MATERIAL SPECIFICATION FOR TRAFFIC PAINT REFLECTORIZING GLASS BEADS

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1750.01 SCOPE

This specification covers the requirements for glass beads for use with traffic paint and requirements for Authority purchase of reflectorizing glass beads.

1750.02 REFERENCES

This specification refers to the following standards, specifications or publications:

ASTM Specifications

D1155-53 (1975) - Standard Test Method for Roundness of Glass Spheres

D1214-58 (1975) - Standard Method of Sieve Analysis of Glass Spheres

E11-81 - Wire Cloth Sieves for Testing purposes.

1750.05 MATERIALS

1750.05.01 Durability

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

1750.05.02 Colour

The glass shall be colourless to a degree that the resulting beads, when added to white paint, do not impart a noticeable hue.

1750.05.03 Bead Type and Grade

Beads shall be supplied in the OVERLAY type and MOISTURE PROOF grade. The beads shall be treated in such a manner as to overcome the effects of water, as vapour or liquid, on the beads before the beads are added to the paint stripe.

1750.07 PRODUCTION

1750.07.01 Roundness

At least 70% by mass of the glass beads shall be true spheres.

1750.07.02 Gradation

The glass beads shall meet the following gradation requirements when tested according to ASTM D1214.

US Standard ASTM E11 Sieve Series	Opening μm	Percentage Passing by Dry Mass
		Overlay Type
No. 20	850	100
No. 30	600	95 - 100
No. 40	425	45 - 70
No. 50	300	20 - 40
No. 70	212	5 - 20
No. 100	150	0 - 3

1750.07.03 Refractive Index

The index of refraction of the glass beads, when tested by the immersion method at 25°C under tungsten light, shall not be less than 1.50.

1750.07.04 Imperfections

The surface of the beads shall be smooth, lustrous and free from film, scratches and pits.

Not more than 25% by mass of the true spheres shall have imperfections such as milkiness, dark specks, incipient fractures, and air inclusions in the form of bubbles greater than 10% of the volume of the spheres.

1750.09 AUTHORITY PURCHASE OF MATERIAL BY PURCHASE ORDER

1750.09.01 Sampling and Testing

1750.09.01.01 General

A maximum of 10% but no less than 1% of the total number of packages in each batch will be taken at random for test purposes by the Authority. The contents of each random package will be riffled until a representative sample of approximately 1000 g (or 500 ml) of beads is obtained. The 1000 g samples will be combined to form a composite sample of about 4 kg (about 4 L in volume) representing a batch of 25,000 kg of beads. The composite sample will be riffled in the laboratory until about a 150 g sample is obtained for the following testing.

1750.09.01.02 Roundness Testing

The percentage true spheres shall be determined by one of the following methods:

(a) by counting the beads under 50X and 100X magnification as follows:

- Glass beads larger than #50 sieve size inclusive, shall be counted under 50X magnification (see gradation requirements).

- Glass beads smaller than #50 sieve size shall be counted under 100X magnification.

- Approximately 1,000 beads contained loosely in a culture dish shall be counted under reflected light for each sieve specified to determine the percentage by mass of perfectly round spheres.

(b) by ASTM D1155.

1750.09.01.03 Imperfections Testing

Imperfections shall be evaluated by observation under 50X and 100X magnification.

1750.09.01.04 Water Resistance Test

One hundred grams of glass beads will be placed in a 500 ml beaker and an equivalent volume of distilled water will be flowed into the beaker on top of the glass beads. The beaker will be permitted to stand for 5 min. At the end of this period, the water shall be poured off and the glass beads will be transferred to a clean, dry beaker and permitted to stand for 5 min. The spheres will then be introduced into a standard 125 m diameter glass funnel having a stem of 125 mm length. The beads shall flow through the funnel without stoppage. (Slight initial agitation to start the flow through the funnel at the beginning of the test will be permissible.)

1750.09.02 Packaging

Beads in bags shall be free of clusters, lumps, moisture and foreign matter.

Glass beads shall be packaged in bags of 25 kg net capacity, and each bag shall be marked to show clearly the following information:

1) "Overlay Type Glass Beads"
2) "Moisture Proof Grade"
3) "MTC"
4) "Batch number" (marked in 25 mm
5) "Manufacturer's name" high letters)

Bags shall be paper-lined burlap with 50 μm polyethylene inserts. The burlap liner, all seams and top closures shall be waterproof and leakproof and shall be capable of maintaining these properties during transportation and numerous handlings.

Bags shall be approximately 0.35 m x 0.66 m with the 50 μm polyethylene insert being 0.35 m x 0.96 m.

All bags shall be subject to prior approval by the Authority and shall be or be equal in quality to either:

1. A Bemis Waterproof, Standard Type, single paper lined, cemented centre seam, taped bottom bag, produced by Bemis Bros. Bag Company, St. Louis, Missouri, U.S.A., or

2. A Lloyd jute bag with polyethylene liner, Code #1010, produced by Lloyd Bag Company Limited, 114, St. Clair Street, Chatham, Ontario.

1750.09.03 Delivery

Delivery details and scheduling shall be as stipulated on the Authority's Purchase Order.

1750.09.04 Quality Assurance

Any shipment or shipments of this material supplied to the Authority will be sampled and tested within a 30 day period immediately following the date of the delivery. Failure to meet the requirements of this specification shall constitute cause for rejection of the shipment. Upon rejection of the shipment, the letters "MTC" shall be made permanently illegible on each bag of the shipment. Rejected materials shall be expeditiously removed and replaced with acceptable materials at no additional cost to the Authority.

1750.09.05 Measurement for Payment

Measurement for payment will be in kilograms of beads delivered.

1750.09.06 Basis of Payment

Payment at the contract price per kilogram shall be full compensation for all labour, equipment and material to supply and deliver the beads as specified on the Authority's Purchase Order.