DOWSIL™ Glazing Sealants
Guide Specification

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.

Structural glazing and weatherproofing silicone products by Dow can contribute to building performance improvements by increasing energy performance and extending building life. When used in combination with other construction materials, use of silicones by Dow can contribute to earning LEED® (Leadership in Energy and Environmental Design) credits as administered by the U.S. Green Building Council.

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
- AIA Continuing Education programs

Working with leading architects and contractors, Dow has contributed to innovative designs such as the Solano County Government Center in Fairfield, CA, Solano County's first LEED-certified building. The building incorporates significant sustainable design/build elements, including extensive use of solar electricity and an award-winning co-generation plant. Silicone sealants by Dow complement its energy-efficient technologies with contributions to its weatherproofing and life-cycle.

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

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Elastomeric glazing sealants [including structural glazing].
2. Glazing opening weatherproofing sealants [and weather barrier transition]

B. Related Sections:

1. *Division 01 Section "Sustainable Design Requirements" for additional requirements, including LEED® product and documentation requirements.*
2. Section 07 01 91 "Joint Sealant Rehabilitation and Replacement" for renovation of exterior joint sealants.
3. Section 07 92 00 "Joint Sealants" for elastomeric weatherproofing joint sealants and interior joint sealants.
4. Section 09 96 53 "Silicone Elastomeric Coatings" for water-repelling liquid silicone elastomeric coatings for exterior surfaces.
5. Section 32 13 73 "Concrete Paving Joint Sealants" for traffic grade joint sealants for concrete paving and parking decks.

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 661 - Standard Test Method for Indentation Hardness of Elastomeric Type Sealants by Means of a Durometer
2. ASTM C 719 - Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).
3. ASTM C 920 - Specification for Elastomeric Joint Sealants.
4. ASTM C 1135 - Test Method for Determining Tensile Adhesion Properties of Structural Sealants
5. ASTM C 1184 - Standard Specification for Structural Silicone Sealants.
6. ASTM C 1193 - Standard Guide for Use of Joint Sealants.
7. ASTM C 1248 - Test Method for Staining of Porous Substrate by Joint Sealants.
8. ASTM C 1330 - Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
9. ASTM D 412 - Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
10. ASTM D 624 - Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
11. ASTM D 2240 - Standard Test Method for Rubber Property - Durometer Hardness.
12. ASTM E 283 – Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
13. ASTM E 331 - Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

B. Sealant, Waterproofing, and Restoration Institute (SWRI): www.swrionline.org

1. SWRI Validation Program.

C. *U. S. Environmental Protection Agency (EPA): www.epa.gov*

1. 40 CFR 59, Subpart D: National Volatile Organic Compound Emission Standards for Architectural Coatings.

D. *US Green Building Council (USGBC): www.usgbc.org*

1. Leadership in Energy and Environmental Design (LEED) Green Building Rating System.

1.3 ADMINISTRATIVE REQUIREMENTS

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

B. Preinstallation Conference: Conduct conference at Project Site.

1.4 ACTION SUBMITTALS

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

1. Preparation instructions and recommendations.
2. Standard drawings illustrating manufacturer's recommended sealant joint profiles and dimensions applicable to Project.

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

C. LEED Submittals:

Specifier: Retain first paragraph below for projects requiring project documentation for LEED-NC, LEED-CI, or LEED-CS

1. LEED NC Credit IEQ 4.1: Product data for sealant and sealant primers applied inside the weather envelope. Including statement of VOC content.

Specifier: Retain first paragraph below for projects requiring project documentation for LEED for Schools.

2. LEED for Schools Credit EQ 4: Laboratory test reports for sealants and sealant primers applied inside the weather envelope, documents indicating compliance with California Department of Health Services testing and product requirements "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

Specifier: Retain paragraph and subparagraph below if project includes structural sealant applications. Edit the following to reflect responsible entity for structural sealant joint design.

D. Structural Sealant Joint Design: [Provide calculations for structural bite, deadload support, glueline thickness, shear, and other parameters.] [Affidavit that drawings, specifications, and design data provided by Architect have been reviewed and are approved as acceptable application of manufacturer's structural silicone sealant and comply with manufacturer's warranty requirements.]

1. Shop Drawings: Show details of proposed sealant joints, indicating dimensions, materials, structural bite, glueline thickness, joint profile, and support framing.

