

MAGNETIC PARTICLES, NONFLUORESCENT
Dry Method

1. SCOPE:

- 1.1 Form: This specification covers magnetic particles in the form of a dry powder.
- 1.2 Application: Primarily as the inspection medium in a dry magnetic particle inspection system as defined in AMS 2640 and 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 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 2825 - Material Safety Data Sheets

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- 2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM B214 - Sieve Analysis of Granular Metal Powders

- 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 magnetic particles which may have been treated to attain the color specified.

- 3.2 Properties: The product shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with test methods specified herein:

- 3.2.1 Contamination: The dry powder shall show no evidence of foreign material or agglomeration, determined by visual examination during the tests to determine other characteristics of the product.

- 3.2.2 Color: The product shall be black, red, gray, or other color, as specified, determined by applying the dry powder on to white paper, at least 8-1/2 x 11 inches (216 x 279 mm), completely covering an area not less than 4 inches (102 mm) in diameter. The color shall be observed under a white light of not less than 100 foot-candles (1076 lm/m²) at the examining surface.

- 3.2.3 Particle Size: The magnetic particles shall be of such size that not less than 98% by weight shall pass through a U.S. Standard No. 80 (180 μm) screen/sieve, determined in accordance with ASTM B214. Determine the dry weight of the residual particulate material not passing through the screen/sieve as related to the original weight of the sample, expressed in percent.

- 3.2.4 Sensitivity: The product shall show a minimum six-hole indication of the test ring specimen defined in MIL-STD-1949, determined as follows:

- 3.2.4.1 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 A of direct current through the bar immediately before coating the ring with 1.0 g of fresh dry powder which has passed the contamination test, using a suitable squeeze-bulb applicator. Examine the ring under a white light of not less than 100 foot-candles (1076 lm/m²) at the examining surface.

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: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and as preproduction tests and shall be performed prior to or on the initial shipment of the product to a purchaser, on each lot, when a change in material, processing, or both requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.
- 4.2.1 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: Sufficient powder 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 A lot shall be all powder produced in a single production run from the same batch of raw materials under the same fixed conditions and presented for manufacturer'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.
- 4.4 Approval:
- 4.4.1 Sample powder shall be approved by purchaser before powder for production use is supplied, unless such approval be waived by purchaser. Results of tests on production powder shall be essentially equivalent to those on the approved sample.
- 4.4.2 Manufacturer shall use ingredients, manufacturing procedures, processes, and methods of inspection on production powder which are essentially the same as those used on the approved sample powder. If necessary to make any change in ingredients, processing techniques, or manufacturing procedures, manufacturer shall submit for reapproval a statement of the proposed changes and, when requested, sample powder. Production powder made by the revised procedure shall not be shipped prior to receipt of reapproval.
- 4.5 Reports: The manufacturer of the product shall furnish with each shipment a report showing the results of tests to determine conformance to the technical requirements of this specification. The report shall include the purchase order number, AMS 3040A, manufacturer's material designation, lot number, date of manufacture, color, and quantity.

- 4.5.1 A material safety data sheet conforming to AMS 2825, or equivalent, shall be supplied to each purchaser prior to, or concurrent with the report of preproduction test results or, if preproduction testing be waived by purchaser, concurrent with the first shipment of the product for production use. Each request for modification of product formulation shall be accompanied by a revised data sheet for the proposed formulation.

- 4.6 Resampling and Retesting: If any sample used in the above tests fails to meet the 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 the specified requirements shall be cause for rejection of the product represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

- 5.1.1 Magnetic particles shall be in packaged in containers of a type and size suitable for the product supplied.
- 5.1.2 Each package or container shall be identified with a durable label that is legible on receipt by purchaser, with not less than the following information:

MAGNETIC PARTICLES, NONFLUORESCENT, DRY METHOD

AMS 3040A

COLOR _____

MANUFACTURER'S IDENTIFICATION _____

DATE OF MANUFACTURE _____ *

LOT NUMBER _____

QUANTITY _____

MANUFACTURER'S INSTRUCTIONS FOR USE _____ **

APPROPRIATE WARNINGS OR PRECAUTIONARY NOTICES _____

* May be included in manufacturer's identification or lot number.

** May be on a separate sheet.

- 5.1.3 Individual packages or containers shall be packed in an exterior shipping container capable of protecting the product during shipment and storage against damage from exposure to moisture, weather, or any other normal hazard.
- 5.1.4 Containers of the product shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the product to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.