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MIL-A-9954 (USAF)
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MIL-A-22936 (WEP)
9 June 1961

MILITARY SPECIFICATION

GLASS BEADS: FOR CLEANING AND PEENING

This specification is mandatory for use by Departments and Agencies of the Department of Defense

1. SCOPE

1.1 Scope. This specification covers glass beads to be used with pressure/suction type blasting equipment.

1.2 Classification. Glass beads shall be of one type and 13 sizes as specified in Table 1.

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on the date of invitation for bids, or request for proposal form a part of this specification to the extent specified herein.

SPECIFICATIONS

Federal

UU-S-48
PPP-C-96
PPP-D-723

Sacks, Shipping, Paper
Cans, Metal, 28 Gage and
Lighter
Drums, Fiber

Military

MIL-D-3464

Desiccants, Activated, Bagged,
Packaging Use and Static
Dehumidification

STANDARDS

Military

MIL-STD-105

Sampling Procedures and Tables for
Inspection by Attributes

FSC 5350

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MIL-STD-129

Marking for Shipment and Storage

MIL-STD-147

Palletized Unit Loads (40" X 48"
4-Way Partial and 4-Way Pallets)

MIL-STD-852 (USAF)

Glass Bead Peening Procedures

TECHNICAL MANUALS

Air Force

T.O. 1-1-5

Abrasive Blasting Method of
Cleaning and Corrosion Removal

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply:

American Society for Testing
Materials Publications

C 169-65T

Methods for Chemical Analysis of
Soda Lime Glass for Silicon Dioxide

D 1214-58

Sieve Analysis of Glass Spheres

(ASTM Standards may be purchased from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.)

3. REQUIREMENTS

3.1 Qualification. The glass beads furnished under this specification shall be products which are qualified for listing on the applicable Qualified Products List at the time set for opening of bids. (See 4.2.1 and 6.3)

3.2 Composition. The glass beads shall be manufactured from a high grade, crown glass of the soda lime type. The glass beads shall contain not less than 62% silica. (See 4.5.1)

NOTE: THIS IS NOT FREE SILICA AND PRESENTS
NO HEALTH HAZARD DUE TO SILICOSIS.

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3.3 Appearance. The glass beads shall be spherical, free flowing, free of defects, and free of foreign matter in accordance with high grade commercial practice. No more than 3% of any size shall be scored, broken or unfused angular glass particles. (See 4.5.2)

3.4 Coating. No silicone or trace of silicone coating will be permissible on the glass beads. (See 4.5.3)

3.5 Specific gravity. The specific gravity of the glass beads shall be not less than 2.3. (See 4.5.5)

3.6 Magnetic iron particles. No more than 0.1% by weight of free magnetic iron particles shall be permissible. (See 4.5.5)

3.7 Roundness. The roundness of the glass beads shall be as specified in Table I for each size. (See 4.5.2)

3.8 Sieve analysis. The glass beads shall conform to the sieve analysis as specified in Table I when tested as specified. (See 4.5.6)

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

4.2 Classification of tests. The inspection and testing of glass beads shall be classified as follows:

a. Qualification tests. Qualification tests are those tests performed on samples submitted for approval of qualified products.

b. Quality Conformance tests. Quality conformance tests are those tests performed on individual lots which have been submitted for acceptance under contract.

4.2.1 Qualification tests. Qualification tests shall consist of all tests specified in this specification. (See 4.5)

4.2.2 Quality conformance tests. Quality conformance tests shall consist of the following tests:

- a. Sieve analysis (See 4.5.6).
- b. Magnetic iron particles (See 4.5.5).
- c. Appearance (See 4.5.2).

