SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS 2431/6B

Issued APR 1988
Revised FEB 2005

Superseding AMS 2431/6A

Peening Media
Glass Shot

1. SCOPE:

This specification, in conjunction with the general requirements covered in AMS 2431 establishes the requirements for glass shot to be used for peening of metal parts.

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. Also, see AMS 2431.

2.1 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 15248-2959 or www.astm.org.

ASTM-D-1214 Test Method for Sieve Analysis of Glass Spheres

2.2 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094 or www.assistdocs.com.

MIL-D-3464 Desiccants, Activated, Bagged, Packaging Use and Static Dehumidification
MIL-G-9954 Glass Beads, for Cleaning and Peening

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

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3. TECHNICAL REQUIREMENTS:

3.1 Glass shot shall conform to AMS 2431 and the requirements specified herein.

3.2 Composition

Shall be high quality glass of the soda-lime type. Silica content shall not be less than 67% by weight.

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

3.2.2 Density shall not be less than 2.3 g/cc.

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

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

3.2.5 Coatings: Silicone or any other coating material are not permitted.

3.3 Workmanship:

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

3.4 Size shall conform to the requirements of Table 1.

3.5 Test Methods and Procedures:

3.5.1 Size Classification: The sieve analysis shall be determined in accordance with ASTM D 1214. The screens shall be in accordance with U.S. Standard Series described in ASTM E 11.

3.5.2 Silica content shall be determined in accordance with ASTM C 169 or a method acceptable to the purchaser.

3.5.3 Hardness shall be determined by a Knoop penetrator using 100 gram load, or Vickers Diamond Pyramid penetrator using 50 gram load, or a method acceptable to the purchaser.

3.5.4 Contamination:

3.5.4.1 Magnetic particle content shall be determined by slowly sprinkling approximately 1500 grams of the sample glass shot on an inclined aluminum tray, 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 a 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 preweighed dish. The procedure shall be repeated with the same 1500 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.

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

3.5.6 Silicone coating: The following test shall be performed to determine the presence of silicone. Slowing pour approximately 50 grams of the sample glass shot into a 250 mL beaker containing approximately 200 mL of reagent water. A small amount of shot floating separately on the water is permissible but a agglomeration indicates presence of silicone.

3.5.7 Shape: A visual count shall be made of three fields of approximately 100 beads each, on the sample prepared as in 4.1.6, using a microscope with 20X magnification and substage lighting, or an optical projector. The three results shall be averaged and compared to Table 1.

3.5.8 Density: Approximately 60 grams of dried shot shall be placed in a 100 mL graduated cylinder containing approximately 50 mL of reagent water. The final volume minus the original volume is the volume of the shot. Calculate density using equation 1.

$$\text{Density} = \frac{\text{Shot Weight, grams}}{\text{Shot Volume, mL}} \qquad \text{(Eq. 1)}$$

4. QUALITY ASSURANCE PROVISIONS:

The provisions of AMS 2431 shall apply except the following modifications and additions take precedence:

4.1 Classification of Tests:

4.1.1 Acceptance Tests: Density (3.2.2), magnetic particles (3.2.3), inclusions (3.2.4), size (3.4), and shape (3.3.1) are acceptance tests and shall be performed on samples representing each lot.

4.1.2 Periodic Tests: Composition (3.2) and hardness (3.2.1) are periodic tests and shall be performed at a frequency acceptable to the purchaser.

4.2 Sampling:

Sampling for testing shall be not less than the following.

4.2.1 Acceptance Tests: Two samples of approximately 200 grams each shall be selected from separate containers chosen at random from each lot except samples for magnetic particle content shall be as in 3.5.4.1.

4.2.1.1 Inclusions: The samples used in 4.2.1.3 may be used to determine inclusions.

4.2.1.2 Density: Two samples of approximately 60 grams each shall be used for density determination.

4.2.1.3 Size: Two samples of approximately 60 grams each shall be used for size determination.

4.2.1.4 Shape: Shot shall be poured into a piece of transparent adhesive tape so that beads adhere to the tape.

4.2.1.4.1 A mechanical method of inspection for shape is permitted provided that it can be correlated to the optical method and is acceptable to purchaser.

4.2.2 Periodic Tests: Sample quantities shall be not be less than the following.

4.2.2.1 Composition: Not less than two samples.

4.2.2.2 Hardness: Twenty microhardness readings shall be made from each sample with no more than 1 impression from any single shot.

5. PREPARATION FOR DELIVERY:

See AMS 2431 and the following:

5.1 Packaging and Identification:

Shot shall be packaged in 50 pound (23 kg) units in multi-wall bags, with a reinforced scrim conforming to MIL-G-9954 “Level A.” An inner plastic bag shall be used having a vapor transmission rate of less than 0.5 grams of water per 100 square inches (645 cm^2) per 24 hours.

5.1.1 Desiccants: All glass shot passing U.S. Screen #100 shall have eight units of MIL-D-3464 desiccant included in each bag.