



AEROSPACE MATERIAL SPECIFICATION

AMS2431™/6**REV. D**Issued 1988-04
Revised 2022-03

Superseding AMS2431/6C

Peening Media
Glass Shot

RATIONALE

AMS2431/6D is the result of a Five-Year Review and update of this specification with changes to Scope (1.2) moved from 8.1, Composition (3.1) adding test methods, Size Classification (3.9.1) adding automatic method, Hardness Testing (3.9.2) adding ASTM E384 test method, Contamination Testing (3.9.3) reduced sample size from 1500 grams, made dimensions approximate, and added alternative method acceptable to CEO, Presence of Silicone Testing (3.9.5) change from reagent water to distilled or tap, and clarified wording for floating shot, Shape (3.9.6) added instructions for test method and added alternative test method acceptable to CEO, Sampling (4.2) added ASTM sampling methods, Acceptance Tests (4.2.1) reduced sample size from 300 grams, Shape (4.2.1.4) added sample sizes, Presence of Silicone (4.2.1.5) added sample size, Packaging and Identification (5.1) deleted package size and reference to MIL specification as it is not applicable, Table 1 changed "AGB-150" to "AGB-140" as the 150 does not exist and was a typographical error and note 2 expansion of definition of sharp particles, and Figure 1 added new this figure as it is now referred to in Table 1, note 3.

1. SCOPE

- 1.1 This specification, in conjunction with the general requirements covered in AMS2431 establishes the requirements for glass shot to be used for peening of metal parts.
- 1.2 Glass shot conforming to this specification is intended for use in peening of metal surfaces to impart compressive stresses, thereby increasing resistance to fatigue and stress-corrosion cracking. Generally, glass shot may be used where:

Glass shot is available in smaller sizes than other media.

Less than 0.015 inch (0.38 mm) radii or narrow slots are intended to be peened.

Ferrous contamination of peening media is undesirable.

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. Also, refer to AMS2431.

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Documents

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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.

AMS2431 Peening Media General Requirements

ARP1917 Clarification of 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 C169 Chemical Analysis of Soda-Lime and Borosilicate Glass

ASTM D346 Standard Practice for Collection and Preparation of Coke Samples for Laboratory Analysis

ASTM D1214 Sieve Analysis of Glass Spheres

ASTM E11-20 Woven Wire Test Sieve Cloth and Test Sieves

ASTM E384-17 Microindentation Hardness of Materials

2.3 U.S. Government Publications

Copies of these documents are available online at <https://quicksearch.dla.mil>.

MIL-D-3464 Desiccants, Activated, Bagged, Packaging Use and Static Dehumidification

MIL-PRF-9954 Glass Beads, for Cleaning and Peening

3. TECHNICAL REQUIREMENTS

Shall be in accordance with AMS2431 and as follows:

3.1 Composition

3.1.1 The shot shall be glass of the soda-lime type. Silica content shall not be less than 67% by weight determined in accordance with ASTM C169 or other method acceptable to the cognizant engineering organization.

3.1.2 Glass shot shall not contain more than 75 ppm arsenic and 100 ppm lead by weight as determined using X-ray fluorescence. See 8.1.

3.2 Hardness

Not less than 90% of the readings shall be 500 to 550 HV or 515 to 575 HK. These hardness ranges are equivalent to 48 to 52 HRC which is provided for reference only.

3.3 Density

Shall be not less than 2.3 g/cc.

3.4 Contamination

Magnetic particles shall not exceed 0.1% by weight of the original sample.

3.5 Inclusions

Not more than 10% of the glass shot shall contain inclusions (including air bubbles) covering more than 20% of their projected area.

3.6 Coatings/Presence of Silicone

Silicone or any other coating material are not permitted. No indication of the presence of silicone shall be found.

3.7 Shape

Glass shot shall be spherical to ellipsoid in shape. Minimum percentage of true spheres shall confirm to Table 1.

3.8 Size

Shall conform to the requirements of Table 1.

3.9 Test Methods and Procedures

3.9.1 Size Classification

The sieve analysis shall be determined in accordance with ASTM D1214. The screens shall be in accordance with U.S. Standard Series described in ASTM E11. Size may also be measured by an automatic method acceptable to the cognizant engineering organization.

3.9.2 Hardness Testing

Hardness shall be determined by a Knoop penetrator using 100 gram load, or Vickers Diamond Pyramid penetrator using 50 gram load determined in accordance with ASTM E384, or a method acceptable to the cognizant engineering organization.

3.9.3 Contamination Testing

Magnetic particle content shall be determined by slowly sprinkling approximately 500 grams of the sample glass shot on an inclined aluminum tray that is approximately 0.062 inch (1.6 mm) deep by 6 inches (152 mm) wide by 12 inches (305 mm) long. The tray shall be supported by a nonmagnetic frame so that it is inclined with an approximately 6 inch (152 mm) rise from end to end, (30 degrees from horizontal). Four 1 x 1 x 6 inches (25 x 25 x 152 mm) bar magnets shall be positioned against the under surface and crosswise of the inclined tray about the middle of its length. Thickness of tray at the magnet locations shall not exceed 0.062 inch (1.6 mm). Magnets shall be not less than 10,000 Gauss each and arranged so that the magnetic north and south poles alternate. The magnetic particles (iron) that accumulate on the tray as the beads roll down shall be brushed into a pre-weighed dish. The procedure shall be repeated with the same 500 gram sample until all visible magnetic particles are collected. The dish shall be reweighed, and the magnetic particle content calculated as a percentage of the total original sample. An alternative method of inspection for magnetic particle content is permitted provided that it can be correlated to the standard method and is acceptable to cognizant engineering organization.

3.9.4 Inclusion Testing

Inclusions shall be determined microscopically, using substage lighting, while glass shot is immersed in a fluid having a refractive index of 1.5.

3.9.5 Presence of Silicone Testing

The following test shall be performed to determine the presence of silicone. Slowly pour approximately 50 grams of the sample glass shot into a 250 mL beaker containing approximately 200 mL of distilled or tap water. A small amount of dispersed floating shot is permissible, but an agglomeration indicates presence of silicone.