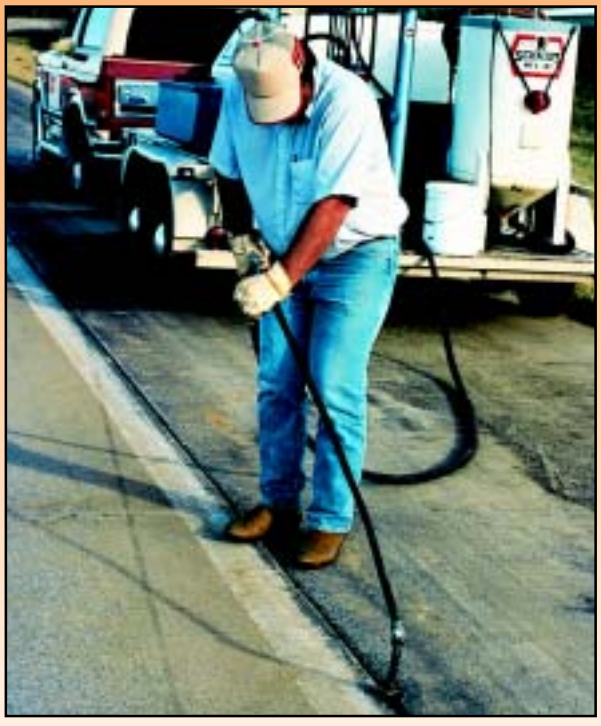
INSTALLATION GUIDE

Dow Corning® brand Silicone Pavement Sealants



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DOW CORNING


DOW CORNING®
888
silicone joint
sealant
COLOR: GRAY
DOW CORNING
890-SL
self-leveling
silicone joint
sealant
COLOR: DARK GRAY
DOW CORNING®
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COLOR: DARK GRAY
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Contents

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Preface

Highway and airport joints call for a tough sealant that can withstand excessive horizontal and vertical movement, has good weatherability and is easy to install with a short downtime and long service life.

Dow Corning® brand silicone pavement sealants can do the job. *Dow Corning*® 888 Silicone Joint Sealant and *Dow Corning*® 890-SL Self-Leveling Silicone Joint Sealant are one-part silicone formulations that can be installed in new or old joints in Portland Cement Concrete (PCC) pavement over a wide temperature range. In addition, *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant can be used on asphalt. These sealants cure upon exposure to moisture in the air to form a permanently flexible, low- to ultra-low-modulus, high-elongation silicone rubber seal. These sealants will collectively be referred to as *Dow Corning* silicone pavement sealants throughout this guide.

Dow Corning silicone pavement sealants are capable of withstanding extension of 100 percent and compression of 50 percent of the original joint width. They have excellent recovery, which makes them ideal for use in joints that experience a high degree of movement. *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant is an ultra-low modulus sealant that can be used to seal joints in asphalt pavements because it places very little stress on the asphalt surface. Asphalt paving materials have low tensile strengths and require a sealant that places very little stress on the asphalt itself while keeping the joint sealed.

To fully utilize these capabilities, the sealant must be properly installed in properly designed joints. This pamphlet provides the correct installation procedures, which begin with good joint design and preparation. A sample specification is provided for these products. The pamphlet also covers backer rod installation, giving a list of installation equipment and manufacturers of recommended equipment, as well as the most frequently asked questions and answers.

Dow Corning Silicone Pavement Sealants

What are they?

Dow Corning silicone pavement sealants are members of the same family and are based upon similar technologies.

Dow Corning 888 Silicone Joint Sealant is a one-part, non-self-leveling silicone formulation that can be installed over a wide temperature range. It requires tooling and cures on exposure to atmospheric moisture to form a durable, flexible, low-modulus, high-elongation, silicone rubber joint sealant for use on Portland Cement Concrete. Primer is not required on most applications. During application, no heating or cooling of the sealant is required, as the material consistency remains relatively unchanged (as compared with nonsilicone-based materials) from -35 to 140°F (-32 to 60°C). It retains its gunnability and can be pumped at low temperatures.

Dow Corning 890-SL Self-Leveling Silicone Joint Sealant is a one-part, self-leveling silicone sealant that readily extrudes over a wide temperature range. It cures on exposure to atmospheric moisture to form a durable, flexible, ultra-low-modulus, high-elongation silicone rubber joint seal for use on asphalt and/or Portland Cement Concrete. Primer is not required on most applications. During application, no heating or cooling of the sealant is required, as the material consistency remains relatively unchanged (as compared with nonsilicone-based materials) from -35 to 140°F (-32 to 60°C). It retains its gunnability and can be pumped at low temperatures.

Where to Use Them

Dow Corning 888 Silicone Joint Sealant is ideal for use in concrete-to-concrete joints (PCC) that experience a high degree of movement, such as transverse pavement expansion and contraction joints in highways, airports and pavements. It withstands extension of 100 percent and compression of 50 percent of original joint width and has excellent recovery. It can be used in transverse, longitudinal, centerline and shoulder joints. Its non-slump characteristic makes it an excellent choice for vertical joints in curbs. It is often used in remedial work, especially where other materials have failed because of excessive movement or poor weatherability.

Dow Corning 890-SL Self-Leveling Silicone Joint Sealant is ideal for use in asphalt-to-concrete, concrete-to-concrete or asphalt-to-asphalt joints that experience a high degree of movement, such as transverse pavement expansion and contraction joints in highways, airports and pavements. It can be used in longitudinal, centerline and shoulder joints. It is also ideal for use in sealing asphalt-to-asphalt joints in new asphalt overlays or joints prepared over reflection cracks in old asphalt overlays. Its self-leveling characteristic makes it an excellent choice for horizontal joints and for joints on moderate slopes. It can also be used in remedial work where other materials have failed because of excessive movement or poor weatherability.

Dow Corning silicone pavement sealants are not recommended for use in totally confined joints where the sealant is not exposed to atmospheric moisture during cure. Additionally, these sealants are not recommended for use in applications involving continuous or semicontinuous water immersion.

Dow Corning 888 Silicone Joint Sealant should be tooled with a recess below the pavement surface to minimize abrasion from traffic and snow removal equipment. *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant requires no tooling. Experience has shown that better silicone pavement joint performance can be obtained by maintaining a recess of 3/8 inch (9.53 mm) or greater.

Other Applications

Contact your Dow Corning representative for more information on the applications listed below or others:

- Airport Runways
- Loop Seals
- Pavements on Grades
- Steel/Armor Joints
- Fast Track Pavements
- Random Crack Sealing
- Bridge Joints
- Jet Fuel Resistance

Important Considerations

JOINT FACES MUST BE CLEAN, DRY, AND FROST-FREE WHEN THE SEALANT IS INSTALLED. JOINTS MUST BE FREE OF STANDING WATER, AND UNDER NO CIRCUMSTANCES SHALL SEALING TAKE PLACE DURING INCLEMENT WEATHER.

Joint Cleanliness – A clean joint shall have no visible signs of residual sealant or debris on the joint face, and will leave no residual cement powder or dust on your fingers after rubbing the joint face.

Pavement Drainage – *Dow Corning* silicone pavement sealants are not recommended for conditions where continuous water/moisture exposure is expected. Sources of subsurface water infiltration include a high water table, shallow or poor drainage ditches, or improperly designed or maintained subsurface drainage systems. All potential applications should be reviewed to ensure that the pavement has positive drainage. The correct application of a primer has been shown to enhance performance of the sealant in these situations; contact your Dow Corning representative for more details.

