

## TrafficPatternsXD™ SPECIFICATION

### Imprinted Aggregate Reinforced Preformed Thermoplastic Pavement Marking System

1. **Use:** TrafficPatternsXD™ is a durable imprinted aggregate reinforced preformed thermoplastic pavement marking system (herein “System”) that provides a textured, highly attractive and durable topical treatment to the surface of asphalt pavement. Typically TrafficPatternsXD replicates, in relief, the grout lines common to brick or other types of unit pavers, but may also be used to create other patterns. It is intended for use on asphalt pavements to create traffic calming solutions and decorative crosswalks, medians, intersections and through areas in parking lots. It provides a seamless, aesthetic look without the trip hazards and ongoing maintenance often associated with pavers and stamped concrete.
  - 1.1 TrafficPatternsXD is typically supplied in panels measuring 2 ft. x 2 ft. [ $\pm\frac{1}{8}$  in.] (.61m x .61m [ $\pm 3$ mm])
  - 1.2 TrafficPatternsXD must be able to be applied to asphalt surfaces without preheating the application surface to a specific temperature.
  - 1.3 TrafficPatternsXD must be able to be applied in temperatures down to 45°F (7°C) without any special storage, preheating or treatment of the material before application.
  - 1.4 TrafficPatternsXD is applied to asphalt pavement using proprietary StreetPrint®/StreetHeat® reciprocating infrared heating equipment. A two-part epoxy sealer specified by the manufacturer, Ennis- Flint, must be applied to the substrate prior to preformed thermoplastic application to ensure proper adhesion, and to provide reinforcement for larger volumes of material. Immediately following sealer application, panels of TrafficPatternsXD are positioned properly on the asphalt substrate. The TrafficPatternsXD is then heated to the required melting temperature. Additional aggregate may be applied to the TrafficPatternsXD surface as needed following the melting process, to achieve added friction properties and a uniform surface appearance. As the TrafficPatternsXD is cooling, it is imprinted with a vibratory plate compactor and a template made from 3/8 in. (9.5 mm) flexible wire rope in the required design to create crisp, clean lines which define the pattern. For crosswalks, it is typically demarcated by applying white PreMark® preformed thermoplastic transverse lines made by Ennis-Flint on both sides of the installation.
  - 1.5 TrafficPatternsXD is available in a variety of standard colors and patterns. Color can be used to create patterns within the crosswalk area to reflect the typical white “continental” crosswalk bars for additional visibility and awareness. Within certain limitations, custom patterns and colors are available upon request.
  - 1.6 TrafficPatternsXD is a resilient, aggregate reinforced preformed thermoplastic product which contains a minimum of thirty percent (30%) intermixed anti-skid/anti-slip elements and where the top surface contains anti-skid/anti-slip elements. These anti-skid/anti-slip elements must have a minimum hardness of 6 (Mohs scale).
  - 1.7 TrafficPatternsXD must be resistant to the detrimental effects of motor fuels, antifreeze, lubricants, hydraulic fluids, etc.
2. **MANUFACTURING CONTROL AND ISO CERTIFICATION:** Ennis-Flint is ISO 9001:2015 certified for design, development and manufacturing of preformed thermoplastic, and will provide proof of current certification.
3. **TrafficPatternsXD™ PREFORMED THERMOPLASTIC MATERIAL:** Must 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. Pigments and anti-skid/anti-slip elements must be uniformly distributed throughout the TrafficPatternsXD preformed thermoplastic material. TrafficPatternsXD conforms 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 potentially being of a color different from white or yellow.
  - 3.1 Pigments:
    - 3.1.1 White: The TrafficPatternsXD material shall be manufactured with sufficient titanium dioxide pigment to meet FHWA Docket No. FHWA-99-6190 Table 5 and Table 6 as revised and corrected.

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- 3.1.2 Other Colors: 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.
- 3.2 Skid Resistance: The surface of the TrafficPatternsXD preformed thermoplastic material shall contain factory applied anti-skid/anti-slip elements with a minimum hardness of 6 (Mohs scale). Upon application the material shall provide a minimum skid resistance value of 60 BPN when tested according to ASTM E 303.
- 3.3 Slip Resistance: The surface of the TrafficPatternsXD preformed thermoplastic material shall contain factory applied anti-skid/anti-slip elements with a minimum hardness of 6 (Mohs scale). Upon application the material shall provide a minimum static friction of coefficient 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.
- 3.4 Thickness: The TrafficPatternsXD material must be supplied at a minimum thickness of 150 mil (3.8mm).
- 3.5 Environmental Resistance: The TrafficPatternsXD material must be resistant to deterioration due to exposure to sunlight, water, salt or adverse weather conditions and impervious to oil and gasoline.
- 3.6 Storage Life: The TrafficPatternsXD material may be stored for 24 months, if stored indoors and protected from the elements.
- 3.7 PreMark® Transverse Lines to Supplement TrafficPatternsXD™ System Application: Supplied as white, retroreflective preformed thermoplastic line stripe material in 90 mil (2.3 mm) or 125 mil (3.2 mm) thicknesses, material is available in 6 in. (.15m), 8 in. (.20m) or 12 in. (.30m) widths. PreMark preformed thermoplastic material may be supplied and applied by the certified applicator in conjunction with the TrafficPatternsXD preformed thermoplastic System, and is available from Ennis-Flint. (Consult the PreMark published application instructions for proper application methods.)

