3M™ Stamark™ Tapes Pavement Surface Preparation and Application Techniques

Information Folder 5.7
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Overview

This information folder contains pavement surface preparation requirements and application procedures for installations of 3M™ Stamark™ High Performance Tape Series 380IES (“380IES”) and 3M™ Stamark™ All Weather Tape Series 380AW (“380AW”). Users should be knowledgeable of all application requirements and procedures prior to product application. Instructions contained in this folder must be followed for material replacement provisions to be considered valid. Material replacement provisions are described in the appropriate product bulletins.

380AW and 380IES are available in a variety of color, widths, and roll sizes. These products are available as unlinered (“Adhesive A Series”) and unlinered (“Adhesive L Series”). Custom sizes are available upon request. The tapes are also available in legend and symbol patterns.

Contact a 3M representative with any questions regarding application procedures or conditions.

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Equipment

- Eradication/removal equipment: Grinder, water blaster, sand blaster, or shot blaster
- Air compressor capable of providing a minimum airflow of 185 cfm airflow and 120 psi at the air nozzle
- Street sweeper with wire brush and vacuum system (recommended)
- Surface preparation adhesive spraying device
- Tape applicator
- Tamping mechanism: Truck tires or a Century Tool Tamper Cart RTC-2
- Depth gauge or a bridge micrometer

Environmental Requirements for Product Application

Stamark tapes can be applied by an overlay application (applying tape on an existing surface) or by a hot inlay application (embedding pavement marking tape into fresh asphalt). The tapes can also be recessed into a grooved surface. Refer to 3M Information Folder 5.18 for more information about a grooved applications.

The following requirements apply to all Stamark tape applications:

- **Air and Surface Temperature:** Minimum 40°F (4°C) and rising.
- **Avoid the Dew Point:** As temperatures fall and get closer to 40°F (4°C), inspect the pavement surface for visible signs of moisture (dew, frost, etc.). Operations may need to be suspended due to the presence of any moisture. The surface temperature must be a minimum of 5°F (2.8°C) above the dew point to apply Stamark tapes.
- **Surface Preparation Adhesive Usage by Time of Year:** Applications outside of the 3M recommended seasonal start and end dates as defined in the 3M™ Stamark™ Pavement Markings Tapes Climate Guide must use 3M™ Stamark™ Surface Preparation Adhesive SPA60 (“SPA60”) or 3M™ Stamark™ Surface Preparation Adhesive P-50 (“P-50”) even when air and surface temperatures are 40°F (4°C) and rising.
- **Pavement Surface:**
  - The pavement surface must be clean and dry.
  - No precipitation within 24 hours prior to application.
  - Other visible signs of moisture (dew or frost) cannot be present.
  - If heavy or prolonged rain is predicted to begin 24 hours after installation, 3M recommends using SPA60 or P-50.

NOTE

If applying Stamark tapes between October and March in a coastal region, 3M recommends waiting 48 hours following a prolonged precipitation event to allow for sufficient drying of the surface.

Pavement Surface Types

The pavement surface type and age determine which application procedures should be used for installing Stamark tapes. See the 3M Road Surface Guide for 3M™ Stamark™ Pavement Marking Tapes for additional details.

ASPHALT CEMENT CONCRETE (ACC)

Standard Mix Asphalt

A standard mix contains both fine (sand) and large (1/4 in. [6 mm]) aggregate with an asphalt cement binder. Stamark tapes can be inlaid or overlaid on this surface.

Open Grade Friction Course

An open grade friction course mix consists of only large aggregate, up to 3/4 in. (19 mm), with an asphalt cement binder. Stamark tapes can be inlaid or overlaid on this surface.

Chip Seal

A chip seal is achieved by spraying a hot asphalt emulsion onto an existing surface and then covering it with 1/4 in. (6.4 mm) aggregate. Excess aggregate is removed after several days of exposure to traffic. Stamark tapes can be overlaid on this surface after the loose aggregate is removed and the surface has cured.

Slurry Seal

A slurry seal is a hot asphalt emulsion sprayed onto an existing surface, as a topcoat dressing only. No aggregate is added. Stamark tape can be overlaid on this surface after the emulsion has fully cured. 3M recommends waiting at least 14 days after the final day of continuous emulsion application before overlaying Stamark tape on this surface. Contact the emulsion manufacturer to determine the cure time.

Recycled Asphalt

Recycled asphalt road surfaces consist of an existing asphalt surface being removed through milling or grinding, reprocessed, and then reapplied. Stamark tape can be inlaid or overlaid on this surface.