E. Samples for Color Selection: For each joint sealant type.

F. Samples for Verification: For each exterior joint sealant product, for each color selected.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified applicator.

B. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.

C. Preconstruction compatibility and adhesion test reports for structural glazing.

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

E. Preconstruction field-adhesion test reports.

F. Field quality control adhesion test reports.

G. Warranty: Sample of unexecuted manufacturer and installer special warranties.

1.6 QUALITY ASSURANCE

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

B. Single Source Responsibility: Provide glazing sealants by a single manufacturer responsible for testing of Project substrates to verify compatibility and adhesion of joint sealants.

Specifier: Consult Dow representative for recommendations on the extent of preconstruction testing and number of samples required for project.

C. Preconstruction Compatibility, Staining, and Adhesion Testing: Submit [four] samples of material that will be in contact with or affect joint sealants. Test sealants with substrate materials using manufacturer's standard test method to determine requirements for joint preparation, including cleaning and priming. Test sealants with related materials to verify compatibility.

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

E. Mockups: Provide glazing sealant [and weather barrier transition] application within mockups required in other sections identical to specified sealants and installation methods.

1.7 PROJECT CONDITIONS

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

B. Do not install sealants when ambient or surface temperatures are outside of range recommended by glazing sealant manufacturer.

1.8 WARRANTY

Specifier: Coordinate Installer's warranty provisions with requirements for Contractor's period for correction of work, which is frequently extended from one year to two or more years for components of the exterior weather envelope.

A. Special Installer's Warranty: Original statement on Installer's letterhead in which Installer agrees to repair or replace joint sealants that demonstrate deterioration or failure within warranty period specified

1. Warranty Period: [Two] years from date of Substantial Completion.

Specifier: Verify warranty provisions for specified products. Dow typically offers warranty periods of up to 20 years for exterior silicone sealants materials.

Dow will issue project-specific warranties for structural sealant applications following review of glazing applications and verification that installation complies with manufacturer recommendations.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint sealant manufacturer agrees to furnish joint sealants to repair or replace those that demonstrate deterioration or failure under normal use within warranty period specified.

1. Warranty Period for Silicone Sealants: [20] years date of Substantial Completion.

C. Warranty Conditions: Special warranties exclude deterioration or failure of joint sealants in normal use due to structural movement resulting in stresses on joint 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 joint sealant products manufactured by The Dow Chemical Company, Midland MI; (877) SEALANT, (877) 732-5268; email: construction@dow.com; website: dow.com/construction, [or comparable products of other manufacturer approved by Architect in accordance with Instructions to Bidders and Division 01 General Requirements].

2.2 MATERIALS, GENERAL

Specifier: Paragraph and related subparagraphs below apply to LEED-NC, LEED-CI, and LEED-CS Credit IEQ 4.1. Primary and secondary insulating glass unit sealants and interior perimeter sealants may be considered as being located inside the weather envelope for purposes of LEED VOC categorization.

A. *VOC Content for Interior Applications: Provide sealants and sealant primers complying with the following VOC content limits per 40 CFR 59, Subpart D (EPA Method 24):*

1. *Architectural Sealants: 250 g/L.*
2. *Sealant Primers for Nonporous Substrates: 250 g/L.*
3. *Sealant Primers for Porous Substrates: 775 g/L.*

Specifier: Paragraph and related subparagraphs below apply to LEED for Schools Credit IEQ 4.

B. *Low-Emitting Sealants for Interior Applications: Provide sealants and sealant primers complying with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."*

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

D. Standard Compliance:

1. Joint Sealants: Comply with ASTM C 920 and other specified requirements for each liquid-applied joint sealant.
2. Structural Glazing Sealants: Comply with ASTM C 1184 and other specified requirements for each liquid-applied structural glazing sealant where indicated.

E. Stain Test Characteristics: Where sealants are required to be nonstaining, provide sealants tested per ASTM C 1248 as non-staining on porous joint substrates indicated for Project.

