

Exhibit B-2 Manufacturer Specifications

TrafficPatterns (APL Product)

by Ennis-Flint, Inc (formaly Flint Trading Inc) (Manufacturer Website)

Active APL Certifications

523-000-009 (Approval Date: 6/1/2009) (Service Life Expectancy:)

Previous APL Numbers

- S523-0009

Product Types

- Patterned Pavement

Resource Links

- [FDOT Standard Specifications for Road and Bridge Construction](#)
- [FHWA IA-14 - Green Bike Lanes](#)
- [Proposed Jan 2020 Specification Modification-Industry Review](#)

Random Sampling Frequency

There are no items to display.

Limitations

There are no items to display.

Documents

There are no items to display.

Comments

Approved for Vehicular and Non-Vehicular applications, requires sealer, Approved for Bike Lane Use


preformed thermoplastic pavement marking material

Manufacturer Detail

Ennis-Flint, Inc (formaly Flint Trading Inc)

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A No-Preheat Type of Preformed Thermoplastic Material

INTERMIX AND SURFACE TREATMENT COMBINATIONS: PreMark® is supplied in these options at time of order.

BD = Beaded

Intermixed beads and factory applied surface beads. **Recommended Use:** roadway and intersection markings requiring retroreflectivity

NB = Non-beaded

Intermixed beads, no surface treatment. **General use:** reversible arrows, base layer for rumble bar, manhole protection rings, base layer for two-layer stencils. **Note:** Reversible arrows require casting of beads during application for initial retroreflectivity and skid resistance.

VG = ViziGrip®

Intermixed beads, factory-applied surface beads and antiskid elements **Recommended use:** pedestrian and/or cyclist traffic, such as crosswalks, bike lanes/paths and parking facilities, where both enhanced skid/slip resistance and retroreflectivity are required.

SK = Skid Only

Intermixed anti-skid elements, factory-applied antiskid elements on the surface. **Recommended use:** areas with pedestrian/cyclists traffic, bike lanes/paths and parking facilities, where enhanced skid/slip resistance is required with no retroreflectivity requirements.

BASIC SAFETY PRECAUTIONS (Read all safety data sheets before using this product):

Protective clothing consisting of leather work shoes, long pants and safety vest should be worn. Avoid all contact with the molten PreMark® material and propane torch flame. If you get molten PreMark on your skin, flush the area immediately with plenty of water and seek medical attention. Do not attempt to remove the molten material from your skin.

If using sealer, note the sealer is for outdoor use only. Always wear eye protection and non-absorbent gloves when working with the sealer. Avoid accidental contact with the sealer. Should sealer contact skin, remove any contaminated clothing and wash the affected area with soap and water for at least 15 minutes. Seek medical attention if irritation persists. Should sealer contact eyes, immediately flush eyes with plenty of water for at least 15 minutes; remove contact lenses; call a physician.

When using EF 2-Part Sealer, always point the tip of the cartridge in a direction where an accidental discharge will not contact personnel at the site. Do not let mixed sealer puddle as intense heat will develop during curing. Do not discard cartridges with unused sealer. Any unused sealer can be discharged through the mixing nozzle into the aluminum tray provided. Cured sealer may be safely disposed.

Dispose of all materials in accordance with all applicable federal, state and local laws and regulations.

Heat torches operate on vaporized propane gas. Use the largest size propane cylinder possible: 40 lb. cylinder or greater. Propane gas cylinders must be used in the standing, upright position with the valve being the uppermost part. Do not use the torch if the propane cylinder is not in the upright position, as this may allow liquid gas to flow into the torch assembly possibly causing damage to the torch and an unsafe condition. A spare tank with additional propane is recommended if the other tank freezes during use. A frozen tank will lessen torch output and slow application.

