



# Standard Practice for Immersed Ultrasonic Testing by the Reflection Method Using Pulsed Longitudinal Waves<sup>1</sup>

This standard is issued under the fixed designation E 214; 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 ( $\epsilon$ ) 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 practice<sup>2</sup> describes an ultrasonic examination procedure for detecting discontinuities in material using instruments that transmit and receive pulsed longitudinal ultrasonic waves introduced into the material to be examined while immersed in or impinged upon by a liquid coupling agent. This practice applies to any material that can conduct sound waves of an appropriate frequency, and can be immersed in a liquid coupling agent for inspection, or can be subject to inspection by the use of a column or stream of the couplant between the search unit and the material being examined.

NOTE 1—Practice E 1001 is a complementary document that extends Practice E 214 by describing more detailed procedures.

1.2 *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:<sup>3</sup>

- E 127 Practice for Fabricating and Checking Aluminum Alloy Ultrasonic Standard Reference Blocks
- E 317 Practice for Evaluating Performance Characteristics of Ultrasonic Pulse-Echo Examination Instruments and Systems Without the Use of Electronic Measurement Instruments
- E 428 Practice for Fabrication and Control of Steel Reference Blocks Used in Ultrasonic Inspection
- E 543 Practice for Agencies Performing Nondestructive Testing

E 1001 Practice for Detection and Evaluation of Discontinuities by the Immersed Pulse-Echo Ultrasonic Method Using Longitudinal Waves

E 1316 Terminology for Nondestructive Testing

### 2.2 ASNT Documents

SNT-TC-1A Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing<sup>4</sup>

ANSI/ASNT-CP-189 Standard for Qualification and Certification of Nondestructive Testing Personnel<sup>4</sup>

### 2.3 AIA Standard:<sup>5</sup>

NAS-410 Certification and Qualification of Nondestructive Test Personnel

### 2.4 Military Specifications<sup>6</sup>

NOTE 2—For DoD contracts, unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS (Department of Defense Index of Specifications Standards) cited in the solicitation.

## 3. Terminology

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

## 4. Basis of Application

4.1 Personnel Qualification. If specified in the contractual agreement, personnel performing examinations to this standard 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 and certified by the employer or certifying agency, as applicable. The practice or standard used and its applicable revision shall be identified in the contractual agreement between the using parties.

4.2 Written Procedure. A detailed written procedure shall be used for the performance of ultrasonic examinations in accordance with this practice. The written procedure should address

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee E07 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.06 on Ultrasonic Testing Procedures.

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<sup>2</sup> For ASME Boiler and Pressure Vessel Code applications see related Practice SE-214 in the Code.

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>4</sup> Available from the American Society for Nondestructive Testing, 1711 Arlington Plaza, P.O. Box 28518, Columbus, OH 43228-0518.

<sup>5</sup> Available from Aerospace Industries Association of America, Inc. (AIA), 1250 Eye St., NW, Washington, DC 20005.

<sup>6</sup> Copies of specifications, standards, drawings and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.