Specifier: ASTM C 920 Joint Sealant Use Types, Grades, Classes, and Uses that are used in reference specifications below are as follows:

Type S: Single component
Type M: Multi-components
Grade NS: Non-sag
Class XX: Movement capability, percent
Class XX/YY: Movement capability, percent, expansion/contraction
Exposure Use NT: Non-traffic
Substrate Use G: Glass
Substrate Use M: Mortars
Substrate Use A: Aluminum
Substrate Use O: Other

Specifier: Glazing sealants listed in the SILICONE GLAZING SEALANTS article are silicone joint sealants with varying chemistry and structural glazing performance intended for application to glass and coated aluminum within glazing assemblies. Dow's product data sheets provide detailed guidance on the recommended applications for these joint sealants.

2.3 SILICONE GLAZING SEALANTS

Specifier: Ideal for structural and non-structural glazing of glass, metal and most plastics and for adhering stiffeners to building panels, **DOWSIL™ 795 Silicone Building Sealant** is also excellent for general weatherproofing applications, including perimeter sealing of door and window framing. It is a neutral, one-part adhesive/sealant for new construction and renovation applications that cures to produce a durable and flexible seal. Compatible with two-part silicone insulating glass seals. 20-year Structural Adhesion and Weatherseal Limited Warranties available. Product complies with GSA Commercial Item Descriptions CID A-A-272A and CID A-A-1556. Volatile Organic Compound (VOC) Content: 32 g/L Maximum

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant **GS#__**: ASTM C 920, Type S, Grade NS, Class 50, Use NT; ASTM C 1184; SWRI validation.

1. Basis of Design Product: **DOWSIL™ 795 Silicone Building Sealant**.
2. Hardness, ASTM D 2240: 35 - 45 durometer Shore A, minimum.
3. Volatile Organic Compound (VOC) Content: 32 g/L maximum.
4. Staining, ASTM C 1248: None on concrete, marble, granite, limestone, and brick.
5. Color: [As scheduled] [As selected by Architect from manufacturers full line of not less than 10] [Match Architect's custom color].

Specifier: Below are detailed product data describing properties of DOWSIL™ 795 Silicone Building Sealant. If required, retain selected characteristics from the following and modify for minimum acceptable criteria:

6. Ultimate Tensile, ASTM D 412: 130 psi (0.9 MPa), at 21 day cure (Dumbbell)
7. Ultimate Tensile, ASTM C 1135: 70 psi (0.5 MPa), at 21 day cure (TA Joint)

Specifier: Designed for excellent adhesion in structural applications, including factory or field glazing, **DOWSIL™ 995 Silicone Structural Sealant** adheres to glass, reflective glass, anodized aluminum, granite and most paints, including fluoropolymer-based paints. It exhibits a medium modulus, which offers an extremely high tensile adhesion strength. Ideal for use as a glazing sealant in high-performance protective window systems that increase personal safety from flying glass. Tolerates the differential thermal and windload movements found in structural glazing applications and the severe stresses required of an impact-resistant glazing product. Product complies with GSA Commercial Item Descriptions CID A-A-272A and CID A-A-1556. Volatile Organic Compound (VOC) Content: 34 g/L maximum.

International standards: DOWSIL™ 995 Silicone Structural Sealant also meets:
Chinese National Standard GB 16776 Structural Silicone Sealant for Building
European Standard EN 13022 Glass in building. Structural sealant glazing. Assembly rules

B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant **GS#__**: ASTM C 920, Type S, Grade NS, Class 50, Use NT; ASTM C 1184; SWRI validation.

1. Basis of Design Product: **DOWSIL™ 995 Silicone Structural Sealant**.
2. Hardness, ASTM D 2240: 35 - 45 durometer Shore A, minimum.
3. Volatile Organic Compound (VOC) Content: 34 g/L maximum.
4. Color: [As scheduled] [As selected by Architect from manufacturers full line of not less than 3 colors] [Match Architect's custom color].

Specifier: Below are detailed product data describing properties of DOWSIL™ 995 Silicone Structural Sealant. If required, retain selected characteristics from the following and modify for minimum acceptable criteria:

5. Ultimate Tensile, ASTM D 412: 300 psi (2.2 MPa), at 21 day cure (Dumbbell)
6. Ultimate Tensile, ASTM C 1135: 160 psi (1.1 MPa), at 21 day cure (TA Joint)

Specifier: Designed for in-shop structural adhesive/sealant applications, such as factory glazing and curtainwall production, where fast cure is needed for rapid throughput of finished units, **DOWSIL™ 983 Structural Glazing Sealant** is a two-component, high-modulus product offering unprimed adhesion to most common construction materials. It has physical properties sufficient for structural adhesive applications, a noncorrosive by-product, excellent weatherability and durability, and recovers after repeated extensions and compressions. 20-year Structural Adhesion and Weatherseal Limited Warranties available. Volatile Organic Compound (VOC) Content: 18 g/L mixed.

