

AEROSPACE MATERIAL SPECIFICATION

Magnetic Particles, Nonfluorescent Dry Method

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 dry powders.

1.2 Application:

This product is used typically as an inspection medium in a dry magnetic particle inspection process in accordance with 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.

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2.1 SAE Publications:

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

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 B 214 Sieve Analysis of Granular Metal Powders

ASTM E 1444 Magnetic Particle Examination

3. TECHNICAL REQUIREMENTS:**3.1 Material:**

The product shall be composed of durable nonfluorescent magnetic particles suitable for use in the dry magnetic particle inspection process in accordance with ASTM E 1444 and 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 specified test procedures:

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, as specified, determined by applying the dry powder onto 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 (1075 lx) 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 screen/sieve, determined in accordance with ASTM B 214. 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 provide indications of at least the first eight holes of the test ring specimen of 4.3.1.2 when tested 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 amperes of direct current through the bar. While the current is flowing, apply approximately 1.0 gram of fresh dry powder that has passed the contamination test, using a suitable squeeze-bulb or shaker applicator. Examine the ring under white light of not less than 100 foot-candles (1075 lx) 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 the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the specified requirements.

4.2 Classification of Tests:

All technical requirements are acceptance tests and preproduction tests and shall be performed prior to or on the initial shipment of magnetic particles to a purchaser, on each lot, 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:

- 4.3.1 For Acceptance Tests: 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.

- 4.3.1.1 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.

- 4.3.1.2 Sensitivity Test Ring: Shall be in accordance with AS5282.

- 4.3.2 For Preproduction Tests: Shall be acceptable to purchaser.

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 equivalent to those on the approved sample.

4.4.2 Manufacturer shall use ingredients, manufacturing procedures, processes, and methods of inspection on production powder that are essentially 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 powder. Production powder 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. This report shall include the purchase order number, lot number, AMS 3040C, date of manufacture, and quantity.

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. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

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

5.1 Packaging and Identification:

5.1.1 Dry magnetic particles shall be in packaged containers of a type and size acceptable to purchaser.

5.1.2 Each package or container shall be legibly identified with a durable label providing not less than the following information:

MAGNETIC PARTICLES, NONFLUORESCENT, DRY METHOD

AMS 3040C

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.