Rubberized Asphalt

Rubberized asphalt mixes contain additives designed to increase durability. The mix can be either a "Standard Mix Asphalt" or an "Open Grade Friction Course" mix. Stamark tape can be applied as noted for those mixes as discussed previously in this guide.

PORTLAND CEMENT CONCRETE (PCC)

New Concrete

During construction, the new surface is often brushed or grooved (tined). Concrete that has been open to traffic for less than 90 days must have the curing compound removed before applying Stamark tapes or surface preparation adhesive. Sandblasting is the most common method for removing curing compound from new concrete. Other methods, such as shotblasting or hydroblasting, can also be used. The pavement must be allowed to dry after hydroblasting before surface preparation adhesive or tape can be applied.

Old Concrete

Old concrete is a PCC surface that has been open to traffic for more than one year and is showing signs of wear. Often this surface is smooth with large amounts of exposed, polished aggregate. Stamark tape can be overlaid using a surface preparation adhesive. The old concrete surface may require texturing prior to surface preparation adhesive and tape application.

Long Line Overlay Application Procedures

This procedure explains how to apply tape to a concrete or asphalt surface in the form of edge lines, skips, and gore markings.

1. Identify if any of the following road surface or traffic conditions are present and account for them prior to starting installation.
   a. For new concrete open to traffic less than 90 days, remove the curing compound by light grinding, sandblasting, shotblasting, or hydroblasting.
   b. Remove any existing roadway markings by grinding, sandblasting, shotblasting or hydroblasting. A minimum of 90% of the road surface under the existing markings must be exposed prior to tape application. See 3M's grinding recommendations in 3M Information Folder 5.18 for proper grinder head setup.
   c. Road lanes are typically exposed to different levels of traffic shear. Road lanes that are exposed to a high frequency of high shear turning—especially by trucks and other large vehicles—require the use of SPA60 or P-50 for application of Stamark tapes. Table A summarizes 3M's product and surface preparation adhesive application recommendations by shear level.

Table A. Surface Preparation Recommendations by Shear Level

Shear Level	Surface Preparation Adhesive Recommendation
Moderate to High Shear	Use SPA60 or P-50.
Low Shear	No surface preparation adhesive is required unless otherwise directed by 3M technical service.

   d. Have a plan to ensure Stamark tape is NOT applied over longitudinal joints, transverse joints, or cracks that are wider or deeper than normal. Applying Stamark tape over joints can cause premature tape failure as the joints can shift and degrade over time.

   Transverse joints or large cracks can prevent the tape from conforming to the road surface. As joint maintenance is required, the markings can be damaged by maintenance equipment and joint fillers.

   NOTE

   If application over a transverse joint is necessary, cut the tape 1 in. (2.5 cm) away from the joint on both sides.

   NOTE

   If application over a longitudinal joint is necessary, SPA60 or P-50 must be applied and allowed to set (cure) as described in 3M Information Folder 5.21 or 3M Information Folder 5.17 respectively, with the longitudinal joint positioned in the middle of the applied tape.

   NOTE

   Following hydroblasting, a 24-hour drying period is required before tape can be applied.

2. Clean the surface of the road where the tape will be applied using a high pressure, high velocity compressed air blower with:
   - A minimum airflow of 185 cfm airflow and 120 psi at the air nozzle
   - No more than 50 feet of 3/4-in. interior diameter hose from the compressor to the air nozzle
   - An air nozzle with an interior diameter of at least 1/2 in. (1.3 cm)
   - A moisture and oil trap
   - 3M recommends the air nozzle be no more than two feet from the ground.

   A street sweeper or pickup broom may also be effective to remove larger or adhered debris, but installers will still need to perform a final pass with the air compressor to completely clean the surface. The road surface must be dry prior to applying tape.

3. 3M recommends performing a snap cleanliness/adhesion test (see 3M Information Folder 5.26) after removal of previous markings and after cleaning is completed, but before tape installation, in order to check the surface cleanliness and integrity.
   a. Cut a 6 in. (15.2 cm) long piece of tape.
   b. Apply it to the removal area
   c. Apply pressure to the tape by stepping on the tape multiple times
   d. Remove the tape. If the tape is 40% or more contaminated (clean rating below 4), then the cleaning procedure needs to be repeated or adjusted.
   e. If micro-fracturing of the substrate is present or suspected contact a 3M technical representative for guidance.
4. Premark the road, laying out the edge line and skip areas where markings will be applied.
5. Determine if application of SPA60 or P-50 ("surface preparation adhesive") is required. Refer to Step 1 and the 3M™ Stamark™ Pavement Marking Tapes Climate Guide for additional guidance.
   - If no surface preparation adhesive is required, skip to Step 7.
   - If surface preparation adhesive is required, proceed to Step 6.

