07010 "Drop-on" Glass Beads for Pavement Markings

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07010-1 General

Supply all materials, as specified herein, and in accordance with the Contract Documents.

07010-2 Scope

This specification is intended to cover glass beads for application on traffic paint for the production of a reflective surface creating night visibility of the paint film without altering day visibility of the markings in any way.

07010-3 Packaging

The glass beads shall be packaged in durable plastic lined waterproof bags so constructed as to ensure safe delivery. The bag, liners, seams and top closures shall be waterproof and leak-proof, and shall be capable of maintaining these properties during transportation and through numerous handlings.

07010-4 Product: Specific Requirements

The beads shall be manufactured from glass of a composition designed to be highly resistant to traffic wear and to the effects of weathering.

The beads shall adhere tightly to standard specification yellow and white traffic paint when applied with a pressurized glass bead gun.

In addition, the glass beads shall conform to the following requirements:

4.1 Roundness

The beads shall be spherical in shape, containing not more than ten (10) percent of irregularly shaped particles by microscopic count.

4.2 Colour

The beads shall be transparent and colourless to prevent their imparting of any noticeable hue to the paint.

4.3 Imperfection

The surface of the beads shall be smooth, lustrous, and free from film, foreign matter, scratches and pits. Not more than twenty-five (25) percent by weight of the true spheres shall have imperfections such as milkiness, dark specks, incipient fractures and air inclusions in a form of a single bubble greater than 1/4 of the diameter of the bead, or many bubbles totaling more than 1/3 of the bead diameter when tested under 50x and 100x magnification as follows:

1. Glass beads retained on a .300 mm sieve shall be counted under 50x magnification.
2. Glass beads passing through a .300 mm sieve shall be counted under 100x magnification.

4.4 Refractive Index

The index of refraction of the glass bead shall not be less than 1.50.

4.5 Durability

The beads shall not show any tendency toward decomposition when exposed to atmospheric conditions, moisture, dilute acids, alkalies or paint constituents.

4.6 Crushing Strength

True spheres shall be tested in compression in accordance with A.S.T.M. D-1213-54 for determining the crushing resistance of glass beads. The minimum crushing strength shall be as follows:

Table 1: Crushing Strength

Size of Beads	Strength
0.9 - 0.6 mesh size	16 kilograms
0.6 - 0.4 mesh size	11.5 kilograms

4.7 Gradation

The beads shall conform to the following gradation requirements:

Table 2: Gradation Requirements

Standard Square Mesh Sieve (mm)	Percent Passing By Weight
0.9	100
0.6	75 - 95
0.3	15 - 35
0.160	0 - 5
0.074	0 - 1

4.8 Moisture Proof Requirements

The beads shall show no tendency to absorb moisture in storage and shall remain free of clusters and hard lumps. The beads shall flow freely and dispense uniformly from the glass bead guns at any time when surface and atmospheric conditions are satisfactory for marking.

4.9 Test for Moisture Resistance

One (1) kilogram of glass beads meeting gradation requirements are placed in a clean cotton bag and shall be submitted to a moisture proof test. This test consists of saturating the bag and glass beads with water by complete immersion. Suspend the bag to allow it to drain for a period of two (2) hours at room temperature (20 degrees to 21 degrees C.). At the end of this time, mix the sample in the bag by shaking the bag thoroughly. Transfer the sample slowly to a clean, dry, glass funnel having a stem 100 mm in length with a 10 mm inside diameter stem entrance opening and a minimum exit opening of 6 mm. The entire sample shall flow freely through the funnel without stoppage. In case the beads clog the funnel when first introduced, it is possible to tap the funnel stem lightly to initiate the flow.

07010-5 Certification of Material and Rejection

The Bidder shall supply with his tender a letter from the manufacturer and an approved testing laboratory certifying that the glass beads meet the enclosed specifications and requirements.

Bidders shall also submit a representative sample of five (5) kilograms of glass beads which the bidder proposes to furnish.

The tender or quotation will be considered incomplete unless the above information is provided.

Any shipment or shipments of this material supplied to the City of Saskatoon may be sampled at any time after receipt of the shipment. Failure of the material in any shipment to meet any of the requirements of this specification shall constitute cause for rejection or other penalty.

Material supplied of inferior quality shall be replaced by the supplier.

End of Specification 07010