

Inch-Pound
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MIL-PRF-9954C  
31 January 2008  
Superseding  
MIL-PRF-9954B  
26 September 2005

## PERFORMANCE SPECIFICATION

### GLASS BEADS: FOR CLEANING AND PEENING

This Specification is approved for use by all 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 will be of one type and 13 sizes as specified in Table 1.

#### 2. Applicable Documents.

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

##### 2.2 Government documents

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract (see 6.2).

Comments, suggestions, or questions on this document should be addressed to WR-ALC/LEEE, 295 Byron Street, Robins AFB, GA 31098-1611. Since contact information can change, you may want to verify the currency of this address information using the ASSIST database at <a href="http://assist.daps.dla.mil">http://assist.daps.dla.mil</a>
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FEDERAL STANDARDS

U.S. ENVIRONMENTAL PROTECTION AGENCY

EPA 3052	Microwave Assisted Acid Digestion of Siliceous and Organically Based Matrices
EPA 6010B	Inductively Coupled Plasma-Atomic Emission Spectrometry

(Copies of these standards may be found online at <http://www.epa.gov/> or at U.S. Environmental Protection Agency, Ariel Rios Building, 1200 Pennsylvania Avenue, N.W., Washington, DC 20460

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-129	MILITARY MARKING FOR SHIPMENT AND STORAGE
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(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch> or <http://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

Non-Government Standards

AMERICAN SOCIETY FOR QUALITY

ANSI/ASQ Z1.4	Sampling Procedures and Tables for Inspection by Attributes
ANSI/ASQ Z1.9	Sampling Procedures and Tables for Inspection by Variables for Percent Nonconforming

ASQ Standards may be purchased from the American Society for Quality, 600 North Plankinton Avenue Milwaukee, WI 53203 or at <http://www.asq.org>

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM C-169	Standard Test Methods for Chemical Analysis of Soda Lime and Borosilicate Glass
ASTM D 1214-58	Standard Test Method for Sieve Analysis of Glass Spheres

ASTM Standards may be purchased from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428 or at <http://www.astm.org>

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of the document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

# MIL-PRF-9954C

BEAD SIZE - % ROUND, MIN - % PASSING													
	1	2	3	4	5	6	7	8	9	10	11	12	13
U.S. STD SCREEN	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		95-100	100					
70						0-15		95-100	100				
80						0-5	0-15		95-100	100			
100							0-5	0-15		95-100	100		
120								0-5	0-15		95-100	100	
140									0-5			95-100	100
170										0-15			95-100
200										0-5	0-15		
230											0-5	0-15	
325												0-5	0-15
400													0-5

Table I

## 3. REQUIREMENTS

3.1 Composition. The glass beads shall be manufactured from commercial grade soda lime glass, and shall contain less than 0.1 weight percent crystalline silica. The glass beads shall contain no less than 62% amorphous silica (This is not free silica and does not cause silicosis). The glass beads shall not contain more than 75 ppm Arsenic and 100 ppm Lead by Weight. (see 4.4.7)

3.2 Appearance and Roundness. 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 un-fused, angular glass particles (see 4.4.2). The roundness of the glass beads shall be specified in Table 1 for each size.

3.3 Coating. No silicone or trace of silicone will be permissible on the glass beads (see 4.4.3).

3.4 Specific Gravity. The specific gravity of the glass beads shall be no less than 2.3 (see 4.4.4).

3.5 Magnetic Iron Particles. No more than 0.1% by weight of free magnetic iron particles shall be permissible (see 4.4.5).

3.6 Sieve Analysis. The glass beads shall conform to the sieve analysis as specified in Table 1 when tested as specified (see 4.4.6).