NOTE

3M does not recommend using surface preparation adhesive on asphalt that is less than four days old as doing so may interfere with the asphalt curing process.

6. Apply the surface preparation adhesive and allow it to set according to the instructions in 3M Information Folder 5.17 and 3M Information Folder 5.21 for P-50 and SPA60 respectively.
7. Apply the tape using the tape applicator or by hand, following the equipment manufacturer's instructions. On asphalt surfaces, apply the tape approximately 4 in. (10.2 cm) from any longitudinal seam. On concrete surfaces, apply the tape approximately 2 in. (5.1 cm) from the concrete longitudinal joints.

NOTE

Do NOT overlap tape. Use the roll-to-roll splicing technique to ensure all tape is directly adhered to the pavement surface.

NOTE

If there is a crack in the pavement, or if the tape is to be applied over a bridge expansion joint, lay the tape over the crack or joint, then cut the tape 1 in. (2.5 cm) away from the crack or joint on each side. (See Figure 1.)

NOTE

For pavement markings placed by hand (i.e. shorter, individual skip marks), walk on the tape to tack the adhesive on to the pavement surface.

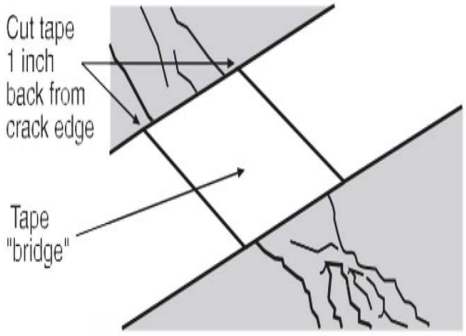


Figure 1. Application of Tape Over a Pavement Crack

8. Tamp the tape with a Century Tool Tamper Cart RTC-2 loaded with a minimum of 200 lb. (91 kg), making a minimum of six passes, or slowly drive over the tape for a total of six tire hits with a vehicle to ensure all edges are firmly adhered.
   - The vehicle must be equipped with a pointing device to help keep the vehicle on the tape.
   - Use a vehicle only on long line markings.
   - Do NOT twist or turn the tamper cart or vehicle wheels on the tape.

NOTE

Tapes 9 in. (20.3 cm) or wider require a total of 12 tire hits, or 12 passes with the tamper cart, to ensure proper tamping across the entire width of the tape.

9. Open the road to traffic.

Transverse Markings Overlay Application Procedure

This procedure explains how to apply tape to a concrete or asphalt surface in the form of crosswalks, stop bars, chevrons, symbols, and legends. (See 3M Information Folder 5.8 for detailed instructions on applying pre-cut symbols and legends.)

1. Identify if any of the following road surface or traffic conditions are present and account for them prior to starting installation.
   a. For new concrete, open to traffic less than 90 days, remove the curing compound by light grinding, sandblasting, shotblasting, or hydroblasting.*
   b. Remove any existing roadway markings by grinding, sandblasting, shotblasting, or hydroblasting. A minimum of 90% of the road surface under the existing markings must be exposed prior to tape application. See 3M's grinding recommendations in 3M Information Folder 5.18 for proper grinder head setup.

      NOTE

      Hydroblasting requires a 24 hour drying period before tape application.

   c. Road lanes are typically exposed to different levels of traffic shear. Road lanes that are exposed to a high frequency of high shear turning—especially by trucks and other large vehicles—require the use of SPA60 or P-50 for application of Stamark tapes. Table A summarizes 3M's product and surface preparation adhesive application recommendations by shear level.

Table B. Tape and Surface Preparation Recommendations by Shear Level

Shear Level	Surface Preparation Adhesive Recommendation
Moderate to High Shear	Use SPA60 or P-50.
Low Shear	No surface preparation adhesive is required unless otherwise directed by 3M technical service.

