SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION
SPECIFICATION FOR GLASS BEADS WITH REQUIRED ROUNDNESS

This specification covers glass beads to be used with waterborne traffic paint. This specification is for the bead with a requirement for a minimum of 80% round beads.

GENERAL REQUIREMENTS

Glass Beads for use with waterborne traffic paint will be moisture resistant conforming to AASHTO M 247, Type I.

The glass spheres will be transparent, colorless and free from milkiness, dark particles or carbon residues, and excessive air inclusions. All +20 mesh beads will be produced from virgin glass by direct melt methods. The glass spheres will be free of hard lumps and clusters and will dispense readily under any conditions suitable for paint striping.

Glass beads will not contain more than 75 parts per million (ppm) arsenic and 100 ppm lead, as tested according to EPA Methods 3052 and 6010C. Other suitable x-ray fluorescence spectrometry analysis methods may be used to screen samples of glass beads for arsenic and lead content.

The glass beads will be without floatation properties. The glass for use with waterborne paint will have dual surface treatment consisting of a moisture resistant silicone treatment, and silane adherence surface treatment. The glass beads will have a minimum refractive index of 1.50.

a. Gradation: The glass beads will meet the following gradation requirements when tested according to ASTM D 1214:

Percent Passing a No. 14 sieve	100
Percent Passing a No. 16 sieve	95-100
Percent Passing a No. 20 sieve	65-85
Percent Passing a No. 30 sieve	45-80
Percent Passing a No. 50 sieve	10-35
Percent Passing a No. 100 sieve	0-5

b. Roundness: The glass beads will have a minimum of 80 percent true spheres as determined by the MN/DOT Method for Determining Roundness of Glass Beads.

c. Coating: The glass spheres will have a dual coating. The coating will have both a moisture resistant coating and an adhesion promoting coating. The glass beads will pass the moisture resistance test and the adherence coating test.

MN/DOT METHOD FOR DETERMINING ROUNDNESS OF GLASS BEADS

a. Reduce bead sample to 25 to 50 grams by means of a sample splitter. Weigh to the nearest 0.01 grams.

b. Split the reduced sample into two fractions using a 297 μm (No. 50) sieve.

c. To separate rounds from imperfects, a smooth, 30 mm by 45 mm (12 in by 18 in), inclined glass or aluminum plate is used. The plate is inclined approximately 3 degrees for the +297 μm (+50) fraction and at approximately 10 degrees for the –297 μm (-50) fraction.

d. Slowly apply part of the beads to the top of the plate. Tap the plate with a wooden pencil or brush to cause round beads to roll down the incline into a collecting pan. Brush the remaining beads into a separate collecting pan. Continue with small applications until the entire sample is processed. Repeat the process with beads that rolled off plate at least three times for the +297 μm (+50) fraction and at least four times for the –297 μm (-50) fraction.

e. Weigh the separated fractions of round beads and calculate percent rounds.

DELIVERY CONTACT INFORMATION

Aberdeen Region

The DOT will contact the vendor at least one week in advance of desired delivery and advise them of the desired quantity and destination. Vendors will notify Dan Martell (605-626-2244 or Dan.Martell@state.sd.us) at least 24 hours prior to delivery arrivals.

Mitchell Region

The DOT will contact the vendor at least one week in advance of desired delivery and advise them of the desired quantity and destination. Vendors will notify Doran Raymond (605-770-7405 or Doran.Raymond@state.sd.us) or Corey Pinkley (605-770-7401 or Corey.Pinkley@state.sd.us) at least 24 hours prior to delivery arrivals.

Pierre Region

The DOT will contact the vendor at least one week in advance of desired delivery and advise them of the desired quantity and destination. Vendors will notify Darren Griese (605-773-3464 or Darren.Griese@state.sd.us) at least 24 hours prior to delivery arrivals.

Rapid City Region

The DOT will contact the vendor at least one week in advance of desired delivery and advise them of the desired quantity and destination. Vendors will notify Steve Frost (605-394-2298 or Steve.Frost@state.sd.us) or Jon Suomala (605-394-2244 or Jon.Suomala@state.sd.us) at least 24 hours prior to delivery arrivals.