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HEAD SIZE - % ROUND, MIN. - % PASSING													
U. S. STD SCREEN	1	2	3	4	5	6	7	8	9	10	11	12	13
	60% Round	60% Round	65% Round	70% Round	70% Round	80% Round	80% Round	80% Round	80% Round	90% Round	90% Round	90% Round	95% Round
10	100												
12	95-100	100											
14	0-15	95-100	100										
20	0-5	0-15	95-100	100									
30		0-5	0-15	95-100	100								
40			0-5	0-15	95-100	100							
50				0-5	0-15	95-100	100						
60					0-5	0-15	95-100	100					
70						0-15	0-5	95-100	100				
80						0-5	0-15	0-5	95-100	100			
100							0-5	0-15	0-5	95-100	100		
120								0-5	0-15	0-5	95-100	100	
140									0-5	0-15	0-5	95-100	100
170										0-15	0-5	0-15	95-100
200										0-5	0-15	0-5	0-15
230											0-5	0-15	0-15
325												0-5	0-15
400													0-5

TABLE I

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4.3 Inspection Lot for Quality Conformance Test. For purposes of inspection, a lot shall consist of one size of glass beads manufactured at the same time and offered for delivery at one time. Each lot shall not exceed 2,000 pounds.

4.4 Sampling.

4.4.1 Sampling for quality conformance tests. Three containers shall be selected at random from each inspection lot. The material from each container shall be quartered or riffled by the method described in ASTM D 1214-58, paragraph 4, except that 500 grams of glass beads shall be used for tests. Each of the samples thus obtained shall be subjected to all of the prescribed tests. If more than one sample fails any test, the inspection lot shall be rejected.

4.5 Test methods.

4.5.1 Silica content. The silica content shall be determined in accordance with ASTM Method C 169-65T.

4.5.2 Scored, broken, unfused angular particles and roundness. These tests shall be made on three random samples as obtained in paragraph 4.4.1 and an actual count made of a field of approximately 100 beads. A microscope with a 20X magnification, substage lighting and a rule micrometer disc or slide, shall be used to make the count. The average count of each specimen shall be reported as percent true spheres.

4.5.3 Coating. The test for silicone coating on the glass beads shall be performed on three random samples obtained as specified in paragraph 4.4.1, as follows: slowly pour 50 grams of the glass beads into a 250 ml beaker containing 200 mls of distilled water. Any coagulation of the glass beads is an indication of silicone coating. The glass beads should disperse when poured into the water; however, a small number floating on the water is permissible.