2. Clean the surface of the road where the tape will be applied using a high pressure, high velocity compressed air blower with:
   - A minimum airflow of 185 cfm airflow and 120 psi at the air nozzle
   - No more than 50 feet of 3/4-in. interior diameter hose from the compressor to the air nozzle
   - An air nozzle with an interior diameter of at least 1/2 in. (1.3 cm)
   - A moisture and oil trap
   - 3M recommends the air nozzle be no more than two feet from the ground.
3. Perform a snap cleanliness/adhesive test.
   a. Cut a 6 in. (15.2 cm) long piece of tape.
   b. Apply it to the removal area.
   c. Step on it multiple times to tamp the tape.
   d. Remove the tape. If the tape is 40% or more contaminated (clean rating below 4), then the cleaning procedure needs to be repeated and/or adjusted.
   e. If micro-fracturing is present or suspected contact a 3M technical representative for guidance.
4. Layout the area where the marking will be applied and premark the road.
5. Determine if application of SPA60 or P-50 is required. Refer to the product bulletin of the tape to be applied for additional guidance.
   a. If no surface preparation adhesive is required, skip to Step 7.
   b. If surface preparation adhesive is required, proceed to Step 6.
6. Apply the surface preparation adhesive and allow it to set according to the instructions in 3M Information Folder 5.17 and 3M Information Folder 5.21 for P-50 and SPA60 respectively.
7. Remark the road (if needed).

NOTE

Always check surface preparation adhesive dryness in different areas and especially in depressions in the road surface where more SPA60 or P-50 may be present and slower to dry.

8. Apply the tape.

For stop bars, crosswalks, symbols, and legends:

Apply the tape by hand. When splicing is required, do NOT overlap the material. Use butt splices instead. (See Figures 2 and 3.)

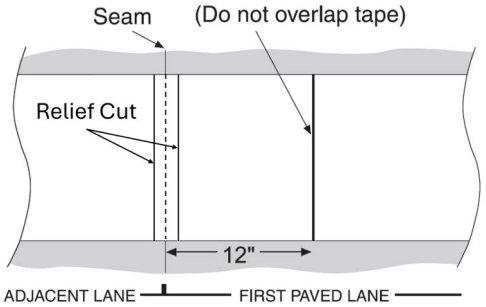


Figure 2. Butt Splice - Top View

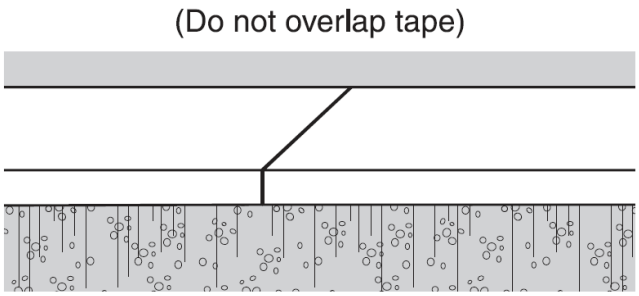


Figure 3. Butt Splice - Side View

NOTE

If there is a crack in the road that causes the tape to bridge, lay the tape over the crack, tamp the tape, and then cut the tape 1 in. (2.5 cm) from each side of the crack. (See Figure 4.) Use this same technique on concrete when the transverse marking is applied over a joint.

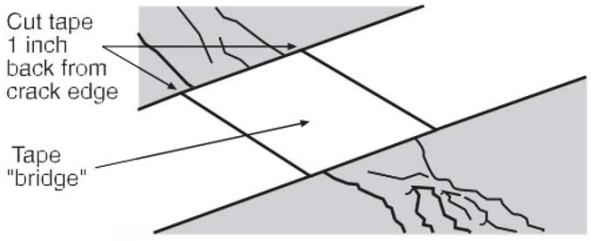


Figure 4. Application of Tape Over a Pavement Crack

For application of Adhesive L Series tapes, including legends and symbols:

a. Position the marking and peel back the liner. See Appendix D for liner removal techniques.
b. Press the exposed tape down.
c. Slowly remove the rest of the liner while carefully guiding the tape into place.

For gore markings:

Tape can be applied by hand as described above, or with any type of tape application equipment that can handle the extra material width.

9. Tamp the tape with a Century Tool Tamper Cart RTC-2 loaded with a minimum of 200 lb. (91 kg) making a minimum of six passes to tack the tape to the asphalt. If the tape is wider than the roller, more passes will be needed to make sure the entire width of the tape has received the required tamping treatment. A minimum of 12 passes is required for any tapes 9 in. (20.3 cm) or wider.

- Always work in the same lengthwise direction as the tape was applied.
- Start in the crosswise middle of the tape and work outward in either direction to remove trapped air.
- Do NOT twist or turn the tamper cart on the tape.
- Make a minimum of six passes (three passes back and forth) over each part of the tape.
- Ensure all edges are firmly adhered.

