

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF MATERIALS TECHNOLOGY
7450 Traffic Drive, Building #4
Hanover, MD, 21076

**PROCEDURE FOR THE QUALIFICATION OF DECORATIVE AGGREGATE
REINFORCED PREFORMED IMPRINTED THERMOPLASTIC PAVEMENT
MARKINGS**

The Maryland Department of Transportation State Highway Administration (MDOT-SHA) maintains a Qualified Products List (QPL) which includes Decorative Aggregate Reinforced Preformed Imprinted Thermoplastic Pavement Markings (DARPITPM). DARPITPM must meet MDOT-SHA's [Special Provision 500](#).

All submitted products must conform to the requirements of the Special Provision for approval. If you are interested in having your product qualified, visit [Maryland's Product Evaluation Listing \(MPEL\)](#) and select VENDOR REGISTRATION to begin. If you are already registered as a vendor, login to your existing account. When your registration has been accepted, you will receive an email request to submit a six-paged detailed application through the MPEL Database.

Approved products are required to continue to meet specifications. Materials used based on Certificates of Compliance may be sampled and tested after qualification. Products found not in compliance with contract requirements or specifications will be subject to rejection whether in place or not. Samples of the product **may be taken** by the Administration periodically to ensure quality assurance and quality control.

Inform the Administration immediately of any changes in the composition of the product. After MDOT-SHA has reviewed the changes, a new sample(s) may be requested to be submitted along with the information above.

Qualification is limited to **three** products per manufacturer for this category.

Materials/Products evaluated and not approved are not eligible for resubmission within six months of the most recent examinations unless requested by the Administration.

Producers are required to recertify their products every 5 years in order to remain on the QPL. Recertification dates are listed on the QPL. Cost reimbursement of \$50.00 will be applied for the Recertification process.

The Recertification will require Manufacturers to submit a certified letter on manufacturer's letterhead stating that the product formulation has not changed. In addition, the submission of current MSDS, current test results, and/or any other pertinent documents are required. Samples will be requested as needed. Manufacturers will be sent an email notification prior to the product recertification date.

**CATEGORY 500
PAVING**

**DECORATIVE AGGREGATE REINFORCED PREFORMED IMPRINTED
THERMOPLASTIC PAVEMENT MARKINGS**

DESCRIPTION. Install Decorative Aggregate Reinforced Preformed Imprinted Thermoplastic Pavement Markings (DARPITPM) for crosswalks, roadways, and other horizontal asphalt surfaces. Install according to the manufacturer’s recommendations and as directed. The locations, patterns, and colors shall be as specified.

MATERIALS.

- (a) **Aggregate Reinforced Preformed Thermoplastic** shall have a minimum of 30% non-skid aggregate uniformly distributed throughout the material. The aggregate reinforced preformed thermoplastic is supplied in panels measuring 24 in. x 24 in. The preformed material shall conform to the pavement contours. The material shall have resealing characteristics and be capable of fusing to itself and previously applied like materials. Pigments and anti-skid/anti-slip elements shall be uniformly distributed throughout the material. The pre-formed material shall be composed of a rosin ester binder impenetrable by motor oil, diesel fuel, anti-freeze, hydraulic fluid and deicing chemicals. The material shall conform to M 249 or as modified to meet specification requirements. The material shall be certified and conform to the following:

CHARACTERISTIC	TEST METHOD	MINIMUM REQUIREMENT
Thickness	-	160 mils ±10 mils
Water absorption	ASTM D 570	Less than 0.5%
Binder content	ASTM T 250	18.0 to 20.0%
Low temp. resistance @ 15F	ASTM T 250	No cracking
Specific gravity	ASTM D 792	2.0 to 2.16
Indentation resistance @ 46.1C	ASTM D 2240	44 – 52
Impact resistance	ASTM D 256 - Method A	Less than 20
Flash point	ASTM D 92	Greater than 440 F
Friction	British Pendulum	BPN greater than 60

- (b) **Sealer/ Primer.** Epoxy sealer or primer as specified and distributed by the manufacturer.
- (c) **Non-Skid Aggregate.** The non-skid aggregate shall have a minimum hardness of 6 on the Mohs scale.

