DOWSIL™ Silicone Paving Joint Sealants
Guide Specification

Silicone pavement sealants by Dow cure to form a permanently flexible, low- to ultra-low-modulus silicone rubber seal. They can withstand a high degree of movement (+100/-50 percent of the original joint width) with excellent recovery, making them ideal for sealing joints under continuous stress. Silicone pavement sealants by Dow can:

- Withstand severe horizontal and vertical concrete expansion joint movements
- Handle temperature and weather extremes
- Offer a long service life

Pavement Sealants by Dow are intended for long service life use in parking structures, parking lots, sidewalks, loading docks, pedestrian bridges, and plazas.

Application Limitations: Do not use silicone paving sealants by Dow for:

- Below-grade applications, and surfaces to be immersed in water for prolonged time
- Materials bleeding oils, plasticizers, and solvents
- Surfaces coated with bitumen-based waterproofing membrane
- Surfaces that will be painted
- Surfaces that will be treated with silane waterproofing within 14 days
- Surfaces subject to staining

To support the growing demand for innovative, high-performance and sustainable structures, Dow is continuously strengthening its suite of construction solutions and services for building professionals. Silicon-based sealants, coatings, water repellents and concrete admixtures by Dow are designed to protect, strengthen, and preserve building materials in new construction and renovation projects. For example, silicone construction sealants have a life expectancy that is typically three times longer than organic sealants used in the same applications. They waterproof, remain flexible, and resist the effects of ultraviolet (UV) light and common temperature extremes.

Dow provides industry professionals with product information, technical expertise, design tools and other resources to create total building system solutions, based on decades of construction industry expertise, technical service, support resources, and customized construction services. Dow offers:

- Information regarding using silicone to achieve LEED credits
- Downloadable product selection guides and data sheets
- Application and technology development education
- Evaluations to ensure proposed applications meet Dow standards for warrantable performance

Dow provides performance-enhancing solutions to serve the diverse needs of more than 25,000 customers worldwide. A global leader in silicones, silicon-based technology and innovation, Dow offers more than 7,000 products and services via the company's DOWSIL™ and XIAMETER™ (xiameter.com) brands. More than half Dow Consumer Solutions' annual sales are outside the United States.

We recommend you consult with your Dow construction technical representative, who can be contacted through:
The Dow Chemical Company, Midland MI; (877) SEALANT ((877) 732-5268); email: construction@dow.com;
dow.com/construction.

Products from Dow appear in the following CSI Master Format specifications sections:

- Section 07 01 91 Joint Sealant Rehabilitation and Replacement
- Section 07 92 00 Joint Sealants
- Section 08 85 00 Glazing Sealants
- Section 09 96 53 Silicone Elastomeric Coatings
- Section 32 13 73 Concrete Paving Joint Sealants

SECTION 32 13 73 – CONCRETE PAVING JOINT SEALANTS

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:

1. Silicone paving joint sealants.

B. Related Sections:

1. Section 07 18 00 "Traffic Coatings" for traffic joint sealants applied as part of a traffic coating application.
2. Section 07 92 00 "Joint Sealants" for non-traffic and traffic elastomeric joint sealants for applications other than those specified in this section.
3. Section 32 13 16 "Asphalt Paving" for formation of joints between concrete and asphalt pavement.

1.2 REFERENCE STANDARDS

Specifier: If retaining References Article, edit to include only those references included in edited section.

A. ASTM International (ASTM): www.astm.org

1. ASTM C 1193 - Standard Guide for Use of Joint Sealants.
2. ASTM C 1330 - Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
3. ASTM D 412 - Test Method for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.
4. ASTM D 2240 - Test Method for Rubber Property - Durometer Hardness.
5. ASTM D 5893/D 5893M - Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate installation of paving sealants with cleaning of paving sealant substrates and other operations that may impact installation or finished paving sealant work.

B. Preinstallation Conference: Conduct conference at Project Site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of paving sealant product specified, including:

1. Preparation instructions and recommendations.
2. Standard drawings illustrating manufacturer's recommended sealant joint profiles and dimensions applicable to Project. Indicate width, width-to-depth ration, thickness of joint sealant, and depth of recess limitations recommended by manufacturer.
3. Recommended primers and accessories.