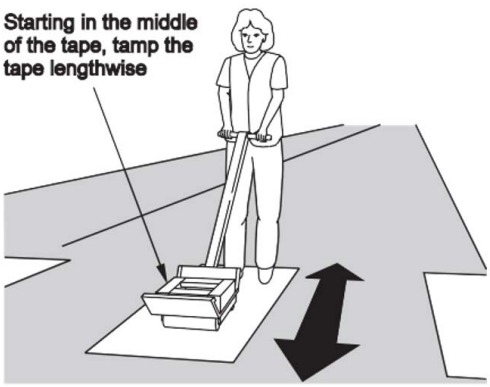


Figure 5. Tamping the Tape

NOTE

Do NOT use a vehicle tire to tamp transverse markings!

10. Open the road to traffic.

Hot Inlay Application

Stamark tapes with pressure sensitive adhesive can be applied on fresh asphalt before the finishing roller passes over the surface. Hot inlaying is the process of embedding pavement marking tape into the road surface. This is done by rolling over the applied tape with a steel-drum finishing roller while the asphalt is still warm. (See Figure 6.)

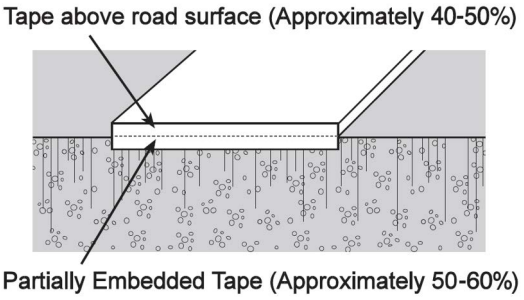


Figure 6. Cross Section of Road with Embedded Tape

Long Line Hot Inlay Applications

This application technique can be performed when installing long lines, including edge, lane, and channelizing lines.

1. Pave a lane so the tape will not be placed on asphalt seams between lanes. Center line markings will then be applied on a fresh, warm mat during paving of the adjacent lane, approximately 4 in. (10.2 cm) away from the asphalt seam.

NOTE

For example, the width of the first lane should be approximately 12 in. (30.5 cm) short of center. For example, a 12 ft-wide (3.7 m-wide) lane should be paved at 11 ft-wide (3.3 m-wide). The second pass will then be paved 13 ft-wide (4.0 m-wide), for a total road width of 24 ft (7.3 m). (See Figures 7 and 8 on page 8.)

2. Compact the fresh asphalt with a compaction roller.
3. Premark the road using a sash chain, line string, or thin wire cable for long applications, or snap chalk lines on the asphalt for the same purpose. For skip line applications, mark the skip sequence on a sash chain or with chalk or paint, followed by the pointer on a tape applicator.
4. Test the asphalt surface temperature. The surface temperature should between 130°F (54°C) and 160°F (71°C). Test the temperature of the asphalt surface with a surface thermometer. There is no minimum air temperature requirement for a hot inlay tape applications, but cooler air temperatures will result in faster asphalt cooling and smaller application windows.

NOTE

When working with a stiffer mix, rubber-based mix (rubberized asphalt), Superpave, Open Grade Friction Course (OGFC), or (Stone Matrix Asphalt) SMA, installers may need to increase the temperature at which the tape is recessed to embed the tape properly. Do NOT exceed 180°F (83°C).

NOTE

Installers should target embedment of 50% to 60% of the tape's thickness below the asphalt surface. However the embedment rate can be affected by multiple factors including:

- Environmental conditions
- Type of surface
- Thickness of the surface

5. Apply the tape using the tape applicator, placing the tape approximately 4 in. (10.2 cm) from the asphalt seam or edge. (See Figures 7 and 8 for examples of layout when using 4 in.-wide tape.)
   a. For hand applied tape, walk on the tape to tack the adhesive on to the asphalt, then roll over the tape with one pass of a Century Tool Tamper Cart RTC-2 loaded with 50 to 100 lb. of weight.

