Preformed Thermoplastic

APPLICATION INSTRUCTIONS

Thermaline®

First-time applicators should contact Ennis-Flint for product support and on-site training.

SURFACE APPLICATION, GENERAL REQUIREMENTS:

Equipment:

- Heating torch with pressure regulator (min 2 bar) and (7.62m) of hose
- Gas Powered Blower or Broom
- Chalk Sticks and Chalk Snap Line
- Adequate Supply of Propane
- Paint roller (for sealer applications only)
- Suitable bead dispenser
- Recommended drop-on material
- Tape Measure
- Utility Knife, Putty Knife
- Hammer and Chisel
- Water sprayer (optional)
- Sealer gun
- EF Sealer or EF 2-part sealer (if needed)

Moisture: Pavement must be dry prior to positioning the *Thermaline®* material. Since *Thermaline®* cannot be applied on a wet surface, you cannot apply the material when it is raining or snowing. However, unlike some other materials, you do not have to wait 24 hours after precipitation before you can apply *Thermaline®* on asphalt. As soon as the precipitation has stopped, *Thermaline®* can be applied if the road surface has been checked for moisture and any moisture has been removed. On concrete surfaces, Ennis-Flint recommends waiting 24 hours after precipitation has stopped before applying *Thermaline®*.

Surface: **New Asphalt:** *Thermaline®* can be applied on new asphalt as soon as the road surface is cool enough for you to walk on it.

Old Asphalt: If the asphalt has limited amount of bitumen or is very polished, the surface should be treated with EF sealer as described below.

Portland cement Concrete: *Thermaline®* can be applied on non-bituminous surfaces such as Portland cement concrete in conjunction with appropriate sealer. New concrete should be fully cured before applying. Curing compounds should be removed by sandblasting, or other standard industry methods. If the concrete is less than 6 months EF 2-part sealer must be used. If the concrete surface is weak and give discoloration when touched by finger, you must also use EF 2-part sealer. For all other concrete surface EF sealer should be used.

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 and you should contact your E-F representative for additional instructions on how to prepare the surface.

Cobble stones: EF 2-part sealer must be used. If the stones are very polished and if the stones move by traffic it will be difficult to achieve a sufficient performance over time.

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

If you have any questions regarding material application on a particular surface contact your E-F representative.

Surface must be free of dirt, dust, deicing agents, chemicals and significant oily substances. Do not apply *Thermaline®* on top of paint or cold plastic.

If the surface area of each marking is above 5m2 the risk of cold spots and moisture is higher so we recommend to use EF 2-part sealer

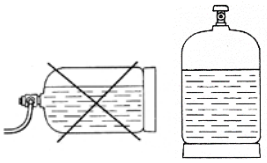
Material: Keep *Thermaline®* dry at all times. Avoid extreme storage temperatures. *Thermaline®* should be stored indoors at temperatures between (2°C) and (32°C). Packages should be stored flat and stacked a maximum of 30 high. *Thermaline®* should be handled with care in temperatures below (10°C), as it will be less flexible in colder weather. Shelf life is 12 months. Sealers should be used for applications on non-bituminous pavements.

Temperature: *Thermaline®* does not have any road or ambient temperature requirements.

SAFETY PRECAUTIONS:
Read and understand all material 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 *Thermaline®* material and heat gun flame. If you do get some molten *Thermaline®* material on your skin, flush the area immediately with plenty of water and then seek medical attention. Do not attempt to remove the molten material from your skin.

