



Standard Practice for Magnetic Particle Testing¹

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

^{ε1} NOTE—Summary of Changes updated editorially in July 2016.

1. Scope*

1.1 This practice establishes minimum requirements for magnetic particle testing used for the detection of surface or slightly subsurface discontinuities in ferromagnetic material. Guide E709 can be used in conjunction with this practice as a tutorial.

NOTE 1—This Practice replaces MIL-STD-1949.

1.2 The magnetic particle testing method is used to detect cracks, laps, seams, inclusions, and other discontinuities on or near the surface of ferromagnetic materials. Magnetic particle testing may be applied to raw material, billets, finished and semi-finished materials, welds, and in-service parts. Magnetic particle testing is not applicable to non-ferromagnetic metals and alloys such as austenitic stainless steels. See Appendix X1 for additional information.

1.3 All areas of this Practice may be open to agreement between the Cognizant Engineering Organization and the supplier, or specific direction from the Cognizant Engineering Organization.

1.4 This standard is a combined standard, an ASTM standard in which rationalized SI units and inch-pound units are included in the same standard, with each system of units to be regarded separately as standard.

1.4.1 *Units*—The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with 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 establish appro-*

priate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 The following documents form a part of this standard practice to the extent specified herein.

2.2 ASTM Standards:²

A275/A275M Practice for Magnetic Particle Examination of Steel Forgings

A456/A456M Specification for Magnetic Particle Examination of Large Crankshaft Forgings

E543 Specification for Agencies Performing Nondestructive Testing

E709 Guide for Magnetic Particle Testing

E1316 Terminology for Nondestructive Examinations

E2297 Guide for Use of UV-A and Visible Light Sources and Meters used in the Liquid Penetrant and Magnetic Particle Methods

E3022 Practice for Measurement of Emission Characteristics and Requirements for LED UV-A Lamps Used in Fluorescent Penetrant and Magnetic Particle Testing

2.3 ASNT Documents:³

SNT-TC-1A Recommended Practice No. "Personnel Qualification and Certification in Nondestructive Testing"

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

2.4 Society of Automotive Engineers (SAE)-AMS Documents:^{4,5}

AMS 2641 Magnetic Particle Inspection Vehicle

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

⁴ Copies of standards, specifications, drawings, and publications required by manufacturers in connection with specification acquisition should be obtained from the contracting activity or as directed by the contracting officer.

⁵ Available from SAE International (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001, <http://www.sae.org>.

* This practice is under the jurisdiction of ASTM Committee E07 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.03 on Liquid Penetrant and Magnetic Particle Methods.

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