GENERAL REQUIREMENTS

(for all application methods shown within this document)

EQUIPMENT

- Flint 2000 EX® or equivalent propane fueled torch with pressure regulator and 25 ft. hose
- Gas Powered Blower or Broom
- Crayon, Chalk Sticks and Chalk Snap Line
- Adequate Supply of Propane
- Tape Measure
- Utility Knife, Putty Knife
- Hammer and Chisel
- Paint roller (for sealer applications only)
- Water sprayer (optional)
- 300/600 ml sealer dispensing gun (for 2-Part Sealer applications only)

The Flint 2000 EX® Heat Torch is recommended because of its fan-shaped nozzle and heat dissemination during application of PreMark®.



MOISTURE: Pavement must be dry prior to positioning the PreMark material or sealer application (if required). PreMark cannot be applied to a wet surface or during precipitation. Once precipitation has stopped, PreMark can be applied to bituminous asphalt, if the road surface has been dried thoroughly with all moisture removed. On concrete surfaces, Ennis-Flint recommends waiting 24 hours after precipitation has stopped before applying PreMark.

SURFACE: Surface must be free of moisture, dirt, dust, salt, deicing agents, chemicals and significantly oily substances. Do not apply PreMark on top of paint, with the exception of over a thin, temporary layer of cured and well-bonded paint on new asphalt. Do not apply PreMark on top of cold plastic or plural component marking materials.

New Asphalt: Being oil impervious, PreMark can be applied on new asphalt as soon as the road surface is cool enough to walk on. If using EF 2-Part Sealer, new asphalt should be allowed to cool completely to prevent premature curing of the sealer before material application.

Concrete and Old Asphalt: PreMark can be applied on portland cement concrete or non-bituminous surfaces with PreMark® Sealer. New concrete should cure a minimum of 45 days before application. Any remaining curing compounds must be removed by sandblasting or other standard industry method. Concrete surfaces must have surface porosity. To test for porosity, sprinkle a few drops of water onto the surface. If the concrete does not readily absorb the water drops, the surface is not sufficiently porous. For old asphalt, after the surface preparation noted above, the surface is ready to be treated with PreMark® Sealer. Contact your Ennis-Flint representative for additional instructions before proceeding.

Sealcoat and Chip Seal: PreMark can be applied over completely cured and well bonded sealcoat and/or chip seal surface rejuvenators, with no loose aggregate present. It is recommended to apply a small test piece on these treatments and perform a chisel test as described herein to assure proper bond is achieved.

Thermoplastic: If applying on existing, well-bonded thermoplastic, scrape off any loose material and remove the oxidized (powdery) layer by scarifying the surface, or heating the surface and scraping off the oxidized layer to expose fresh material.

MATERIAL: Keep PreMark dry at all times. Avoid extreme storage temperatures. Store indoors, ideally at temperatures between 35°F and 90°F (2°C and 32°C). Packages should be stored flat and stacked a maximum of 30 high. Handle PreMark with care in temperatures below 50°F (10°C) as it will be less flexible in colder weather. Shelf life is 24 months. PreMark® Sealer should be used for applications on non-bituminous pavements unless otherwise required to use EF 2-Part Sealer for large area applications and interconnected, multicolored markings.

TEMPERATURE: PreMark does not have any minimum road or ambient temperature requirements for application.

INSTRUCTIONS FOR APPLICATION ON BITUMINOUS ASPHALT (Read General Requirements on Page 1.)

