

**SPECIFICATION
SKID/SLIP RESISTANT BIKE LANE GREEN
PREFORMED THERMOPLASTIC PAVEMENT MATERIAL**

1. **USE:** A durable, high skid and slip resistant, pavement marking material suitable for use as bike lane, bike path, bus lane, roadway, intersection, airport, commercial or private pavement delineation and markings. For use on asphalt or portland cement concrete pavement surfaces.
 - 1.1. The material must be a resilient light green color preformed thermoplastic product which contains a minimum of thirty percent (30%) intermixed anti-skid/anti-slip elements with a hardness range of 7-9 (Mohs scale), and where the top surface contains anti-skid/anti-slip elements with a hardness of 9 (Mohs scale).
 - 1.2. The material shall be resistant to the detrimental effects of motor fuels, antifreeze, lubricants, hydraulic fluids, etc.
 - 1.3. The material shall be capable of being applied on bituminous and/or portland cement concrete pavements by the use of a handheld heat torch, and/or infrared heater.
 - 1.4. The material shall be capable of being applied to asphalt and portland cement concrete surfaces without preheating the application surface to a specific temperature.
 - 1.5. The material shall be capable of conforming to pavement contours, breaks and faults through the action of traffic at normal pavement temperatures.
 - 1.6. The material is typically supplied in segments measuring 2 ft. x 3 ft. (.61 m x .915 m).
 - 1.7. The material shall be capable of being applied in temperatures down to 45°F (7.2°C) without any special storage, preheating or treatment of the material before application.
 - 1.8. The material shall contain heating indicators evenly distributed on the surface that shall act as visual cues during both the application process and post-application.
 - 1.9. If required, white, retroreflective and skid resistant preformed thermoplastic symbols and/or word legends may be incorporated into the skid/slip resistant material background in an interconnected fashion, such that the two materials shall be factory assembled together and applied as a single layer.

2. **MANUFACTURING LOCATION, CONTROL AND ISO CERTIFICATION:** The marking material must be produced in the United States, and the manufacturer must be ISO 9001:2008 certified for design, development and manufacturing of preformed thermoplastic pavement markings, and provide proof of current certification.

3. **MATERIAL:** Shall be composed of an ester-modified rosin impervious to degradation by motor fuels, lubricants, etc., in conjunction with aggregates, pigments, binders, and anti-skid/anti-slip elements uniformly distributed throughout the material. The thermoplastic material shall conform to AASHTO designation M249, with the exception of the relevant differences due to the material being supplied in a preformed state, being non-reflective, and being of a color different from white or yellow.

3.1. **Pigment: Light Green:** The material shall be manufactured with appropriate pigment to ensure that the resulting colors complies with the Light Green color as specified in the FHWA Memorandum dated April 15th, 2011: Interim Approval for Optional Use of Green Colored Pavement for Bike Lanes (IA-14).

3.1.1. Daytime chromaticity coordinates for the color used for green colored pavement shall be as follows:

1		2		3		4	
X	y	x	y	x	y	x	y
0.230	0.754	0.266	0.500	0.367	0.500	0.444	0.555

3.1.2. Nighttime chromaticity coordinates for the color used for green colored pavement shall be as follows:

1		2		3		4	
X	y	x	y	x	y	x	y
0.230	0.754	0.336	0.540	0.450	0.500	0.479	0.520

3.2. The pigment system must not contain heavy metals or any carcinogen, as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant Federal Regulations.

- 3.3. **Heating indicators:** The top surface of the material shall have regularly spaced indents. The closing of these indents during application shall act as a visual cue that the material has reached a molten state, allowing for satisfactory adhesion and proper embedment of the anti-skid/anti-slip elements, and a post-application visual cue that proper application procedures have been followed.
- 3.4. **Skid Resistance:** The surface of the preformed thermoplastic material shall contain factory applied anti-skid elements with a minimum hardness of 9 (Mohs scale). Upon application the material shall provide a minimum skid resistance value of 60 BPN when tested according to ASTM E 303.
- 3.5. **Slip Resistance:** The surface of the preformed thermoplastic material shall contain factory applied anti-skid elements with a minimum hardness of 9 (Mohs scale). Upon application the material shall provide a minimum static coefficient of friction of 0.6 when tested according to ASTM C 1028 (wet and dry), and a minimum static coefficient of friction of 0.6 when tested according to ASTM D 2047.
- 3.6. **Thickness:** The material must be supplied at a minimum thickness of 90 mils (2.29 mm) or 125 mils (3.15 mm).
- 3.7. **Environmental Resistance:** The material shall be resistant to deterioration due to exposure to sunlight, water, salt or adverse weather conditions and impervious to oil and gasoline.

4. **APPLICATION:**

- 4.1. **Asphalt:** The material shall be capable of being applied using the propane torch method, and/or infrared heater recommended by the manufacturer. The material shall be capable of being applied at ambient and road temperatures down to 45°F (7.2°C) without any preheating of the pavement to a specific temperature. A sealer specified by the manufacturer shall be applied to the pavement surface prior to material application to ensure proper adhesion. The sealer must be supplied by the material manufacturer in 300/600ml cartridges along with sealer application supplies. A thermometer shall not be required during the application process. The pavement shall be clean, dry and free of debris. Supplier must enclose application instructions in English and Spanish with each box/package only pertaining to an application method that does not require preheating of the pavement to a specific temperature before application.
- 4.2. **Portland Cement Concrete:** The same application procedure shall be used as described under Section 4.1.

5. **PACKAGING:** The preformed thermoplastic markings shall be packaged in cardboard cartons. The cartons in which packed shall be non-returnable, shall contain a minimum of 35% post-consumer recycled materials, and shall not exceed 40 in. (1.02 m) in length and 25 in. (.64 m) in width. The cartons shall be labeled for ease of identification. The weight of the individual carton must not exceed 70 lb. (32 kg). A protective film around the carton must be applied in order to protect the material from rain or premature aging.
6. **TECHNICAL SERVICES:** The successful bidder shall provide technical services as required. Regionally-located manufacturer's representative, employed directly by the manufacturer, can provide no-cost on-site training for proper application.
7. **PERFORMANCE:** The preformed thermoplastic markings shall meet state specifications and be approved for use by the appropriate state agency.