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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 3043C

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Superseding AMS 3043B

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

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.

1.2 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 canceled and no superseding document has been specified, the last published issue of that document shall apply.

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7161 FAX: (724) 776-0243
TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS: http://www.sae.org

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or www.sae.org.

AMS 2641 Vehicle, Magnetic Particle Inspection, Petroleum Base
AMS 2820 Aerosol Packaging
AMS 3042 Magnetic Particles, Nonfluorescent, Wet Method, Dry Powder

AS5282 Tool Steel Ring for Magnetic Particle Inspection

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or 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 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.

3.2 Storage Life:

The product shall meet the requirements specified in 3.3 when tested at any time up to 12months 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 1.2 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 60 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 hours 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 (1075 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 (1075 lx) at the examining surface.

3.4 Aerosol Spray Cans:

The magnetic particles shall be packaged in aerosol cans conforming to AMS 2820 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 °F ± 2 (25 °C ± 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 to 129 °F (52 to54 °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 °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.

3.4.1.3 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 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 °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 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.

4.6 Reports:

The vendor 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, AMS 3043C, manufacturer's material designation, lot number, date of manufacture, and quantity.

4.7 Resampling and Retesting:

If any sample used in the above tests fails to meet specified requirements, disposition of the product may be based on the results of testing three additional samples for each original nonconforming sample. Failure of any retest sample to meet specified requirements shall be cause for rejection of the product represented. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

5.1.1 The magnetic particles shall be packaged in aerosol cans conforming to AMS 2820 and meeting the requirements of 3.4. Magnetic particles shall be completely mixed with vehicle and each can shall contain a pellet to aid in agitation or mixing of the material prior to spraying. The aerosol cans shall be of suitable size for hand application of the product or as otherwise specified by purchaser.

5.1.2 A lot of particles in aerosol cans may be packaged in small quantities and delivered under the basic lot approval provided lot identification is maintained.