If using sealer take the following additional precautions: The sealer is for outdoor use only. Always wear safety goggles and non-absorbent gloves, when working with the sealer. Avoid accidental contact with the sealer. In the unlikely event of sealer contacting skin, remove contaminated clothing, and wash the affected area with soap and water for at least 15 minutes. Seek medical attention if irritation persists. In the event of accidental sealer contact with the eyes, immediately flush eyes with plenty of water for at least 15 minutes; remove contact lenses; call a physician. Dispose of all materials in accordance with all applicable laws and regulations. For 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. In the unlikely event of sealer contacting skin, remove contaminated clothing, and wash the affected area with soap and water for at least 15 minutes. Destroy any contaminated leather. Seek medical attention if irritation persists. Do not discard cartridges with unused sealer. Any unused sealer can be discharged through the mixing nozzle onto the aluminum tray provided. Cured sealer can safely be disposed of. Dispose of all materials in accordance with all applicable federal, state and local laws and regulations. Do not let mixed sealer puddle as intense heat will develop during curing.

Heat torches operate on vapourised propane gas. Use the largest size propane cylinder possible. Ennis-Flint recommends using a 19 kg. cylinder or greater. The 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 itself.



INSTRUCTIONS FOR APPLICATION ON ASPHALT:

Figure 1:
Clean area

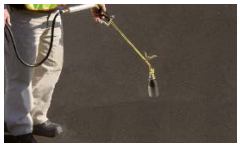


Figure 2:
Remove moisture.

Figure 3:
Position material.

Figure 4:
Heat material.

Figure 5:
Post Sprinkle.

1. Clean intended application area thoroughly. See Figure 1. All loose particles, sand, dust, etc. must be removed. Utilise a power blower or compressed air if available, otherwise sweep completely.

2. Ensure that no moisture is present prior to positioning the *Thermaline®* material on the pavement surface. See Figure 2. Surface moisture is not often visible so you should assume that some moisture is present. Remove moisture by drying the application area with a propane fueled torch.

3. Position all connecting parts of the *Thermaline®* (lines, legends, or symbols) on to the pavement surface with the exposed beaded side up. See Figure 3. There should be no gaps between the adjoining segments. You may overlap the edges slightly. Check to ensure that proper layout and alignment is obtained before heating the material.

4. Prepare to heat the *Thermaline®* material by readying the heating torch and propane cylinder. Positioning yourself with the wind at your back as you face the marking will allow the wind to move the heat over the unheated portion of the material while at the same time keeping the heat away from your feet. The *Thermaline®* material must be heated above its melting temperature to achieve a bond with the pavement. Note: Insufficient heat will result in inadequate bonding and failure. Heat the *Thermaline®* material slowly, but steadily, keeping the nozzle of the torch about (10 cm to 20 cm) above the material, while using a sweeping motion approximately (.6m to .9m) wide. It is important to maintain a minimum distance of (10 cm) between the torch nozzle and the material. Any closer will cause superficial scorching of the material without adequate melting throughout. Continue to heat the *Thermaline®* **and heat the same area several times** until the surface material have sunken into the material. At this point stop the heating process and post sprinkle the drop-on material evenly across the heated area. Note: The organic pigment in yellow *Thermaline®* is susceptible to a superficial colour change if exposed to intense heat yielding a deep orange colour. This colour change affects the topmost layer of material only. Normal traffic wear will expose the underlying yellow colour.

5. After the material has cooled to near ambient temperature, inspect the recently applied *Thermaline®* to ensure that complete bonding has occurred over the entire area. Ennis-Flint recommends performing a chisel test to verify bond. Cut an area in the interior of the marking with a chisel where it appears that the *Thermaline®* material has received the least amount of heat. For white *Thermaline®* this area will appear the whitest in colour. Using the tip of the chisel try and lift the edge of the *Thermaline®* material up off of the pavement surface. If the material can be lifted without evidence of asphalt on the underside, insufficient heat has been applied. Press the small section of material back into place and simply 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.

6. *Thermaline®* will cool and set rapidly within a couple of minutes of application. If desired, setting time can be accelerated with a spray of cool water.

INSTRUCTIONS FOR APPLICATION ON NON-BITUMINOUS SURFACES with EF Sealer:

1. Before proceeding, ensure that the concrete surface is porous. 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 and you should contact your Ennis-Flint representative for additional instructions on how to prepare the surface.