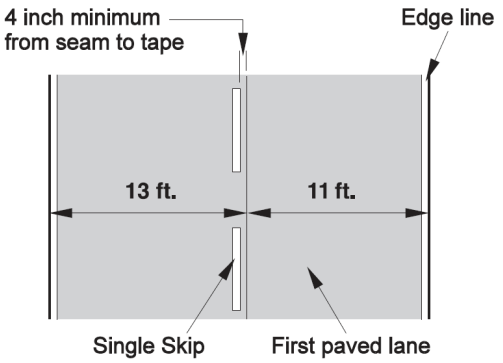


Figure 7. Example: Two Lane Highway Skip Line Layout

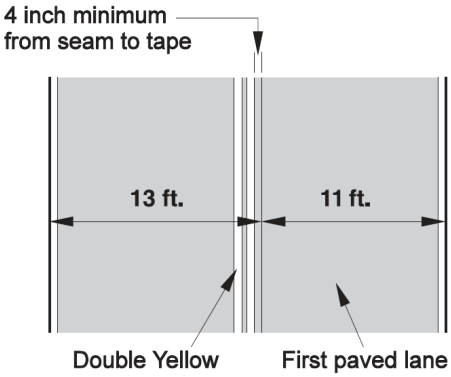


Figure 8. Example: Two Lane Highway Double Yellow Line Layout

6. Press the tape into the asphalt using a tandem steel-drum finishing roller at 2 to 3 mph (3 to 5 kph) over the tape to press it into the warm pavement surface. (See Figure 9.) Target tape embedment of 50% to 60%. Use a minimum amount of water to clean and lubricate the steel drums during the hot inlay operation. Excess water on the pavement surface may affect tape adhesion.

NOTE

For best inlay results the weight of the steel-drum roller should be greater than 110 PLI (pounds per lineal inch) of drum width. See "Appendix A. Pounds Per Lineal Inch Calculation Guide" section on page 13 for information on calculating PLI.

NOTE

If the tape wrinkles or distorts severely in front of the roller, the mat temperature may be too hot, or the roller speed may be too fast. Allow the surface to cool slightly and retry. Do NOT remove the inlaid tape since removal of the tape will remove the asphalt.

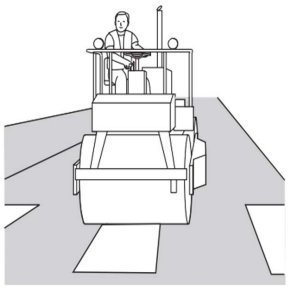


Figure 9. Pressing Tape Into the Warm Pavement

7. Repeat Steps 1 through 6 until the road is fully marked.
8. The road may be opened to traffic as soon as hot inlay operations are complete and the asphalt has cooled to temperatures that support vehicles without surface damage.

NOTE

Tape pattern is important for visibility performance. An improper hot inlay may cause tape pattern flattening. A measured increase of applied tape width greater than 1/8 in. (3 mm) may indicate that pattern flattening occurred.

Hot Inlay Application of Transverse Markings

This application technique can be performed when installing crosswalks, stopbars, gore markings, symbols, and legends.

1. Pave a lane so that the tape will not be placed on asphalt seams between lanes. Generally, the width of the first lane should be approximately 12 in. (30.5 cm) short of center. Pavement markings will then be applied on a fresh, warm mat during paving of the adjacent lane, approximately 4 in. (10.2 cm) away from the asphalt seam.
2. Compact the fresh asphalt with a compaction roller.
3. Premark the area where the marking will be applied.
4. Test the asphalt surface temperature. The surface temperature should between 130°F (54°C) and 160°F (71°C). Test the temperature of the asphalt surface with a surface thermometer. There is no minimum air temperature requirement for a hot inlay tape applications, but cooler air temperatures will result in faster asphalt cooling and smaller application windows.

NOTE

When working with a stiffer mix, rubber-based mix (rubberized asphalt), Superpave, Open Grade Friction Course (OGFC), or (Stone Matrix Asphalt) SMA, installers may need to increase the temperature at which the tape is recessed to embed the tape properly. Do NOT exceed 180°F (83°C).

NOTE

Installers should target embedment of 50% to 60% of the tape's thickness below the asphalt surface. However the embedment rate can be affected by multiple factors including:

- Environmental conditionss
- Type of surface
- Thickness of the surface

5. Apply the tape by hand, leaving it approximately 4 in. (10.2 cm) short of the asphalt seam or edge.

For application of liner back tapes, including legends and symbols:

a. Position the marking and peel back the liner. See 3M Information Folder 5.8 for liner removal techniques.
b. Press the exposed tape down.
c. Slowly remove the rest of the liner while carefully guiding the tape into place.

