



## **DOWSIL™ Air Barrier Coatings Guide Specification**

**DOWSIL™ DefendAir 200C Silicone Liquid Applied Air and Weather Barrier** is a fluid-applied, 100% silicone elastomeric air- and weather-barrier designed to protect against air infiltration and water penetration. The vapor permeable, one component, water-based coating cures to form a flexible membrane that is impervious to water but has the ability to “breathe,” allowing water vapor to escape from inside the substrate. DOWSIL™ DefendAir 200C provides long-term air and water protection properties even when exposed to sunlight, rain, snow, or temperature extremes. It requires no primer on many substrates and cures to form a flexible membrane that can handle the normal movements of seasonal thermal expansion-contraction. DOWSIL™ DefendAir 200C offers the following advantages:

- Compatibility – fully compatible with DOWSIL™ brand Sealants, DOWSIL™ 123 Silicone Seal, DOWSIL™ Silicone Transition Strip, DOWSIL™ Silicone Transition Molded Corners, and DOWSIL™ 778 Silicone Liquid Flashing
- Ease of Installation – One-Coat installation
- Air Tight – Exceeds industry requirements
- Primerless adhesion on most substrates
- Solventless; low VOC
- Elastomeric – Accommodates building movement
- Seamless – Cured membrane is continuous and does not form seams or laps
- Nail sealability

**DOWSIL™ DefendAir 200C Silicone Liquid Applied Air and Weather Barrier** is available with a 15-year limited air barrier system warranty. For additional information, contact your Dow representative.

Dow provides a broad range of high-performance silicone sealants, preformed silicone seals, primers, and water-repellent silicone elastomeric coatings for the construction industry for both new and renovation projects. 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 by Dow 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
- Evaluations to ensure proposed applications meet Dow standards for warrantable performance
- AIA Continuing Education programs

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](mailto:construction@dow.com); [dow.com/construction](http://dow.com/construction).

Dow products 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 fluid-applied, vapor-permeable silicone air barrier assembly.
- B. Related Sections:

Specifier: If retaining optional Related Sections paragraph, edit below to correspond to Project sections.

- 1. Section 06 16 00 "Sheathing" for air barrier coating substrate.
- 2. Section 07 92 00 "Joint Sealants" for installation requirements for elastomeric joint sealants applied in conjunction with work of this Section.

## 1.2 REFERENCE STANDARDS

Specifier: If retaining this optional Reference Standards Article, edit to include only those references included in edited section.

- A. Reference Standards, General: Applicable editions of cited reference standards are those current at time of issuing of project, or edition cited in applicable building code for project.
- B. Air Barrier Association of America (ABAA): [www.airbarrier.org](http://www.airbarrier.org)
  - 1. Training and Certification Program for Air Barrier Contractors and Installers.
- C. ASTM International (ASTM): [www.astm.org](http://www.astm.org)
  - 1. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants
  - 2. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension
  - 3. ASTM D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
  - 4. ASTM D 1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection, Self Sealability Test
  - 5. ASTM D 4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
  - 6. ASTM D 4541 - Standard Test Method for Pull-Off Strength of Coatings using Portable Adhesion Testers
  - 7. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials
  - 8. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials
  - 9. ASTM E 162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source
  - 10. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
  - 11. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
  - 12. ASTM E 2178 - Standard Test Methods for Air Performance of Building Materials
  - 13. ASTM E 2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
  - 14. ASTM G 154 - Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials
- D. California Department of Health Care Services (DHCS):
  - 1. Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers

- E. Federal Government Publications: [www.epa.gov/nscep](http://www.epa.gov/nscep)
  - 1. 40 CFR 59, Subpart D-200 - National Volatile Organic Compound Emission Standards for Architectural Coatings
- F. National Fire Protection Association (NFPA): [www.nfpa.org](http://www.nfpa.org)
  - 1. NFPA 285 – Standard Fire Test Method For Evaluation Of Fire Propagation Characteristics Of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components
- G. Sealant, Waterproofing, and Restoration Institute (SWRI): [www.swrionline.org](http://www.swrionline.org) :
  - 1. SWRI Validation Program

### 1.3 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Conference: Conduct conference at Project site. Review air barrier assembly installation requirements including substrate condition inspection, testing requirements, environmental conditions, mockups, details, and scheduling and inspection of work.

### 1.4 ACTION SUBMITTALS

- A. Product Data: For specified products, including:
  - 1. Substrate preparation instructions and recommendations.
  - 2. Recommended primers and accessories
  - 3. Standard details illustrating applications of air barrier assembly products required for Project.
  - 4. Product test reports.

Specifier: Retain one of two subparagraphs below based upon LEED rating applicable to project; first subparagraph applies to LEED-NC and LEED-CS; second subparagraph applies to LEED for Schools. This LEED requirement related only to products located inside the building weather envelope; its applicability is subject to interpretation.