Dew Point – The temperature at which the air is saturated with moisture vapor and liquid water (dew) begins to form. Do not install sealant when the temperature is below the dew point.

Inclement Weather – If rain or other inclement weather occurs during joint preparation or sealing, all operations should cease and sufficient time must be allowed so that the joints are dry prior to starting/continuing the sealing operation.

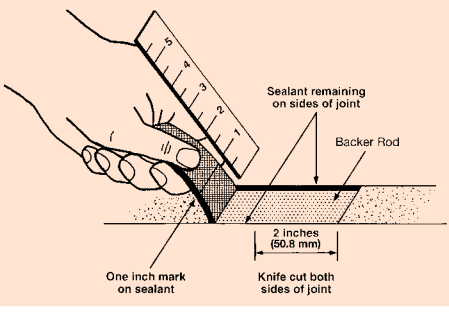
IN NO CASE SHOULD SEALANT BE INSTALLED IN A JOINT THAT HAS STANDING WATER.

Prior to work of any kind pertaining to joint sealing, the joint sealing contractor, in conjuction with the owner or owner's representative and Dow Corning, must meet and discuss method of installation and install a test section. A field adhesion test must be performed on the test section as outlined in Dow Corning's field adhesion test procedure to confirm adhesion under site conditions.

The field adhesion test is a simple screening procedure that may help detect application problems such as improper cleaning, use of improper primer, poor primer application or improper joint configuration.

1. Make a knife cut horizontally from one side of the joint to the other.
2. Make two vertical cuts (from the horizontal cut) approximately 3 inches (76.2 mm) long, at both sides of the joint.
3. Place a 1-inch (25.4 mm) mark on the sealant tab as shown in the illustration.
4. Grasp the 2-inch (50.8-mm) piece of sealant firmly just beyond the 1-inch (25.4 mm) mark and pull at a 90° angle.
5. If dissimilar substrates are being sealed, check the adhesion of sealant to each substrate separately. This is accomplished by extending the vertical cut along one side of the joint, checking adhesion to the opposite side and then repeating for the other surface.
6. The adhesion test is considered passing when 1 inch (25.4 mm) of sealant is elongated to 4 inches (101.6 mm) without bond loss.

Figure 1 – Standard Field Adhesion Hand Pull Test



How to Use *Dow Corning* Silicone Pavement Sealants

Cure Characteristics

Dow Corning silicone pavement sealants cure by reacting with atmospheric moisture, but the rate of cure is dependent on temperature and humidity. At a temperature of 75°F (24°C) and relative humidity of 50 percent, *Dow Corning* 888 Silicone Joint Sealant will cure to a tack-free surface in one hour or less and reach its ultimate properties in 7 to 14 days. Temperatures of 100°F (38°C) will reduce the tack-free time to about 30 minutes, and ultimate properties of the sealant could be reached in just a few days of continuous exposure. Conversely, low temperatures will reduce the cure rate and increase the time required for the sealant to become tack-free. For example, at 40°F (4°C) the tack-free time will be about two to three hours. At a temperature of 75°F (24°C) and a relative humidity of 50 percent, *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant will skin over in about 40 minutes. The self-leveling sealant will reach its ultimate properties in 14 to 21 days. *Dow Corning* silicone pavement sealants will cure slightly faster at higher temperatures and slower at lower temperatures.

While it may require days for the sealant to reach ultimate properties, roads or runways may be quickly reopened to traffic, often within minutes of sealant placement, provided that the sealant is properly recessed. When sealant is placed in new pavement or in resealing jobs where there is no excessive faulting or slab deflection (vertical movement), the roadway may be opened to traffic as soon as a skin forms on the sealant.

Where excessive faulting or vertical deflection occurs as a result of traffic, the sealant should be allowed to sufficiently cure and develop integrity before the road or runway is reopened. The time required to develop integrity will depend on several factors, such as the amount of vertical movement, the time of year, temperature and humidity, and the sealant being used.

Allow the sealant to develop sufficient integrity to resist being forced from a joint by a backer rod that is pumped upward by traffic movement. This problem occurs occasionally in the cooler spring or fall months on older pavement without load transfer devices or aggregate interlock.

Once cured, *Dow Corning* silicone pavement sealants have the capability to withstand a high degree of extension and compression with no loss of bond.

Joint Design

Good sealant installation begins with good joint design – and anticipated movement is a key design consideration. While the high-movement capability of *Dow Corning* silicone sealants provides added safety when anticipated and actual movements differ, proper design and correct installation procedures will maximize performance.

Joint Width

Joints may be either sawed or formed to the required dimensions. The minimum joint width recommended for *Dow Corning* silicone pavement sealants is 1/4 inch (6.35 mm). But a 3/8-inch (9.53-mm) width is generally preferred for faster sealant installation.

Transverse joints must be wide enough to prevent excessive movement. A 1/4-inch (6.35-mm) wide joint with 20-foot (6-m) spacing may be satisfactory in a warm climate, but more severe climates with wide temperature ranges or less frequent spacing will require a wider joint. Joint spacing, the coefficient of thermal expansion of the pavement, expected temperature range, and the anticipated temperature at time of sealing must all be considered.

The joints should be sized so that the maximum extension and compression do not exceed +100 and -50 percent respectively. This sizing should include a safety factor of two or three to allow for non-uniformity of joint movement two to three slabs working in unison. The time of year (spring, summer, fall) should also be considered.

