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British Standard Specification for

Solid glass beads for use with road marking compounds and for other industrial uses

1. Scope

This British Standard specifies requirements for bulk supplies of glass beads for road marking, impacting, plastic reinforcement and general industrial applications.

2. References

The titles of the standards publications referred to in this standard are listed on the inside back cover.

3. Definitions

For the purposes of this British standard the following definitions apply.

3.1 Foreign Matter: Non-glass materials including magnetic particles.

3.2 Grains: Glass particles that present sharp angles.

3.3 Gas Inclusions: Voids in the interior of the glass beads that affect the optical properties.

3.4 Roundometer: A vibrating glass plate used to separate mechanically spherical beads from other particles.

3.5 Spherical Beads: Glass beads that have the required properties when tested using the roundometer or microscope.

3.6 Fused Particles: Two or more glass beads that have joined together.

3.7 Pavement: A road, runway or other paved area.

3.8 Moisture Proof Coating: A coating applied to the surface of the glass beads to ensure ease of flow during application.

3.9 Flotation Coating: A clear coating applied to the surface of the glass beads allowing a greater area of the surface applied glass beads to be exposed.

4. Classes of glass beads

This British Standard deals with the following classes of glass beads, based on their application.

Class	Application
A	Incorporation in thermoplastic road marking compounds.
B	Surface applied for thermoplastic road marking compounds and pavement marking paints.
C	For impacting, plastic reinforcement and general industrial applications.

5. Sampling and testing

5.1 General: For the purposes of carrying out the testing procedures described in appendices B to M adequate and representative samples shall be taken in accordance with appendix A.

5.2 Testing: The samples shall be tested in accordance with appendices B to M.

WARNING: Some of the liquids specified for use in the tests may be toxic, corrosive and/or flammable. It is essential that care be taken in handling all chemicals.

6. Properties

6.1 Properties common to all applications (classes A, B, and C)

6.1.1 Particle Size Distribution: When tested in accordance with appendix B the glass beads shall comply with the requirements of tables 1, 2, or 3 as appropriate.

6.1.2 Freedom From Defects: When tested in accordance with appendices C and D (class A) or with appendix D (classes B and C), glass beads shall comply with the requirements of tables1, 2 or 3 as appropriate.

6.1.3 Chemical Composition: When tested in accordance with BS2649: Part 1, the chemical composition shall be:

silicon dioxide	Sio_2	not less than 70 %
calcium oxide	CaO	together not less
magnesium oxide	MgO	than 8 %
sodium oxide	Na_2O	
potassium oxide	K_2O	together not more
aluminium oxide	Al_2O_3	than 8 %
farric oxide	Fe_2O_3	

The glass shall be colourless (i.e. have no appreciable tint when spread in a single layer on a white ground (see appendix N)).

6.1.4 Magnetic Particles: When tested in accordance with appendix F, magnetic particles shall not exceed 0.1 %.

6.1.5 Resistance to Acid: When tested in accordance with appendix J, glass beads shall not develop surface haze or dulling (see appendix N).

6.1.6 Resistance to Calcium Chloride: When tested in accordance with appendix K, glass beads shall not develop surface haze or dulling (see appendix N).

6.1.7 Resistance to Sodium Sulphide: When tested in accordance with appendix L, the sodium sulphide solution shall not darken the glass beads (see appendix N).

6.1.8 Water Resistance: Class A and Class B glass beads shall be tested in accordance with appendix M. The glass beads shall not develop surface haze or dulling (see appendix N) and titration to the end point shall not require more than 4.5 ml of 0.1N hydrochloric acid.

Table 1. Class A glass beads: Particle size distribution, Roundness & Defects

Sieve	% retained	Minimum % spherical beads by mass tested in accordance with appendix C	Maximum % of defective beads tested in accordance with appendix D
1.18 um	0 to 3		
850 um	5 to 20		
425 um	65 to 95	70	30
Below 425 um	0 to 10		

Table 2. Class B glass beads: Particle size distribution, Roundness & Defects

Sieve	% retained	Maximum % spherical beads by microscope tested in accordance with appendix D	Maximum % of defective beads tested in accordance with appendix D
um			
850	0 to 5		
600	5 to 20		
300	30 to 75	80	20
180	10 to 30		
Below 180	0 to 15		

NOTE: These glass beads may be applied by either gravity feed or air assisted feed and may have a moisture proof coating or a flotation coating. Flotation coatings are most useful for paint applications.

6.2 Optical Properties: refractive index for road marking applications (Classes A & B). When tested in accordance with the method of appendix E the glass shall have a refractive index of not less than 1.50.

6.3 Properties of coating for road marking applications (Classes A & B)

6.3.1 General: Coated glass beads shall be tested in accordance with either 6.3.2 or 6.3.3 as specified by the purchaser.

6.3.2 Moisture Proofing: When the glass beads are tested in accordance with appendix G, the presence of a coating for moisture proofing shall be shown

6.3.3 Flotation Coating: When the glass beads are tested in accordance with appendix H the presence of flotation coating shall be shown.

7. Containers

7.1 Material: Containers shall be made of material that does not contaminate the contents and that protects the contents from contamination.

NOTE: Unless otherwise agreed with the purchaser the solid glass beads are normally supplied either

(a) in bags each containing 25 Kg + 0.5 % - 0 % , or

(b) on pallets each carrying 1 tonne + 0.5 % - 0 % in bags each of 25 Kg ± 0.5 %

8. Marking

Each container shall be clearly and indelibly marked with the following information:

(a) the class of glass bead;

(b) the application of glass bead as described in clause 4;

(c) in the case of class B beads, the type of coating i.e.

'Moisture Proofing' or (M)

'Flotation' or (F)

(d) the number of this British Standard, i.e. BS 6088;

(e) the mass of the contents of the container;

(f) the name, trade mark or other means of identification of the manufacture;

(g) the batch number;

(h) the date of manufacture.

Marking BS 6088 on or in relation to a product is a claim by the manufacturer that the product has been manufactured in accordance with the requirements of the standard. The accuracy of such a claim is therefore solely the manufacture's responsibility. Enquiries as to the availability of third party certification to support such claims should be addressed to the Director, British Standard Institution, Maylands Avenue, Hemel Hampstaad, Harts HP2 4SQ in case of certification marks administered by BSI or to the appropriate for other certification marks.