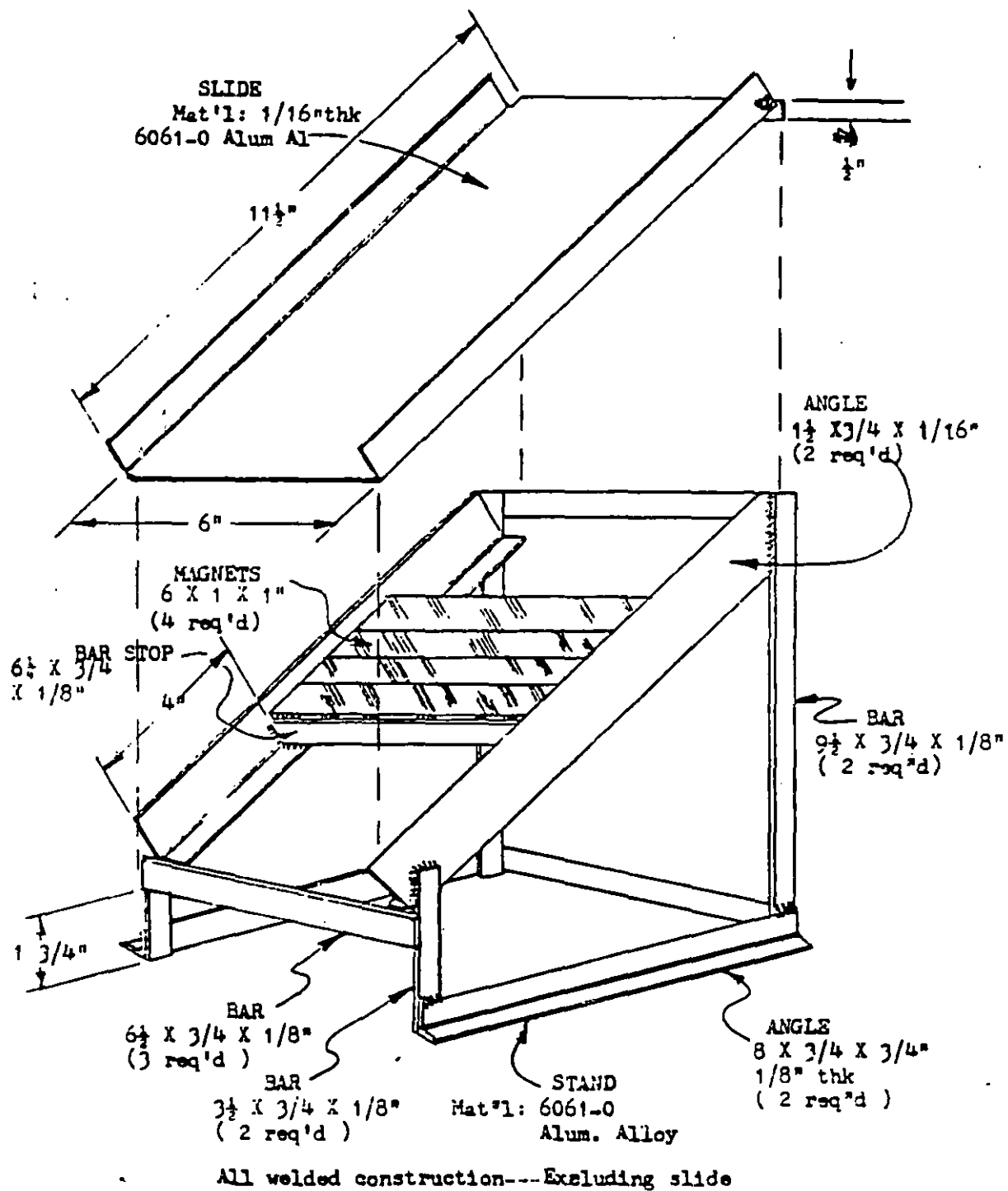
4.5.4 Specific Gravity. A 60 gram sample of glass beads, previously dried, shall be placed in a 100 ml graduated cylinder containing 50 mls of distilled water. The total volume, minus 50, will give the volume of the beads. The specific gravity shall be computed as follows:

$$\text{Sp. Gr.} = \frac{\text{Weight of sample (grams)}}{\text{Water level (mls) after addition of sample - 50 mls}}$$

4.5.5 Magnetic iron particles. Three samples obtained as specified in 4.4.1 shall each be sprinkled on an inclined magnetic plane (See Figure I) until no magnetic particles are retained on the inclined magnetic plane. After each sprinkling of the glass beads, carefully brush any magnetic particles into a tared weighing dish. When no more magnetic particles are visible on the magnetic plane, weigh the magnetic iron particles and compute the percentage.

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FIGURE I



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4.5.6 Sieve Analysis. Samples as obtained in 4.4.1 shall be tested in accordance with ASTM Method D 1214-58, except that a 100 gram sample shall be used instead of a 50 gram sample.

4.5.7 Inspection of fill of containers and preparation for delivery. A random sample of filled containers shall be selected from each inspection lot in accordance with MIL-STD-105 at Inspection Level II and the AQL shall be 2.5% defective.

5. PREPARATION FOR DELIVERY

5.1 Packing and Palletizing. Packing shall be Level A, B or C, as specified. When specified, the containers for Level A or B shall be palletized in accordance with MIL-STD-147. When palletizing is specified for Level C, the pallet shall be the four way commercial expendable type.

5.1.1 Level A. The glass beads shall be packed for overseas shipment in 50 pound containers conforming to one of the following:

1. Multi-wall paper shipping sacks conforming to Federal Specification UU-S-48, Type II or III, Grade X with "dipped ends".
2. Fiber drums conforming to Federal Specification PPP-D-723, Type III.
3. Metal cans conforming to Federal Specification PPP-C-96.

