



Standard Practice for Ultrasonic Pulse-Echo Straight-Beam Contact Testing¹

This standard is issued under the fixed designation E114; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This practice² covers ultrasonic examination of materials by the pulse-echo method using straight-beam longitudinal waves introduced by direct contact of the search unit with the material being examined.

1.2 This practice shall be applicable to development of an examination procedure agreed upon by the users of the document.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *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.*

2. Referenced Documents

2.1 ASTM Standards:³

E317 Practice for Evaluating Performance Characteristics of Ultrasonic Pulse-Echo Testing Instruments and Systems without the Use of Electronic Measurement Instruments
E543 Specification for Agencies Performing Nondestructive Testing

E1316 Terminology for Nondestructive Examinations

2.2 ASNT Standards:⁴

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

¹ This practice is under the jurisdiction of ASTM Committee E07 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.06 on Ultrasonic Method.

Current edition approved June 15, 2010. Published July 2010. Originally approved in 1955. Last previous edition approved in 2005 as E114 - 95 (2005). DOI: 10.1520/E0114-10.

² For ASME Boiler and Pressure Vessel Code applications see related Practice SE-114 in Section II of that Code.

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

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

2.3 Other Documents:

NAS-410 Certification and Qualification of Nondestructive Test Personnel⁵

3. Terminology

3.1 Refer to Terminology E1316 for definitions of terms used in this practice.

4. Basis of Application

4.1 *Purchaser-Supplier Agreements:* The following items require agreement between the using parties for this practice to be used effectively:

4.1.1 *Qualification of Nondestructive Testing Agencies—*Agreement is required as to whether the nondestructive testing agency, as defined in Specification E543 must be formally evaluated and qualified to perform the examination. If such evaluation and qualification is specified, a documented procedure such as Specification E543 shall be used as the basis for evaluation.

4.1.2 *Personnel Qualification—*Nondestructive testing (NDT) personnel shall be qualified in accordance with a nationally recognized NDT personnel qualification practice or standard such as ANSI/ASNT CP-189, SNT-TC-1A, NAS-410, or a similar document. The practice or standard used and its applicable revision shall be specified in the contractual agreement between the using parties.

4.1.3 *Extent of Examination—*The extent of the examination shall be determined by agreement of the using parties.

4.1.4 *Time of Examination—*The time of examination shall be determined by agreement of the using parties.

4.1.5 *Interpretation Criteria—*The criteria by which the ultrasonic signals and part acceptability will be evaluated and shall be determined by agreement of the using parties.

⁵ Available from Aerospace Industries Association of America, Inc. (AIA), 1000 Wilson Blvd., Suite 1700, Arlington, VA 22209-3928, <http://www.aia-aerospace.org>.

*A Summary of Changes section appears at the end of this standard