B. Paving Sealant Schedule: Indicate paving sealant location, paving sealant type, manufacturer and product name, and color, for each application. Utilize paving sealant designations included in this Section.

C. Sample for Color Selection: For each paving sealant type.

D. Sample for Verification: For each paving sealant product, provide samples in color offered with joint sealants formed between two 6-inch- (150-mm-) long strips of material matching appearance of surfaces adjacent to joint sealants.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified applicator.

B. Manufacturer’s instructions for installation and field quality control testing.

C. Preconstruction field-adhesion test reports.

D. Field quality control adhesion test reports.

E. Warranty: Sample of special warranty.

1.6 QUALITY ASSURANCE

Specifier: Retain paragraph below when applicable to products specified in Part 2. Approved extrusion coating applicator may be able to provide enhanced warranties listed in Warranty Article below.

A. Applicator Qualifications: Experienced applicator equipped and trained for application of paving sealants required for this Project with record of successful completion of projects of similar scope.

B. Single Source Responsibility: Provide paving sealants by a single manufacturer.

C. Preconstruction Field-Adhesion Testing: Prior to installing pavement sealants, field test adhesion to joint substrates using ASTM C 1193 Method A. Verify adhesion is adequate. Modify joint preparation recommendations for failed joints and re-test. Submit written

1.7 PROJECT CONDITIONS

A. Do not install silicone sealant during inclement weather or when such conditions are expected. Allow wet surfaces to dry.

B. Do not install silicone sealants when shop conditions exceed temperature range limits or other non-standard dust or dirt conditions exist.

C. Do not install sealants when temperature is above 122 deg F (50 deg C) or below 40 deg F (4.4 deg C).

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

1.8 WARRANTY

Specifier: Verify warranty provisions for specified products. Dow typically offers warranty periods of up to 5 years for exterior silicone paving sealant materials.

A. Special Manufacturer's Warranty, General: Manufacturer's standard form in which paving sealant manufacturer agrees to furnish paving sealants to repair or replace those that demonstrate deterioration or failure within warranty period specified.

1. Warranty Period for Silicone Sealants: [5] years from date of Substantial Completion Color: [As scheduled].

B. Warranty Conditions: Special warranties exclude deterioration or failure of paving sealants due to substrate settlement resulting in stresses on paving sealants exceeding sealant manufacturer's written specifications, joint substrate deterioration, mechanical damage, or normal accumulation of dirt or other contaminants.

PART 2 – PRODUCTS

2.1 MANUFACTURER

Specifier: Retain option for substitutions below when required for project.

A. Basis-of-Design Product: Provide paving sealant products manufactured by The Dow Chemical Company, Midland MI; (877) SEALANT (877) 732-5268); email: construction@dow.com [or comparable products of other manufacturer approved by Architect in accordance with Instructions to Bidders and Division 01 General Requirements].

2.2 MATERIALS, GENERAL

A. Compatibility: Provide paving sealants and accessory materials that are compatible with joint substrates and with materials in close proximity under use conditions, as demonstrated by sealant manufacturer by testing and related experience.

B. Standard Compliance:

1. Paving sealants: Comply with ASTM D 5893 and other specified requirements for each liquid-applied paving sealant.

Specifier: ASTM D 5893 Joint Sealant Use Types that are used in reference specifications below are Type SL: Self-leveling, and Type NS: Non-sag. Dow's product data sheets provide detailed guidance on the recommended applications for these paving sealants.

2.3 SILICONE PAVING JOINT SEALANTS

Specifier: **DOWSIL™ 888 Silicone Joint Sealant** is a low-modulus silicone sealant for sealing transverse contraction and expansion joints, longitudinal, center line and shoulder joints in Portland cement concrete in new and remedial joint sealing applications. It offers fast curing (one hour tack free) with all temperature gunnability to unprimed substrates.