C. Two-Component, Nonsag, Neutral-Curing Silicone Joint Sealant **GS#__**: ASTM C 920, Type M, Grade NS, Class 25, Use NT; ASTM C1184, Type M, Use NT.

1. Basis of Design Product: **DOWSIL™ 983 Structural Glazing Sealant**.
2. Hardness, ASTM D 2240: 35 to 45 durometer Shore A.
3. Volatile Organic Compound (VOC) Content As Mixed: 18 g/L maximum.
4. Colors: [Black] [Grey].

Specifier: Below are detailed product data describing properties of DOWSIL™ 983 Structural Glazing Sealant. If required, retain selected characteristics from the following and modify for minimum acceptable criteria:

5. Ultimate Tensile, ASTM D 412: 240 psi (1.7 MPa), at 21 Day cure (Dumbbell)
6. Ultimate Tensile, ASTM C 1135: 140 psi (1.0 MPa), at 21 Day cure (TA Joint)

Specifier: Designed for applications where fast cure is needed, **DOWSIL™121 Structural Glazing Sealant** is a two-component product offering unprimed adhesion to glass and coated aluminum. It has physical properties sufficient for structural adhesive applications, excellent weatherability and durability, and recovers after repeated extensions and compressions. It is also suited for reglazing application to existing structural sealants from Dow. 20-year Structural Adhesion and Weatherseal Limited Warranties available. Volatile Organic Compound (VOC) Content: 18 g/L mixed.

D. Two-Component, Nonsag, Neutral-Curing Silicone Joint Sealant **GS#__**: ASTM C 920, Type M, Grade NS, Class 25, Use NT; ASTM C1184, Type M, Use NT.

1. Basis of Design Product: **DOWSIL™121 Structural Glazing Sealant**.
2. Hardness, ASTM D 2240: 35 to 45 durometer Shore A
3. Volatile Organic Compound (VOC) Content As Mixed: 18 g/L maximum.
4. Colors: [Black] [Grey].

Specifier: Below are detailed product data describing properties of **DOWSIL™121 Structural Glazing Sealant**. If required, retain selected characteristics from the following and modify for minimum acceptable criteria:

5. Ultimate Tensile, ASTM D 412: 300 psi (2.4 MPa), at 7 Day cure (Dumbbell)
6. Ultimate Tensile, ASTM C 1135: 135 psi (0.93 MPa), at 7 Day cure (TA Joint)

2.4 WEATHERPROOFING LIQUID SILICONE JOINT SEALANTS

Specifier: Joint sealants listed in the EXTERIOR WEATHERPROOFING LIQUID SILICONE JOINT SEALANTS article are non-traffic-bearing, non-sag silicone joint sealants with varying chemistry intended for non-structural glazing applications such as cap seals, and for framing perimeter seal applications. These sealants are incorporated in this section as a convenience to the specifier; they are also specified in Section 079200 Joint Sealants. Dow's product data sheets provide detailed guidance on the recommended applications for these joint sealants.

Specifier: **DOWSIL™ 756 SMS Building Sealant** is a one-component, medium-modulus, neutral cure elastomeric silicone sealant suitable for weatherproofing porous stone, metal panels, curtain wall framing, and other above-grade expansion and control joints for both new and remedial construction. Volatile Organic Compound (VOC) Content: 60 g/L maximum.

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant **GS#**__: ASTM C 920, Type S, Grade NS, Class 50, Use NT; ASTM C 1184; SWRI validation.

1. Basis of Design Product: **DOWSIL™ 756 SMS Building Sealant**.
2. Hardness, ASTM D 2240: 35 durometer Shore A, minimum.
3. Volatile Organic Compound (VOC) Content: 60 g/L maximum.
4. Staining, ASTM C 1248: None on white marble.
5. Color: [As scheduled] [As selected by Architect from manufacturers full line of not less than 8] [Match Architect's custom color].