- B. LEED Submittals:
  - 1. Product Data for LEED-NC Credit IEQ 4.2 Low-Emitting Materials-Paints and Coatings, including printed statement of VOC content.
  - 2. Laboratory Test Reports for LEED for Schools Credit IEQ 4 Low-Emitting Materials: indicating compliance with California DHS standard.

### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified applicator.

Specifier: Retain subparagraph below if seeking ABAA certification of Project.

- 1. Provide list of ABAA-certified air barrier installation personnel performing work on Project.
- B. Preconstruction compatibility and adhesion test reports.
- C. Manufacturer's instructions for installation and field quality control testing.
- 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: Employer of experienced applicators trained by manufacturer for application of air barrier products required for this Project with record of successful completion of projects of similar scope.

Specifier: Retain subparagraph below if seeking ABAA certification of Project.

- 1. Employer of ABAA-certified air barrier installers.
- B. Mock-Up: Prior to installation of air barrier assembly, apply air barrier products [to integrated exterior wall mockup specified in Division 01 General Requirements] [to portion of wall construction designated by Architect] to verify details under product data submittals and to demonstrate tie-ins with adjoining construction, and other termination conditions, as well as application and execution specifics.
  - 1. Apply air barrier assembly to mock-up components, including back-up wall substrates, window and door frames and sills, insulation, flashing, corner condition, junctions with roof system and foundation wall, and typical penetrations and gaps, illustrating materials interfaces and seals.
  - 2. Retain mock-ups during application of the work.

## 1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to Project site in original packaging with seals unbroken, labeled with manufacturer's name, product, date of manufacture and/or use-by date, and directions for storage.
- B. Store materials in their original undamaged packages in a clean, dry, protected location at a temperature not above 90 deg F (32 deg C).

## 1.8 PROJECT CONDITIONS

- A. Do not apply air barrier products when air or substrate temperatures will be above 100 degrees F° (38 degrees).
  - 1. Allow wet substrates to dry before applying products
- B. Don not apply air barrier products when air or substrate temperatures will be above 100 deg F (38 deg C) or below 20 deg F (-6 deg C) at time of product application.

## 1.9 WARRANTY

Specifier: Dow will furnish up to a 15-year project-specific material system warranty for commercial applications of **DOWSIL™ DefendAir 200C** when properly applied as a complete system (including all related Dow transitions and sealants) by an experienced applicator in accordance with Dow's written instructions. A 10-year project specific material warranty for commercial applications of **DOWSIL™ DefendAir 200C** is available when only **DOWSIL™ DefendAir 200C** is used. Consult your Dow representative for details.

- A. Special Warranty, General: Manufacturer's standard project-specific form in which manufacturer agrees to repair or replace air barrier coatings and accessory products that demonstrate deterioration or failure within warranty period specified due to material failure under normal use. Failure includes water or air penetration through air barrier assembly.
  - 1. Warranty Period: [10 to 15] years from date of Substantial Completion.

## PART 2 – PRODUCTS

### 2.1 MANUFACTURER

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

- A. Basis-of-Design Products: Provide air barrier coatings and accessory products manufactured by The Dow Chemical Company, Midland MI; (877) SEALANT, (877) 732-5268; email: construction@dow.com; website: www.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

- A. Single Source Responsibility: Provide air barrier coatings and accessory products of a single manufacturer through a single source.

Specifier: Retain "VOC Content" paragraph for materials used inside the weatherproofing system for projects meeting LEED-NC and LEED-CS Credit IEQ 4.2 requirements or for general sustainable design requirements.

- B. VOC Content: Provide products complying with the following limits when calculated according to 40 CFR 59, Subpart D (EPA Method 24), and in accordance with VOC limitations of authorities having jurisdiction.
  - 1. Coatings: 250 g/L.
  - 2. Coating Primers: 200 g/L.
  - 3. Sealants: 250 g/L.
  - 4. Sealant Primers for Nonporous Substrates: 250 g/L.
  - 5. Sealant Primers for Porous Substrates: 775 g/L.

Specifier: Retain "Low-Emitting Materials" paragraph for materials used inside the weatherproofing system for projects meeting LEED for Schools Credit IEQ 4 requirements.

- C. Low-Emitting Materials: Provide products complying with testing and product requirements of California DHCS.

### 2.3 PERFORMANCE REQUIREMENTS

- A. Air Barrier Assembly, General: Provide air barrier assembly consisting of fluid-applied coating, molded transition strips, and liquid sealants that together perform as a continuous vapor-permeable air barrier, capable of accommodating normal structural movement, transitions between coating substrate materials, penetrations of coating substrates, and tie-ins to framed openings, waterproofing systems, and roofing systems, without deterioration or air leakage exceeding specified limits.
- B. Air-Barrier Assembly Air Leakage: Not more than 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft. (0.2 L/s x sq. m of surface area at 75 Pa) when tested according to ASTM E 2357.
- C. Allowable UV Exposure Time: Not less than 12 months.
- D. Surface-Burning Characteristics: Provide air barrier coatings that achieve flame-spread index of 25 or less and smoke-developed index of 450 or less per ASTM E 84.

