



AEROSPACE MATERIAL SPECIFICATION

AMS3043™**REV. F**

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Revised 2023-05

Superseding AMS3043E

Magnetic Particles, Nonfluorescent, Wet
Method, Oil Vehicle, Aerosol Packaged

RATIONALE

AMS3043F is the result of a Five-Year Review and update of the specification. The revision updates use of the product in line with general industry practice (1.2), updates warnings (1.3), deletes reference to a dated specification (3.1, 3.4, and 5.1.1), eliminates preproduction approval (4.2), and updates testing protocols (3.4, 3.4.1.2, 3.4.2, and 3.4.3).

1. SCOPE

1.1 Form

This specification covers nonfluorescent magnetic particles in the form of a mixed, ready-to-use suspension in an odorless oil vehicle and packaged in aerosol cans.

1.2 Application

These particles have been used typically as the inspection medium in a wet magnetic particle inspection system in accordance with ASTM E3024/E3024M, but usage is not limited to such application.

1.3 Safety-Hazardous Materials

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

1.3.1 Material Hazards

The hazard characteristics of each material shall be properly identified, and the manufacturer shall provide an SDS (safety data sheet) which contains all relevant safety information for the product.

1.3.2 Physical Hazards

Aerosol cans may have physical hazards, e.g., gas under pressure, flammability, that should be taken into consideration during storage and use. The user should learn of these hazards and take the necessary precautions.

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2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2641	Vehicle, Magnetic Particle Inspection, Petroleum Base
AMS3042	Magnetic Particles, Nonfluorescent, Wet Method, Dry Powder
AS5282	Tool Steel Ring for Magnetic Particle Inspection
AS7766	Terms Used in Aerospace Metals Specifications

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D3094	Standard Test Method for Seepage Rate of Aerosol Products
ASTM E709	Standard Guide for Magnetic Particle Testing
ASTM E3024/E3024M	Standard Practice for Magnetic Particle Testing for General Industry

2.3 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Material

The product shall be composed of durable nonfluorescent magnetic particles conforming to AMS3042 which may have been treated to attain the color specified. The particles shall be mixed in the proper proportion with an inspection vehicle conforming to AMS2641 and packaged in aerosol cans.

3.2 Storage Life

The product shall meet the requirements specified in 3.3 when tested at any time up to 12 months from date of manufacture.

3.3 Properties

The product shall conform to the following requirements: tests shall be performed on the product supplied and in accordance with specified test procedures, using a test suspension prepared by spraying the complete contents of several aerosol cans into a clean container to produce at least 1 quart (1 L) of suspension, agitating the aerosol cans frequently to exhaust all particulate material.

3.3.1 Contamination

The product shall show no evidence of foreign material, agglomeration, or scum, determined by visual examination of the test suspension at the following times:

3.3.1.1 During preparation of the test suspension as in 3.3.

3.3.1.2 After mixing the test suspension, allowing it to stand for not less than 30 minutes, and agitating it slightly.

3.3.1.3 During tests to determine other characteristics of the product.

3.3.2 Concentration

The concentration of magnetic particles in the freshly sprayed suspension shall be 1.0 to 2.4 mL of magnetic particles in 100 mL of suspension, determined by mixing the suspension thoroughly, filling a 100-mL calibrated centrifuge tube as specified in ASTM E709, demagnetizing, allowing to stand undisturbed for at least 30 minutes, and reading, on the centrifuge tube, the volume of particles settled from the suspension.

3.3.3 Sensitivity

The product shall provide indications of at least the first six holes of the ring test specimen of 4.4 when tested as follows:

3.3.3.1 Place the ring on a 1-inch (25-mm) diameter copper bar and circularly magnetize in a standard magnetic particle inspection unit by passing 2500 A of direct current through the bar immediately before spraying the ring with the contents of an agitated aerosol can from the same lot that has passed the concentration and contamination tests. Examine the ring under a white light of not less than 100 foot-candles (1076 lx) at the examining surface.

3.3.4 Color

The color of the magnetic particles in suspension shall be black, red, gray, or as otherwise specified, determined by observing a well-dispersed sample of the test suspension in a glass container under a white light of not less than 100 foot-candles (1076 lx) at the examining surface.

3.4 Aerosol Spray Cans

The magnetic particles shall be packaged in aerosol cans and meet the following requirements. The aerosol cans selected for test shall be maintained at room temperature for not less than 12 hours prior to testing.

3.4.1 Sprayability and Leakage

3.4.1.1 All aerosol pressure cans shall be equipped with a spray nozzle. The nozzle shall provide a fine, steady spray and shall deposit the product evenly on a flat or vertical surface. No chunks of solids shall be expelled and no clogging of the nozzle shall occur. After clearing the nozzle in accordance with manufacturer's instructions, there shall be no perceptible leakage.

3.4.1.2 The characteristics of the spray pattern and the performance of the spray nozzle shall be evaluated by vigorously shaking the can for not less than 30 seconds with the contained pellet sounding on each shake and spraying a pattern on large sheets of newspaper or similar surfaces to determine the coverage and evenness of the spray. After spraying several patterns, the nozzle shall be examined for evidence of chunks of solids and clogging. The nozzle shall be cleared by inverting the can and spraying until only gas escapes. The can shall be immersed for not less than 15 minutes in water at 126 to 129 °F (52 to 54 °C); there shall be no visible evidence of leakage from, or distortion of, the pressurized container. After vigorous shaking, two more patterns shall be sprayed. The spray characteristics shall not have changed and there shall be no chunking or clogging of the nozzle.

CAUTION: Do not heat the pressurized can over 129 °F (54 °C).

3.4.2 Complete Expulsion

The complete usable portion of the contents shall have been expelled before the propellant is expended. The expelled contents shall be not less than specified on the container and the particle content shall conform to the aerosol spray requirements. Vigorously shake each can being tested for not less than 30 seconds with the contained pellet sounding on each shake. Expel the contents in a series of short blasts into a clean graduated glass container in such a manner that the entire contents of the can will be retained in the glass container. Repeat the vigorous shaking and short blasts until there is no further escape of gas.

3.4.3 Gas Seepage

Shall be not greater than 3 cubic centimeters (3 mL) per 24 hours, determined in accordance with ASTM D3094 or equivalent.

3.4.4 Magnetic particles shall be completely mixed with vehicle and each can shall contain a pellet to aid in agitation or mixing of the product prior to spraying. The aerosol cans shall be of suitable size for hand application of the product or as otherwise ordered.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of the product shall supply all samples for the producer's tests and shall be responsible for the performance of all specified tests. The purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

All technical requirements, except storage life (3.2), are acceptance tests and shall be performed on each lot.

4.3 Sampling and Testing

Shall be as follows:

4.3.1 For Acceptance Tests

Sufficient product shall be taken at random from each lot to perform all required tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.3.1.1 A lot shall be all product produced in a single production run from the same batch of raw materials under the same fixed conditions and presented for inspection at one time. A lot may be packaged in smaller quantities and delivered under the basic lot approval provided lot identification is maintained.

4.4 Tool Steel Test Ring

Shall be in accordance with AS5282.

4.5 Reports

The producer of the product shall furnish with each shipment a report stating that the product conforms to all technical requirements. This report shall include the purchase order number, lot number, AMS3043F, producer's material designation, lot number, date of manufacture, and quantity.