

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

SAE

AMS 2640K

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Superseding AMS 2640J

MAGNETIC PARTICLE INSPECTION

This specification has been declared "CANCELLED" by the Aerospace Materials Division, SAE, as of April 1996, and has been superseded ASTM E 1444. The requirements of the latest issue of ASTM E 1444 shall be fulfilled whenever reference is made to the cancelled AMS 2640J. By this action, this document will remain in the Numerical Section of the Index of Aerospace Material Specifications noting that it is superseded by ASTM E 1444.

If you need a copy of the previous revision of this specification, please contact SAE Headquarters at (412) 776-4970.

PREPARED UNDER THE JURISDICTION OF AMS COMMITTEE "K"

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**AEROSPACE
MATERIAL
SPECIFICATION**

AMS 2640J
Superseding AMS 2640H

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MAGNETIC PARTICLE INSPECTION

1. SCOPE:

1.1 Purpose: This specification covers procedures for wet and dry methods of magnetic particle inspection.

1.2 Application: Primarily for detecting the presence of small grinding or quenching cracks, seams, nonmetallic inclusions, and other imperfections on and immediately below the surface of magnetizable materials.

1.2.1 When AMS 2640 appears on the drawing or is required by written instructions, magnetic particle inspection shall be performed on parts which have been heat treated to the final condition and whose surfaces have been finished machined. If surface treatments are to be applied, an inspection may be performed before such treatments. If surface treatments are of the type which may cause cracks, then an inspection shall be performed after such treatments, using a magnetic substance with a suitable color. This paragraph shall not be interpreted as prohibiting additional magnetic particle inspections during manufacture of parts.

1.2.2 Either fluorescent or nonfluorescent magnetic particle inspection may be used unless one or the other is specifically called for on the drawing or in other inspection procedure instructions.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

AMS 3160 - Solvent, Petroleum

AMS 3161 - Oil, Inspection, Odorless, Heavy Solvent

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AMS 2640J

- 2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM D96 - Water and Sediment in Crude Oils

- 2.3 ASNT Publications: Available from American Society for Nondestructive Testing, 3200 Riverside Drive, P.O. Box 5642, Columbus, OH 43221.

ASNT-TC-1A - Recommended Practice, Personnel Qualification and Certification in Nondestructive Testing

3. TECHNICAL REQUIREMENTS:

- 3.1 Qualification of Personnel: Interpretation of the indications revealed by
Ø this inspection procedure and final disposition of parts shall be the responsibility of only qualified personnel having considerable experience with magnetic particle inspection and nonuniformity of its results. Unless otherwise specified, inspection personnel shall be certified in accordance with ASNT-TC-1A with a minimum classification level of II.

3.2 Process:

- 3.2.1 Wet Method: All materials and parts shall be inspected by the wet method unless the dry method (3.2.2) is specified. Wet method shall use either the continuous or the residual method as warranted by the particular material or part undergoing inspection.

3.2.1.1 Materials and Control:

- 3.2.1.1.1 Liquid Vehicle: Shall be a light petroleum distillate of
Ø approximately 3.0 centistokes (36 SUS) viscosity at 100°F (38°C) similar in properties to AMS 3160 or AMS 3161 or shall be water containing a suitable corrosion inhibitor, wetting agents, and defoaming agents.

- 3.2.1.1.2 Magnetic Substance: Shall be suitable for the purpose and in either paste or power form; it shall be capable of being satisfactorily dispersed in the liquid vehicle. The concentration of magnetic substance in the suspension shall conform to 3.2.1.1.3.1 or 3.2.1.1.3.2 as applicable.

- 3.2.1.1.3 Suspension: The viscosity of the petroleum distillate vehicle shall never exceed 5.0 centistokes (42.5 SUS) at operating temperature. Suitable means shall be provided for agitating the suspension. The suspension shall consist of magnetic substance of adequate concentration in the liquid vehicle to produce clear indications of imperfections with the magnetizing procedure, type of magnetic substance, and examining method used.

- 3.2.1.1.3.1 Nonfluorescent Suspension: