



3M™ Stamark™ Low VOC Surface Preparation Adhesive SPA60

Spray Application Instructions for Bulk Liquid for Longitudinal Pavement Marking Tapes

Information Folder 5.21

August 2013

Replaces Information Folder 1.7 dated November 2005

Description 3M™ Stamark™ Low VOC Surface Preparation Adhesive SPA60 is a high strength, sprayable liquid adhesive that can be used for outdoor pavement marking tape applications to enhance the adhesion of Stamark pavement marking tapes, especially for marginal or difficult application conditions.

SPA60 is a low Volatile Organic Compound (VOC) adhesive that is fully compliant with California SCAQMD* Rule 1168. It has a clear to light yellow color and is fast drying with good open time.

**South Coast Air Quality Management District is known to have some of the most stringent air quality standards in the United States.*

Directions for Use SPA60 is intended for industrial or professional outdoor use only.

SPA60 is extremely flammable; proper handling and storage precautions must be observed. Refer to the Material Safety Data Sheet (MSDS). Open containers slowly and carefully and away from the face to vent any internal pressure. Bulk liquid SPA60 is intended to be applied using a PS-14 adhesive spray applicator and 8004E spray tip that are clean and in good operating condition. Other spray equipment may be suitable; see the Spray Equipment Options section in this document. Do not use outdated material. Dispose of outdated material according to local regulations.

Due to the rapid drying characteristics of SPA60. Care must be taken to fully flush the PS-14 at the conclusion of the shifts following procedures specified in this document. In process cleaning may also be required as noted as well. Failure to properly clean the PS-14 will result in permanent damage to the pump.

Coverage The PS-14 applicator is designed to spray a 6-inch (15.2 cm) wide pattern for application of 4-inch (10.2 cm) wide tape. Using the PS-14 applicator and correctly applying a 6-inch wide spray pattern, SPA60 will cover approximately 450 lineal feet per gallon. The applied wet thickness is approximately six to seven (6-7) mils (0.006 to 0.007 inches). Adhesive should extend at least one (1) inch (2.5 cm) beyond both edges of the intended tape location to allow for ease of straight tape application over adhesive. **Ensure that no tape is applied over uncoated pavement.**

Note: If you are using tape wider than four (4) inches, spray multiple passes, overlapping the previous pattern by 1 one to two (1-2) inches. Allow additional time for overlapped areas to dry. Refer to Information Folder 5.7 for additional information.

**Application
Conditions**

1. SPA60 is best applied at temperatures of 60°F (16°C) or above and low to moderate humidity. SPA60 can also be used successfully at temperatures down to 40°F (4°C) and at higher humidity, but drying times can be substantially longer. See paragraph (8) in the following Application Procedures section.
 2. Do not apply to surfaces that have visible signs of moisture such as dampness, liquid water, dew or frost.
 3. Asphalt surfaces must be at least a full three (3) days old before applying SPA60. The solvents in SPA60 can weaken fresh asphalt pavement surfaces.
 4. Road surfaces must be properly cleaned and prepared prior to SPA60 application. Refer to Information Folder 5.7 and Information Folder 5.18 for recommendations.
 5. Traffic must be kept off of pavement surfaces coated with SPA60 prior to tape application to prevent damage to and contamination of the SPA60 coating.
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**Application
Procedures**

SPA60 must coat the pavement surface as a wet liquid and then dry. If the SPA60 dries in the air (airborne drying) and then contacts the pavement it will not form the required bond to the pavement. Properly applied and dried SPA60 will appear clear or translucent on the pavement surface. Improperly applied SPA60 will have a foamy, frothy, stringy, opaque, or white appearance on the pavement surface.

Hot, windy, low humidity conditions are likely to cause airborne drying. Small orifice (smaller than 8004) spray tips may also cause airborne drying.

Because conditions may change throughout the day, the spray fan should be regularly observed to guard against airborne drying.



Stringy or web appearance



Heavy Over Spray Coat



Pooling



Correct Uniform Spray Pattern

**Application
Procedures
(continued)**

1. Install a clean 8004E single jet spray tip (8004E, 8004EVS, brass or stainless) in good operating condition. **Make sure any installed screen filter placed in front of the spray tip is absolutely clean and free of obstructions or remove the screen filter entirely.** Screen filter obstruction can lead to excessive adhesive pressure drop and poor spray patterns and spray quality. Spray tips do wear over time and can wear out. Spray tips should be replaced when good spray patterns (full, uniform, consistent spray pattern) cannot be achieved even after thorough cleaning of the spray tip and the spray applicator.
2. Completely clean and flush all of the functional components of the **PS-14 adhesive spray applicator** (the siphon tube, the pump, all piping and the spray tip) with an appropriate cleaning solvent before spraying SPA60. Methyl Ethyl Ketone (MEK) is the preferred solvent. Methyl Acetate is also an acceptable cleaning solvent. **Never use gasoline or similar materials to flush the PS-14 Applicator. Gasoline and similar materials actually cause SPA60 to gel and solids to precipitate from solution and create plugging and blockage.**

Dispose of any cleaning solvent and adhesive residues according to local regulations and guidelines. If using SPA60 in an area where the use of these solvents is prohibited, there are small (8 lb) pressurized cylinders of cleaning solvents that work and conform to the same VOC regulations as SPA60. Contact technical service for more specific information on cleaning options.

3. Lift and fully extend the recessed pour spout from the top of the 5-gallon container. Twist off the threaded cap to open. **Keep the outside surface of the pour spout and the inside of the pour spout cap clean and free of adhesive residue or the adhesive will bond the cap strongly to the spout and be extremely difficult to remove.** It is recommended that the inside of cap immediately be coated with a light lubricant such as a spray oil or light grease.
4. Insert the PS-14 siphon tube into the open pour spout and place the end of the siphon tube at the very bottom of the 5-gallon container.
5. Adjust the orientation angle of the flat fan spray pattern delivered by the spray nozzle to be perpendicular to the direction of travel. The spray nozzle should also be adjusted to spray straight down onto the pavement and not at an angle.
6. Adjust the height of the spray nozzle and spray arm to deliver a 6-inch wide coating of SPA60 on the pavement surface. Typically the height of the spray tip above the pavement surface is six (6) inches. Wider spray widths than six (6) inches will result in a thinner and unacceptable coating of SPA60.
7. To spray apply SPA60 onto the pavement, push the PS-14 applicator at a normal walking speed (or slightly faster) with the front wheel pressed firmly on the pavement. Avoid front wheel bounce on rough surfaces as this causes gaps in the coating. Typically a poor spray fan (non-uniform, streaky, trickly) can be improved by walking faster to increase the pump spray pressure. NOTE: After a thorough solvent flush of the spray cart, it may be necessary to first push the cart 50 to 100 feet or more to prime the pump and obtain a good uniform spray. A brisk walking speed can also help prime the pump.
8. Allow the applied SPA60 to dry and set fully before applying pavement marking tape. Typical dry time for SPA60 at temperatures at 70°F and average humidity is approximately five (5) minutes or less. Cooler temperatures such as 40°F or high humidity conditions can extend dry time to 30 minutes or more. The best practice is to always test SPA60 dryness at the current conditions using the test method in the attached Appendix A.
9. After SPA60 is fully dry and set (refer to the attached **Appendix A**), it has an optimal open time of approximately 30 minutes when the pavement marking tape should be applied in order to achieve maximum bond strength. Apply the pavement marking tape and complete the tape application procedures preferably before the 30 minute open time expires. Pavement marking tapes can be applied after this open time, but bond strengths may be lower.

Note: Do not allow SPA60 to remain on the pavement without tape application for extended times such as 2 hours or more. The lengthy open time can reduce the initial bond strength and the adhesive surface often becomes contaminated with dirt, dust and debris that can also reduce adhesion performance.

Spray Tip Clean-Up

The spray tip should be cleaned often. Whenever a non-uniform spray pattern is observed, first clean the spray tip. If cleaning the spray tip does not improve the spray pattern, next try solvent flushing the applicator lines and pump as described in the next section. Alternatively, a dirty spray tip can be quickly replaced with a clean spray tip.

