METHOD OF TEST FOR
GLASS BEAD APPLICATION RATE AND DRY FILM THICKNESS
FOR SPRAY APPLIED PAVEMENT MARKINGS

1. SCOPE

1.1   This method covers the determination of glass bead rate and dry film thickness for spray applied pavement markings.

2. DEFINITIONS

2.1   Unbeaded - No overlay of glass beads is applied to the pavement marking coating.

2.2   Beaded - An overlay of glass bead is applied to the pavement marking coating.

3. APPARATUS

3.1   BALANCE: A weighing device having a capacity of 1.0 kg or more, sensitive and readable to 0.1 g or less and accurate within 0.1% of the test load at any point within the range of use for this test.

3.2   TEST PANELS: Steel Q panels measuring not less than 152 mm wide, 305 mm in length and of a minimum thickness of 0.8 mm shall be used.

3.3   DRY FILM THICKNESS GAUGE: Magnetic Type 2 – Constant Pressure Probe Gauge. The gauge must have a minimum capacity of 1250 µm and an accuracy at least within 10%.

4. PROCEDURE

4.1   Bare steel Q panels are weighed and the mass recorded. The panels are used as the substrate for both the glass bead application rate and the dry film thickness measurement.

4.2   Two panels are obtained per test site (one unbeaded and one beaded). The panels are placed on the pavement surface so that the short side of the panel is parallel with the direction of the pavement marking striping operation. The panels should be placed between 2 and 3 m apart. The unbeaded panel is obtained by momentarily turning off the glass bead application gun on the striping equipment.

4.3　　The coated panels are removed from the roadway surface and permitted to dry or cure on a flat, level surface. For paints, a minimum of 24 hours is required before conducting tests. For spray field reacted materials please refer to the coating manufacturer's product data sheets for minimum cure times.

4.4　　In order to obtain accurate measurements the coated panels must be kept free from dirt grease and any other foreign matter.

4.5　　The panels are re-weighed and the mass recorded. All weight determinations should be made to the nearest 0.1 g.

5. CALCULATION OF GLASS BEAD APPLICATION RATE

5.1　　The Glass Bead Application Rate is calculated as follows:

A= Weight of unbeaded panel (grams)

B= Weight of coated unbeaded panel (grams)

C= Weight of beaded panel (grams)

D= Weight of coated beaded panel (grams)

E=B-A

F=D-C

where E= Weight of coating on unbeaded panel (grams)

where F= Weight of coating & beads on beaded panel (grams)

Glass Bead Application Rate = (G*H* (F-E))/(E*100)

where G= Coating Density (kg/l)

where H= Weight Solids of Coating (%)

5.2　　Both the Coating Density and Weight Solids of the Coating can be obtained from the coating manufacturer's product data sheet or the manufacturer.

5.3　　Glass Bead Application Rate shall be expressed in kg/l of pavement marking material.

6. MEASUREMENT OF DRY FILM THICKNESS

6.1　　Calibration and Verification: Type 2 – Constant Pressure Probe Gauges

6.1.1　Different manufacturers of Type 2 gauges follow different methods of calibration or adjustment. Calibrate the gauge according to manufacturer's instructions.

6.1.2 Magnetic gauges are sensitive to geometrical discontinuities of the steel such as holes, corners or edges. The sensitivity to edge effects and discontinuities varies from gauge to gauge. Measurements should not be made closer than 1.5 cm from the panel and paint edges.

6.2 Measurement of Dry Film Thickness

6.2.1 With a properly calibrated gauge, measure the dry film thickness as specified below.

6.2.2 Make five separate spot measurements spaced randomly over the panel. Take the average of the five spot measurements. The dry film thickness shall be expressed in μm (micrometers).

6.2.3 A spot measurement is as follows: A minimum of three gauge readings shall be made for each spot measurement. For each new gauge reading move the probe to a new location within 4 cm-diameter circle defining the spot. Discard any unusually high or low gauge reading that cannot be repeated consistently.

6.2.4 Take the average of the acceptable gauge readings as the spot measurement.

APPENDIX

Example of Glass Bead Application Rate

Weight of bare steel panel for unbeaded sample 293.2 g

Weight of bare steel panel for beaded panel sample 295.6 g

Weight of coated unbeaded panel 301.6 g

Weight of coated beaded panel 310.9 g

Coating Density 1.52 kg/l

Weight Solids 52.2%

E=B-A F=D-C

E=301.6-293.2= 8.4 g F=310.9-295.6=15.3 g

Glass Bead Application Rate = (1.52*52.2*(15.3-8.4))/(8.4*100)

Glass Bead Application Rate = 0.652 kg/l