

Transportation Safety Division

# 3M™ Preformed Thermoplastic Pavement Markings Application Guidelines

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## 1 Description

3M™ Preformed Thermoplastic Pavement Markings (“**Preform Thermo**”) are durable pavement markings composed of a material that has been designed for simple installation on roadways. Preform Thermo has been designed to deliver excellent levels of retroreflective performance. Preform Thermo is suitable to application as roadway, intersection, commercial, or private pavement delineation and markings, including straight lines, arrows, symbols, and legends.

## 2 Equipment Description

Preform Thermo is simple to apply and requires the use of only a hand torch or infrared heater and some common surface preparation equipment.

### 2.1 Equipment

- o Broom or powered blower
- o All required PPE
- o Chalk stick, spray paint, or snap line for layout
- o Putty knife or scraper
- o Full 40 lb. propane tank- small 20 lb. tanks tend to freeze up prematurely
- o Infrared thermometer
- o Tape measure and razor knife
- o Application torch capable of producing at least 250,000 BTUs, regulator and a 30+ foot hose

## 3 Surface Preparation

Successful completion of a Preform Thermo pavement marking project requires proper conditions and the use of proper application techniques. Following the application procedure described below will contribute significantly to the success of your Preform Thermo pavement marking project.

### 3.1 Temperature

Preform Thermo should be applied only under the following temperature conditions:

- o Air and pavement temperatures of at least 50 °F (10 °C) and rising.

**Note:** Wind (wind chill) can accelerate cooling. Do not apply Preform Thermo when wind chill temperatures are 45 °F (7 °C) or lower, regardless of the atmospheric temperature. Also note that shaded pavement can be cooler than the ambient temperature.

### 3.2 Moisture

Road surfaces must be clean and dry prior to the application of Preform Thermo. After periods of prolonged rainfall, use extra caution to verify that the pavement is completely dry prior to application. Avoid applying where dew is present.

### 3.3 Oil, Debris, and Dust

The pavement surface must be free of oil, dirt, dust, grease, and all other similar foreign materials at the time of application.

### 3.4 New Asphalt Cement Concrete (ACC)

Preform Thermo may be applied directly to new ACC surfaces and as soon as the asphalt material has cooled and can support the weight and movement of the application equipment. New asphalt surfaces must be free of excess oils and asphalt emulsions for Preform Thermo to adhere properly.

In general, it is good practice to open new asphalt to traffic for 3–7 days before laying Preform Thermo. This helps prevent tracking asphalt onto the surfaces of markings.

### 3.5 Portland Cement Concrete (PCC)

Preform Thermo can also be installed on Portland cement concrete, when used with a 3M surface preparation adhesive, 3M™ Stamark™ Surface Preparation Adhesive P50 or 3M™ Stamark™ Low VOC Surface Preparation Adhesive SPA60, if concrete has cured for at least 45 days before application. See Appendix A for surface preparation adhesive application instructions.

**Important Note:** WET ADHESIVE IS FLAMMABLE. Ensure adhesive is dry before applying Preform Thermo and follow all 3M installation instructions.

#### 3.5.1 Preform Thermo Application into Grooved Pavement

Preform Thermo can be applied into properly prepared grooves cut into pavement surfaces. Applying pavement marking products into grooves provides several benefits, including enhanced protection of the pavement marking and retroreflective media from snowplow damage.

For more information regarding applying Preform Thermo into grooves, see [3M Information Folder 5.18](#), “Guidelines for Pavement Marking Applications in Grooved Pavement Surfaces.”

### 3.6 Application Over Existing Pavement Markings

For best results, remove any existing pavement marking tape to expose at least 80% of the pavement surface before applying Preform Thermo. Existing pavement markings, including temporary paint, should be removed using methods such as grinding, shot blasting, or sand blasting.

### 3.6.1 Application Over Existing Thermoplastic Markings

Preform Thermo may be applied over existing hydrocarbon and alkyd thermoplastic markings provided existing lines are well worn, have few intact beads, and are well anchored to the pavement surface. Existing hydrocarbon and alkyd thermoplastic marking lines with substantial bead coverage should be lightly ground to roughen their surfaces.

## 4 Application Procedure

### 4.1 Clean the Surface

Remove any dirt, gravel, or loose debris from the pavement surface. To ensure a clean surface, it should be blown with a high-velocity high-pressure air source (185 cfm, 90 psi) to remove any loose material prior to application of Preform Thermo. Use a grinder or shot blaster to remove any automotive fluid surface contamination, such as oil or grease.

Refer to the [3M Road Surface Guide](#) for surface preparation guidelines for questionable road surfaces.

**Note:** The cleanliness of the application surface is the most significant factor determining adhesion. Sufficiently cleaning the application surface is critical to application success.

### 4.2 Layout Preform Thermo

Mark the area with chalk lines or marking tool.

### 4.3 Remove Moisture

Briefly sweep heat across the application surface to ensure no residual moisture remains on the pavement.