**4. SPECIALIZED APPLICATION EQUIPMENT:**

- 4.1 Stamping Templates: A wire rope template is required in the execution of the TrafficPatternsXD System. The template is used for imprinting the defined pattern once the TrafficPatternsXD preformed thermoplastic has been applied. The wire rope diameter for the imprinting template used for the specified pattern is 3/8 in. (9.5mm). The stamping templates are produced and distributed by Ennis-Flint.
- 4.2 StreetPrint®/StreetHeat® Heating Equipment: Ennis-Flint manufactures and distributes StreetPrint®/StreetHeat® brand reciprocating infrared heating equipment designed specifically to elevate the temperature of the TrafficPatternsXD preformed thermoplastic material and asphalt pavement without adversely affecting it. The primary heating unit must employ 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, thereby allowing the operator to monitor the temperature of the TrafficPatternsXD preformed thermoplastic at all times during the pavement heating process.
- 4.2.1 A smaller, mobile StreetPrint®/StreetHeat® infrared heater manufactured and distributed by Ennis-Flint is designed specifically to heat areas such as borders and narrow areas that are inaccessible to the primary heaters. This secondary heater also allows the operator to monitor the temperature of the TrafficPatternsXD preformed thermoplastic at all times during the heating process.
- 4.2.2 The Magnum or Flint2000EX hand-held propane heat torch distributed by Ennis-Flint shall be used to heat isolated areas of the preformed thermoplastic.
- 4.3 Sealer: A two-part epoxy sealer specified and distributed by Ennis-Flint must be applied to the substrate prior to the TrafficPatternsXD material application to ensure proper adhesion, and to provide reinforcement for larger volumes of material.
- 4.4 Specialized Sealer Dispensing Gun: Used to dispense the required two-part epoxy sealer onto the substrate. The sealer dispensing guns are distributed by Ennis-Flint.

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- 4.5 TrafficPatternsXD™ Hand Held Finishing Tool: Enables the applicator to complete the imprinting of the thermoplastic in areas around permanent structures, such as curbs and manholes covers, which may be inaccessible to the stamping template. The hand held finishing tools are distributed by Ennis-Flint.
- 4.6 Aggregate: Supplemental anti-skid/anti-slip elements to be applied to the surface of the molten TrafficPatternsXD thermoplastic as needed, if the factory applied anti-skid/anti-slip elements embed too deeply into the surface of the molten thermoplastic material during the heating process. (Embedded aggregate is exposed upon wear for extended skid resistance.) The aggregate is distributed by Ennis-Flint.
- 4.7 Air Powered Spray Hopper: Used to spray supplemental anti-skid/anti-slip elements (aggregate) on the surface of the molten TrafficPatternsXD preformed thermoplastic in a uniform manner. The air powered spray hoppers are distributed by Ennis-Flint.
- 4.8 Vibratory Plate Compactor (700-900 lb. / 318-408 kg): Shall be used for pressing the 3/8" (9.5mm) wire rope stamping templates into the TrafficPatternsXD thermoplastic to create the specified pattern in both the thermoplastic and asphalt substrate. Ennis-Flint does not supply vibratory plate compactors.

#### 5. APPLICATION (Asphalt Substrate Only):

- 5.1 Manufacturer Certified Applicator Requirement: TrafficPatternsXD material shall be supplied and applied only by an Ennis-Flint TrafficScapes™ Certified Applicator. The applicator shall provide proof of current certification before commencing work. The TrafficScapes Certified Applicator shall follow the current published TrafficPatternsXD application procedures.
- 5.2 Substrate Condition: The TrafficPatternsXD material must only be applied to a stable, high quality asphalt pavement substrate over a stable base that is free of defects, as per the Ennis-Flint published TrafficPatternsXD Substrate Guide. The asphalt pavement surface shall be dry and free from all foreign matter, including but not limited to dirt, dust, de-icing materials, and chemical residue.
- 5.3 Procedure: TrafficPatternsXD is applied to asphalt pavement using StreetPrint®/StreetHeat® reciprocating infrared heating equipment. The material must be able to be applied at ambient and road temperatures down to 45°F (7°C) without any preheating of the pavement to a specific temperature. A two-part epoxy sealer specified by Ennis-Flint must be applied to the substrate prior to the TrafficPatternsXD preformed thermoplastic application. Immediately following sealer application, the panels of aggregate reinforced TrafficPatternsXD preformed thermoplastic are positioned properly on the asphalt substrate with the aggregate side facing up. The TrafficPatternsXD preformed thermoplastic is then heated to the required melting temperature. Additional aggregate may be applied to the TrafficPatternsXD preformed thermoplastic surface as needed following the melting process. As the TrafficPatternsXD material is cooling, it is imprinted with a stamping template made from 3/8 in. (9.5 mm) flexible wire rope in the required design using a vibratory plate compactor. The TrafficPatternsXD preformed thermoplastic material is then allowed to cool thoroughly before being opened to vehicle or pedestrian traffic. (Consult the published TrafficPatternsXD application procedures for complete information.)
- 5.4 TrafficPatternsXD shall not be applied to Portland Cement Concrete.

6. **PACKAGING**: The TrafficPatternsXD preformed thermoplastic material shall be packaged in cardboard cartons with a plastic sheet between each layer of preformed thermoplastic. The cartons in which TrafficPatternsXD is packed shall be non-returnable and shall not exceed 25 in. (.64m) in length and 25 in. (.64m) in width. The cartons shall be labeled for ease of identification. The weight of the individual carton must not exceed seventy (70) pounds (32 kg). A protective film around the carton must be applied in order to protect the TrafficPatternsXD material from rain or premature aging.

7. **TECHNICAL SERVICES**: The successful bidder shall provide technical services as required.