AEROSPACE MATERIAL SPECIFICATION

AMS3040™	REV. E

Issued 1974-03
Reaffirmed 2018-09
Revised 2023-05

Superseding AMS3040D

Magnetic Particles, Nonfluorescent Dry Method

RATIONALE

AMS3040E is the result of a Five-Year Review and update of the specification. The revision updates use of the product in line with general industry practice (3.1), eliminates preproduction testing (4.2), permits statistical sampling (4.2.1.2), and allows the use of powder which was produced to the prior revision (8.3).

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 E3024/E3024M, 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 cancelled and no superseding document has been specified, the last published issue of that document shall apply.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS3040E/

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AS5282 Tool Steel Ring for Magnetic Particle Inspection

AS7766 Terms Used in Aerospace Metals Specifications

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM B214 Standard Test Method for Sieve Analysis of Granular Metal Powders

ASTM E3024/E3024M Standard Practice for Magnetic Particle Testing for General Industry

2.3 Definitions

Terms used in AMS are defined in AS7766.

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 E3024/E3024M 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, or other color, 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 (1076 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 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 provide indications of at least the first eight holes of the test ring specimen of 4.3.1.3 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 A of direct current through the bar. While the current is flowing, apply approximately 1.0 g 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 (1076 lx) at the examining surface.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The manufacturer of the product shall supply all samples for the manufacturer's tests and shall be responsible for the performance of all required tests. The 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 shall be performed on each lot.

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 the manufacturer's inspection at one time.

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

4.3.1.3 Sensitivity Test Ring

Shall be in accordance with AS5282.

4.4 Reports

The producerof 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, AMS3040E, date of manufacture, and quantity.

4.5 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 the 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
AMS3040E
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.

6. ACKNOWLEDGMENT

The producerand/or distributor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS

Magnetic particles not conforming to this specification, or to modifications authorized by the purchaser, will be subject to rejection.

8. NOTES

8.1 Revision Indicator

A change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.

8.2 Dimensions and properties in inch/pound units and the Fahrenheit temperatures are primary; dimensions and properties in SI units and the Celsius temperatures are shown as the approximate equivalents of the primary units and are presented only for information.