

**KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, 2015 EDITION**

Delete SECTION 2213 and replace with the following:

SECTION 2213

SPRAYED THERMOPLASTIC PAVEMENT MARKING MATERIAL

2213.1 DESCRIPTION

This specification covers thermoplastic materials suitable for use as retroreflecting pavement markings on asphalt pavement. The material is applied to the pavement in molten form by spray means. Glass beads are pre-mixed into the material furnished, and also dropped on the surface of the molten material immediately after it is applied to the pavement surface, at a rate specified. Upon cooling to normal pavement temperature, the material produces an adherent retroreflective marking of specified thickness and width, capable of resisting deformation by traffic.

2213.2 REQUIREMENTS

a. General.

- (1) Provide the material in white and/or yellow as specified.
- (2) Provide 100% solids thermoplastic material that is homogeneously composed of pigment, filler, resins and glass beads. The material must have a minimum binder content of 25% by mass composition and be free of foreign objects that would cause bleeding, staining, or discoloration. Upon heating to application temperature, the material will not exude fumes that are toxic, or injurious to persons or property.

b. Pigment.

- (1) Use high-grade titanium dioxide as the pigment for the white material. The material must contain a minimum of 10% titanium dioxide by mass.
- (2) Use heat resistant and colorfast yellows, golds, or oranges to produce a material to comply with color requirements.
- (3) Yellow pigments must comply with the latest OSHA standards for toxic heavy metals.
- (4) Use a filler consisting of white calcium carbonate, silica, or an approved substitute.

c. Glass Beads. Provide glass beads according to the thermoplastic manufacturer's recommendations that comply with AASHTO M 247 or specification provided by the manufacturer. Beads will be submitted by the manufacturer and tested at the MRC lab according to type before use on KDOT projects.

d. Thermoplastic Material. Provide thermoplastic material that complies with the following:

- (1) Specific Gravity--2.0 maximum
- (2) Daylight Reflectance (Y)
 - (a) White—75% minimum
 - (b) Yellow—45% minimum
- (3) Color—meets the requirements of ASTM D 6628. Yellow lines must display a nighttime presence of yellow when viewed under automobile headlights.
- (4) Retroreflectivity—Provide sprayed thermoplastic that meets the following minimum retroreflectivity requirements using an acceptable 30-meter retroreflectometer:

Color	Millicandelas/sq m/lux (min.)
White	350
Yellow	250

- (5) Softening Point--180°F minimum
- (6) Cracking Resistance at Low Temperature--No visible cracks when observed from a distance of one foot.

e. Binder-Sealer. When a binder-sealer is specified, provide one that is recommended by the manufacturer of the thermoplastic material, and apply it according to the manufacturer's instructions. The binder-sealer must be compatible with the pavement material, and form a tight bond between the pavement and the thermoplastic material.

f. Verification Testing. The Engineer will take verification samples. Verification samples of thermoplastic will be taken from 1 lot of each color per project, using KT-30. Send the samples to MRC for testing and evaluation. Lots previously tested by MRC will be exempt from testing, and may be exempt from sampling if coordinated with MRC.

2213.3 TEST METHODS

a. Thermoplastic Material. Use AASHTO T 250 except for:

- (1) Softening Point-Heat the material for 4 hours \pm 5 minutes at $375 \pm 2^\circ\text{F}$.
- (2) Cracking Resistance at Low Temperature-Heat the material for 4 hours \pm 5 minutes at $375 \pm 2^\circ\text{F}$.
- (3) Glass Beads content. ASTM D 4797. ~~and AASHTO T 247.~~
- (4) Titanium Dioxide. KTMR-40, Titanium Dioxide Content in Thermoplastic and Sprayed Thermoplastic Pavement Marking Material.

b. Glass Beads.

- (1) AASHTO T 346

2213.4 PREQUALIFICATION

a. Manufacturers interested in prequalifying material under this specification must provide a 10-lb sample of each color and a sealer (if required by the mfg.) to the Engineer of Tests. Also include a copy of the quality control test report for each lot of material, material safety data sheets, and a complete set of installation recommendations and instructions.

b. If the material complies with all laboratory requirements, the manufacturer will be contacted to arrange for the field evaluation. The field evaluation will consist of 2 or 3 test projects at times and locations as determined by the Bureau of Transportation Safety and Technology. Manufacturers must specify if the material may be used on both asphalt and concrete surfaces or only on asphalt or concrete surfaces.

Duration of the test project will be dependent on the submittal of test data from the AASHTO National Transportation Product Evaluation Program (NTPEP). Forward an official copy of the test data along with evidence that the material referenced is identical to that submitted for prequalification to the Engineer of Tests for evaluation. Materials with no test data will have a test project duration of 18 months; materials with test data will have a test project duration of 12 months. Materials will be evaluated initially and every 3 to 6 months throughout the duration of the test project for retroreflectivity, color and durability.

c. The material will be evaluated for compliance with all requirements of this specification, and the manufacturer will be notified of the results. The Bureau of Construction and Materials will maintain a list of qualified materials and installation instructions.

d. Products will remain on the prequalified list as long as the results of verification testing and field performance are satisfactory. Any changes in formulation should be reported to the Engineer of Tests for review and evaluation to determine if requalification is necessary.

2213.5 BASIS OF ACCEPTANCE

a. Thermoplastic Material.

- (1) Prequalification as required by **subsection 2213.4.**
- (2) Receipt and approval of a Type C certification as specified in **DIVISION 2600** for each lot of material used.

b. Glass Beads for Drop-on Application.

- (1) Receipt and approval of a Type D certification as specified in **DIVISION 2600**.
- (2) Copy of the MRC test report for each lot of beads used on the project that shows compliance with the specification.

c. Binder-Sealer. If binder-sealer is required, it will be accepted based on brand name as recommended by the thermoplastic material manufacturer, and visual observation of performance in the field.

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