1. To clean the spray tip, first try cleaning the exterior of the spray tip, spraying the tip with a solvent or wiping the tip with a solvent soaked cloth and then wiping or brushing the softened adhesive residue from the tip. Commercially available carburetor cleaner sprays usually work well for flushing or softening residue.
2. If procedure (1) above does not result in a clean spray tip and a uniform spray pattern, next try cleaning the spray tip orifice by **carefully** inserting and removing a fine wire into the orifice. **Use caution using the wire** because it can damage the orifice and affect the spray pattern.
3. If procedures (1) and (2) above do not result in a clean spray tip, the tip may need to be removed for more thorough cleaning. Remove the tip and soak the tip for several hours in a good cleaning solvent such as Methyl Ethyl Ketone (MEK). After soaking, brush and wipe adhesive residue from the tip exterior and clean the tip orifice by blowing compressed air through the orifice or by inserting and removing a fine wire.

PS-14 Adhesive Spray Applicator Clean Up

It is recommended that the PS-14 applicator be cleaned whenever it is not used for more than ten (10) minutes at typical outdoor application conditions (70°F to 80°F). SPA60 dries so quickly that after only a few minutes at typical conditions, material in the lines and especially the spray tip can start to dry and cause flow restrictions and poor spray pattern quality.

Never use gasoline or similar materials to flush the PS-14 applicator. Gasoline and similar materials actually cause SPA60 to gel and cause solids to precipitate from solution and create plugging and blockages. Similarly, gasoline and similar materials remaining in the lines, pump or spray tip of a clean PS-14 applicator can cause gels and precipitation for the first use of SPA60.

1. To clean the PS-14 applicator, pull the applicator backwards eight to ten (8-10) feet or more to draw as much of the adhesive in the applicator pump and lines back into the adhesive container. This can be observed in the translucent siphon tube and when there are mostly air bubbles in the siphon tube, the lines are empty.
2. Remove the siphon tube from the adhesive container and insert it into a container of recommended cleaning solvent such as Methyl Ethyl Ketone (MEK). Replace the pour spout cap on the adhesive container to prevent adhesive drying.
3. Place a catch pan under the spray nozzle and rotate the front wheel forward until the solvent from the spray nozzle appears to be all clean solvent, without adhesive or residue and the solvent spray pattern is uniform.
4. Rotate the pump wheel backward to draw the excess solvent from the applicator components back into the solvent container. Replace the solvent container cap.
5. Dispose of any cleaning solvent and adhesive residues according to local regulations and guidelines.

Alternative Spray Equipment

The PS-14 applicator is the intended spray applicator for bulk liquid SPA60. Other equipment can and has been used to successfully apply SPA60.

SPA60 is extremely flammable. It is the user's responsibility to ensure that the spray method employed meets all appropriate environmental, health and safety regulations and requirements.

Use only airless spraying equipment. Air atomization spraying results in airborne drying and reduced wetting to the pavement surface, resulting in poor adhesion to the pavement.

SPA60 must coat the pavement surface as a wet liquid and then dry. If the SPA60 dries in the air (airborne drying) and then contacts the pavement it will not form the required bond to the pavement. Properly applied and dried SPA60 will appear clear or translucent on the pavement surface.

Improperly applied SPA60 will have a foamy, frothy, stringy, opaque, or white appearance on the pavement surface. **NOTE:** Refer to the photos in the Application Procedures section in this document.

Hot, windy, low humidity conditions are likely to cause airborne drying. Small orifice (smaller than 8004) spray tips may also cause airborne drying.

Because conditions may change throughout the day, the spray fan should be regularly observed to guard against airborne drying.

Use the Adhesive Drying Test Method in the attached Appendix A of this document as a verification test for proper application.

Apply SPA60 at a wet film thickness of six to seven (6-7) mils (0.006 to 0.007 inches) or more. The adhesive should extend at least one (1) inch (2.5 cm) beyond both edges of the intended tape location to allow for ease of straight tape application over adhesive. **Ensure that no tape is applied over uncoated pavement.**

Recommended Storage

Store SPA60 away from heat in a cool, dry place and protect from freezing. Store out of direct sunlight. Store away from acids and oxidizing agents. Keep container tightly closed and in a well ventilated area when not in use. Contents may be under pressure; open carefully.

Store product at 60°-80°F (16°-27°C) for maximum storage life. Higher temperatures reduce normal storage life. Lower temperatures may cause increased viscosity of a temporary nature. Rotate stock on a "first in-first out" basis.