Figure 2 – Joint Design Considerations: *Dow Corning* 888 Silicone Joint Sealant

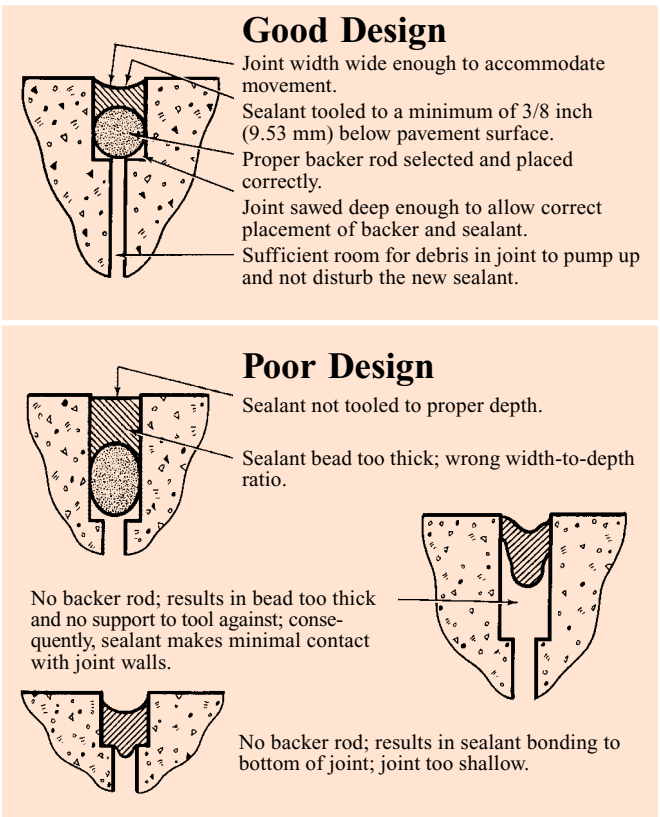
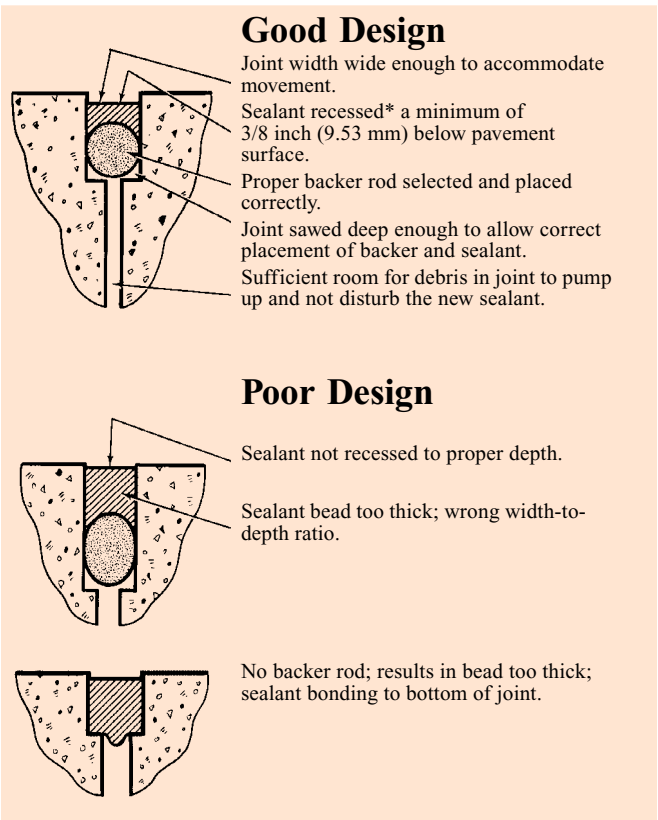


Figure 3- Joint Design Considerations: *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant



*Recess if measured from the highest point of the installed backer material to the lowest point of the pavement surface at the joint wall.

Joint Depth

The joint must be deep enough to allow proper placement of the sealant and a bond breaker/backer rod. Minimum depth requirements will vary slightly depending on joint width (see Table 1 on Page 18).

Experience has shown that better performance of *Dow Corning* silicone pavement sealants can be obtained by maintaining a recess of 3/8 inch (9.53 mm) or greater. It is especially important to maintain the proper recess as the joint width approaches and/or exceeds one inch. Dow Corning recommends the following recess guidelines:

Joint Width	Recess
1/4 to 1-1/4 inches (6.35 to 31.8 mm)	3/8 inch (9.53 mm)
Greater than 1-1/4 inches (Greater than 31.8 mm)	1/2 inch (12.7 mm)

Joint Preparation

Obtaining the desired performance depends upon using correct installation procedures. All contaminants, especially dried laitance from saw-cutting and previous sealants, must be removed with a high pressure water wash followed by a sand blast. Leaving materials of this type on the surface of the joint face will prevent development of a good adhesive bond. A clean joint will have no visible signs of residual sealant or debris on the joint wall, and will leave no residual cement powder or dust on your fingers after rubbing the joint face.

Dow Corning 888 Silicone Joint Sealant will not bond to wet concrete. *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant will not bond to wet asphalt or concrete. Moisture in and on the pavement is difficult to detect. The pavement MUST be allowed to dry. When in doubt, it is wiser to allow additional drying time than to risk sealant adhesion failure.

JOINT FACES MUST BE CLEAN, DRY AND FROST-FREE WHEN THE SEALANT IS INSTALLED.

After drying, it is especially important that the top 1 inch (25.4 mm) of each joint face be sandblasted. When sandblasting, follow all federal, state and local laws and/or regulations regarding the proper use and handling of equipment. The primary purpose is to remove traces of residual laitance. The sandblasting nozzle must be held at an angle to the joint face and within 1 or 2 inches (25.4 or 50.8 mm) of the pavement. Pointing it toward the bottom of the joint or at too great a distance from the face allows the force of the blast to dissipate ineffectively. These points and others regarding surface preparation of new and old concrete pavement are expanded upon in following sections.

Backer Rod Selection

Another essential element in good joint design is use of a bond breaker/backer rod. A primary function of the backer rod is to act as a bond breaker, preventing three-sided adhesion of the sealant while at the same time forming the desired cross section of the sealant bead. Failure to utilize a backer rod will allow the sealant to bond to the bottom of the joint. This results in excessive stress on the sealant.

Another function of the backer rod is to control the thickness of the sealant bead. The backer rod should be approximately 25 percent oversized so that it fits tightly into the joint. A loose backer rod will be pushed deeper into the joint when the sealant is installed and will not provide adequate support for proper tooling of *Dow Corning* 888 Silicone Joint Sealant. Thus, the thickness of the sealant bead cannot be controlled as required. With proper tooling, *Dow Corning* 888 Silicone Joint Sealant is pushed down onto the backer rod and firmly against the joint walls, resulting in intimate contact, proper wetting and good adhesion with the joint walls. *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant requires a tight-fitting backer rod to control thickness of the sealant bead and to prevent the sealant from bypassing the backer rod to the bottom of the joint.

Failure to use a backer rod, or use of the wrong material, will nearly always result in failure or reduced performance of the sealant. Dow Corning recommends the use of a closed cell, expanded polyethylene foam rod for general use with *Dow Corning* silicone pavement sealants. Where the joints are irregular, bond breakers such as *Sof Rod*™* help prevent the self-leveling sealants from bypassing the backer rod and allow the sealants to enter the bottom of the joint. In all cases, the backer rod must be oversized so that it fits tightly in the joint.

Sealant and Backer Rod Placement Depths

The sealant bead must be placed a minimum of 3/8 inch (9.53 mm) below the pavement surface. The sealant bead should be a minimum of 1/4-inch (6.35-mm) thick but should not be greater than 1/2-inch (12.7-mm) thick. A width-to-depth ratio of 2:1 is ideal and should be maintained throughout the bead whenever possible.

Based on these values, the top surface of the backer rod is typically positioned so that it is between 5/8 inch (15.9 mm) and 7/8 inch (22.2 mm) below the pavement surface. If other operations, such as diamond grinding, are to be done after sealant placement, the sealant recess and the resulting joint depth and backer rod placement must be increased.

**Sof Rod* is a trademark of Applied-Extrusion Technologies.

Sealing New Concrete Pavement

Before attempting to seal joints in new concrete, the concrete must be given plenty of time to cure, dry and develop strength such that the joint reservoir can be sawn without concrete damage (i.e., raveling, spalling, etc.). The time between sawing of the initial cut (contraction cut to control cracking) and the joint sealant reservoir will depend upon such factors as mix design (i.e., conventional, Fast Track, High Early Concrete mixes), cement type, time of year concrete is placed, temperature, etc. Only clean and dry joints should be sealed.

For conventional concrete mixes, it is recommended that the concrete be allowed to cure and dry a minimum of 7 days in good drying weather before installing *Dow Corning* silicone pavement sealants. Cold, wet, inclement weather will require a longer drying time. An additional day of good drying weather should be allowed for each day of poor drying weather.

