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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 3045D

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Superseding AMS 3045C

Magnetic Particles, Fluorescent
Wet Method, Oil Vehicle, Ready-to-Use

1. SCOPE:

1.1 Form:

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

1.2 Application:

These particles have been used typically as the inspection medium in a wet method, magnetic inspection system as defined in 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 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 3044 Magnetic Particles, Fluorescent, 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 Raw Linseed Oil, (Gravimetric Method)
ASTM E 1444 Magnetic Particle Examination

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 fluorescent color specified. The particles shall be supplied ready-to-use, mixed in the proper proportion with an inspection vehicle.

3.1.1 Fluorescent 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 matter, agglomeration, or scum, determined by visual examination of the 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 conformance with other characteristics of the product.

3.3.2 Concentration: The concentration of magnetic particles in the vehicle shall be 0.10 to 0.40 mL of fluorescent particles in 100 mL of suspension, determined by mixing the test suspension thoroughly, filling a 100 mL calibrated centrifuge tube as specified in ASTM D 1966, allowing it to stand undisturbed for not less than 60 minutes, and reading, on the calibrated tube, the volume of particles settled from the suspension.

3.3.3 Sensitivity: The product shall provide indications of at least the first seven holes of the test ring 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 magnetizing the ring in a standard magnetic particle inspection unit by passing 2500 amperes of direct current through the copper bar immediately before flooding 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 visible 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 $\mu W/cm^2$ and a wave length of 320 to 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 production inspection. The surface finish of the test specimen shall be representative of production parts. Magnetize and flood the specimen as specified in 3.3.3.1, using a sample of agitated test suspension that has passed the contamination (3.2.1) and concentration (3.3.2) tests. View the flaw indications in a darkened area under backlight 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 manufacturer of the product shall supply all samples for manufacturer's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that 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 the product to a purchaser, when a change in ingredients and/or processing requires reapproval as in 4.4.2, and when a purchaser deems confirmatory testing to be required.

4.3 Sampling and Testing:

Shall be as follows:

4.3.1 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 Lot: A lot shall be all product produced in a single production run from the same batches of raw materials under the same fixed conditions and presented for manufacturer's inspection at one time.

4.3.1.2 A statistical sampling plan, acceptable to purchaser, may be used in lieu of sampling as in 4.3.1.

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.

4.3.4 Tool Steel Test Ring: Shall be in accordance with AS5282.

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.

4.4.2 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.

4.5 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 3045D, manufacturer's material designation, lot number, and date of manufacture.