6. Tamp the tape with a Century Tool Tamper Cart RTC-2 loaded with 200 lb. (90.8 kg) to tack the tape to the asphalt.
   - Always work in the same lengthwise direction as the tape was applied.
   - Start in the crosswise middle of the tape and work outward in either direction to remove trapped air. (See Figure 10.)
   - Make sure all tape edges are thoroughly tamped.
   - Do NOT twist or turn the tamper cart on the tape.
   - One pass over each area is sufficient to tack the tape to the asphalt.
   - If the tape folds or distorts in front of tamper center, remove 50 lb. (22.7 kg) of weight and continue tamping.

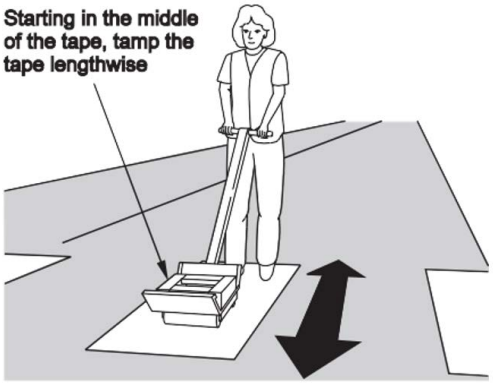


Figure 10. Tamping the Tape

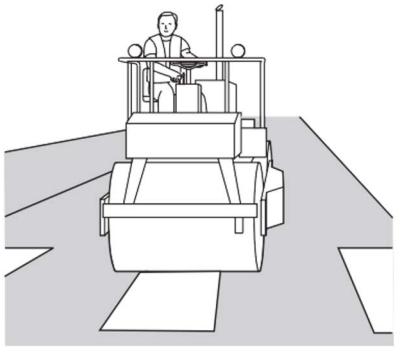


Figure 11. Pressing Tape Into Warm Pavement

7. Slowly roll over the tape with a tandem steel-drum finishing roller with **no vibration** to press (inlay) the tape into the warm pavement surface. Use a finishing roller (3 to 5 ton) for intersection markings if one is available. Finishing rollers are generally more maneuverable and allow the markings to be hot inlaid more efficiently.
   - Roll back and forth in a straight line over the same section of tape before moving to the next section.
   - Keep the finishing roller at 2 to 3 mph (3 to 5 kph) when rolling over the tape.
   - Use a minimum amount of water to clean and lubricate the steel drums during the inlay operation.
   - Under normal conditions, at least three passes back and forth of the finishing roller are required to hot inlay the tape.
   - 50% to 60% of the tape's thickness should fall below the asphalt surface. (See Figure 6 on page 7.) To test for embedment use a 40 mil depth gauge or a bridge micrometer.

NOTE

If the tape wrinkles or distorts severely in front of the roller, the mat temperature may be too hot or the roller speed may be too fast. Allow the surface to cool slightly and retry. Do NOT remove the inlaid tape since removal of the tape will remove the asphalt.

8. Repeat Steps 1 through 7 until the road is fully marked.
9. The road may be opened to traffic as soon as the hot inlay operations are complete and the asphalt has cooled to temperatures that support vehicles without surface damage.

NOTE

Tape pattern is important for visibility performance. An improper inlay may cause tape pattern flattening. A measured increase of applied tape width greater than 1/8 in. (3 mm) may indicate pattern flattening occurred.

Applying Stop Bar Marking Over Pavement Seams

1. Once the second lane is paved, apply additional tape so it bridges the asphalt seam and meets the end of the tape placed in the first paved lane. Do NOT overlap the tape. Use butt splices instead. (See Figures 12 and 13.)

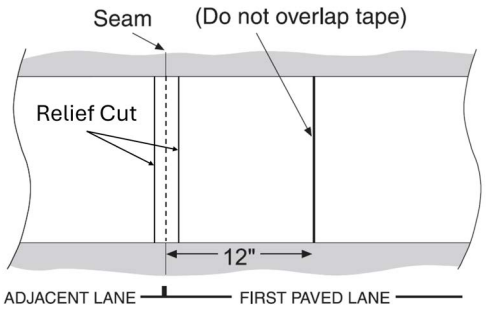


Figure 12. Butt Splice - Top View

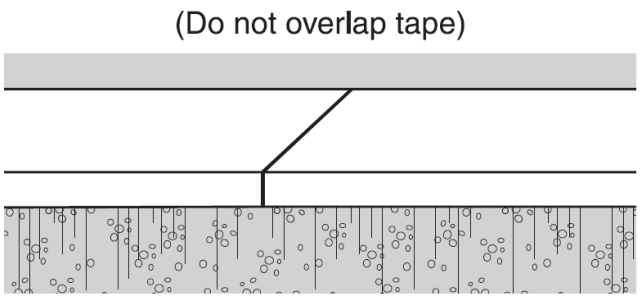


Figure 13. Butt Splice - Side View (Cross Section)

2. The tape between the asphalt seam and the butt splice will not be inlaid. Use a utility knife to score a relief cut across the width of the tape just outside the seam and into the hot inlay area to help prevent tape loss in snowplow regions. (See Figure 12.)