Specifier: **DOWSIL™ 791 Silicone Weatherproofing Sealant** is a one-component, medium-modulus, neutral-cure silicone sealant for general glazing and above-grade weathersealing in curtainwalls and building facades for both new and remedial construction. Product complies with GSA Commercial Item Descriptions CID A-A-272A and CID A-A-1556. Volatile Organic Compound (VOC) Content 30 g/L maximum.

B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant **JS#**__: ASTM C 920, Type S, Grade NS, Class 50, for Use NT; SWRI validation.

1. Basis of Design Product: **DOWSIL™ 791 Silicone Weatherproofing Sealant**.
2. Hardness, ASTM D 2240: 34 durometer Shore A, minimum.
3. Volatile Organic Compound (VOC) Content: 30 g/L maximum.
4. Staining, ASTM C 1248: None on concrete, granite, limestone, and brick.
5. Color: [As selected by Architect from manufacturer's full line of not less than 6 colors].

Specifier: **DOWSIL™ 795 Silicone Building Sealant** is a one-component, medium modulus, neutral-cure, RTV (room temperature vulcanizing) silicone rubber sealant for structural and non-structural glazing, structural attachment for panel systems, as well as above-grade weathersealing joints with most common constructions materials for both new and remedial construction. Product complies with GSA Commercial Item Descriptions CID A-A-272A and CID A-A-1556. Volatile Organic Compound (VOC) Content: 32 g/L maximum.

C. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant **JS#**__: ASTM C 920, Type S, Grade NS, Class 50, Use NT; SWRI validation.

1. Basis of Design Product: **DOWSIL™ 795 Silicone Building Sealant**.
2. Hardness, ASTM D 2240: 35 - 45 durometer Shore A, minimum.
3. Volatile Organic Compound (VOC) Content: 32 g/L maximum.staining, ASTM C 1248: None on concrete, granite, limestone, and brick.
4. Staining, ASTM C 1248: None on concrete, marble, granite, limestone, and brick.

5. Color: [As scheduled] [As selected by Architect from manufacturers full line of not less than 10] [Match Architect's custom color].

Specifier: Designed for excellent adhesion in structural applications, including factory or field glazing, **DOWSIL™ 995 Silicone Structural Sealant** adheres to glass, reflective glass, anodized aluminum, granite and most paints, including fluoropolymer-based paints. It exhibits a medium modulus, which offers an extremely high tensile adhesion strength. Ideal for use as a glazing sealant DOWSIL™ 995 Sealant is also frequently used as a perimeter sealant for architectural metals. Product complies with GSA Commercial Item Descriptions CID A-A-272A and CID A-A-1556. Volatile Organic Compound (VOC) Content: 34 g/L maximum.

D. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant GS#__: ASTM C 920, Type S, Grade NS, Class 50, Use NT; ASTM C1184; SWRI validation.

1. Basis of Design Product: **DOWSIL™ 995 Silicone Structural Sealant**.
2. Hardness, ASTM D 2240: 35 - 40 durometer Shore A, minimum.
3. Volatile Organic Compound (VOC) Content: 34 g/L maximum.
4. Color: [As scheduled] [As selected by Architect from manufacturers full line of not less than 3 colors] [Match Architect's custom color].

Specifier: **DOWSIL™ 999A Silicone Building & Glazing Sealant** is a one-part, weather-resistant silicone sealant formulated for a wide range of building construction applications. It is particularly effective for glazing butt and lap shear joints and sealing curtainwall and other glass, plastic and metal assemblies. It can also be factory applied as a primary seal to glass, plastic, and metal assemblies. DOWSIL™ 999A Sealant is not suitable for structural glazing. It is compatible with acrylic and polycarbonate glazing sheets and one-part DOWSIL™ silicone construction sealants. It is also compatible with most laminated glass. A 10 year general product limited warranty is available. Volatile Organic Compound (VOC) Content: 36 g/L maximum.

E. Single-Component, Nonsag, Acid-Curing Silicone Joint Sealant **GS#__**: ASTM C 920, Type S, Grade NS, Class 25, Use NT.

