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400 Commonwealth Dr., Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 3045B

Issued 3-1-74
Revised 7-1-89

Superseding AMS 3045A

MAGNETIC PARTICLES, FLUORESCENT
Wet Method, Oil Vehicle, Ready-to-Use

1. SCOPE:

1.1 Form: This specification covers one type of fluorescent magnetic particles in the form of a mixed, ready-to-use suspension in an odorless inspection oil vehicle.

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

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 following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications 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 2825 - Material Safety Data Sheets
AMS 3044 - Magnetic Particles, Fluorescent, Wet Method, Dry Powder

2.2 ASTM Publications: Available from ASTM, 1916 Race Street, Philadelphia, PA 19103.

ASTM D96 - Water and Sediment in Crude Oils

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 fluorescent magnetic particles, suitable for long time use, which have been dyed or otherwise treated to attain the color specified. The particles shall be supplied ready-to-use, mixed in the proper proportion with an inspection vehicle.

3.1.1 Fluorescent magnetic particles shall conform to AMS 3044.

3.1.2 Magnetic particle inspection vehicle shall conform to AMS 2641.

3.2 Storage Life: The product shall meet the requirements of 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 in accordance with specified test methods:

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 4.3.3.

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 vehicle shall be 0.15 - 0.30 mL of fluorescent magnetic particles in 100 mL of suspension, determined by mixing the test suspension thoroughly, filling a 100 mL calibrated centrifuge tube as specified in ASTM D96, allowing it to stand undisturbed for a least 30 minutes, and reading, on the calibrated tube, the volume of the particles settled from the suspension.

3.3.3 Sensitivity:

3.3.3.1 Ring Test: The product shall show a five-hole indication on the ring test specimen defined in MIL-STD-1949, determined by placing the ring on a 1-inch (25-mm) diameter copper bar and circularly magnetizing the ring in a standard magnetic particle inspection unit by passing 2500 amperes of direct current through the bar immediately before flushing the ring with the agitated test suspension that has passed the contamination (3.3.1) and concentration (3.3.2) tests. Examine the ring in a darkened area where the white light does not exceed 2 foot-candles (20 lx). An ultraviolet (black) light shall be used at a measured intensity of not less than 1,000 uW/cm^2 and a wave length of 320 - 400 nm filtered to peak at 365 nm to activate the fluorescent magnetic particles.

3.3.3.2 Flaw-to-Background Test: Obtain a test part, or prepare a test specimen, containing flaws of the size expected to be found in routine inspection. The surface finish of the test specimen shall be representative of production parts. Magnetize and flush the specimen as specified in 3.3.3.1, using a sample of agitated test suspension that has passed the contamination (3.3.1) and concentration (3.3.2) tests. View the flaw indications in a darkened area under ultraviolet light as defined in 3.3.3.1. Indications shall be sharp and distinct. Background fluorescence around the flaws shall be of a level which will neither obscure the flaw indications nor cause difficulty in flaw detection.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all samples for vendor'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 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 and/or processing 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 Ø 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 Ø same batches 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 identification is maintained.

4.3.1.2 When a statistical sampling plan and acceptance quality level (AQL) have Ø been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3.1 and the report of 4.5 shall state that such plan was used.

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

4.3.3 Sample Preparation: The product to be sampled shall be mixed thoroughly for not less than 30 minutes and a sample of at least 1 gallon (3.8 L) of suspension drawn off while being stirred.

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 essentially equivalent to those on the approved sample.

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production product which are essentially the same as those used on the approved sample product. If necessary to make any changes in ingredients, processing techniques, or manufacturing procedures, vendor 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.

4.5 Reports: The vendor of the product shall furnish with each shipment a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the product conforms to the other technical requirements of this specification. This report shall include the purchase order number, AMS 3045B, vendor's material designation, lot number, date of manufacture, and quantity.