Removal

Stamark durable tapes are designed for permanent, non-removable applications. They can be removed by grinding, sandblasting, shotblasting, or hydroblasting. See 3M's grinding recommendations in 3M Information Folder 5.18 for proper grinder head setup.

3M Related Literature

Always confirm you have the most current version of the applicable product bulletin, information folder, or other product information from 3M's website at www.3m.com/roadsafety.

- 3M Product Bulletin 270ES 3M™ Stamark™ Pavement Marking Tape 270ES
- 3M Product Bulletin 380AW 3M™ Stamark™ High Performance All Weather Tape Series 380AW
- 3M Product Bulletin 380IES 3M™ Stamark™ High Performance Tape Series 380IES
- 3M Information Folder 5.17 Using 3M™ Stamark™ Surface Preparation Adhesive P-50 with 3M™ Stamark™ Pavement Marking Tapes
- 3M Information Folder 5.18 Grooving and Grinding Guidelines for 3M™ Pavement Markings
- 3M Information Folder 5.21 Using 3M™ Stamark™ Surface Preparation Adhesive SPA60 with 3M™Stamark™ Pavement Marking Tapes
- 3M Information Folder 5.8 Application of 3M™ Stamark™ Pre-Cut Symbols and Legends
- 3M™ Stamark™ Pavement Markings Tapes Climate Guide
- 3M Road Surface Guide for 3M™ Stamark™ Pavement Marking Tapes
- 3M Personal Safety Division's Helpful Tips for the New US OSHA Construction Silica Regulations

Health and Safety

Tools and Equipment Usage

When using any equipment, always follow the manufacturer's instructions for safe operation.

Chemicals

When handling any chemical products, read the manufacturers' container labels and the safety data sheets (SDS) for important health, safety, and environmental information.

Follow this link to obtain SDS sheets for 3M products.

Follow this link to obtain information about substances of very high concern (SVHC) for EU products.

Traffic Control and Work Zone Safety

Always follow applicable temporary traffic control procedures and safe work zone practices. For example, eye, ear, respiratory, or other protection may be appropriate during grooving, surface preparation, or for the removal of existing pavement markings. For respiratory protection requirements, refer to the OSHA Respirable Crystalline Silica Standard and the Small Entity Compliance Guide for Respirable Crystalline Silica Standard for Construction at www.osha.gov.

Gloves

⚠ **CAUTION**

Wear gloves when applying any Stamark tape to help prevent hand injuries.

Flames and Torches

⚠ **CAUTION**

Do NOT use a flame or torch to remove Stamark tapes. Burning may violate local, state, or federal air quality regulations. Also, exposing the tape to very high temperatures with the use of a flame or torch could generate emissions that may be harmful to skin, eyes, and the respiratory system.

Warranty Information

Technical Information

Technical information, guidance, and other statements provided by 3M are based upon records, tests, or experience that 3M believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed. Such information is intended for people with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license to any intellectual property rights is granted or implied with respect to this technical information.

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Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment, reviewing all applicable regulations and standards, and reviewing the product label and use instructions. Failure to properly evaluate, select, and use a 3M product in accordance with instructions or to meet all applicable safety regulations may result in injury, sickness, death, and/or harm to property.

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Appendix A. Pounds Per Lineal Inch Calculation Guide

To calculate the pounds per lineal inch for a steel drum roller, installers will need to know:

- The width of the roller in inches
- The total weight of the machine in pounds
- The number of rollers on the machine (usually two)

The resulting formula is as shown below:

$$\text{PLI} = \frac{\text{Weight of Machine}}{\text{Number of Rollers} * \text{Width of Roller}}$$

Example

For a machine that weighs 10 tons (20,000 lb.), that has two rollers, each of which are 60 in. wide:

$$\text{PLI} = \frac{20{,}000 \text{ lbs}}{2 \text{ rollers} * 60 \text{ in./roller}} = 166.66 \text{ lbs/in.}$$