Dow Corning silicone pavement sealants have been successfully used in many Fast Track and High Early Concrete applications. Because of the continued introduction of new methods and mix types, please contact your Dow Corning representative for current recommendations in these applications.

Joint sealant reservoirs are prepared by saw-cutting (i.e., diamond blades) the concrete to the specified width and depth. It is recommended that freshly sawed joints be washed with high pressure water immediately after sawing to remove most of the saw slurry from the joint faces. Joint washing should be in one direction (working forward) to minimize recontamination.

After the joints have dried, the joints should be sandblasted to remove residual laitance from the joint walls. Sandblasting should be done in two passes, one for each face, with the nozzle held at an angle to the joint face and within 1 or 2 inches (25.4 or 50.8 mm) of the pavement. Sandblasting should be done to the depth at which the sealant and backer rod are to be installed.

Experience has shown that the best method for removing contaminants is by sandblasting the dry joint that was previously flushed with water after the saw-cutting process. Other techniques, such as grinding or wire-brushing, are **not** recommended. They have been found to be less effective due to possible operator error and/or equipment problems. If conditions are such that sandblasting is not permitted, high pressure waterblasting may be used as an alternative. Contact your Dow Corning representative BEFORE attempting to use this joint cleaning method to discuss the appropriate procedures.

After sandblasting, the sand, as well as any dust and dirt deposited by wind and traffic, must be blown out of the joint and away from the area around it using a high-pressure air blast. As with the water wash, the air blast should move in only one direction (forward) to prevent recontamination of the joint. Compressed air, at a pressure of at least 90 psi (620 kPa), should be used to blow out the joint just before installation of the backer rod. Air compressors used for this purpose **must** be equipped with traps capable of providing moisture-free and oil-free air.

Just before the backer rod is installed into the joint, rub your finger across the dry joint face to determine that residual dust or dirt has been removed. If joints still contain dust or dirt, these contaminants must be removed before backer rod and sealant installation.

Solvents should **not** be used to remove oils, because they generally only carry the materials further into the concrete pores or spread them over the surface.

NOTE: Many new concrete additives are being sold to the highway industry that allow concrete to be placed and opened to traffic in record time. These materials may be additives to or substitutions for Portland Cement Concrete. When using any of these new materials, adhesion testing of *Dow Corning* silicone pavement sealants is required. To test adhesion, submit samples of the material to Dow Corning at least 30 days before anticipated use. Dow Corning will test the material and provide you with specific recommendations.

Resealing Old Concrete Pavement

The installation techniques required for resealing can be summarized as removal of old sealant/seal, proper cleaning of the joint, and installation of the bond breaker and sealant.

The tools and techniques used to remove the existing sealant or joint filler will be determined by the material in the joint and by available equipment. The old sealant can be removed by cutting and/or saw-cutting, which slightly widens the joint to produce a new surface for sealing. Some materials, compression seals for example, are simply pulled out of the joint and then sandblasted to remove the lubricant/adhesive.

After removing previous materials, immediately high-pressure water wash the joint to remove sawing residue. Wash in one direction (forward) to prevent recontamination. When the joint has dried, it should be sandblasted to remove any residual dust using techniques described previously.

After sandblasting, the joint should be blown out with compressed air at a pressure of 90 psi (620 kPa) to remove sand and dust. Air should be free of oil and water.

As a final check before bond breaker and sealant installation, the joints should be inspected for residual dust and/or old sealing material. If dust or old sealing material remain, these contaminants should be removed using techniques described previously.

Table 1 – Theoretical Estimating Requirements*

Joint Width, inches	Sealant Bead Thickness, inches	Minimum Joint Depth, inches	Backer Rod Diameter, inches	Backer Rod Depth, inches	Estimated Coverage (linear feet/gal.)	
					888	890-SL
1/4	1/4	1-1/8	3/8	5/8	246	275
3/8	1/4	1-3/8	1/2	5/8	149	173
1/2	1/4	1-3/8	5/8	5/8	103	123
5/8	5/16	1-5/8	3/4	11/16	66	83
3/4	3/8	1-7/8	1	3/4	46	60
7/8	7/16	2	1	13/16	33	45
1	1/2	2-1/8	1-1/4	7/8	26	35
>1	1/2	>2-1/8	1-1/4+	1	–	–

*Installation yields (linear feet/gallon) are based on calculations for an exact sealant bead shape-factor. Actual yield will vary depending on deviation from calculated bead shape, tooling techniques, backer material placement, waste, and applicator experience.

Table 2 – Metric Estimating Equivalents*

Joint Width, mm	Sealant Bead Thickness, mm	Minimum Joint Depth, mm	Backer Rod Diameter, mm	Backer Rod Depth, mm	Estimated Coverage (linear meters/liter)	
					888	890-SL
6.35	6.35	28.6	9.53	15.9	19.8	22.1
9.53	6.35	34.9	12.7	15.9	12.0	13.9
12.7	6.35	34.9	15.9	15.9	8.3	9.9
15.9	7.94	41.3	19.1	17.5	5.3	6.7
19.1	9.53	47.6	25.4	19.1	3.7	4.8
22.2	11.1	50.8	25.4	20.6	2.6	3.6
25.4	12.7	54	31.8	22.2	2.1	2.8
>25.4	12.7	>54	31.8+	25.4	–	–

*1 inch = 25.4 millimeters, 1 gallon = 3.79 liters.
Installation yields (linear meters/liter) are based on calculations for an exact sealant bead shape-factor. Actual yield will vary depending on deviation from calculated bead shape, tooling techniques, backer material placement, waste, and applicator experience.

Full Depth Asphalt Pavements

NOTE: Only *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant is recommended for sealing joints in asphalt pavements.

Sealing New Asphalt Pavements

Before attempting to seal joints in new asphalt, the asphalt must be given sufficient time to cool and to cure, so that damage will not result from sawing. This time will depend upon a number of factors, such as mix design, time of year for placement, geographic location, and past experiences. The asphalt must also be completely dry prior to sealant installation.

Joints should be prepared by saw-cutting (i.e., diamond blades) to the specified width and depth. Routers (i.e., impacting devices) should not be used, as routing of asphalt pavements can cause damage to the pavement, which in turn leads to poor joint performance. In new construction, a shallow cut is recommended where the backer material is placed on the bottom of the joint. A shallow cut saves time and saw blades. All joints to be sealed must be sound, clean, dry and frost-free.

Freshly sawed joints should be washed with water immediately after sawing to remove any loose material from the joint faces. Joint washing should be in one direction (forward) to prevent or minimize recontamination. Any contaminants remaining on the surface of the joint wall may prevent development of a good bond.

Experience has shown that the best method for removing contaminants is by sandblasting (sand cleaning) the dry joint that was previously flushed with high-pressure water after the saw-cutting process. Other techniques, such as grinding, wire-brushing, or routing have been found to be less effective and may cause damage to the joint.

Sandblasting should be done in two passes, one for each face, with the nozzle held at an angle to the joint face and within 1 or 2 inches (25.4 or 50.8 mm) of the pavement. Sandblasting should be done to the depth at which the sealant and backer material are to be installed. The sand, as well as dust and dirt deposited by wind and traffic, must be blown out of the joint and away from the area around it using a high-pressure air blast. The air blast should move in only one direction (forward).