Shelf Life: When stored at the recommended conditions in the original, unopened container, this product has a shelf life of 18 months from the manufacturing date on the container.

Waste Disposal Method

Incinerate waste in a permitted hazardous waste incinerator. As a disposal alternative, dispose of waste product in a permitted hazardous waste facility.

Health and Safety Information

Read all health hazard, precautionary, and first aid statements found in the Material Safety Data Sheet (MSDS), and/or product label of chemicals prior to handling or use.

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Avoid breathing of vapors, mists or spray. Avoid eye contact with vapors, mists, or spray. Keep out of the reach of children.

Keep away from heat, sparks, open flame, pilot lights and other sources of ignition. Ground containers securely when transferring contents. Wear low static or properly grounded shoes. Do not smoke or ignite matches, lighters, etc. while handling this material. Avoid static discharge. Vapors may ignite explosively. May cause flash fire.

For further information, contact 3M Traffic Safety and Security Division at 1-800-553-1380 in the U.S. or at 1-800-265-1840 in Canada; select technical service for pavement markings. Visit us on the Internet at www.3M.com/roadwaysafety.

Appendix A

Adhesive Dryness / Adhesive Set

Test Method for Determining if Surface Preparation Adhesives are Properly Dried or Set

Scope This test method describes how to rate the dryness or set status of liquid surface preparation adhesives (SPAs) applied to pavement surfaces. SPAs must be fully dried, solid films, well bonded to the pavement surface in order to function properly with adhesive coated preformed pavement marking tapes.

This method uses common foam ear plugs pressed onto the SPA surface to determine the condition, and uses a 1-5 rating scale to quantify the condition. An earlier, similar method, described in 3M pavement marking tape product literature, uses a fingertip to assess SPA condition.

Apparatus Testing Equipment and Materials – new, unused foam earplugs are all that is needed.

The best types of foam earplugs for this test are the “classic” cylindrical shape as they have two flat surfaces on each earplug (and therefore can be used for two tests). The flat surfaces are best suited for this test method.

Good foam earplugs for this test are the simple tapered shape with a single flat surface on each earplug. The flat surface is best suited for this test method.



Acceptable foam earplugs for this test are the simple tapered shape with a single flat surface on each earplug. The flat surface is best suited for this test method.



Sample Preparation

Choose those specific areas of the SPA-coated pavement that appear to have the heaviest coating amount as these will be the last to dry or set and will typically have the poorest rating. Conduct the test on those areas.

Test Procedure

1. Place a flat end of an unused, uncontaminated foam earplug onto the surface of the SPA.

Note: earplugs can be cut in half if the test does not seem to be working well – sometimes earplugs have excessive mold release compound from the manufacturing process and the adhesive will not adhere well. Alternately, earplugs can be cut in half to expose a fresh surface for multiple or additional test use.



2. Press and hold very firmly for at least three (3) seconds to maximize the adhesive bond of the earplug to the SPA.



3. Quickly pull the earplug straight up and off the SPA surface.



4. Examine the flat end of the foam earplug and rate the appearance using the criteria defined below.

**Adhesive Dryness /
Set Rating**

Adhesive Residue on the Foam Earplug

Examine the flat end of the foam earplug that was pressed onto the SPA surface. Estimate the percentage of the area that is contaminated with SPA residue and assign a rating value per the rating scale below.

- | | |
|--------------------------------|---|
| 5 Excellent | No adhesive residue on earplug end and/or some of the earplug remains bonded to the SPA/pavement surface) |
| 4 Acceptable | 0 to 25% of the earplug end is contaminated with adhesive residue |
| 3 Poor | 25 to 50% of the earplug end is contaminated with adhesive residue |
| 2 Very Poor | 50 to 75% of the earplug end is contaminated with adhesive residue |
| 1 Complete Test Failure | 75 to 100% of the earplug end is contaminated with adhesive residue |

(e.g. Rating = 5, Excellent)

(e.g. Rating = 3, Poor)



**FOR INFORMATION OR ASSISTANCE
CALL: 1-800-553-1380**

**IN CANADA CALL:
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**Internet:
www.3M.com/roadwaysafety**

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