#### 4. VERIFICATION

4.1 Classification of 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 Conformance Inspection. Quality conformance tests shall consist of the following tests:

- a. Sieve analysis (see 4.4.6)
- b. Magnetic iron particles (see 4.4.5)
- c. Appearance and Roundness (see 4.4.2)
- d. Coating (see 4.4.3)
- e. Heavy Metals analysis (see 4.4.7)

4.3 Sampling For Quality Conformance Test. For purposes of inspection, a lot shall consist of media of the same chemical composition and size. If production is continuous, a lot shall be the product of not more than eight hours of continuous production and it is not to exceed 20,000 pounds. Alternatively, Statistical Process Control Methods may be used to monitor the quality of the product so that it meets the requirements of the applicable detail specification. Two representative samples of the 1500 grams each shall be selected from separate containers chosen at random. Each sample shall be used in the following tests.

#### 4.4 Test Methods.

4.4.1 Silica Content. The silica content shall be determined in accordance with ASTM Method C 169 or a generally accepted instrumental method with traceable standards.

4.4.2 Scored, Broken, Un-fused Angular Particles and Roundness. For each representative sample, three random samples will be taken and an actual count of a field of approximately 100 beads each. A microscope, or similar magnification device with 20X magnification or greater, shall be used to make the count. The average count of each specimen shall be reported as percent true spheres. An automated method is acceptable provided it correlates to the optical method or a generally accepted instrumental method with traceable standards.

4.4.3 Coating. For each representative sample, the test for silicone coating shall be performed as follows: slowly pour 50 grams of the glass beads into a 250 ml beaker containing 200 ml of distilled water. Any air entrainment causing the beads to coagulate into discrete lumps is an indication of silicone. The glass beads should disperse when poured into the water; however, a small number of beads floating on the water are permissible.

4.4.4 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 or with a generally accepted instrumental method with traceable standards.

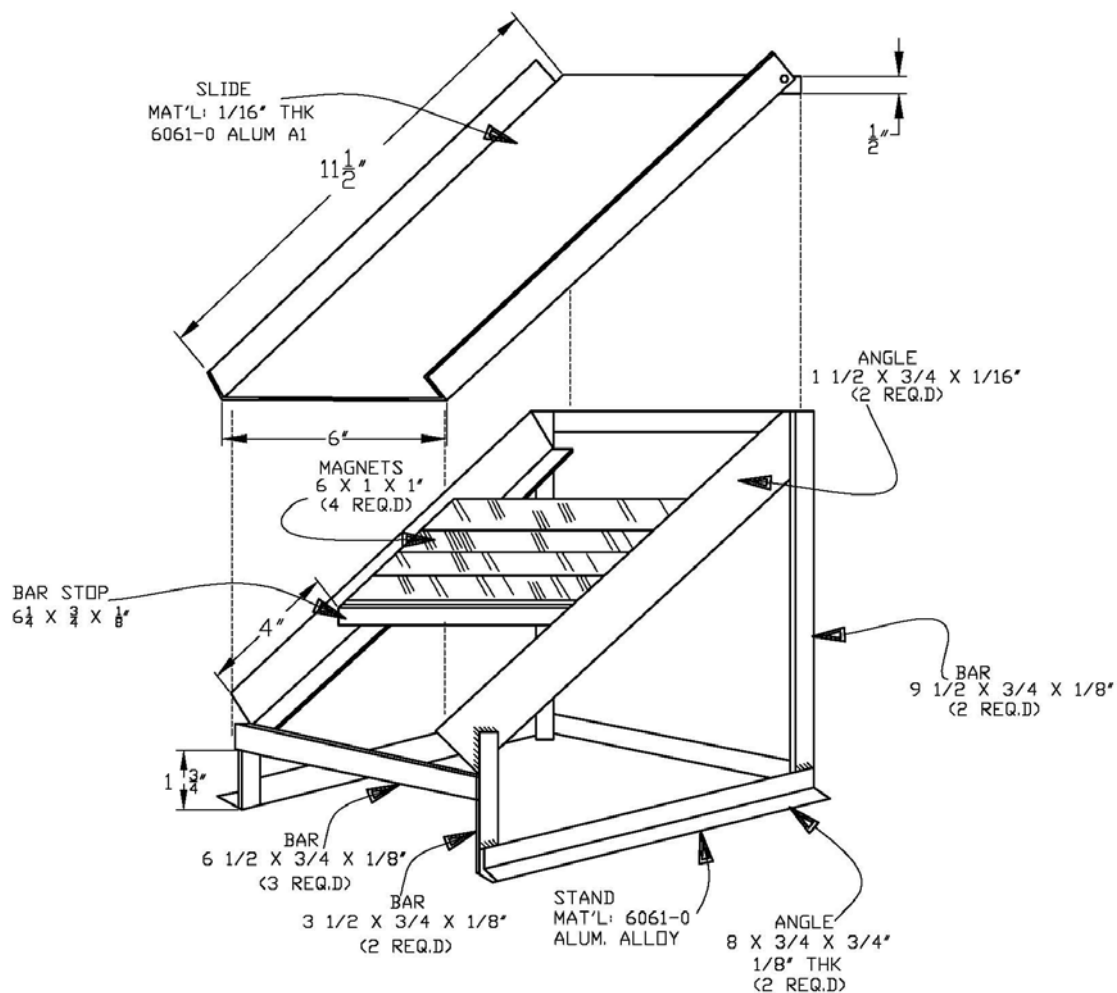
$$\text{Sp. Gr.} = \frac{\text{Weight of sample (grams)}}{\text{Water level (mls) after Addition of Sample -50 mls}}$$