CONSTRUCTION.

- (a) **Qualifications.** Submit qualifications to perform the work in writing. This information is required as part of the subcontractor approval process. Qualifications include the following:
- (1) Records of the Contractor's/subcontractor's past successful experience in performing DARPITPM work. A minimum of five projects within the past three years is required. Include project locations, names of clients, name and telephone number of an individual representing the owner, costs, and size of projects.
 - (2) Documentation of the experience of the crew members including length of employment with the Contractor/subcontractor, work experience, work resume, and specialized education and training history. The paving superintendent/engineer having at least 3 years' experience in DARPITPM work. The crew shall have no more than one trainee.
- (b) **Quality Control Plan.** Submit a written Quality Control Plan for approval at least two weeks before the planned start of the stamped patterned work. Show how the Contractor proposes to control the equipment and material application for the treatment process of the asphalt surface to ensure conformance with the manufacturer's specifications and the Contract Documents.
- (c) **Quality Assurance.** The Engineer will provide quality assurance by:
- (1) Verifying that the imprinting tools and materials are compatible.
 - (2) Monitoring the Contractor/subcontractor conformance with the Quality Control Plan.
 - (3) Verifying the Contractor/subcontractor qualifications to produce this type of markings and comply with these and the manufacturer's specifications.
 - (4) Verifying the actual results of all Quality Control tests for the actual materials in the batch submitted for the project.
- (d) **Equipment.** All equipment designed and used per the manufacturers' recommendations.
- (1) **Stamping Templates.** Use 3/8 in. wire rope/cable templates to provide the primary imprinting of the specified pattern into the asphalt pavement. Templates are to be designed and constructed in the same shape and size as the pre-cut thermoplastic panels.
 - (2) **Reciprocating Infrared Heating Equipment (RIHE).** Designed specifically to elevate the temperature of the preformed thermoplastic material and asphalt pavement without adversely affecting the material. The RIHE uses a bank of propane-fired infrared heaters mounted on a track device that allows the heater bank to reciprocate back and forth over a designated area. The RIHE allows the operator to monitor the temperature of the preformed thermoplastic during the pavement heating process to ensure that the pavement is not overheated or adversely affected. Heaters without these controls are prohibited.

- (3) **Mobile Infrared Heater (MIH).** Designed specifically to heat areas such as borders and narrow areas that are inaccessible to the RIHE. The MIH heater allows the operator to monitor the temperature of the preformed thermoplastic during the heating process.
 - (4) **Hand-held Portable Propane Heat Torch.** Use to heat isolated areas of the preformed thermoplastic where it is difficult to operate the mobile infrared heater. These torches may not be used as the RIHE.
 - (5) **Finishing Tools.** Use tools designed to enable the applicator to complete the imprinting of the asphalt pavement in areas which may be inaccessible to the template such as curbs and manhole covers.
 - (6) **Air Powered Spray Hopper Gun.** Air assisted spreader for spraying non-skid aggregate coating in a uniform manner over the area. Includes air compressor with hose and fittings.
 - (7) **Vibratory Plate Compactors.** Use compactors weighing 700 to 900 pounds to press the stamping templates into the heated thermoplastic and asphalt pavement, thus creating the specified pattern.
 - (8) **Sealer/ Primer Dispenser.** Designed to apply the seal/primer uniformly.
- (e) **Sample Panel.** Provide one sample panel demonstrative of the patterns and colors required before the start of any work. Make the panel at least 48 x 48 in. to demonstrate the typical pattern, texture, surface finish, color, joints, and standard of workmanship. Place the sample panel at an approved location.
- Before starting any work, obtain approval of the sample panel from the Landscape Programs Division. If the finish, pattern, color, or texture of the sample panel is rejected, submit additional sample panels at no additional cost until the finish is approved. Approved sample panels are to remain at the approved location to be used as a basis for comparison on the project.
- (f) **Pre-installation Meeting.** Conduct a pre-installation meeting at the project site to review procedures for ensuring quality construction practices. Provide at least a 10-day notice of the meeting to the following representatives and others that are directly concerned with the installation, including:
 - (1) Contractor's superintendent responsible for DARPITPM, and subcontractor's superintendent if applicable.
 - (2) DARPITPM installer.
 - (3) Engineer and a representative of the Landscape Programs Division.
 - (g) **Pavement Markings.** Do not install pavement markings within the areas designated for the stamped pattern.

