic leak tracer source.

5. Personnel Qualification

5.1 It is recommended that personnel performing leak testing attend a dedicated training course on the subject and pass a written examination. The training course should be appropriate for NDT level II qualification according to Recommended Practice No. SNT-TC-1A of the American Society for Nondestructive Testing or ANSI/ASNT Standard CP-189.

6. Significance and Use

6.1 *Test Method A*—This test method is useful for locating and estimating the size of pressurized gas leaks, either as a quality control test or as a field inspection procedure. It is also valuable as a pretest before other more time consuming and more sensitive leak tests are employed. It should not be used exclusively to locate highly toxic or explosive gas leaks.

6.2 *Test Method B*—This test method is useful for locating leaks in systems that are not under pressure or vacuum as either a quality control or a field inspection procedure. It is not useful for estimating the size of a leak. It is also valuable as a pretest before leak tests using pressurized gas methods and more sensitive leak tests are employed.

7. Interferences

7.1 The areas to be tested must be free of oil, grease, paint, and other contaminants that might mask a leak.

7.2 Under certain conditions background noise detected by the instrument can prevent the detection of relevant leakage. This background noise can result from equipment vibration and