1. Basis of Design Product: **DOWSIL™ 999A Silicone Building & Glazing Sealant**.
2. Hardness, ASTM D 2240: 25 durometer Shore A, minimum.
3. Volatile Organic Compound (VOC) Content: 36 g/L maximum.staining, ASTM C 1248: None on concrete, marble, granite, limestone, and brick.
4. Ultimate Tensile, ASTM D 412: 325 psi (1.2 MPa) at 21 day cure (Dumbbell)
5. Color: [As scheduled] [As selected by Architect from manufacturers full line of not less than 6 colors] [Match Architect's custom color].

2.5 WEATHER BARRIER TRANSITION

Specifier**: DOWSIL™ Silicone Transition Strip (STS)** is a silicone sealant-compatible flexible membrane interface between a variety of air/vapor barrier materials and window, storefront, and curtainwall opening frames. It permanently accommodates the differential thermal movement between wall systems and metal frames, maintaining airtight- and watertight-connections necessary in high performance buildings. Coordinate with Division 07 air barrier section and Division 08 opening sections. Recommended silicone Sealants for installing STS include: DOWSIL™ 758 Silicone Weather Barrier Sealant; DOWSIL™ 791 Silicone Weatherproofing Sealant; and DOWSIL™ 795 Silicone Building Sealant.

A. Silicone Elastomer Weather Barrier Transition: Highly flexible clear flashing and transition sheet and pre-molded corners for bonding with silicone sealant to weather barrier substrates and to adjacent curtain wall, storefront, and window frames and other transition substrates.

1. Basis of Design Product: **DOWSIL™ Silicone Transition Strip (STS)**.

Specifier: Air infiltration and water penetration testing below reflects performance of DOWSIL™ STS when installed according to manufacturer's installation instructions as perimeter flashing isolated on test window unit in sheathed wall. Test report copies available from manufacturer. Volatile Organic Compound (VOC) Content: 0 g/L.

2. Air Infiltration, ASTM E 283: Maximum 0.025 cfm/sq. ft. (0.127 L/s per sq. m) at 6.24 lbf/sq. ft. (300 Pa).
3. Water Penetration under Static Pressure, ASTM E 331: None at 15 lbf/sq. ft. (720 Pa).
4. Movement Capability: Not less than plus 200, minus 75 percent.
5. Tensile Strength, ASTM D 412: Not less than 800 psi (5.5 MPa).
6. Tear Strength, ASTM D 624: Not less than 200 psi (16 kN/m).
7. Elongation, ASTM D 412: Not less than 400 percent.
8. Hardness, ASTM D 2240: 50 - 60 durometer Shore A.
9. Bonding Sealant: Manufacturer's recommended neutral-curing silicone.
10. Volatile Organic Compound (VOC) Content: 0 g/L

2.6 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, as recommended by sealant manufacturer for application.

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

D. Glazing Setting Blocks and Spacers: Inorganic type compatible with silicone sealant and recommended by sealant manufacturer.

1. Acceptable materials include silicone, alcryn, polyurethane foam tape, and vinyl extrusions.
2. Test setting blocks and spacers for compatibility prior to installation.

E. 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 joint sealants. Verify joint dimensions are adequate for development of sealant movement capability. Proceed with joint sealant work once conditions meet sealant manufacturer's recommendations.

Specifier: Include the following two paragraphs if silicone sealant is used for structural sealant applications.

B. Aluminum Framing:

1. Verify framing surfaces to receive glazing are flat and smooth without slots, serrations, and other irregularities.

Specifier: Due to graphite lubricant used in extrusion process, which affects adhesion, mill-finish aluminum is not an acceptable substrate for structural silicone sealant

2. Verify aluminum framing has alodine, anodized, fluorocarbon paint, polyester powder coat finish, or other acceptable finish or material.

3.2 PREPARATION

A. Structural Silicone Joint Design: Install sealant in joint design configuration recommended by manufacturer and as follows:

1. Glueline thickness: 1/4 inch (6 mm) minimum and not to exceed 1/2 inch (13 mm).
2. Structural Bite: 1/4 inch (6 mm) minimum and equal to or greater than glueline thickness
3. Bite-to-Glueline Ratio: 3:1 or less.
4. Design and fill joint using manufacturer's recommended sealant application procedures.

B. Joint Surface Cleaning: Clean joints prior to installing joint sealants using materials and methods recommended by sealant manufacturer.