A. Single-Component, Nonsag, Silicone Paving Sealant **PS#**__: ASTM D 5893, Type NS

1. Basis of Design Product: **DOWSIL™ 888 Silicone Joint Sealant**.

Specifier: Below are detailed product data describing properties **DOWSIL™ 888 Silicone Joint Sealant**. If required, retain selected characteristics from the following and modify for minimum acceptable criteria:

2. Joint Movement Capability, ASTM C 719: 100/50, 10 cycles, no failure.
3. Elongation, ASTM D 412: 1200 percent, minimum.
4. Hardness, ASTM D 2240: 15 durometer Shore A, minimum
5. Volatile Organic Compound (VOC) Content: 37 g/L maximum.
6. Color: Gray.

Specifier: **DOWSIL™ 890-SL (Self-Leveling) Silicone Joint Sealant** is an ultra-low modulus sealant for sealing irregular and spalled joints in Portland cement concrete in new and remedial joint sealing applications without the need for tooling. It offers fast curing (one hour skin over time) with all temperature gunnability to unprimed substrates.

B. Single-Component, Self-Leveling, Silicone Paving Sealant **PS#**__: ASTM D 5893, Type SL.

1. Basis of Design Product: **DOWSIL™ 890-SL Silicone Joint Sealant**.
2. Joint Movement Capability, ASTM C 719: 100/50, 10 cycles, no failure.
3. Elongation, ASTM D 412: 1400 percent, minimum.
4. Hardness, ASTM D 2240: 50 durometer Shore 00, minimum
5. Volatile Organic Compound (VOC) Content: 30 g/L maximum.
6. Color: Gray.

Specifier: **DOWSIL™ 902 RCS Joint Sealant** is a self-leveling, cold-applied, rapid-cure, two-part silicone rubber sealant intended for use seal expansion joints that experience both thermal and/or vertical movements due to traffic loading, such as those found on bridges, that vary in width from 1 to 3 inches (25 to 76 mm) at the time of sealing. The substrate may be concrete/concrete, concrete/steel or steel/steel. It offers fast curing (one hour tack free or less) with wide temperature gunnability.

C. Multi-Component, Self-Leveling, Silicone Paving Sealant **PS#__**: Type SL.

1. Basis of Design Product: **DOWSIL™ 902 RCS Joint Sealant**.
2. Joint Movement Capability, ASTM C 719: 100/50, 10 cycles, no failure.
3. Elongation, ASTM D 412: 1500 percent, minimum.
4. Hardness, ASTM D 2240: 55 durometer Shore 00, minimum.
5. Color: Gray.

2.4 ACCESSORIES

A. Joint Substrate Primers: Substrate primer recommended by sealant manufacturer for application.

B. Cylindrical Sealant Backing: ASTM C 1330, Type B non-absorbent, bi-cellular material with surface skin, or Type O open-cell polyurethane with impervious skin, as recommended by sealant manufacturer for application.

C. Bond Breaker Tape: Polymer tape compatible with paving sealant materials and recommended by sealant manufacturer.

D. Masking tape: Non-staining, non-absorbent type compatible with silicone sealant and adjacent surfaces.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine joint profiles and surfaces to determine if work is ready to receive paving sealants. Verify joint dimensions are adequate for development of sealant movement capability. Proceed with paving sealant work once conditions meet sealant manufacturer's recommendations.

1. Joint Size Limitations: Comply with width, width-to-depth ration, thickness of joint sealant, and depth of recess limitations published by manufacturer for specific products.

3.2 PREPARATION

A. Joint Surface Cleaning: Clean joints not more than two hours prior to installing paving sealants using materials and methods recommended by sealant manufacturer.

1. Remove laitance, form-release agents, dust, and other contaminants.
2. Porous surfaces: Grinding, saw cutting, sand or water blast cleaning, or mechanical abrading followed by vacuum cleaning or blasting with oil-free compressed air.
3. Nonporous surfaces: Use two-cloth solvent wipe in accordance with ASTM C 1193.

Specifier: Include the following paragraph for renovation projects.