Specifier: Retain "Fire Propagation Characteristics" Paragraph for projects where an NFPA 285-tested exterior wall assembly is required by authorities having jurisdiction. IBC 2012 requires wall assemblies to pass NFPA 285 testing when 1) assemblies incorporate foam plastics; 2) walls over 40 ft in height are clad with metal composite materials, high-pressure decorative laminates, or fiber-reinforced plastics; and 3) walls over 40 ft in height incorporate combustible water-resistive barriers. Verify local requirements.

- E. Fire Propagation Characteristics: Provide air barrier coatings and accessory materials that are tested for compliance with NFPA 285 when used as part of an exterior wall assembly identical to that required for Project.

1. When testing of identical wall assembly is not available, provide engineering judgment by qualified third-party testing agency acceptable to authorities having jurisdiction demonstrating equivalent compliance with requirements.

## 2.4 SILICONE AIR BARRIER ASSEMBLY

Specifier: **DOWSIL™ DefendAir 200C Silicone Air Barrier Coating** is a fluid applied, water-based, vapor-permeable, one-component elastomer treatment for above-grade application to gypsum sheathing, concrete unit masonry, and other exterior wall backup substrates. Refer to DOWSIL™ DefendAir 200C data sheet for actual test results.

- A. Air Barrier Coatings: Fluid-applied, water-based, vapor-permeable, one-component silicone elastomeric coating.
  1. Product: **DOWSIL™ DefendAir 200C Silicone Liquid-Applied Air and Weather Barrier.**
  2. Air Permeance, ASTM E 2178: Not more than 0.004 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft. (0.02 L/s x sq. m of surface area at 75-Pa).
  3. Volatile Organic Compound (VOC) Content: <19 g/L maximum.
  4. Vapor Permeance, ASTM E 96, Method A: Not less than 10 perms
  5. Ultimate Elongation, ASTM D 412: Not less than 600 percent.
  6. UV Exposure and Resistance, ASTM G 154: Not less than 5,000-hour exposure.
- B. Silicone Elastomer Weather Barrier Transition Strips: Highly-flexible clear flashing and transition sheet with pre-molded corner accessory pieces for bonding to weather barrier substrates and to adjacent curtain wall, storefront, and window frames and other transition substrates using silicone sealant.
  1. 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.

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 412: 50 - 60 durometer Shore A.
- C. Silicone Elastomer Seals: Highly flexible low-modulus flashing and transition material for bonding to substrates with silicone sealant. SWRI validated.
    1. Product: **DOWSIL™ 123 Silicone Seal.**
    2. Bonding Sealant: Manufacturer's recommended neutral-curing silicone.
    3. Hardness, ASTM D 2240: 25 durometer Shore A, minimum.
  - D. Detail Joint and Bonding Sealant: ASTM C 920, single-component, neutral-curing silicone, Grade NS, SWRI-validated, of Class indicated, compatible with adjacent materials. Provide products recommended by air barrier manufacturer for application.
    1. Class 25: Product: **DOWSIL™ 758 Silicone Weather Barrier Sealant.**
    2. Class 50: Product: **DOWSIL™ 791 Silicone Weatherproofing Sealant.**
    3. Class 50: Product: **DOWSIL™ 795 Silicone Building Sealant.**

4. Class 50: Product: **DOWSIL™ 756 SMS Building Sealant**.

E. Detail Joint and Bonding Sealant: Single-component, neutral-curing silicone, Grade NS, of Class indicated, compatible with adjacent materials. Provide products recommended by air barrier manufacturer for application.

1. Class 25: Product: **DOWSIL™ 778 Liquid Flashing**

## 2.5 ACCESSORY MATERIALS

A. Crack Fillers: Substrate manufacturer's recommended crack fillers or sealants compatible with air barrier assembly components and adjacent materials.

Specifier: **DOWSIL™ DefendAir 200C** provides adequate primer-free adhesion on most substrates. Retain "Primer" paragraph below when preconstruction testing indicates need for primer. Consult Dow product representative.

B. Primer: Air barrier coating manufacturer's recommended, factory-formulated, alkali-resistant primer compatible with substrate and adjacent materials.

Specifier: Retain "Block Filler" paragraph when required for concrete masonry unit substrate to provide smooth continuous finish to Accept air barrier coating.