- PREPARE** application area thoroughly. All loose particles, sand, dust, etc. must be removed by using a power blower, compressed air, or sweeping completely. Do not apply over paint, with the exception of over a thin, temporary layer of cured and well-bonded paint on new asphalt. Do not apply over tape, MMA, epoxy, salt, deicing agents, chemicals, or very oily substances. Ensure that no moisture is present prior to positioning the PreMark material. Surface moisture is not often visible; always assume moisture is present. Remove moisture by drying the area with a propane fueled heat torch (Fig. 1). **It is not necessary to heat and hold the substrate to a specific temperature because PreMark® is a No-Preheat type of preformed thermoplastic material.**
- POSITION** all connecting parts of the PreMark material (lines, legends, or symbols) onto the pavement surface, top side up (Fig. 2). The top side of the material has the heating indicators (indents) and the factory-applied surface treatment (beads, anti-skid elements or a combination). There should be no gaps between the adjoining segments. Ensure that proper layout and alignment is obtained before heating the material.
- HEAT** the PreMark material. Standing with the wind at your back, face the marking so the wind will move heat from the torch over the unheated material, away from your feet. Heat material slowly but steadily until molten, keeping the torch nozzle about 4 to 8 inches above the material, while using a sweeping motion approximately 2 to 3 feet wide (Fig. 3). Heating with the torch nozzle closer than 4 inches will cause superficial scorching of the material without adequate melting throughout. Regularly-spaced heating indicators (indents) have been manufactured into the top surface of the material. The closing of these indents will provide a visual cue during application that the material has reached a molten state allowing for proper bond and bead embedment. Continue to heat the material until the heating indicators (indents) close, the material edges flow or “roll”, and the seams between material segments fuse together. Note: Insufficient heat will result in inadequate bonding and failure. Significantly overheating the material will over-embed the factory-applied surface treatment into the PreMark material, causing the marking to be less retroreflective and/or skid-resistant initially. If applying non-beaded markings, any additional beads, if required, should be applied to the material surface immediately following heating while the material is molten for proper adhesion. Note: Any superficial browning or scorching of the material from slight overheating will wear off within days of being opened to traffic. This discoloration affects the topmost layer of material only. Normal traffic wear will expose the underlying color.
- INSPECT** for proper bond and bead/anti-skid element embedment after the material has cooled to near ambient temperature. Make sure edges are rounded and thoroughly bonded. Perform a chisel test to verify bond. Look carefully at the heated material away from the edges for any remaining visible indents and/or under-embedded glass beads/anti-skid elements. Using a 1”chisel, hammer a small “V” shape (<) into the material. Using the chisel tip, carefully lift up the point of the “V” shape (<) off the pavement surface. Evidence of asphalt aggregate bonded to the underside of the lifted material indicates good adhesion (Fig. 4). Little to no evidence of asphalt on the underside of the lifted material indicates the marking was not heated sufficiently in that area. Press the material back into place and reapply heat until adequate bonding has occurred. Note: Do not leave the project until a sufficient bond has been established, as attempts to reheat at a later date will be unsuccessful. PreMark will cool and set rapidly within minutes of application allowing traffic to resume. If desired, setting time can be accelerated with a spray of cool water.



Fig. 1 Prepare area by removing debris with blower then remove moisture with heat torch



Fig. 2 Position PreMark® material according to diagram provided



Fig. 3 Heat PreMark® material according to instructions.



Fig. 4 Perform chisel test to verify bond. Evidence, as shown, of asphalt aggregate bonded to the underside of the lifted material indicates good adhesion.

INSTRUCTIONS FOR APPLICATION ON CONCRETE & NON-BITUMINOUS SURFACES

- Ensure the surface is porous. Refer to the Surface section under “General Requirements” on page 1.
- Follow steps 1 and 2 as stated above for “Instruction for Application on Bituminous Asphalt”
- With marking positioned on the surface but not heated, delineate or trace completely around the marking with chalk or crayon to create an outline. Move the unheated marking from the pavement carefully and set aside for application of sealer.
- Apply PreMark one-part sealer within the outlined area using a roller or sprayer. If sprayed, roll sealer to form a thin, even coating. Allow the sealer to dry until it will not transfer to the gloved finger when touched. It is imperative that the sealer be dry to the touch when the PreMark is applied or the application will likely fail. The more porous the surface, the more sealer is required. Caution: Do not attempt to speed up the drying process by using an open flame, as the sealer is flammable at this stage. It is important to cover the entire area with sealer where the PreMark will be applied.
- Continue with Steps 3 through 4 as stated above under “Instruction for Application on Bituminous Asphalt” until application is complete. Note: When verifying proper bond with the chisel test in step 4 on a non-bituminous surface, it is unlikely that any part of the pavement will be lifted with the PreMark. Adequate bonding has occurred if the PreMark separates from itself, where part of it remains adhered to the pavement. If the material is able to be removed from the substrate, there is insufficient bond and additional heat must be applied.