2. Follow steps 1 and 2 as stated for application on asphalt.

3. Delineate the area to receive the *Thermaline®* using a chalk line, chalk or crayon. Once the marking has been traced, or the area delineated, remove the marking from the pavement.

4. Apply sealer approved for use with *Thermaline®* to areas outlined in chalk or crayon. Allow it to dry until it will not transfer to the gloved finger when touched. 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.** Remember: It is important to cover the entire area with sealer where the *Thermaline®* will be applied.

5. Continue with Steps 3 through 6 as stated above under "Instruction for Application on Asphalt" until application is complete. Note: When trying to lift the recently applied *Thermaline®* material (step 6) off of the non-bituminous surface it is unlikely that any part of the pavement will be lifted up (with the *Thermaline®*). Adequate bonding has occurred if the *Thermaline®* separates and part of the material remains stuck to the pavement.

INSTRUCTIONS FOR APPLICATION WITH EF 2-part Sealer

1. Follow steps 1 and 2 as stated for application on asphalt.

2. Delineate the area to receive the *Thermaline®* using a chalk line, chalk or crayon. Once the marking has been traced, or the area delineated, remove the marking from the pavement.

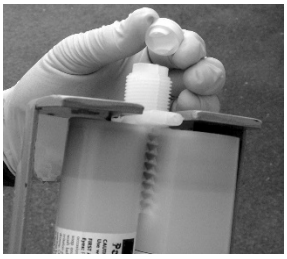
3. Remove the contents of the sealer kit from the shipping carton. Install the sealer cartridges into the sealer gun. Point the gun upwards (nose up), and remove the nose plug. With the gun still pointing upwards, mount the mixing nozzle and ensure that it is properly secured to the sealer cartridge. Point the gun downward and squeeze the handle gently until the sealer is approximately 2 in. 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 and insert a new nose plug.

4. Continue with Steps 3 through 6 as stated above under "Instruction for Application on Asphalt" until application is complete. Note: When trying to lift the recently applied *Thermaline®* material (step 6) off of the non-bituminous surface it is unlikely that any part of the pavement will be lifted up (with the *Thermaline®*). Adequate bonding has occurred if the *Thermaline®* separates and part of the material remains stuck to the pavement.

5. The amount of sealer in a 300/600 ml cartridge will be sufficient for applying 4 m2of *Thermaline®*. Note: It is critical that the sealer does not cure up before the *Thermaline®* material has been applied and heated, therefore do not apply sealer to an area larger than what can be heated in 20 minutes. Holding the tip of the nozzle above the application area, squeeze out an appropriate amount of sealer. Using the recommended roller and spread out the applied sealer over the selected application area. Do not apply sealer outside the chalk line. The sealer should appear as a light coat of paint, leaving a shiny surface. Do not wait for the sealer to cure up before applying the *Thermaline®* material.

6. Cold temperature considerations: *EF 2-Part* Sealer may dispense more slowly in temperatures around 7º C. When working in these temperatures we suggest the *EF 2-Part* Sealer be kept close to room temperature whenever possible.

7. Continue with Steps 3 through 6 as stated above under "Instruction for Application on Asphalt" until application is complete. Note: When trying to lift the recently applied *Thermaline®* material (step 6) off of the non-bituminous surface it is unlikely that any part of the pavement will be lifted up (with the *Thermaline®*). Adequate bonding has occurred if the *Thermaline®* separates and part of the material remains stuck to the pavement.



NOTES:

- Do not allow 2 pieces of *Thermaline®* (unbeaded side) to remain in direct contact with each other, as they will bond together especially in hot weather.
- You can "cut and paste" with *Thermaline®*. Use a knife to score the material and carefully break it along the score. In warm weather you can use scissors. Don't throw or drop *Thermaline®*; it is less flexible in colder weather.
- *Thermaline®* is oil impervious and can be applied on fresh asphalt as soon as the road surface sets.
- Dispose of all materials in accordance with all applicable local laws and regulations.

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