Specifications For Manufactured Materials

Section: PAVEMENT MARKING MATERIALS

Subject: GLASS BEAD SPECIFICATION

DROP ON GLASS BEADS FOR PAVEMENTS MARKINGS

1. GENERAL

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

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

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

1.4 Packaging

The beads shall be packaged in 205 litre returnable "open head" drums.

Each container shall be plainly marked showing quantity of content, lot and batch number, name and address of manufacturer.

Drums are to be good quality open head "returnable" type with 3.75 mil open top poly liners draped outside of containers with separate poly top.

Container liners required for packaging are to be supplied by the supplier. Top tied liners are not acceptable.

The supplier is to be responsible for transporting empty containers and liners returned to factory from the Department's warehouses.

At the end of the season the supplier shall pick up the containers no later than December 15 of the current year.

The Department will be responsible for returning containers to the supplier that are emptied after pick up date.

There will not be a deposit charge to the Department for delivered or returned containers.

The Department will not accept bent or damaged containers that are delivered to their sites.

Containers shall be vapour-proof sealed.

2. SPECIFIC REQUIREMENTS

2.1 Roundness

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

2.2 Colour

The beads shall be transparent and colourless to the extent that they do not impart a noticeable hue to the paint.

2.3 Imperfections

The surface of the beads shall be smooth, lustrous and free from film, scratches and pits. Not more than 25% by weight of the true spheres shall have imperfections such as milkiness, dark specs, incipient fractures and air inclusions in a form of a single bubble greater than 1/2 the diameter of the bead or many bubbles totalling more than 1/3 of the bead diameter when tested under 50x and 100x magnification as described below.

2.3.1 Glass beads retained on a 300 µm sieve shall be counted under 50x magnification.

2.3.2 Glass beads passing through a 300 µm sieve shall be counted under 100x magnification.

2.4 Refractive Index

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

2.5 Gradation

The beads shall conform to the following gradation requirements:

Sieve Size	Percent Passing By Weight
850 µm	100
600 µm	80-95
300 µm	10-30
150 µm	0-15

2.6 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 atmosphere conditions are satisfactory for marking.

2.7 Coatings

Beads are to be dual coated with moisture resistance and adherence coatings.

3. TEST PROCEDURES

3.1 Sampling

Ten samples of beads will be selected by a Department's representative at random from an 18140 kg batch designated by the supplier as one shipment. Individual tests will be carried out on each of the samples selected.

Samples will be reduced to appropriate test size with a sample splitter.

3.2 Sieve Analysis

The sieve analysis will be performed according to A.S.T.M. test method D1214, except for the following:

The sample size shall not be less than 50 grams (g) or more than 100g. No attempt will be made to select an exact sample weight. A mechanical sieve shaker, set for five minutes of operation, will be used.

4. ACCEPTANCE

The gradation will be acceptable if the average test results of ten sieve analysis, plus or minus two standard deviations, is within the specification limits. This criterion will be applied to each individual sieve size.

For Roundness, Colour, Imperfections and Refractive Index, the material will be acceptable if nine out of ten samples meet the specification's requirements.