C. Block Filler: Air barrier coating manufacturer's recommended latex block filler compatible with substrate and adjacent materials.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

A. Examine substrates to determine if work is ready to receive air barrier system. Verify that surfaces are clean, dry, and free of frost, dust, dirt, grease, oil, curing compounds, form release agents, laitance, efflorescence, mildew, excess alkalinity, and other conditions affecting performance of work.

1. Verify that new concrete and mortar to receive coating application has cured adequately in accordance with substrate and air barrier coating manufacturers' instructions.

**DOWSIL™ DefendAir 200C Silicone Air Barrier Coating** was developed to obtain good adhesion without primer. Depending on substrate, primer may be required to promote adhesion. Testing should be conducted to determine if primer is required. Field adhesion test is required for manufacturer's water repellent warranty.

B. Preinstallation Testing: Prior to application of air barrier coatings, perform the following tests to verify condition of substrate in accordance with manufacturer's instructions:

1. Adhesion: Perform substrate field adhesion tests on each substrate to determine if primer is required to satisfactorily adhere air barrier coatings to substrates.
2. Alkalinity: Verify substrate is within alkalinity range acceptable to manufacturer.
3. Moisture Level: Verify substrate moisture content is acceptable to manufacturer. Verify substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.

C. Proceed with air barrier coating work once conditions meet air barrier coating manufacturer's recommendations.

### 3.2 PREPARATION

A. General: Comply with air barrier coating manufacturer's written instructions for preparation of substrates. Protect work of other trades against damage from application of air barrier coatings.

- B. Cleaning: Clean substrates to remove contaminants and foreign material by pressure cleaning, wire brushing, grinding or other method recommended by air barrier coatings manufacturer.
- C. Substrate Repair: Repair deteriorated or damaged substrates, repair masonry joints, and fill cracks, voids, honeycomb, and other defects using materials as recommended in writing by air barrier coating manufacturer. Allow patching materials to cure.
  - 1. Fill cracks larger than 1/16 inch (1.6 mm) wide using joint sealant listed in Part 2. Fill cracks larger than 1 inch (25 mm) wide using joint sealant and compatible bond breaker where movement is expected.
- D. Protection: Protect adjacent surfaces not designated to receive air barrier coatings. Provide protection for pedestrians, vehicles, landscaping, and surrounding areas to prevent contact with coating materials.

Specifier: Retain "Primer" paragraph when required for project based upon preconstruction testing.

- E. Primer: Apply primer to substrates where required based upon preinstallation testing and air barrier coating manufacturer's recommendations, using application methods and rate of application recommended by manufacturer. Allow to dry prior to application of air barrier coating.

Specifier: Block filler may be required on some CMU substrates based upon coarseness of CMU finish and quality of mortar joint tooling.

- 1. Apply block filler as primer on concrete masonry unit substrates where required to fill pores and provide smooth, substrate for application of air barrier coating.

### 3.3 AIR BARRIER APPLICATION

- A. Transition Strips and Elastomer Seals: Install with approved sealants in accordance with manufacturer's written instructions.
  - 1. Form tie-in to window, storefront, and curtain wall frames, door frames, louver frames, roofing system perimeters, and at interface of other adjacent materials utilizing compatible accessory materials forming part of air barrier assembly.
  - 2. Promptly adhere laps and bonds to substrates.
- B. Air Barrier Coating: Apply air barrier coating using application methods and rate of application recommended by manufacturer. Apply using nap roller or airless sprayer, as allowed by authorities having jurisdiction.
  - 1. Provide wet application of not less than 0.030-inch (0.76 mm) thickness or more as required by substrate conditions in order to provide finished dry film thickness of not less than 0.015 inch (0.38 mm).
  - 2. Apply additional coats when required to provide uniform, continuous cured airtight and watertight film.

### 3.4 FIELD QUALITY CONTROL

- A. Owner may retain testing agency to perform the following tests:
  - 1. Verification that substrate preparation meets requirements.
  - 2. Testing and certification that coating materials comply with requirements for thickness and continuity.
  - 3. Testing of application for compliance with adhesion and film thickness requirements.
- B. If testing indicates products or work do not meet requirements, Owner may stop work and require Contractor to remove non-complying materials and materials applied over non-complying substrates, and otherwise correct application.

### 3.5 CLEANING AND PROTECTION



- A. Curing and Protection: Allow air barrier coatings to cure before exposure to traffic or other construction operations. Prevent damage to coatings resulting from construction operations or other causes. Replace damaged air barrier coatings prior to concealment behind subsequent construction.
- B. Cleaning: Remove overspray and excess material as work progresses, using materials and methods approved by manufacturer that will not damage adjacent materials.
- C. Remove temporary coverings and protection upon completion. Clean and repair adjacent surfaces damaged by air barrier coating application.

END OF SECTION

**LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY**

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that our products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent.

Dow's sole warranty is that our products will meet the sales specifications in effect at the time of shipment.

Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted.

**TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, DOW SPECIFICALLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY.**

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