Pre-heating of the surface is not necessary. This step is to ensure there is no underlying moisture from rain, dew, or other drainage.

### 4.4 Place the Preform Thermo into Pre-Arranged Layout

Be careful. Pavement may be hot.

### 4.5 Begin Heating

Using a 250,000 BTU torch, the regulator throttle should be at approximately the 50% position.

### 4.6 Hold Torch 12–18” Above the Preform Thermo & Keep Nozzle Moving

Be careful not to hold the torch stationary over one location as this can cause uneven heating.

Hold torch so the flame is perpendicular to the Preform Thermo to help ensure the force of the flame doesn't cause the material to fold over on itself.

ALWAYS KEEP THE TORCH MOVING AND BE AWARE OF FLAME LOCATION AND SURROUNDINGS.

### 4.7 Watch for the Preform Thermo to Bubble and Sizzle

Integrated heat-indicators begin to disappear when the Preform Thermo begins to melt. The Preform Thermo will appear to be shiny, its edges will relax and slant downward, and it will completely conform to surface.

Be mindful of the torch height. Placing the torch too close to the material will cause the glass beads to be enveloped by the molten Preform Thermo, affecting retroreflectivity.

## 4.8 Let Cool Between 10–20 Minutes

Cool time varies with ambient and/or surface temperature.

Once cool, below 100 °F (38 °C) or within 10 °F (5 °C) of ambient, Check marking edges with a putty knife or scraper - marking edges should be tightly held to pavement. If any point lifts easily off the pavement, reapply heat to the area as described in steps 4.5–4.7. The material must become fully molten to fully conform and adhere to the application surface.

For wider markings, cut a 1-inch triangle in the middle of the marking and test a corner of that triangle for adhesion in the same way. Following test, reheat at location of cut triangle.

## 5 Storage and Handling

Store Preform Thermo in original packaging in a dry, indoor area, at a temperature of 33–105 °F (1–41 °C). Use within one year of receipt. Store boxes flat, top side up, and stacked no more than 30 high. Always handle boxes with care; do not throw, drop, flip, or impact boxes. Material may be damaged if handled roughly.

## 6 Health and Safety Information

Read all health hazard, precautionary, and first aid statements found in the Safety Data Sheets (SDS) and Article Information Sheets for important health, safety, and environmental information. To obtain SDSs and Article Information Sheets for 3M products, go to [3M.com/SDS](http://3M.com/SDS), contact 3M by mail, or for urgent requests call 1-800-364-3577.

## 7 Disposal

Dispose all materials in accordance with local, state or province, and federal or country requirements.

## 8 Other Product Information

Always confirm that you have the most current version of the applicable product bulletin, information folder, or other product information from 3M's Website at <http://www.3M.com/roadsafety>.

For situations not specifically covered in this folder, it is the responsibility of the installer to contact the appropriate 3M sales representative or 3M Application Engineer at 1-800-533-1380 for guidance.

## 9 Literature References

<a href="#">3M IF 5.17</a>	3M™ Stamark™ Surface Preparation Adhesive P-50 Instructions for use with 3M™ Stamark™ Pavement Marking Tapes
<a href="#">3M IF 5.18</a>	3M™ Stamark™ Pavement Marking Tape and Liquid Pavement Markings Application Guidelines for Pavement Markings in Grooved Pavement Surfaces
<a href="#">3M IF 5.21</a>	3M™ Stamark™ Low VOC Surface Preparation Adhesive SPA60 Spray Application Instructions for Bulk Liquid for Longitudinal Pavement Marking Tapes
<a href="#">PB Preform Thermo</a> <a href="#">3M Road Surface Guide</a>	3M™ Preformed Thermoplastic Pavement Markings

# Appendix A:

## Surface Preparation Adhesives

3M™ Stamark™ Surface Preparation Adhesive P50 and 3M™ Stamark™ Low VOC Surface Preparation Adhesive SPA60 are the only surface preparation adhesives recommended for use with Preform Thermo. Both P50 and SPA60 should be applied using a long-handled, thick (3/8–3/4-inch [0.95–1.9 cm]) nap paint roller with a solvent resistant core.

See Table 1 below to determine how much adhesive is required to cover a specific area.

