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

Delete the entire SECTION 2216 and replace with the following:

SECTION 2216

MULTI-COMPONENT LIQUID PAVEMENT MARKING MATERIAL

2216.1 DESCRIPTION

This specification covers multi-component, liquid materials* suitable for use as retroreflecting pavement markings on portland cement concrete or asphalt pavements. Glass beads or other reflective elements are dropped at a specified rate on the surface of the liquid material immediately after it is applied to the pavement surface. Upon curing, it produces an adherent retroreflective marking of specified thickness and width, capable of resisting deformation by traffic.

*These can be modified urethanes, polyureas, methylmethacrylates, special epoxies or other applicable materials.

2216.2 REQUIREMENTS

a. Color. Provide material that complies with the requirements of ASTM D 6628. Provide white and yellow material that complies with the following Daylight Reflectance values:

TABLE 2216-1: DAYLIGHT REFLECTANCE	
Color	**45 Degrees-0 Degrees, % Min.**
White	75
Yellow	45

b. Provide material that is a homogeneous blend of liquid resins, pigments, and fillers and is also free of lead and other toxic heavy metals.

c. Provide one of the above-mentioned liquid marking materials or a material as approved by KDOT. The burden of proof of a product rests with the producer. Provide all supporting technical data, including test reports, field test data, etc. for consideration of the product.

d. Retroreflectivity. Provide multi-component pavement marking material that meets the following minimum retroreflectivity requirements using an acceptable 30-meter retroreflectometer:

TABLE 2216-2: MULTI-COMPONENT RETROREFLECTIVITY REQUIREMENTS	
Color	**millicandelas/sq m/lux (min.)**
White	325
Yellow	250

e. Hardness. Provide material with Shore D hardness of 75 minimum.

f. Bond Strength to Concrete. Provide material that when catalyzed, has such a high degree of adhesion to the specified concrete surface that there is a 100% concrete failure. Apply the material at a film thickness of 0.01 ± 0.001 inch to concrete with a minimum compressive strength of 4000 psi. Allow the material to cure for 72 hours at 77ºF before the test is performed.

g. Yellowness Index. White only. Value after 72 hours in QUV – 30 maximum when tested at 0.01 ± 0.001 inch and a 72-hour cure.

h. Glass Beads For Drop-On Application. Provide glass beads according to the multi-component manufacturer's recommendations.

i. Verification testing. The Engineer will take a ½-pint sample of each color and a ½-pint sample of the hardener used on the project. Send the samples to MRC for testing and evaluation. Lots previously tested will be exempted from testing and may be exempted from sampling if coordinated with MRC. Testing will include infrared spectroscopy. Deviations as determined by comparison with the prequalification sample will be cause for removal from the prequalified list.

2216.3 TEST METHODS

a. Bond Strength to Concrete. AASHTO T 237

b. Hardness. ASTM D 2240

c. Yellowness Index. ASTM E 313

2216.4 PREQUALIFICATION

a. Manufacturers interested in prequalifying material under this specification must provide a 1-quart sample of each color plus 1 quart of hardener to the Engineer of Tests. Also include a copy of the quality control test report for each lot of material, an infrared spectroscopy analysis for each component, material safety data sheets and a complete set of installation recommendations and instructions. .

b. The material will be evaluated for compliance with all requirements of this specification, and the manufacturer will be notified of the results. Each color and the hardener will be analyzed and "fingerprinted" using infrared spectroscopy for use in screening future verification samples to verify that materials submitted for use are of an identical formulation as originally approved.

c. 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.

d. The Bureau of Construction and Materials will maintain a list of qualified materials and installation instructions. 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.

2216.5 BASIS OF ACCEPTANCE

a. Multi-Component Liquid Material

(1) Prequalification as required by **subsection 2216.4**.

(2) Receipt and approval of a Type C certification as specified in **DIVISION 2600**.

b. Glass Beads/Reflective Elements for Drop-on Application.
(1) Receipt and approval of a Type D certification as specified in **DIVISION 2600**.
(2) Copies of testing results for each lot of beads used on the project.

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