4. Paper sacks, of the multi-wall, sewn open mouth type, constructed as follows: (a) A water resistant scrim of not less than two layers of 30 pound natural kraft, reinforced with glass fibers, and (b) not less than three layers of 50 pound natural kraft, and (c) one layer of 60 pound natural kraft. The scrim laminant shall be of asphalt or non-asphaltic material with a softening point of not less than 180° to 200°F. The lengthwise glass fibers of the scrim paper, shall be spaced not more than an average of $\frac{1}{2}$ inch apart and the crosswise fibers spaced not less than an average of two per inch; except when a diamond pattern is employed for crosswise reinforcement, the spacing between the parallel sides of the diamond shall average not more than one inch. The closing materials shall be tape, 12/6 cotton thread, paper filler cord with a pull tape feature.

5.1.2 Level B. The glass beads shall be shipped in 50 pound containers conforming to one of the following:

1. Multi-wall shipping sacks conforming to Federal Specification UU-S-48, Type II or III, Grade L/W.
2. Fiber drums conforming to Federal Specification PPP-D-723, Type I.
3. Metal cans conforming to Federal Specification PPP-C-96.

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5.1.3 Level C. The glass beads, in 50 pound containers, shall be shipped in accordance with the suppliers commercial practice in a manner to assure protection against damage during direct shipment from the supply source to the first receiving activity for immediate use. Shipping containers shall comply with the Uniform Freight Classification Rules, or regulations of other carriers as applicable to the mode of transportation.

5.1.4 Prior to packing in the above containers, the glass beads shall first be packaged in a plastic bag with a minimum of eight units of desiccant conforming to MIL-D-3464. The plastic bag shall have a minimum vapor transmission rate of less than 0.5 grams of water per 100 square inches per 24 hours. The mouth of these bags shall be twisted, doubled and wire tied.

5.2 Marking. Each container shall be marked in accordance with MIL-STD-129, and shall also be marked with the batch/grind and lot number.

6. NOTES.

6.1 Intended use. The glass beads covered by this specification are intended for use dry in suction/pressure blasting equipment to clean, peen, polish and finish ferrous and non-ferrous materials in accordance with Technical Manual T.O. 1-1-5, Military Standard MIL-STD-852 (USAF) and other government/industry documents.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Size desired.
- c. Quantity desired.
- d. Capacity of containers and type of container to be furnished.
- e. Selection of applicable levels of packaging and packing.

6.3 Qualification. With respect to products requiring qualification, awards will be made only for such products as have, prior to the time set for opening of bids, been tested and approved for inclusion in the applicable Qualified Products List, whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, and manufacturers are urged to have their products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Warner Robins Air Materiel Area (WRAMA), Attn: WRNEC, Robins Air Force Base, Georgia 31093, and information pertaining to qualification of products may be obtained from this activity. (See 3.1 and 4.2.1).

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Custodians:

Army - MR
Navy - AS
Air Force - 84

Review Activities:

Army - MR, WC
Navy - AS, SC
Air Force - 84

Preparing Activity:

Air Force - 84
(Project No. 5350-0031)

User Activities:

Army -
Navy - CG
Air Force - 71, 82

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER

2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION

4. TYPE OF ORGANIZATION (Mark one)

☐ VENDOR☐ USER☐ MANUFACTURER☐ OTHER (Specify): _____

b. ADDRESS (Street, City, State, ZIP Code)

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER (Last, First, MI) - Optional

b. WORK TELEPHONE NUMBER (Include Area Code) - Optional

c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional

8. DATE OF SUBMISSION (YYMMDD)

DD FORM 1426
82 MAR

PREVIOUS EDITION IS OBSOLETE.

(TO DETACH THIS FORM, CUT ALONG THIS LINE.)