Compressed air, at a pressure of at least 90 psi (620 kPa), should be used to blow out the joint just before installation of the backer rod. Air compressors used for this purpose **must** be equipped with traps capable of providing moisture-free and oil-free air.

Just before actual sealing of the joint, rub your finger across the dry joint face to determine that residual dust has been removed. If joints still contain dust or dirt, these contaminants must be removed before backer rod and sealant installation.

Resealing Old Asphalt Pavements

All old sealant and/or joint filler must be removed prior to sealant installation. The tools and techniques used to remove the existing sealant or joint filler will be determined by the material in the joint and by available equipment. The old sealant typically can be removed by cutting, plowing and/or saw-cutting, which also widens the joint to the required dimensions. Residue from sawing (i.e., wet sawing) of asphalt and any old caulk or sealant material still remaining on the joint face must be removed before backer rod placement and resealing. As discussed in previous sections, any debris and residue left by the wet sawing operation must be removed by an immediate high-pressure water wash. This is followed, after drying, by sandblasting (i.e., sand cleaning) using techniques described previously.

After sandblasting, the joint is blown out with compressed air to remove final dust and dirt from the previous step and any dust and dirt that may have been blown in by traffic, wind, etc. The compressed air is supplied from a compressor equipped with traps to provide oil-free and water-free air at a minimum of 90 psi (620 kPa).

As a final check prior to installing backer material and sealant, the joints should be checked to ensure that joints are dry and no residual dust remains. This is accomplished by rubbing your finger along the joint face to examine for dust. If dust is present, it must be removed before proceeding with backer material installation.

Asphalt Overlays

NOTE: Only *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant is intended for sealing joints in asphalt pavements.

Sealing Joints in New Asphalt Overlays

It is recommended that joints in fresh asphalt be sawn (i.e., diamond blades) after the asphalt has cooled and "cured" such that sawing does not damage the asphalt joint (i.e., raveling). The joints should be centered DIRECTLY OVER the concrete joints below. To control cracking, it is common practice to carefully saw these joints to a depth of 1/2 of the total asphalt thickness. Then the sealant reservoir should be sawed to proper dimensions. Joint dimensions should be as per state specifications.

As discussed previously, the joint must be free of moisture, sawing residues, dirt, dust, etc., prior to sealant installation. The removal techniques have been described in previous sections.

Sealing Reflection Cracks in Older Asphalt Overlays

When *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant is used for sealing reflection cracks in older asphalt pavements, additional joint preparation steps must be used. Cracks that have formed in the asphalt pavement must be totally removed by saw-cutting. This can be accomplished by saw-cutting along both sides of the crack, exposing freshly cut and sound asphalt joint faces. Routers or hammering devices are not recommended as these devices will typically cause raveling.

As discussed previously, the joint must be dry and free of sawing residue, dust, dirt, etc., prior to backer material and sealant installation. The techniques have been described in earlier sections and apply here also.

Sealing Concrete/Asphalt Shoulder Joints

NOTE: Only *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant is intended for sealing joints in asphalt pavements.

When *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant is used to seal concrete-to-asphalt shoulder joints, the asphalt should be completely removed from the concrete face to which the sealant will be bonding. This can be accomplished by saw-cutting tightly along the concrete. Failure to remove all the asphalt will result in joint failure. A fresh and sound joint face must also be prepared in the asphalt by saw-cutting. Saw cut the asphalt a minimum of 1/4 inch (6.35-mm) beyond any raveled edges. If the concrete-to-asphalt shoulder has been sealed before, the previous sealant should be removed from both the concrete and asphalt faces. This is accomplished by saw-cutting.

As discussed previously, any debris left by the sawing operation must be removed by an immediate high-pressure water wash. This is followed, after drying, by sandblasting using techniques described previously.

Backer Material Installation

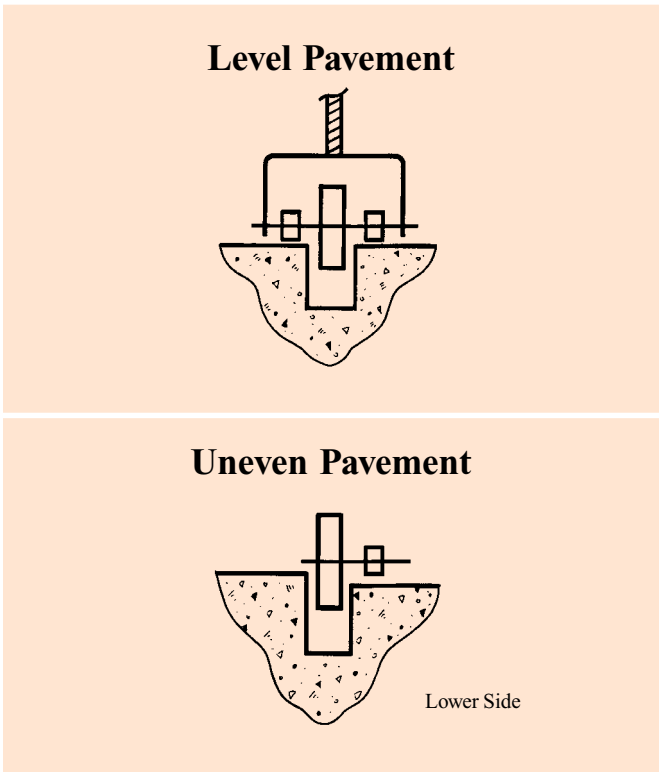
After the final cleaning, the backer material should be installed at the proper depth, as shown in Table 1 on Page 18. The depth is measured from the paved surface of the lowest slab (if faulting is present) to the top of the backer rod.

Backer rod may be installed by hand, but a roller device (Figure 4 on Page 24) to aid in placement can be easily constructed. This device will not only speed installation, but also ensures a consistent, uniformly placed backer at the proper depth.

For new construction that has deep tining, the backer material should be placed deeper such that the sealant will be below tining and have specified bead thickness.

In cases where the pavement is faulted or where future surface grinding is anticipated, the backer material (and sealant) may be installed deeper than normal so that after grinding, the sealant is at the recommended recess. Ideally, grinding should be performed prior to backer material and sealant placement. The sealant bead thickness should not be increased. Any areas damaged by grinding should be repaired.

Figure 4 - Backer Rod Installation Tools



Sealant Installation

Dow Corning silicone pavement sealants should be pumped directly from the original drum or pail into the joint by use of an air-powered pump. The nozzle should be moved steadily along the joint, pushing the sealant ahead to form a uniform bead. With proper backer rod installation, the following applies:

- *Dow Corning* 888 Silicone Joint Sealant should fill the joint from the top of the backer rod to slightly below the pavement surface. Immediately after placement and before a skin forms, *Dow Corning* 888 Silicone Joint Sealant must be tooled so that

it is forced against the joint faces and the bead is recessed the required 3/8 inch (9.53 mm) below the pavement surface. This tooling is required because the material is not self-leveling and must be forced against the joint faces to wet them and gain maximum adhesion.

- *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant should fill the joint from the top of the backer rod to 3/8 inch (9.53 mm) below the pavement surface.

Preferably, the sealants should be installed when the temperature is at 40°F (4°C) and rising. However, the material has been installed at lower temperatures. Situations of this type require caution that the joint is clean, dry and frost-free. They should be discussed with representatives of the manufacturer before installation.

