

SPECIALIST PEENING BEAD SPECIFICATION



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1. SCOPE

This specification establishes the requirements for glass beads to be used for specialist peening operations within industrial processes.

2. APPLICABLE DOCUMENTS

The referenced documents and standards below forms part of this specification to the extent specified herein. Allglass 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 the document shall apply.

AMS2431/6C – This specification in conjunction with the general requirements establishes the requirements for glass beads to be used for peening of metal parts. Conforming to Rolls Royce specification **CSS8**.

MIL-G-9954 This specification covers glass beads to be used with pressure/suction type blasting equipment. Conforming to Rolls Royce specification **CSS8**.

BS6088:1981 Specification for solid glass beads for use with road marking compounds and for other industrial uses. (Withdrawn 02.08.13. to be replaced by EN1423:2012).

EN1423:2012 Road marking materials. Drop on materials. Glass beads, antiskid aggregates and mixtures of the two.

ISO565:1990 Test sieves – Metal wire cloth, perforated and metal plate and electroformed sheet – Nominal size of openings.

BS1796-1:1989, ISO2591-1:1988 Test sieving methods using test sieves of woven wire cloth and perforated metal plate.

3. TECHNICAL REQUIREMENTS

3.1. Glass beads conform either to AMS2431/6C or MIL-G9954.

3.2. Composition

- 3.2.1. The beads are manufactured from glass of the soda-lime type. Silica content is above 67% by weight. Testing/frequency is determined according to table 1.
- 3.2.2. Glass beads contain no more than 100ppm of Pb (lead) and 75ppm of As (arsenic) by weight. Testing/frequency is determined according to table 1.
- 3.3. Hardness is not to be less than 90% of the readings between 500 to 550HV or 5mohs. Testing/frequency determined according to table 1.
- 3.4. Density is not to be less than 2.3 g/cc. Testing/frequency determined according to table 1.
- 3.5. Magnetic Particles do not exceed 0.1% by weight of original sample. Testing/frequency determined according to table 1.
- 3.6. Air Inclusions do not exceed more than 10% of the original sample and include inclusions including air bubbles covering more than 20% of their projected area. Testing/frequency shall be determined according to table 1.
- 3.7. Coatings of any kind including silicone are not permitted.
- 3.8. Shape conforms to requirements of table 2 and table 3. Testing/frequency is determined according to table 1.
- 3.9. Size conforms to requirements of table 2 and table 3. Testing/frequency determined according to table 1.
- 3.10. Test Methods and Procedures
- 3.10.1 Granulometry is the measure of the size gradation of a collection of glass beads. The granulometry of the glass beads is declared giving the minimum and the maximum percentages by mass of the cumulative retained glass beads on metal wire cloth test sieves sizes R 40/3 according to ISO 565:1990, using the test sieving procedure defined in ISO 2591-1.
- 3.10.2 Silica Content is determined in accordance with EN1423:2012 or a method acceptable to the purchaser.
- 3.10.3 Dangerous Substances, the reference method to determine the content of chemical substances in glass beads is inductively coupled plasma, atomic emission spectrometry (ICP-AES) capable of measuring parts per million levels of requested elements. In order to frequently measure the chemical composition of glass beads before shipment, a portable or fixed X-Ray Fluorescence (XRF) analyzer is used.
- 3.10.4 Shape, a visual count is made using a microscope with 20X magnification or an optical projector. The beads in the projected sample shall be counted or perfectly spherical glass beads. A percentage of perfectly spherical glass beads is compared with the total sample to determine the amount of round beads as a percentage.
- 3.10.5 Density, approximately 60 grams of glass is to be placed in a 100ml graduated cylinder containing approximately 50ml of reagent water. The final volume minus the original volume is the volume of the shot. Calculate density using equation 1.

$$\text{Density} = \frac{\text{Shot Weight (grams)}}{\text{Shot Volume (ml)}}$$

3.10.6 Contamination

3.10.6.1 Magnetic Particle content is determined by slowly sprinkling approximately 1500 grams of the sample glass shot on an inclined stainless steel tray with bar magnets positioned in the underside of the tray. The collected magnetic particles are brushed onto a tray and measured against the total volume of the original sample.