1. Remove laitance, form-release agents, dust, and other contaminants.
2. Clean porous and nonporous surfaces utilizing chemical cleaners acceptable to sealant manufacturer.

    a. Use two-cloth solvent wipe in accordance with ASTM C 1193.

3.3 APPLICATION

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

B. 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.

C. 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 joint sealant allowing optimal sealant movement. Install 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.

D. Spacers and Setting Blocks: Install as indicated on drawings and reviewed shop drawings. Ensure joint openings and recesses are accurately sized.

E. Temporary Glass Support: Use temporary fasteners, clips, two-sided adhesive, and other means to retain glass panels while sealant is applied and allowed to cure as approved by the design professional.

F. Sealant Application: Install sealants using methods recommended by sealant manufacturer, in depths between 1/4 and 1/2 inch unless otherwise recommended for 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. Complete horizontal joints prior to vertical joints. Lap vertical sealant over horizontal joints.
2. 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.
3. Tool 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 approved by sealant manufacturer for application. Do not use water, soap, or alcohol to facilitate tooling.

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

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

H. Allow sealant to fully cure before adhesive is stressed. Use test specimens formed at time of sealant application to verify curing time. When cured, remove temporary glass supports.

I. Ensure installed sealant is not painted as part of other construction operations

3.4 WEATHER BARRIER TRANSITION APPLICATION

A. Preparation: Prepare field of weather barrier surface and surface of adjacent substrate in accordance with sealant manufacturer's written instructions. Perform field adhesion testing to determine need for application of primer. Clean surfaces to dust free, and perform solvent wipe where recommended.

B. Application: Apply bead of recommended liquid joint sealant to each side of joint in bead size recommended by manufacturer. Press transition extrusion into sealant using roller to ensure uniform and complete contact. Lap vertical and horizontal joints as indicated in manufacturer's instructions. Trim transition material. Remove excess sealant.

3.5 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Perform adhesion tests in accordance with manufacturer’s instructions and with ASTM C 1193, Method A.

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 to Architect indicating tests, locations, dates, results, and remedial actions taken.

3.6 GLAZING SEALANT SCHEDULE

A. Structural glazing adhesive joints for glazing units located within [aluminum storefront] [aluminum entrance framing] [sloped glazing assemblies] [and] [curtain wall] systems.

a. Joint Sealant: Single-component neutral-curing non-staining silicone sealant **GS#**__.
b. Joint Sealant Color: [As selected by Architect from manufacturer's full range] [Match Architect's custom color].

B. Exterior non-structural exposed joints within glazed [aluminum storefront] [aluminum entrance framing] [sloped glazing assemblies] [and] [curtain wall] systems.

1. Joint Sealant: Single-component neutral-curing non-staining silicone sealant **GS#**__.
2. Joint Sealant Color: [As selected by Architect from manufacturer's full range] [Match Architect's custom color].

C. Exterior non-structural exposed joints within glazed [aluminum storefront] [aluminum entrance framing] [sloped glazing assemblies] [and] [curtain wall] systems.

1. Joint Sealant: Single-component neutral-curing non-staining silicone sealant **GS#**__.

D. Exterior exposed perimeter joints between [aluminum storefront] [aluminum entrance framing] [sloped glazing assemblies] [and] [curtain wall] systems and adjacent materials.
1. Joint Sealant: Single-component neutral-curing non-staining silicone sealant **GS#**__.
2. Joint Sealant Color: [As selected by Architect from manufacturer's full range] [Match Architect's custom color].

END OF SECTION

Additional Specifier's 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 joint sealant substrates when other manufacturers waive priming requirements as a cost-saving provision that may benefit the contractor but not the owner.

SWRI Certification: This respected industry certification is an additional layer of Dow's quality assurance provided by an independent agency.

Laboratory Testing: Dow provides laboratory testing of joint sealants on proposed substrates when requested for a project – another quality assurance process that helps protect the long-term integrity of your building.

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 joint sealant. Special attention to perimeter joints at wall openings.
- Compatibility of joint sealant chemistry with substrates in contact. Special attention to primary and secondary insulating glass unit sealants, glass coatings, air barrier membranes and accessories.
- Extent of each type of joint sealant applications through drawing identification or editing of the joint sealant schedules.
- Cross-reference to applicable specification sections for joint sealant requirements written under other sections.
- Submittal requirements for color-matching of samples from multiple sources.