In new construction, where the concrete pavement is deeply tined, it is recommended that the sealant be placed below the tining grooves. Thus, if concrete chipping occurs at the joint face, a watertight seal will be maintained. Excess sealant on the pavement surface should be scraped up and removed to prevent possible tracking.

When the specifications call for nonsilicone sealants – especially asphalt-based materials in the longitudinal joints and silicone in the transverse, the silicone sealant should always be installed first in order to prevent contamination of the joint faces. Preferably, the silicone will also be installed in the longitudinal joint a foot (305 mm) or so in both directions from the transverse joint. This should reduce the possibility of a weak point at the intersection of transverse and longitudinal joints.

Many devices for injecting and tooling the sealant are shop fabricated. The specific device selected depends largely upon the applicator's personal preference. For assistance, please contact your Dow Corning representative.

For *Dow Corning* 888 Silicone Joint Sealant, success has been achieved with such things as flexible spatulas and backer rods of larger diameter than the joint width. Flexible devices with "give" to them seem to offer better results, because they are able to form the sealant to the contours of the pavement.

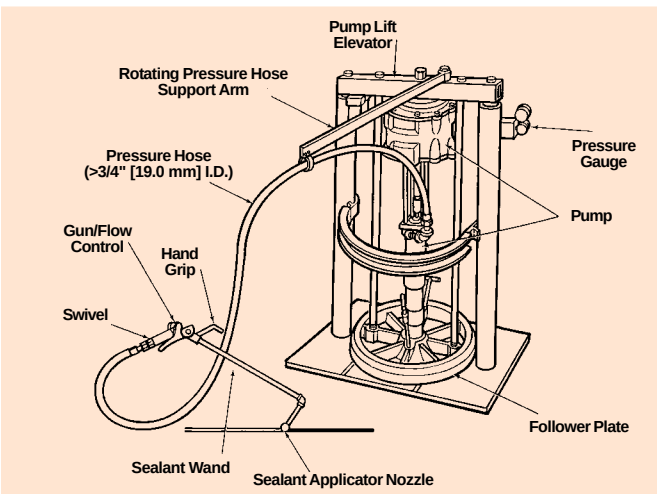
Installation Equipment

The equipment needed to install *Dow Corning* silicone pavement sealants can be manually or power operated. Powered equipment is recommended because of the speed and ease of application. Manually operated equipment can be successfully

used for small applications. Twenty-nine-ounce (858-mL) cartridges are available for activities of this type. Air-powered versions of the small, hand-held caulking guns are also available.

The major pieces of power equipment required to install *Dow Corning* silicone pavement sealants are an extrusion pump (Figure 5) to transfer the material from the container to the joint and an air compressor capable of delivering air at 60 CFM (28.3 L/s) and 100 psi (690 kPa). Complete units including air-powered pump, follower plate and hose are required for both pails and drums. For versatility, the same unit can be used for both drums and pails, provided that the system offers interchangeable follower plates.

Figure 5 – Extrusion Pump



Air-powered equipment is available with varying output capacities. The ratio of the extrusion pump and accessory components of the system, especially hose diameter, will determine output volume. Specific ratios vary among manufacturers, but a ratio of 35:1 is the minimum capable of delivering a sufficient volume of sealant for efficient operation. Selection of the pump and accessory equipment should be based on desired production rates.

A partial list of manufacturers of this equipment is shown in Table 3. They should be contacted for specific recommendations.

Table 3 – Manufacturers of Power Installation Equipment

Aro Corporation
One Aro Center
Bryan, OH 43506
(419) 636-4242

Graco, Inc.
47700 Halyard Drive
P.O. Box 8065C
Plymouth, MI 48170-2412
(734) 416-3400

Semco Sales & Service, Inc.
5454 San Fernadino Road
Glendale, CA 91203
(818) 247-7140

Two of these manufacturers have evaluated *Dow Corning* silicone pavement sealants in their facilities and their specific recommendations are shown in Table 4.

Regardless of which manufacturer's system is chosen several common equipment features will be required. *Dow Corning* silicone pavement sealants cure on exposure to atmospheric moisture, so seals and hoses should be selected that will prevent or minimize moisture permeation.

Hoses and hose connections must not only prevent moisture permeation, but must also be able to withstand pumping pressures and be tough enough to resist abrasion on the job site. Hoses lined with *Teflon*™* are recommended because their low-air and moisture permeability will provide long, trouble-free service. Other hoses, such as the BUNA-N hose, have also been found to provide satisfactory performance over an entire construction season. Nylon-lined hoses are not recommended.

Most unlined hoses allow the sealant to cure in the hose and block flow. This blockage may take several weeks to several months to form, but in extreme cases may take just 1 to 2 days, depending on the hose material, wall thickness and the temperature/humidity conditions. Regular cleaning of hoses of this type will be necessary.

**Teflon* is a registered trademark of E.I. Dupont de Nemours & Co., Inc.

All seals and packings should be made of *Teflon*. The more common neoprene, urethane and leather seals are not satisfactory, because they do not prevent moisture permeation.

Hose runs should be kept to a minimum and reasonable length to reduce pressure drops. A hose I.D. (inside diameter) of at least 3/4 inch (19.0 mm) is recommended. When longer hose runs are needed, it is suggested that a larger diameter hose (1 to 2 inch [25.4 to 50.8 mm]) be coupled with a smaller, 3/4 inch (19.0 mm) whip hose near the wand to minimize the overall pressure drop.

Daily cleanup is not needed. However, the sealant nozzle should be sealed to prevent curing.

When the equipment and hoses will not be used on a regular basis, they should be cleaned by flushing the entire system with a high-flash solvent such as xylene, *Chlorothene*™* or mineral spirits. Follow manufacturer's directions for use and handling and conform to all local, state and federal regulations. Proper eye protection should be worn. On start-up, care must be taken that these materials are completely flushed from the pump and hoses. DO NOT USE GREASE TO PURGE OR CLEAN THE PUMP.

*Trademark of The Dow Chemical Company

AV04514

Water-washing the joint

Sandblasting the joint

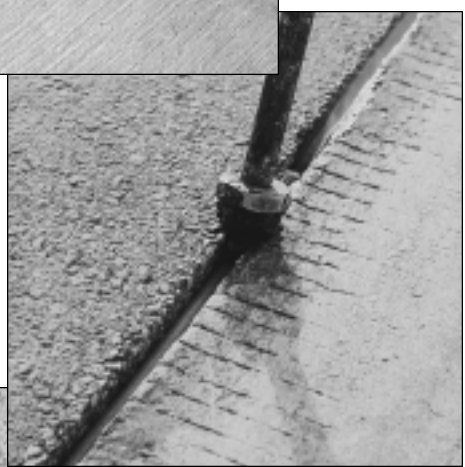
AV04515

AV04516

Air-blasting the joint

AV04517

Installing the backer rod



AV04220

Installing Dow Corning *890-SL Self-Leveling Silicone Joint Sealant*

AV04518

Tooling the Dow Corning *888 Silicone Joint Sealant*

Table 4 – Pump Manufacturers' Recommendations

GRACO, INC.

Drums: 55:1 King, *Teflon*-packed (207-568) on a double-post ram (207-279).

Pails: 40:1 Bulldog, *Teflon*-packed (206-741) on a 5-gallon (18.9-L) pail ram (206-450).