3.10.6.2 Inclusions are measured microscopically

4. QUALITY ASSURANCE PROVISIONS

4.1. Classification of tests.

4.1.1. Acceptance Tests

Density, magnetic particles, air inclusions, size, shape, angular/non-round particles and dangerous substances are acceptance tests and are performed on representative sample.

4.1.2. Periodic Test

Chemical composition and hardness are performed at a frequency acceptable to the purchaser or according frequency of tests included in table 1.

5. PREPARATION FOR DELIVERY

5.1. Packaging and Identification

5.1.1. Glass beads are packaged in 25kg paper bags with polythene internal liners and stitched closed or 1000kg bags as specified by the customer. Packaging labels include specification code, product grade, batch number, weights and any other information as required by the customer. Packaging in pre-printed bags or different customisation of bag size, weight, material type can be done as agreed between supplier and customer.

5.1.2. Desiccants

All glass beads below 300 micron have desiccant applied.

5.1.3. Transport & Storage

In order to prevent compaction and clumping, glass beads must be transported/stored in dry ambient conditions and not double stacked. In general product should be used within 6 months of production date.

6. ACKNOWLEDGEMENT

See AMS2341, EN1423:2012

7. REJECTIONS

See AMS2341, EN1423:2012

8. INTENDED USE

Specialist peening beads to AGB and Mil specifications are manufactured and supplied for use where the process requires beads of this type. Standard industrial grade glass beads are not supplied for these specialist applications and therefore should not be used as a substitute.

Table 1

Chemical Composition

Specifications	AGB Beads	MIL Spec	Frequency of Testing
SiO ₂	<75%	<75%	Annual/external
Na ₂ O	<15%	<15%	Annual/external
CaO	<10%	<10%	Annual/external
MgO	<4%	<4%	Annual/external
As	<75ppm	<75ppm	Annual/external
Pb	<100ppm	<100ppm	Annual/external
Sb	N/A	N/A	Annual/external

Physical Properties

Hardness (Mohs)	5 Mohs / 500-550 HV	5 Mohs / 500-550 HV	Annual/external
Magnetic Particles	0.1%	0.1%	Per Batch
Air Inclusions	<10%	<10%	Per Batch
Density	>2.3 g/cc	>2.3 g/cc	Per Batch
Shape	Spherical	Spherical	Per Batch
Colour	Clear - White	Clear - White	Per Batch
Gradiation	As Per Specification	As Per Specification	Per Batch
Roundness	60 - 95%	60 - 95%	Per Batch
Angular/Non Rounds	<3%	<3%	Per Batch
Batch Quantity	40 * 25kg Sacks	1000kg/Batch	

Table 2
AMS2431/6C

US Standard Mesh/Screen	Micron	AGB-50	AGB-35	AGB-30	AGB-25	AGB-20	AGB-15	AGB-12	AGB-9	AGB-06	VG300	MIC C250-425
20	850	100										
30	600	95-100										
35	500		100								0-1	0
40	425	0-15	95-100	100							0-5	0-10
45	355	0-5		95-100	100							
50	300		0-15		95-100	100					90-100	60-100
60	250		0-5	0-15		95-100					0-3	0-30
70	212			0-5	0-15		100					0-5
80	180				0-5	0-15	95-100	100				
100	150					0-5		95-100				
120	125						0-15		100			
140	106						0-5		95-100	100		
170	90							0-15		95-100		
200	75							0-5				
230	63								0-15			
270	53											
325	45								0-5	0-15		
400	38									0-5		
QUALITY		70%	70%	70%	80%	80%	80%	85%	90%	90%	70%	70%

Table 3
MIL SPEC G-9954A

US Standard Mesh/Screen	Micron	Size 4	Size 5	Size 6	Size 7	Size 8	Size 9	Size 10	Size 11	Size 12	Size 13
20	850	100									
30	600	95-100	100								
40	425	0-15	95-100	100							
50	300	0-5	0-15	95-100	100						
60	250		0-5		95-100	100					
70	212			0-15		95-100	100				
80	180			0-5	0-15		95-100	100			
100	150				0-5	0-15		95-100	100		
120	125					0-5	0-15		95-100	100	
140	106						0-5			95-100	100
170	90							0-15			95-100
200	75							0-5	0-15		
230	63								0-5	0-15	
270	53										
325	45									0-5	0-15
400	38										0-5
QUALITY		70%	70%	80%	80%	80%	80%	90%	90%	90%	90%