



AEROSPACE MATERIAL SPECIFICATION

AMS3043

REV. D

Issued 1974-03
Revised 2008-11
Reaffirmed 2014-08

Superseding AMS3043C

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

RATIONALE

AMS3043D has been reaffirmed to comply with the SAE five year review policy.

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 E 1444, 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.

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.

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2.1 SAE Publications

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

AMS2641	Vehicle, Magnetic Particle Inspection, Petroleum Base
AMS2820	Packaging, Aerosol
AMS3042	Magnetic Particles, Nonfluorescent, Wet Method, Dry Powder
AS5282	Tool Steel Ring for Magnetic Particle Inspection

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 D 1966	Test Method for Foots in Linseed Oil
ASTM E 1444	Magnetic Particle Examination

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 in accordance with AMS2820.

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 D 1966, 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 amperes 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 (1000 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 (1000 lx) at the examining surface.

3.4 Aerosol Spray Cans

The magnetic particles shall be packaged in aerosol cans conforming to AMS2820 and meeting the requirements of 3.4.1 and 3.4.2. The aerosol cans selected for test shall be maintained at room temperature for not less than 12 hours prior to testing. During testing, the aerosol can may be immersed in water at $77\text{ }^{\circ}\text{F} \pm 2$ ($25\text{ }^{\circ}\text{C} \pm 1$) periodically to maintain the container and its contents at room temperature.

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 $126\text{ to }129\text{ }^{\circ}\text{F}$ ($52\text{ to }54\text{ }^{\circ}\text{C}$); there shall be no visible evidence of leakage from, or distortion of, the pressurized container. The pressurized can shall be immersed in water at $77\text{ }^{\circ}\text{F} \pm 2$ ($25\text{ }^{\circ}\text{C} \pm 1$) until the temperature has stabilized and, 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.

3.4.1.3 CAUTION

DO NOT HEAT THE PRESSURIZED CAN OVER $129\text{ }^{\circ}\text{F}$ ($54\text{ }^{\circ}\text{C}$).

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 5 fluid ounces (148 mL) and the particle content shall conform to the aerosol spray requirements. Vigorously shake for not less than 30 seconds each unused can to be tested, with the contained pellet sounding on each shake, and 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. The aerosol can may be immersed periodically in water at $77\text{ }^{\circ}\text{F} \pm 2$ ($25\text{ }^{\circ}\text{C} \pm 1$) to maintain the can and its contents at room temperature. Repeat the vigorous shaking and short blasts until there is no further escape of gas.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The manufacturer of the product shall supply all samples for manufacturer's tests and shall be responsible for the performance of all specified tests. 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.

4.2.2 Preproduction Tests

All technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of a product to a purchaser, when a change in ingredients and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

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.

4.3.2 For Preproduction Tests

As agreed upon by purchaser and vendor.

4.4 Tool Steel Test Ring

Shall be in accordance with AS5282.

4.5 Approval

4.5.1 Sample product shall be approved by purchaser before product for production use is supplied, unless such approval be waived by purchaser. Results of tests on production product shall be equivalent to those on the approved sample.

4.5.2 Manufacturer shall use ingredients, manufacturing procedures, processes, and methods of inspection on production product that are the same as those used on the approved sample. If necessary to make any changes in ingredients, processing techniques, or manufacturing procedures, manufacturer shall submit for reapproval a statement of the proposed changes in ingredients and/or processing and, when requested, sample product. Production product shall not be shipped prior to receipt of reapproval.