NOTE: Graco provides interchangeable follower plates for use with both drums and pails.

Hoses: 3/4-inch (19.0-mm) I.D., high-pressure, *Teflon*-lined.

NOTE: The systems above are capable of delivering sufficient material to seal a minimum of 36 ft/minute (11 m/min) of 1/2-inch (12.7-mm) wide joints. Delivery rates are affected by hose length and diameter, nozzle diameter and air pressure.

Table 5 – Manufacturers of Manual Installation Equipment

Force-Flow, Inc.
P.O. Box 24228
Cleveland, OH 44124
(216) 431-7270

Albion Engineering Co.
2080A Wheatsheaf Lane
Philadelphia, PA 19124-5091
(215) 535-3476
Fax: 1-800-841-7132

The manually operated equipment available from the manufacturers listed in Table 5 is of two types. The first is capable of extruding the sealant directly from the original pail into the joint. The second type requires the use of a bulk caulking gun. This equipment should be cleaned daily. For the 29-fl oz (858-mL) cartridges, caulking guns are available from local hardware supply houses.

Sample Specification for *Dow Corning* 888 Silicone Joint Sealant

Test Method	Test	Material Requirement
As Supplied		
ASTM D 2202	Flow, maximum	0.2
ASTM D 1475	Specific Gravity	1.450-1.515
ASTM C 1183 (Type S)	Extrusion Rate, mL/minute, minimum	50
ASTM C 679	Tack-Free Time, minutes	35-75
Upon Complete Cure		
ASTM D 2240	Durometer[1], Shore A, points	15-25
ASTM D 412, Die C	Modulus, at 150% Elongation[1], psi (kPa), maximum	45 (310)
ASTM D 412, Die C	Elongation[1], minimum	1200
ASTM D 5329[2] (Section 9, modified)	Adhesion to Concrete, minimum % elongation	500
Performance		
ASTM C 719	Movement, 10 cycles at 100/-50%	No failure
ASTM C 793	Accelerated Weathering, at 5,000 hours	No cracks, blisters or bond loss

[1]Sample cured 7 days at 77+/- 2°F (25°C+/-1°C) and 50 +/- 5% relative humidity. Proper joint design and proper joint preparation are necessary for maximum performance.

[2]With the use of appropriate spacers, a 1/2-inch x 1/2-inch x 2-inch (12.7-mm x 12.7-mm x 50.8-mm) sealant bead is placed between two 1-inch x 1-inch x 3-inch (25.-4-mm x 25.4-mm x 76.2-mm) concrete blocks. The sealant is allowed to cure for 7 days at room temperature. As soon as possible, the spacers are carefully removed, without damaging the test specimen, in order to increase cure rate.

Sample Specification for *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant

Test Method	Test	Material Requirement
As Supplied		
ASTM D 1475	Specific Gravity	1.26-1.34
ASTM C 1183 (Type S)	Extrusion Rate, mL/minute, minimum	50
CTM 0098	Skin Over Time, minutes, maximum	60
CTM 0208	Non-Volatile Content, minimum	96
Upon Complete Cure		
ASTM D 412, Die C, modified	Elongation[1], % minimum	1400
ASTM D 5329 (Section 9, modified)	Joint Modulus at 50% Elongation[1], psi (kPa), maximum	7 (49)
	Joint Modulus at 100% Elongation[1], psi (kPa), maximum	8 (56)
	Joint Modulus at 150% Elongation[1], psi (kPa), maximum	9 (62)
ASTM D 5329 (Section 9, modified)	Adhesion to Asphalt/Concrete[1], elongation	600 min
Performance		
ASTM C 719	Movement, 10 cycles at +100/-50%	No failure
ASTM C 793	Accelerated Weathering, at 5,000 hours	No cracks blisters or bond loss

[1]Sample cured 21 days at 77°+/-2°F (25+/- 1°C) and 50 +/- 5% relative humidity. Proper joint design and preparation are necessary for maximum performance.
NOTE: Specification writers should contact Dow Corning before writing specifications on this product. Dow Corning's Application Guide Specification for *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant has been written to cover many applications. For more detailed product information, please contact your local Dow Corning representative.

Questions and Answers

Q. How long will *Dow Corning* silicone joint sealants effectively seal a highway joint?

A. *Dow Corning* 888 Silicone Joint Sealant is a relatively new product and its ultimate life expectancy is still unknown. It is anticipated that when properly installed, the sealant will last from 10 to 30 years. A prototype of this sealant has been in use in Europe since 1972. Additionally, a bridge joint installed in Michigan in 1973 continues to perform. Installations in Georgia, Minnesota, Arizona, and South Dakota placed between 1976 and 1978 are still performing after 18 to 20 years. Therefore, a 10-year minimum life expectancy is not unrealistic. Weatherometer testing has shown that the material retains its elastomeric properties after as much as 30 years of simulated exposure.

Dow Corning 890-SL Self Leveling Silicone Joint Sealant is a new product, and its ultimate life expectancy is still unknown. However, since it is very similar to *Dow Corning* 888 Silicone Joint Sealant, it is expected to have the same long life.

Q. What kind of equipment is needed to install *Dow Corning* 888 Silicone Joint Sealant?

A. Basic equipment needed is: 1) an air-powered dispensing pump, and 2) a conventional air compressor. The product does not require heating, so expensive heating kettles are not needed. It also requires no mixing.

Q. Can the same equipment be used to install both *Dow Corning* silicone pavement sealants?

A. Yes. Both sealants are compatible, and no special equipment is needed to install the self-leveling sealants. However, care should be exercised to ensure that only *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant is used on asphalt.

Q. Can the same equipment be used to install *Dow Corning* silicone pavement sealants and other silicone sealants?

A. Due to possible differences in the sealant chemistry, cross contamination could cause cure inhibition. If other silicones are used, the equipment must be thoroughly flushed with solvents such as xylene or *Chlorothene* prior to using *Dow Corning* silicone pavement sealants.

Q. What is the minimum joint width that can be sealed?

A. It is recommended that joints to be sealed should be a minimum of 3/8 inch (9.53 mm) wide. A 1/4-inch (6.35-mm) joint may also be sealed, but the rate of sealing is slower. The joint width should be determined by joint spacing. It is recommended that joints to be sealed should be designed for 25 percent movement.

Q. What is the maximum joint width that can be sealed?

A. It is recommended that joints to be sealed should be no more than 2 inches (50.8 mm) wide. A Dow Corning representative should be consulted on a case-by-case basis for sealing joints wider than 2 inches (50.8 mm). The joint width should be determined by joint spacing. It is recommended that joints to be sealed should be designed for +25 percent movement. In the case of repair of asphalt, the joints must be widened enough so that all existing cracks are removed. The asphalt to be sealed must be sound.

Q. Why do you recommend designing joints for a ±25 percent movement when your literature claims that the product can perform at +100/-50 percent movement?

A. The +100/-50 percent movement values were determined under controlled laboratory conditions for comparison with other joint sealing materials. In the laboratory, the percent of movement can be precisely controlled. In the field, however, this movement is not really controlled. For example, in new construction where each joint is designed for 25 percent movement, *Dow Corning* 888 Silicone Joint Sealant will take the movement of 2 or 3 slabs working in unison (50 to 75 percent movement). Thus, the sealant provides the insurance needed when designed and actual joint movements are different.