B. Rehabilitation of Existing Paving Joints: Remove existing joint sealant materials. Clean joints and remove joint sealant residue. Repair deteriorated or damaged substrates as recommended by sealant manufacturer to provide suitable substrate. Allow substrate patching materials to cure prior to application of new joint sealant.

C. Masking: Mask adjacent surfaces to prevent staining or damage by contact with sealant or primer.

D. Joint Priming: Prime joint substrates when recommended by sealant manufacturer or when indicated by preconstruction testing or experience. Apply recommended primer using sealant manufacturer's recommended application techniques.

1. Apply primer to concrete and other substrates as recommended by manufacturer or indicated as result of sealant adhesion test.
2. Apply primer with brush or clean cloth moistened with primer. Uniformly coat surface but do not saturate.
3. Allow to dry according to manufacturer's recommendations prior to sealant application.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Install sealants using methods recommended by sealant manufacturer unless more stringent requirements are indicated. Comply with recommendations in ASTM C 1193.

B. Joint Backing: Select joint backing materials recommended by sealant manufacturer to be compatible with sealant material. Install backing material at depth required to produce profile of paving sealant allowing optimal sealant movement. Install continuously without gaps, twisting, stretching, or puncturing backing material. Use gage to ensure uniform depth to achieve correct profile, coverage, and performance.

1. Install bond breaker tape over substrates when sealant backings are not used.

C. Sealant Application: Apply in continuous operation from bottom to top of joint vertically and horizontally in a single direction. Apply using adequate pressure to fill and seal joint width.

1. Use sealant-dispensing equipment to push sealant bead into opening. Fill joint opening to full and proper configuration. Apply in continuous operation. Ensure sealant fills entire joint and firmly contacts all surfaces.
2. Tool non-sag type sealants immediately with appropriately shaped tool to force sealants against joint backing and joint substrates, eliminating voids and ensuring full contact.

a. Provide concave, smooth, uniform, sealant finish. Eliminate air pockets and ensure complete contact on both sides of joint opening.
b. Tool joints with one continuous stroke.
c. Using tooling agents recommended by sealant manufacturer for application. Do not use water, soap, or alcohol to facilitate tooling.

D. Cleaning: Remove excess sealant using materials and methods approved by sealant manufacturer that will not damage joint substrate materials.

1. Remove masking tape after tooling joint without disturbing seal.
2. Remove excess sealant while still uncured.

E. Curing and Protection: Allow sealant to skin over and follow manufacturer's recommendations prior to allowing exposure to traffic. Use test specimens formed at time of sealant application to verify curing time. Prevent damage to joint sealants resulting from construction operations or other causes. Replace damaged joint sealants at time of Substantial Completion.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Perform adhesion tests in accordance with manufacturer’s instructions and with ASTM C1193, Method

1. Perform [5] tests for the first [1000 feet (300 m)] of joint length for each kind of sealant and joint substrate, and one test for each [1000 feet (300 m)] of joint length thereafter or 1 test per each floor per building elevation, minimum.
2. For sealant applied between dissimilar materials, test both sides of joint.

B. Remove sealants failing adhesion test, clean substrates, reapply sealants, and re-test. Test adjacent sealants to failed sealants.

C. Submit report of field adhesion testing indicating tests, locations, dates, results, and remedial actions taken.

END OF SECTION

Additional Specifiers Notes

Substitution Reviews: When reviewing substitution requests for other products for compliance with this specification, Dow recommends particular attention to the following issues:

Primer Requirements: Dow's experience often results in requiring priming of paving sealant substrates when other manufacturers waive priming requirements as a cost-saving provision that may benefit the contractor but not the owner.

Silicone vs. Urethane Substitutions: Organic-based urethane sealants are not a substitute for silicone technology. The limited warranty periods available for urethane sealants indicate that their expected life is significantly less than that of silicone sealants.

Coordination: Make sure you coordinate the following:

- Profile of typical joints to accept paving sealant.
- Compatibility of paving sealant chemistry with substrates in contact.
- Extent of each type of paving sealant application through drawing identification or editing of the paving sealant schedules.
- Cross-reference to applicable specification sections for paving sealant requirements written under other sections.