**Table 1.** Coverage for P-50 and SPA60 adhesives.

Adhesive Type	One Coat
SPA60 Roller Application	Apply one even coat on the road surface where to marking is to be installed - SPA60 coverage of 225 sq. ft. per gallon.
P50 Roll Application	Apply one even coat on the road surface where to marking is to be installed. - 75 sq. ft/gallon (1.8 sq. m/liter),

### 9.1 Procedure

#### 1 - Clean the road

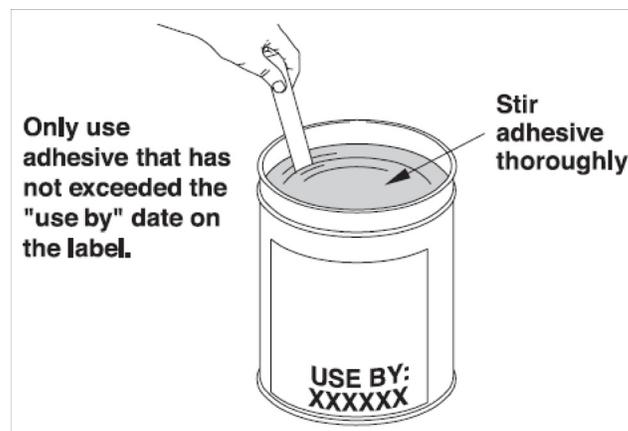
Clean the surface of the road where the tape will be applied. Clean the road surface using high velocity, high pressure compressed air blower with minimum 185 cfm airflow and 120 psi at the air nozzle (recommended). The road surface must be dry.

#### 2- Premark the road

Layout the area where the marking will be applied.

#### 3 - Stir the adhesive

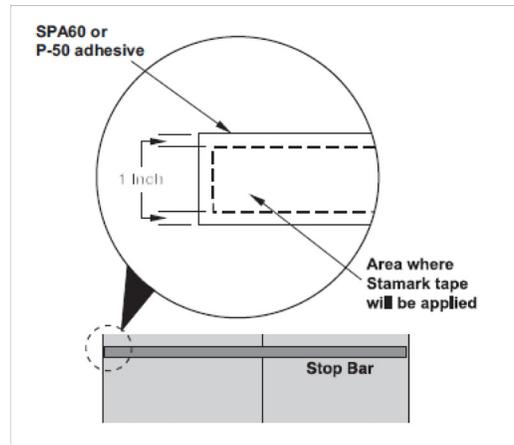
Thoroughly mix the P50 or SPA60 adhesive by stirring with a wide wooden paint paddle (see figure 1) or air driven paint mixer. Alternatively, roll the unopened five gallon pail back and forth several times until adhesive is thoroughly mixed. Ensure that any sediment on the bottom of the five-gallon container is completely mixed in and the solution has a uniform consistency prior to use.



**Figure 1.** Thoroughly mix adhesive.

#### 4 - Apply the adhesive

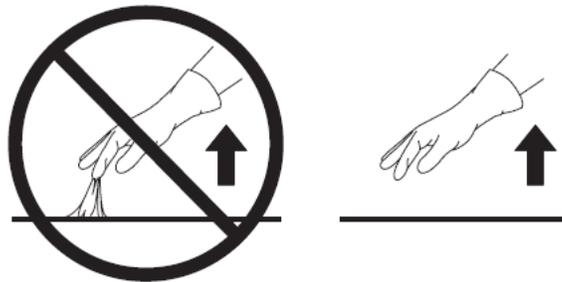
Evenly apply one coat of adhesive to the road surface using a solvent-resistant roller with a 3/8–3/4-inch (0.95–1.9 cm) nap. The adhesive coating on the pavement must extend at least one inch (2.5 cm) beyond the premarked area. (See Figure 2.)



**Figure 2.** Adhesive coverage must extend beyond the premarked area by at least one inch (2.5 cm).

#### 5- Allow the adhesive to set

- a Allow the P50 to set. P50 is set when it feels tacky but is no longer in liquid form, as illustrated in Figure 3, and has a matte finish rather than a glossy, wet appearance. P50 dries quickly (to a set state) under most circumstances. Typical time for P50 to set is two to three minutes under optimal conditions of 70 °F (21 °C) and medium to low humidity levels. For more information on P50 application procedures see [3M Information Folder 5.17](#).



**Figure 3.** Adhesive is set when it is no longer liquid. P50 feels tacky when set but does not lift from the road. SPA60 neither feels tack nor lifts from the road when dry.

- b Allow SPA60 to dry. SPA60 is dry when it no longer feels tacky. Dry time is approximately five minutes. Lower temperatures and higher humidity will increase dry times. For more information on SPA60 application procedures see [3M Information Folder 5.21](#).

**Important Note:** Always check different areas of applied adhesive for dryness, especially in roadway depressions, where more P50 or SPA60 may be present and, therefore, slower to dry.

#### 6- Remark the road (if needed)

#### 7- Apply preform thermo

Once adhesive is dry, apply Preform Thermo as described above, in Section 4.

**Important Note:** WET ADHESIVE IS FLAMMABLE. Ensure adhesive is dry before applying Preform Thermo.

## **9.2 Storage**

Surface preparation adhesive P-50 and SPA60 must be stored in a cool, dry area indoors. A storage temperature of 40-100°F (4-38°C) is recommended. Use all tape products within one year of receipt. Unopened containers of P-50 or SPA60 must be used within two years of receipt. Check label for expiration date of receipt.

## For Information or Assistance

Call: 1-800-553-1380

In Canada Call:

1-800-3M HELPS (1-800-364-3577)

## Internet:

<http://www.3M.com/roadsafety>

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