SPECIAL PROVISIONS

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- (h) **Traffic Control.** Protect the asphalt pavement surface from traffic and environmental effects until the stamped patterned asphalt pavement treatment has been completely imprinted, set, cooled, dried, and cured.
- (i) **Utility Cuts.** Complete all utility cuts, traffic loop detector cuts, and other items that require cut and installation under the asphalt surface before beginning installation of the stamped patterned asphalt pavement treatment.
- (j) **Air and Surface Temperature.** 45 F and rising and the ground not frozen.
- (k) **Pavement Surface.** Dry for at least 12 hours before installation. Free of sand, dirt, dust, oil, grease, foliage, de-icing materials, and any other contaminants before installation. Clean contaminated surfaces to a width of 2 –3 ft. outside of proposed treatment area. Repair or replace pavement damaged by the cleaning process at no additional cost.
- (l) **Surface Preparation.** Remove existing pavement markings per Section 558. There should be no precipitation in the area or any expected during the installation period. Do not proceed with installation if any precipitation is expected.
- (m) **Sealer/Primer.** Apply sealer/primer per the manufacturer's recommendations before layout and installation of preformed thermoplastic.
- (n) **Pattern Layout.** Layout the preformed thermoplastic sheets with the aggregate side facing up immediately after applying the primer/sealer per the manufacturer's recommendations and as shown and as directed.
- (o) **Heating Asphalt Pavement.** After the preformed thermoplastic sheets have been laid out, heat the asphalt pavement with an approved pavement heating equipment. Monitor the asphalt pavement surface temperature using a calibrated infra-red thermometer to ensure that the surface is not heated above 325 F. Do not overheat or burn the pavement or cause discoloration.
- (p) **Non-skid Aggregate Application.** After the preformed thermoplastic sheets and asphalt pavement are heated sufficiently to close the seams and reached the proper temperature, apply non-skid aggregate with air powered spray hopper at a rate of 50 pounds per 500 sf.
- (q) **Surface Imprinting.** While the thermoplastic is still warm, place and hold the 3/8 in. diameter wire stamping template in position according to the required design and press into the surface using vibratory plate compactors. Once the stamping template is compacted to full depth and the top of the template is level with the surrounding pavement, the stamping template can be removed. Re-heat and re-stamp areas that have an imprint depth less than the depth of the template.
- (r) **Traffic Control.** After the pattern has been stamped into the melted thermoplastic, protect it from traffic and other impacts that could cause damage until it cools and hardens. The road may be opened to traffic once the thermoplastic has cooled to 140°F and per the manufacturer's recommendations.

07/26/2024

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- (s) **Observation and Maintenance Period.** The Contractor shall be responsible for any defects in materials and workmanship of the treatment product for a period of one year from date of completion of roadway of project. GP 4.10 applies for this work.

MEASUREMENT AND PAYMENT. Decorative Aggregate Reinforced Preformed Imprinted Thermoplastic Pavement Markings will be measured and paid for the Contract unit price per square foot for the completed installation. The payment will be full compensation for pavement preparation, furnishing aggregate reinforced thermoplastic, sealer/primer, non-skid aggregate, reciprocating infrared heating equipment, mobile infrared heaters, hand held portable propane heat torches, stamping templates, vibratory plate compactors, sealer/primer dispensers, air powered spray hoppers, sample panels, installing the Decorative Aggregate Reinforced Preformed Imprinted Thermoplastic Pavement Markings, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.