SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®

400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 3043A

Issued 3-1-74
Revised 7-1-88

Superseding AMS 3043

MAGNETIC PARTICLES, NONFLUORESCENT
Wet Method, Oil Vehicle, Aerosol Packaged

1. SCOPE:

1.1 Form: This specification covers nonfluorescent magnetic particles having black, red, gray, or other color, as specified, supplied in the form of a mixed, ready-to-use suspension of powder in an odorless oil vehicle, and packaged in aerosol cans.

1.2 Application: Primarily as the inspection medium in a wet magnetic particle system as defined in AMS 2640 or MIL-STD-1949.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications 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 2640 - Magnetic Particle Inspection
AMS 2641 - Vehicle, Magnetic Particle Inspection, Petroleum Base
AMS 2820 - Aerosol Packaging
AMS 2825 - Material Safety Data Sheets
AMS 3042 - Magnetic Particles

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
ASTM E11 - Wire-Cloth Sieves for Testing Purposes

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia PA 19120.

2.3.1 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of
MIL-STD-1949 - Inspection, Magnetic Particle

3. TECHNICAL REQUIREMENTS:

3.1 Material: The product shall be composed of durable nonfluorescent magnetic Ø particles conforming to AMS 3042 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 AMS 2641 and packaged in aerosol cans in accordance with AMS 2820.

3.1.1 Storage Life: The product shall meet the requirements specified in 3.2 when tested at any time up to 12 months from date of manufacture.

3.2 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.

3.2.1 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:

3.2.1.1 During preparation of the test suspension as in 3.2.

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

3.2.1.3 During tests to determine other characteristics of the product.

3.2.2 Concentration: The concentration of nonfluorescent magnetic particles in Ø the freshly sprayed suspension shall be 1.0 - 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 D96, and allowing to stand undisturbed for at least 60 minutes, and reading on the tube the volume of particles settled from the suspension.

3.2.3 Sensitivity: The product shall show not less than a five-hole indication of the ring test specimen defined in MIL-STD-1949, determined as follows:

3.2.3.1 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.

3.2.4 Aerosol Spray Cans: The magnetic particles shall be packaged in aerosol cans meeting the requirements specified herein. 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°F ± 2 (25°C ± 1) periodically to maintain the container and its contents at room temperature.

3.2.4.1 Sprayability and Leakage:

3.2.4.1.1 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.

3.2.4.1.2 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 then be cleared by inverting the can and spraying until only gas escapes. The can shall then be immersed for not less than 15 minutes in water at 125° - 130°F (52° - 54°C); there shall be no visible evidence of leakage from, or distortion of, the pressurized container. The pressurized can shall then be immersed in water at 77°F ± 2 (25°C ± 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.

3.2.4.1.3 CAUTION: DO NOT HEAT THE PRESSURIZED CAN OVER 130°F (54°C).

3.2.4.2 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 glass container graduated in ounces (mL) 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°F ± 2 (25°C ± 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 performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.5. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to all technical requirements of this specification, except storage life (3.2), are classified as acceptance tests and shall be performed on each lot.

4.2.2 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be performed prior to or on the initial shipment of the product to a purchaser, when a change in material, processing, or both requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, contracting officer, or request for procurement.

4.3 Sampling: 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 determininations 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 vendor's inspection at one time. A lot may be packaged in smaller quantities and delivered under the basic lot approval provided lot identity is maintained.

4.3.2 For Preproduction Tests: As agreed upon by purchaser and vendor.

4.4 Approval:

4.4.1 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.