GENERAL NOTES AND TIPS:

• PreMark is compatible with asphalt and concrete as well as special surfaces such as bricks, pavers, and cobblestones using the approved two-part sealer. PreMark may experience a reduced lifespan on bricks, pavers, and cobblestones. In addition, PreMark will likely crack along the seams between pavers.

• If applied over substrate joints, (i.e. saw cut control, isolation/expansion; cold/construction), make a deep score in the material once it has set up but not entirely cooled down.

• Do not throw or drop PreMark, either within or out of the package.

• Do not allow PreMark pieces to remain in direct contact with each other; they may bond together in hot weather. Use the plastic separation sheets from the package to avoid this risk.

• In snow areas, PreMark must be well bonded with rolled/ feathered edges for the best snow plow resistance.

• In warm weather, PreMark can be cut with scissors or scored with a knife and carefully broken along the score if small repairs are needed.

• If using a torch with a higher heat output than the Flint 2000 EX or an infrared heater, the factory-applied surface treatment on PreMark can over-embed more easily. Additional glass beads and/or anti-skid elements may need to be applied immediately following heating.

PreMark® Preformed Thermoplastic Application Instructions

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INSTRUCTIONS FOR APPLICATION **REQUIRING EF 2-PART SEALER**

IMPORTANT NOTE BEFORE YOU START APPLICATION: Ambient and surface temperatures must be 45°F (7°C) and rising for EF 2-Part Sealer use. For large area markings, such as colorized bike lanes or large interstate shields with multiple material sections, do not apply two-part sealer to an area larger than can be heated in 20 minutes. Leave the 8 inches of material closest to the continuation edge unheated. Repeat steps 1 through 5 working in intervals until entire application area is complete.



- PREPARE** application area thoroughly. All loose particles, sand, dust, etc. must be removed by using a power blower, compressed air, or sweeping completely. Do not apply over paint, with the exception of over a thin, temporary layer of cured and well-bonded paint on new asphalt. Do not apply over tape, MMA, epoxy, salt, deicing agents, chemicals, or very oily substances. Always handle the material with care. A multicolor marking consists of interconnected individual pieces of preformed thermoplastic. Do not lift an entire assembled segment by holding onto a small individual piece, as it may separate. The material should be handled on the plastic sheet with which it is packed until it is placed in its final position (Fig. 1). With marking positioned on the surface, delineate area or trace completely around the marking with chalk or crayon to create an outline (Fig. 2). Move the unheated marking from the pavement carefully and set aside for application of EF 2-Part Sealer (“the sealer”).
- APPLY** the sealer after ensuring that no moisture is present. Surface moisture is not often visible; always assume moisture is present. Remove moisture by drying the application area with a propane fueled heat torch (Fig. 3). It is not necessary to heat the substrate to a specific temperature. Remove the sealer kit contents from the carton. Install the sealer cartridges into the sealer gun. Point the gun upwards (nose up), and remove the cap or nut and plugs. With gun still pointing upwards, attach the mixing nozzle and ensure it is properly secured to the sealer cartridge (Fig. 4). Point the gun downward and squeeze the handle gently until the sealer is approximately 2 inches from the tip of the mixing nozzle. If circumstances do not permit the mixed sealer to be used within 10 minutes, remove the mixing nozzle, reinsert plugs and secure with cap or nut.

One 300/600 ml sealer cartridge is sufficient for applying 50 sq. ft. of PreMark material. It is critical the sealer does not cure before PreMark has been applied and heated; therefore, do not apply two-part sealer to an area larger than can be heated in 20 minutes. Do not apply sealer outside the chalk line, as it may stain the substrate. Holding the tip of the nozzle over the application area, squeeze out an appropriate amount of sealer. Spread the sealer within the delineated application area with the roller provided (Fig. 5). The sealer should appear as a light coating with a shiny surface. Do not wait for the sealer to cure before applying the PreMark material. Cold temperature consideration: the sealer may dispense more slowly in temperatures around 45°F (7°C). Whenever possible, keep the unopened sealer cartridges insulated with a material heater blanket or inside the cab of the work vehicle keeping sealer closer to room temperature until ready for use.

