



Designation: E543 – 21

Standard Specification for Agencies Performing Nondestructive Testing¹

This standard is issued under the fixed designation E543; 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 U.S. Department of Defense.

1. Scope*

1.1 This specification covers minimum requirements for agencies performing nondestructive testing (NDT).

1.2 When using this specification to assess the capability of, or to accredit NDT agencies, Guide E1359, Specification E329, ISO 9001, ISO 17025, or ISO 17020 may be used as a basis for the survey. It can be supplemented as necessary with more detail in order to meet the auditor's specific needs.

1.3 This specification can be used as a basis to evaluate testing or inspection agencies, or both, and is intended for use for the qualifying or accrediting, or both, of testing or inspection agencies, public or private.

1.4 *Units*—The use of SI or inch-pound units, or combination thereof, will be the responsibility of the technical committee whose standards are referred to in this 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 establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

B193 Test Method for Resistivity of Electrical Conductor Materials

E94 Guide for Radiographic Examination Using Industrial Radiographic Film
E114 Practice for Ultrasonic Pulse-Echo Straight-Beam Contact Testing
E125 Reference Photographs for Magnetic Particle Indications on Ferrous Castings
E127 Practice for Fabrication and Control of Flat Bottomed Hole Ultrasonic Standard Reference Blocks
E164 Practice for Contact Ultrasonic Testing of Weldments
E165 Practice for Liquid Penetrant Testing for General Industry
E213 Practice for Ultrasonic Testing of Metal Pipe and Tubing
E215 Practice for Standardizing Equipment and Electromagnetic Examination of Seamless Aluminum-Alloy Tube
E243 Practice for Electromagnetic (Eddy Current) Examination of Copper and Copper-Alloy Tubes
E273 Practice for Ultrasonic Testing of the Weld Zone of Welded Pipe and Tubing
E309 Practice for Eddy Current Examination of Steel Tubular Products Using Magnetic Saturation
E317 Practice for Evaluating Performance Characteristics of Ultrasonic Pulse-Echo Testing Instruments and Systems without the Use of Electronic Measurement Instruments
E329 Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
E376 Practice for Measuring Coating Thickness by Magnetic-Field or Eddy Current (Electromagnetic) Testing Methods
E426 Practice for Electromagnetic (Eddy Current) Examination of Seamless and Welded Tubular Products, Titanium, Austenitic Stainless Steel and Similar Alloys
E427 Practice for Testing for Leaks Using the Halogen Leak Detector Alkali-Ion Diode (Withdrawn 2013)³
E431 Guide to Interpretation of Radiographs of Semiconductors and Related Devices
E432 Guide for Selection of a Leak Testing Method
E433 Reference Photographs for Liquid Penetrant Inspection

¹ This specification is under the jurisdiction of ASTM Committee E07 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.09 on Nondestructive Testing Agencies.

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² 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.

³ The last approved version of this historical standard is referenced on www.astm.org.