4.4.5 Magnetic Iron Particles. For each representative sample, approximately 500 grams of beads shall be obtained per Section 4.3 and shall be sprinkled on an inclined magnetic plane consisting of four 10,000 gauss strength magnets. The magnets shall be centered directly behind the plane as depicted in Figure 1. After sprinkling the glass beads, carefully brush any magnetic particles into a tarred, weighing dish. The glass beads are to be re-sprinkled until no magnetic particles are retained on the magnetic plane. When no more particles are visible on the magnetic plane, weigh the magnetic iron particles and compute the percentage. No more than 0.1% by weight of free magnetic iron particles shall be permissible.

4.4.6 Sieve Analysis. For each representative sample, the sieve analysis shall be performed on the sample obtained in Section 4.3 after it has been accurately reduced by riffle splitter (1:1 splitter). The samples to be taken are as follows: for MIL Size 3-7 approximately 100 grams, MIL Size 8-10 approximately 50 grams, MIL Size 11-13 approximately 25 grams. The glass beads shall conform to the size specification in MIL G-9954-A, Table 1. The size of the glass beads shall be measured in accordance with ASTM D 1214 or any other generally accepted mechanical or optical method that is just as accurate as ASTM D1214. Trace amounts (<0.4%) round to zero.

4.4.7 Heavy Metal Analysis. The Weight percentage of Arsenic and Lead shall be determined in accordance with EPA 3052 and EPA 6010B or a generally accepted instrumental method with traceable standards.

FIGURE I



ALL WELDED CONSTRUCTION.....EXCLUDING SLIDE  
MAGNETS MUST BE MINIMUM 10,000 GAUSS STRENGTH

## 5. PACKAGING

5.1 Packaging For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the Military Service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended Use. The glass beads covered by this specification are intended for use in suction/pressure blasting equipment to clean, peen, polish and finish ferrous and non-ferrous materials as referenced in contract order.

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 or containers and type of container to be furnished
- e. Selection of applicable levels of packaging and packing.

6.3 Packaging. Glass beads will 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 glass beads to ensure carrier acceptance and safe delivery. Product to be packaged in 50 pound paper bag construction with poly-liner, or other package specified at time of order.

6.4 Subject term (keyword listing)

- a. Cleaning
- b. Deburring
- c. Finishing
- d. Peening

6.5 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.



MILITARY INTEREST

Civil Agency Coordinating Activity:  
GSA - FSS

Custodians:  
Air Force –99  
Navy - AS  
Army – MR

Preparing Activity:  
Air Force -84

Agent Activity:  
Air Force –99

(Project 5350-2008-001)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <http://assist.daps.dla.mil>.