- POSITION** the PreMark material. After the sealer application, immediately position the PreMark segments onto the pavement surface, top side up (Fig. 6) The top side of PreMark has heating indicators (indents), and the factory-applied surface treatment (beads, anti-skid elements or a combination). There should be no gaps between the adjoining segments, and the segments should align properly to form overall marking according to diagram provided in the package. Ensure proper layout is obtained before heating the material. Heating should begin immediately after proper layout has been confirmed.
- HEAT** the PreMark material. Standing with the wind at your back, face the marking so the wind will move heat from the torch over the unheated material, away from your feet. Heat material slowly but steadily until molten, keeping the torch nozzle about 4 to 8 inches above the material, while using a sweeping motion approximately 2 to 3 feet wide (Fig. 7). Heating with the torch nozzle closer than 4 inches will cause superficial scorching of the material without adequate melting throughout. Regularly-spaced heating indicators (indents) have been manufactured into the top surface of the material. The closing of these indents will provide a visual cue during application that the material has reached a molten state indicating proper bond and bead embedment. Continue heating the material until the heating indicators (indents) close, the material edges round or “roll”, and the material seams fuse together. Note: Insufficient heat will result in inadequate bonding and failure. Significantly overheating the material will over-embed the factory-applied surface treatment into the PreMark material, causing the marking to be less retroreflective and/or skid-resistant initially.
- INSPECT** for proper bond and bead/anti-skid element embedment after the material has cooled to near ambient temperature. Make sure edges are rounded and thoroughly bonded. Perform a chisel test to verify bond. Look carefully at the heated material away from the edges for any remaining visible indents and/or under-embedded glass beads/anti-skid elements. Using a 1” chisel, hammer a small “V” shape (<) into the material. Using the chisel tip, carefully lift up the point of the “V” shape (<) off the pavement surface. Evidence of asphalt aggregate bonded to the underside of the lifted material indicates good adhesion (Fig. 8). Little to no evidence of asphalt on the underside of the lifted material indicates the marking was not heated sufficiently in that area. Apply a small amount of sealer beneath the material, press it back into place, and reapply heat until adequate bonding has occurred. Note: Do not leave the project or begin applying adjacent rows until a sufficient bond has been established, as attempts to reheat at a later date will be unsuccessful.

Cold temperature consideration: Ambient and surface temperatures must be 45°F (7°C) and rising for EF 2-Part Sealer use. Material will not fully bond with the pavement until the sealer cures. Since the sealer will take longer to cure in cooler temperatures, 45°F-55°F (7°C-13°C), allow for more time to elapse before checking bond. To facilitate sealer curing, apply more heat to the material surface, but carefully avoiding risk of sinking all the surface treatment. Thereafter, check the bond at 15 minute intervals. Sealer should cure within an hour at the 45°F-55°F (7°C-13°C) temperature range.

Note: When applying a very large marking, such as an interstate shield or bike lane with multiple material sections, leave the 8 inches closest to the continuation edge unheated. Repeat steps 1 through 5 within 50 sq. ft. sections at a time until entire application area is complete. Do not expose uncovered areas of applied sealer to the flame of the torch, as this will cause the sealer to cure prematurely.



Fig. 1 Handle sheets with plastic



Fig. 2 Position marking to draw outline of application area



Fig. 3 After moving material aside, remove moisture from substrate



Fig. 4 Prepare sealer cartridges for use in sealer gun.



Fig. 5 Squeeze out sealer and spread with roller.



Fig. 6 Position PreMark® material according to diagram provided.



Fig. 7 Heat PreMark material



Fig. 8 Perform chisel test to verify bond. Evidence of aggregate bonded to the underside of the lifted material indicates good adhesion.



OPTIONAL: If using a large infrared heater, contact your Ennis-Flint representative for more information.