



Standard Practice for Magnetic Particle Examination¹

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

1. Scope

1.1 This practice establishes minimum requirements for magnetic particle examination used for the detection of surface or slightly subsurface discontinuities in ferromagnetic material. This practice is intended as a direct replacement of MIL-STD-1949. Guide E 709 can be used in conjunction with this practice as a tutorial.

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

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

2.2 ASTM Standards:

A 275/A 275M Test Method for Magnetic Particle Examination of Steel Forgings²

A 456 Specification for Magnetic Particle Inspection of Large Crankshaft Forgings²

D 96 Test Methods for Water and Sediment in Crude Oil by the Centrifuge Method (Field Procedure)³

E 543 Practice for Evaluating Agencies that Perform Non-destructive Testing⁴

E 709 Guide for Magnetic Particle Examination⁴

E 1316 Terminology for Nondestructive Examinations⁴

2.3 ASNT Document:

SNT-TC-1A Recommended Practice and Supplement Magnetic Particle Inspection⁵

2.4 *Society of Automotive Engineers (SAE)-AMS Documents:*⁶

AMS 2300 Premium Aircraft-Quality Steel Cleanliness Magnetic Particle Inspection Procedure⁷

AMS 2301 Aircraft Quality Steel Cleanliness Magnetic Particle Inspection Procedure⁷

AMS 2303 Aircraft Quality Steel Cleanliness Martensitic Corrosion Resistant Steels Magnetic Particle Inspection Procedure⁷

AMS 2641 Magnetic Particle Inspection Vehicle⁷

AMS 3040 Magnetic Particles, Nonfluorescent, Dry Method⁷

AMS 3041 Magnetic Particles, Nonfluorescent, Wet Method, Oil Vehicle, Ready-To-Use⁷

AMS 3042 Magnetic Particles, Nonfluorescent, Wet Method, Dry Powder⁷

AMS 3043 Magnetic Particles, Nonfluorescent, Wet Method, Oil Vehicle, Aerosol Packaged⁷

AMS 3044 Magnetic Particles, Fluorescent, Wet Method, Dry Powder⁷

AMS 3045 Magnetic Particles, Fluorescent, Wet Method, Oil Vehicle, Ready-To-Use⁷

AMS 3046 Magnetic Particles, Fluorescent, Wet Method, Oil Vehicle, Aerosol Packaged⁷

AMS 5355 Investment Castings⁷

2.5 Federal Standards:⁶

FED-STD-313 Material Safety Data Sheets, Preparation and the Submission of⁸

FED-STD-595 Colors⁸

2.6 Military Standards:⁶

MIL-STD-1907 Inspection, Liquid Penetrant and Magnetic Particle Soundness Requirements for Materials, Parts, and Weldments⁸

¹ This practice is under the jurisdiction of ASTM Committee E-7 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.03 on Liquid Penetrant and Magnetic Particle Methods.

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² *Annual Book of ASTM Standards*, Vol 01.05.

³ *Annual Book of ASTM Standards*, Vol 05.01.

⁴ *Annual Book of ASTM Standards*, Vol 03.03.

⁵ Available from American Society for Nondestructive Testing, 1711 Arlinggate Plaza, P.O. Box 28518, Columbus, OH 43228-0518.

⁶ 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.

⁷ Available from Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.

⁸ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.