

PAVEMENT MARKING, METHYL METHACRYLATE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Methods and materials for installing durable colored pavement marking materials, consisting of anti-slip treated methyl methacrylate. The material does not need to be retro-reflective.

1.2 REFERENCES

A. The manufacturer must be ISO 9001:2008 certified for design, development and manufacturing of colored pavement materials, and provide proof of current certification.

1.3 SYSTEM DESCRIPTION

A. Properly designed roadway pavement coatings have been scientifically formulated to provide the optimal balance of performance properties for a durable, long lasting color and texture to a roadway pavement surface. Some of these key properties include wear and crack resistance, color retention, adhesion, minimal water absorption and increased friction properties. As well, the roadway pavement coating must be environmentally safe and meet EPA requirements for Volatile Organic Compounds (VOC).

B. The material shall be capable of being applied on bituminous and/or Portland cement concrete pavements and must be able to be applied after 30 days of placement. The use of a compactor or similar equipment shall not be necessary.

C. The material must be capable of conforming to pavement contours, breaks and faults through the action of traffic at normal pavement temperatures. It shall not be necessary to use a grid template or to make pattern grooves or other indentations in the asphalt or concrete surface prior to applying the material. It shall not be necessary to inlay the material in grooves or indentations. It shall not be necessary to heat the pavement or application surface to a specific temperature.

1.4 SUBMITTALS

A. Confirmation of coating color.

- a. **Green:** The color must meet the FHWA guidance for the chromaticity coordinates for bicycle lane coloration.
- b. **Others:** The colors selected must meet with any specified guidelines determined by the owner.

B. Confirmation of anti-skid / anti-slip properties of coating material if required.

A. Material Warranty

1. Manufacturer provides a full warranty covering 100 percent of the pavement marking materials for one year.

2. Contractor is responsible for quality control of the proper placement of the materials and all other factors that affect the service life of the materials.

3. Contractor removes and replaces 100 percent of the markings for all failed sections at no cost to OWNER in the event of a performance failure.

1.6 DELIVERY, STORAGE, AND HANDLING

A. According to manufacturer's recommendations.

B. Provide Material Safety Data Sheets (MSDS) when material is delivered.

1.7 ACCEPTANCE

A. Provide documentation of the manufacturer and production batch identification for the covering used.

PART 2 PRODUCTS

2.1 MATERIAL

A. The Methyl Methacrylate (MMA) Acrylic Resin Material System shall be Color-Safe Primer, Color-Safe and Color-Safe No-Track Topcoat as manufactured by Transpo Industries.

B. Must be resistant to the detrimental effects of motor fuels, antifreeze, lubricants, hydraulic fluids composed of an ester modified resin impervious to degradation by motor fuels, lubricants, etc. in conjunction with aggregates, pigments, binders, and anti-skid/anti-slip elements.

C. Pigments and anti-skid/anti-slip elements must be uniformly distributed throughout the material.

1. Pigments: The pigment system must not contain heavy metals nor any carcinogen, as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant Federal Regulations.

D. Skid Resistance: The aggregate used in the Methyl-Methacrylate coating should have a minimum hardness of 7 (Mohs scale). Upon application the material shall provide a minimum skid resistance value of 60 BPN when tested according to ASTM E 303 or minimum value of 40 when tested according to ASTM E 274.

E. Hardness: The material must meet a minimum hardness value of 55-60 per ASTM D2240.

F. Environmental Resistance: The material must be resistant to deterioration due to exposure to sunlight, water, salt or adverse weather conditions and impervious to oil and gasoline.

G. The material must be able to be applied in temperatures down to 40 °F.

H. Performance Measures for Durability.

1. Minimum Durability – 90 percent of each colored area, legend, or symbol must be present.

2. Failure to meet any of the specified performance measures on at least 90 percent of the colored area is considered a failure. ENGINEER may require partial or complete replacement of the colored area under the warranty terms.

3. Failure to meet any of the specified performance measures on at least 90 percent of the legend or symbol is considered a complete failure of that legend or symbol. Replace under the warranty terms.

I. Elongation of material resin should have a minimum of 30% when tested in accordance with ASTM D638 Type I.

J. Water Absorption shall be a maximum of 0.25% when tested in accordance with ASTM D570.

K. Solids Content should be a minimum of 99% when tested in accordance with ASTM D1644.

L. Aggregate: If non-skid qualities are required, the aggregate shall be determined by owner with options of #0, #1 or #2 kiln dried silica sand, corundum or bauxite dependent on use of pavement marking and ADT.

PART 3 EXECUTION

3.1 PREPARATION

A. Depending upon the condition and age, existing roadway pavement may or may not be suitable for the successful application of pavement coating. CONTRACTOR can advise whether the roadway pavement is suitable or not. ENGINEER shall make the final determination as to the suitability of the existing roadway pavement.

B. CONTRACTOR is responsible for all surface preparation such as de-greasing, sweeping, power blowing, shot-blasting or power washing in accordance with manufacturer's instructions.

C. Line control.

1. Establish control points prior to application.

2. Pavement markings that are to be left in place, utilities, drainage structures, curbs and any other structure within or adjacent to the treatment location shall be masked to protect from application. Masking material to be removed with no damage after material is placed.

3. Maintain line within 2 inches of the established control points and mark the roadway between control points as needed. Remove paint that is not placed within tolerance of the established control points and replace at no expense to the OWNER.

3.2 APPLICATION GUIDELINE

A. The pavement shall be clean, dry and free of debris before the application of the MMA pavement marking. The material must be able to be applied at ambient and road temperatures down to 40 °F without any preheating of the pavement to a specific temperature.

B. Asphalt: The material shall be applied using equipment recommended by the manufacturer. The MMA resin should be capable of Resin/Aggregate or Spray/Aggregate Broadcast Method. Refer to Technical Data Sheet supplied by Transpo Industries for various application instructions. A primer specified by the manufacturer may be applied to the substrate prior to material application to ensure proper adhesion, and to provide reinforcement for larger volumes of material. A sealer may be applied to the colored MMA resin once it is cured. The material for each product must cover the entire application area and be flush across the surface. Once applied, no part of the pavement surface must be visible in the application area. Supplier must enclose application instructions with each box/package, or make available on website.

C. Portland Cement Concrete: The same application procedure shall be used as described above.

D. Catalyst will be added at the recommendation of the manufacturer dependent on ambient and pavement temperature.

E. Final thickness:

1. The material must be supplied at a minimum thickness of 80 mils.

3.4 OPENING TO TRAFFIC

A. Minimally, the material must cure before the colored area is opened to traffic. No traffic, both motorized and non-motorized, shall be permitted to come into contact with these markings until the materials have set and the manufacturer's specified curing time has elapsed. The contractor will be responsible for maintaining appropriate traffic control measures to ensure that the markings can be applied and can cure without damage or disruption from such traffic. No separate measurement or payment will be made for traffic control or curing time.

END OF SECTION