

CONFIRMED
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Specification for

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

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Concrete Society Limited	Institution of Municipal Engineers*
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Convention of Scottish Local Authorities	Ministry of Defence
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Department of the Environment (Transport and Road Research Laboratory)	Road Surface Dressing Association
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Federation of Manufacturers of Construction Equipment and Cranes	Trades Union Congress

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the Technical Committee entrusted with the preparation of this British Standard:

British Resin Manufacturers' Association	Road Marking Manufacturers and Contractors Association
Chemical Industries Association	Zinc Pigment Development Association
Glass Manufacturers' Federation	
Oil and Colour Chemists Association	

This British Standard, having been prepared under the direction of the Road Engineering Standards Committee, was published under the authority of the Executive Board and comes into effect on 31 August 1981

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The following BSI references relate to the work on this standard:
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Foreword

This British Standard has been prepared under the direction of the Road Engineering Standards Committee specifically to cover solid, reflective glass beads referred to in BS 3262 and in BS 6044. The beads may be incorporated in the mix before application and/or applied to the surface afterwards. The specification also applies to glass beads used in a number of other industrial applications.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 14, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in amendment table on the inside front cover.

1 Scope

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

2 References

The titles of the 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, plastics reinforcement and general industrial applications. |

5 Sampling and testing

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

5.2 Testing. The samples shall be tested in accordance with Appendix B to Appendix 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 Table 1, Table 2 or Table 3 as appropriate.

6.1.2 Freedom from defects. When tested in accordance with Appendix C and Appendix D (class A) or with Appendix D (classes B and C), glass beads shall comply with the requirements of Table 1, Table 2 or Table 3 as appropriate.

6.1.3 Chemical composition. When tested in accordance with BS 2649-1, the chemical composition shall be:

silicon dioxide	SiO ₂	} not less than 70 % together not less than 8 %
calcium oxide	CaO	
magnesium oxide	MgO	
sodium oxide	Na ₂ O	} together not more than 18 %
potassium oxide	K ₂ O	
aluminium oxide	Al ₂ O ₃	
ferric oxide	Fe ₂ O 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 0.1 N hydrochloric acid.

6.2 Optical properties: refractive index for roadmarking applications (classes A and 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 coatings for road marking applications (classes A and 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.

Table 1 — Class A glass beads: particle size distribution, roundness and defects

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

Table 2 — Class B glass beads: particle size distribution, roundness and defects

Sieve	% retained	Minimum % spherical beads by microscope tested in accordance with Appendix D	Maximum % of defective beads tested in accordance with Appendix D
µm			
850	0 to 5	80	20
600	5 to 20		
300	30 to 75		
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.