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

- E479 Guide for Preparation of a Leak Testing Specification (Withdrawn 2014)³
- E493 Practice for Leaks Using the Mass Spectrometer Leak Detector in the Inside-Out Testing Mode
- E494 Practice for Measuring Ultrasonic Velocity in Materials by Comparative Pulse-Echo Method
- E498 Practice for Leaks Using the Mass Spectrometer Leak Detector or Residual Gas Analyzer in the Tracer Probe Mode
- E499 Practice for Leaks Using the Mass Spectrometer Leak Detector in the Detector Probe Mode
- E515 Practice for Leaks Using Bubble Emission Techniques
- E545 Test Method for Determining Image Quality in Direct Thermal Neutron Radiographic Examination
- E566 Practice for Electromagnetic (Eddy Current/Magnetic Induction) Sorting of Ferrous Metals
- E569 Practice for Acoustic Emission Monitoring of Structures During Controlled Stimulation
- E570 Practice for Flux Leakage Examination of Ferromagnetic Steel Tubular Products
- E571 Practice for Electromagnetic (Eddy-Current) Examination of Nickel and Nickel Alloy Tubular Products
- E587 Practice for Ultrasonic Angle-Beam Contact Testing
- E592 Guide to Obtainable ASTM Equivalent Penetrameter Sensitivity for Film Radiography of Steel Plates ¼ to 2 in. (6 to 51 mm) Thick with X-Rays and 1 to 6 in. (25 to 152 mm) Thick with Cobalt-60
- E650 Guide for Mounting Piezoelectric Acoustic Emission Sensors
- E664 Practice for the Measurement of the Apparent Attenuation of Longitudinal Ultrasonic Waves by Immersion Method
- E690 Practice for In Situ Electromagnetic (Eddy Current) Examination of Nonmagnetic Heat Exchanger Tubes
- E703 Practice for Electromagnetic (Eddy Current) Sorting of Nonferrous Metals
- E709 Guide for Magnetic Particle Testing
- E746 Practice for Determining Relative Image Quality Response of Industrial Radiographic Imaging Systems
- E747 Practice for Design, Manufacture and Material Grouping Classification of Wire Image Quality Indicators (IQI) Used for Radiology
- E748 Guide for Thermal Neutron Radiography of Materials
- E749 Practice for Acoustic Emission Monitoring During Continuous Welding
- E750 Practice for Characterizing Acoustic Emission Instrumentation
- E751 Practice for Acoustic Emission Monitoring During Resistance Spot-Welding
- E797 Practice for Measuring Thickness by Manual Ultrasonic Pulse-Echo Contact Method
- E801 Practice for Controlling Quality of Radiographic Examination of Electronic Devices
- E803 Test Method for Determining the *L/D* Ratio of Neutron Radiography Beams
- E908 Practice for Calibrating Gaseous Reference Leaks
- E976 Guide for Determining the Reproducibility of Acoustic Emission Sensor Response
- E999 Guide for Controlling the Quality of Industrial Radiographic Film Processing
- E1001 Practice for Detection and Evaluation of Discontinuities by the Immersed Pulse-Echo Ultrasonic Method Using Longitudinal Waves
- E1004 Test Method for Determining Electrical Conductivity Using the Electromagnetic (Eddy Current) Method
- E1025 Practice for Design, Manufacture, and Material Grouping Classification of Hole-Type Image Quality Indicators (IQI) Used for Radiography
- E1030 Practice for Radiographic Examination of Metallic Castings
- E1032 Practice for Radiographic Examination of Weldments Using Industrial X-Ray Film
- E1065/E1065M Practice for Evaluating Characteristics of Ultrasonic Search Units
- E1067 Practice for Acoustic Emission Examination of Fiber-glass Reinforced Plastic Resin (FRP) Tanks/Vessels
- E1118 Practice for Acoustic Emission Examination of Reinforced Thermosetting Resin Pipe (RTRP)
- E1139 Practice for Continuous Monitoring of Acoustic Emission from Metal Pressure Boundaries
- E1208 Practice for Fluorescent Liquid Penetrant Testing Using the Lipophilic Post-Emulsification Process
- E1209 Practice for Fluorescent Liquid Penetrant Testing Using the Water-Washable Process
- E1210 Practice for Fluorescent Liquid Penetrant Testing Using the Hydrophilic Post-Emulsification Process
- E1211 Practice for Leak Detection and Location Using Surface-Mounted Acoustic Emission Sensors
- E1212 Practice for Establishing Quality Management Systems for Nondestructive Testing Agencies
- E1219 Practice for Fluorescent Liquid Penetrant Testing Using the Solvent-Removable Process
- E1220 Practice for Visible Penetrant Testing Using Solvent-Removable Process
- E1254 Guide for Storage of Radiographs and Unexposed Industrial Radiographic Films
- E1255 Practice for Radioscopy
- E1312 Practice for Electromagnetic (Eddy Current) Examination of Ferromagnetic Cylindrical Bar Product Above the Curie Temperature
- E1315 Practice for Ultrasonic Examination of Steel with Convex Cylindrically Curved Entry Surfaces (Withdrawn 2006)³
- E1316 Terminology for Nondestructive Examinations
- E1324 Guide for Measuring Some Electronic Characteristics of Ultrasonic Testing Instruments
- E1359 Guide for Auditing and Evaluating Capabilities of Nondestructive Testing Agencies
- E1417 Practice for Liquid Penetrant Testing
- E1418 Practice for Visible Penetrant Testing Using the Water-Washable Process
- E1419 Practice for Examination of Seamless, Gas-Filled, Pressure Vessels Using Acoustic Emission
- E1441 Guide for Computed Tomography (CT)
- E1444 Practice for Magnetic Particle Testing