Q. How long after resealing can the road be reopened to traffic?

A. Generally, the road may be reopened 30 minutes after sealing is complete. This allows the sealant to skin over, minimizing the possibility of dirt and stones penetrating the wet sealant.

Q. Why must *Dow Corning* 888 Silicone Joint Sealant be tooled?

A. *Dow Corning* 888 Silicone Joint Sealant is not a flowable or self-leveling sealant. Therefore, it must be tooled to ensure intimate contact with the substrate.

Q. Why does Dow Corning recommend that all silicones be recessed below the road surface?

A. By recessing the silicone sealant at least 3/8-inch (9.53-mm) below the road surface, the contact between vehicle tires and sealant is eliminated. This allows traffic to proceed almost immediately after installation by eliminating direct contact between sealant and vehicle tires, thus preventing "tracking" of uncured sealant. Since silicones are not abrasion resistant, vehicle tire contact should be eliminated.

Q. What is the most effective way to seal concrete joints where an edge has been chipped off?

A. Assuming the chipped area is small, the sealant should be installed so that it is recessed below the lowest point of the chipped area and does not come in contact with traffic.

Silicone sealants are not designed to be concrete patching materials. When the chips or spalls become large, joints should be repaired prior to sealing.

Q. How can I bid on a joint sealing job against hot pour or similar products when *Dow Corning* silicone joint sealants cost so much more?

A. The way to compete is on a cost/performance basis. For example, asphalt-based products are expected to last only 1 to 3 years compared with an expected 10-year minimum life span for silicones. This means that every 3 years the asphalt-type material will need to be replaced. Therefore, over a 10-year period, sealing and resealing with hot-pour-type products will cost more because of increased labor and material costs. Remember also, *Dow Corning* self-leveling products offer a direct savings to the contractor in the form of reduced labor costs, increased production rates and cold application method.

Q. **What federal or ASTM specifications do *Dow Corning* silicone joint sealants meet?**

A. There are presently few federal or ASTM specifications written for chemically curing joint sealants. ASTM D 5893 is currently the only national standard for silicone sealants in pavement applications. There are numerous state DOT specifications (more than 35 at last count) that have now been written for use of low modulus, high-movement-capability silicone joint sealants. In addition, test sites have been established in most of the other states and are still under evaluation. The AASHTO-AGC-ARTBA Joint Committee (Task Group 23, Subcommittee on New Highway Materials) included a discussion of silicone joint sealants in their booklet entitled "Guide Procedures for Concrete Pavement 4R Operations – I 985." Additionally, the Federal Aviation Administration has recently published the "FAA Engineering Brief Number 36 Silicone Joint Sealants." This publication approves the use of these materials in airfield situations. Both the Navy and the Air Force have written specifications to include silicone pavement joint sealants for their facilities.

Q. **Are *Dow Corning* silicone joint sealants resistant to jet fuels?**

A. Independent evaluations and field test applications have shown *Dow Corning* silicone pavement sealants will not degrade with exposure to jet fuel. Dow Corning has created a piece of literature explaining the jet fuel resistance characteristics of *Dow Corning* silicone pavement sealants (Form No. 62-207). Additionally, airfield case histories of our products are available upon request. Contact your Dow Corning representative for additional information.

Q. **Can *Dow Corning* 888 Silicone Joint Sealant be used in asphalt pavement or with asphalt shoulders?**

A. Dow Corning does not recommend use of this product in this type of situation. However, *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant is an ultra-low-modulus sealant specifically designed for use in asphalt pavements. It provides excellent performance where asphalt pavement is involved.

Q. Can a torch be used to dry previously used wet joints?

A. This technique is not recommended for two reasons. First, the torch will draw water from the bottom of the joint and give the substrate the appearance of being dry at the surface even though it is not dry throughout. Second, the carbon by-products of burning will be deposited on the joint surface, and these deposits will prevent or minimize adhesion.

Q. Can *Dow Corning* silicone pavement sealant be used with polymeric concrete?

A. Because of the variety of materials and techniques used to make polymeric concrete, there is not a single answer to this question. However, caution is recommended and each situation should be tested to determine the adhesion of the sealant to the substrate. Prior to use with polymeric concrete, please contact Dow Corning technical representatives for advice and testing.

Q. Specifications for *Dow Corning* silicone joint sealants show two values for percent elongation. What is the difference between them?

A. The tests are very different and relate elongation to different product characteristics. Elongation values obtained from Corporate Test Method (CTM) 0137A are based on ASTM D 412, which evaluates standard elastomeric properties of a small lab sample. Using *Dow Corning* 888 Silicone Joint Sealant as an example, the value of >1200 percent is the ultimate elongation when the sample tears apart, much as a rubber band would break. Elongation values are also obtained using CTM 0950A, which is based on ASTM D 3583 and tests a bead of sealant (1/2 inch x 1/2 inch x 2 inches [12.7 mm x 12.7 mm x 50.8 mm]) cured between two concrete blocks. This test evaluates sealant performance in a manner that is similar to its actual use as a highway joint seal. The value of >500 percent is obtained by pulling the blocks apart and is dependent not only on the elastomeric properties of the sealant, but also on its ability to adhere to concrete (PCC).

Q. **Why do silicones require more cleaning than other materials?**

A. Silicone sealants DO NOT require more cleaning than other materials. Good preparation techniques are a fundamental requirement for all applications (such as painting and joint sealing, etc.) that rely on the formation of an adhesive bond. Improper cleaning prevents or minimizes the contact between the substrate and the sealant, thus minimizing the life expectancy of the product.

Q. **Are all silicones alike?**

A. All silicones are NOT alike. All true silicones have certain inherent properties such as weather and UV resistance and high/low-temperature performance capabilities. Aside from these similarities, there are product differences that allow one silicone sealant to outperform another silicone sold for the same application. Because of Dow Corning's leadership in the field of silicone technology, we offer the best available product for pavement sealing requirements of all kinds.

Q. **Why is an ultra-low-modulus sealant such as *Dow Corning* 890-SL Self-Leveling Silicone Joint Sealant necessary when sealing asphalt?**

A. The sealant used to seal joints in asphalt should not have tensile strength greater than that of the asphalt. Otherwise, the asphalt will fail cohesively. It will be pulled apart by the sealant during pavement movement. The tensile strength of asphalt is typically considered to be less than 5 psi (34 kPa).

Q. **What are the advantages of the self-leveling sealants?**

A. Compared to conventional silicones (non-sag type), self-leveling sealants require NO TOOLING. This eliminates one labor-intensive step in the sealant installation. Combined with the higher extrusion rates of the self-leveling sealants, installation rates are significantly increased. Since the sealants do not require tooling, there is very little waste.

Key Word Index

Handling Precautions

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND MATERIAL SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE MATERIAL SAFETY DATA SHEET IS AVAILABLE ON THE DOW CORNING WEBSITE AT WWW.DOWCORNING.COM, OR FROM YOUR DOW CORNING REPRESENTATIVE, OR DISTRIBUTOR, OR BY CALLING YOUR GLOBAL DOW CORNING CONNECTION OR (989) 496-6000 or 1-800-322-8723.

For more information on these products, please refer to Dow Corning's technical data sheets and installation guides, or call Dow Corning Customer Service at (989) 496-6000 or 1-800-322-8723.

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