How can you build a better barrier?

DOWSIL™ Silicone Air Barrier System
A silicone system for building protection
Air and moisture protection for more energy-efficient buildings

You know us. You trust us.

Meeting regulatory requirements for energy efficiency is a significant challenge that continues to grow as codes tighten and building owners demand more sustainable, near-zero-energy buildings. Traditional air barrier systems have reached their limit, struggling to meet the installation and performance needs of modern building construction.

Drawing upon more than 40 years of successful silicone weatherproofing experience, Dow offers durable and reliable solutions for airtight and watertight performance. By bringing the key benefits of silicone technology to the air and weather barrier industry, Dow offers architects and contractors an edge over incumbent technologies and the potential to outperform current air barrier industry standards.

The DOWSIL™ Silicone Air Barrier System is an air and weather barrier solution that helps to ensure energy efficiency and protection from the elements. Alleviating the shortcomings of current air barriers, this system addresses architects’ needs for high-performance building designs:

• Airtight performance exceeding industry standards
• Long-term UV resistance
• Passes NFPA 285 assembly testing
• Complete offering of compatible accessory materials
• Vapor-permeable and breathable
• One-coat spray application; may also be roller applied
• Water-based, low-VOC formulation is an excellent choice for green constructions
• Can be applied at temperatures as low as 20°F (-6°C)
• Primerless adhesion to most construction substrates
A silicone system for building protection

The DOWSIL™ Silicone Air Barrier System is a suite of fully compatible high-performance silicone technologies from Dow designed to work in concert to help protect the entire building envelope in both new construction and renovation projects.

- DEFENDAIR™ 200C Air and Weather Barrier Coating
- DEFENDAIR™ 200 Primer
- DOWSIL™ Silicone Transition System (STS)
  - DOWSIL™ Silicone Transition Strips
  - DOWSIL™ Silicone Transition Corners
- DOWSIL™ 758 Silicone Weather Barrier Sealant
- DOWSIL™ 791 Silicone Weatherproofing Sealant
- DOWSIL™ 778 Silicone Liquid Flashing
High Performance Building Solutions from Dow help you Build a Better Barrier™

Airtightness
Uncontrolled air leakage can result in increased energy use and costs. The DOWSIL™ Silicone Air Barrier System is specifically designed to help ensure the airtightness of the building envelope.

- The air infiltration rates of DEFENDAIR™ 200C Air and Weather Barrier Coating beat current industry standards, helping keep energy costs down.
- By securely adhering to challenging flashing materials and construction substrates, DOWSIL™ 758 Silicone Weather Barrier Sealant helps to ensure continuous sealing without additional penetrations from mechanical fasteners.

Temperature flexibility
DEFENDAIR™ 200C Coating offers a durable airtight seal over a wide range of temperatures. It can be installed at temperatures as low as 20°F and has a service temperature range of -20°F to 300°F. As substrates expand and contract thermally, DEFENDAIR™ 200C Coating will remain flexible – moving with the substrates while maintaining its adhesion. When complemented by its other silicone accessory components (DOWSIL™ 791 Silicone Weatherproofing Sealant, DOWSIL™ 778 Silicone Liquid Flashing and DOWSIL™ Silicone Transition System), the DOWSIL™ Silicone Air Barrier System offers exceptional flexibility and durability while maintaining an airtight building envelope.

UV resistance
Ongoing exposure to sunlight and ultraviolet (UV) radiation especially during construction delays – is a reality often faced on construction projects. Compared to organic materials, silicones offer greater UV stability, making them the right choice for applications requiring temporary – or long-term – outdoor exposure.

- DEFENDAIR™ 200C Coating remains unaffected by UV exposure, making it an excellent choice for rainscreen applications where the barrier will be exposed to UV radiation. This allows design professionals more freedom in rainscreen applications, minimizing concern about how their designs will affect the air barrier performance.
- Extended sun exposure from unanticipated construction delays will not affect the performance of DEFENDAIR™ 200C Coating. Other manufacturers caution that their air barrier should be covered within as little as 30 days; failure to do so can add costs and cause delays if the material needs to be replaced. With no limit on exposure time before the exterior cladding is installed, contractors need not worry if DEFENDAIR™ 200C Coating is left exposed.
Weatherproofing

Expanding on Dow’s successful history with weatherproofing sealants for joint sealing, our next-generation options work as a system – helping to ensure weatherproof protection throughout the building envelope.

- **DEFENDAIR™ 200C Air and Weather Barrier Coating** helps to prevent water infiltration but has the ability to “breathe.” This water-based coating dries to form a flexible membrane that is impervious to liquid water but allows moisture vapor to escape. This mitigates concerns about potential corrosion and mold growth caused by moisture trapped inside wall assemblies.

- **DOWSIL™ 791 Silicone Weatherproofing Sealant** offers robust primerless adhesion to all materials of the DOWSIL™ Silicone Air Barrier System. Together, this sealant and other DOWSIL™ materials comprise a compatible system that offers long-term durability for the building envelope.
Components of the DOWSIL™ Silicone Air Barrier System

Air and weather barrier

DEFENDAIR™ 200C Air and Weather Barrier Coating is a water-based, liquid-applied silicone air and water barrier for both renovation and new construction.

Applications:
- Suitable for use on many construction projects, including exterior sheathing, preformed panels, steel stud walls and rainscreen applications
- Adheres strongly to common wall substrates, such as DensGlass, concrete masonry units (CMU), oriented strand board (OSB), plywood and others

Features/Benefits:
- Airtight performance exceeding industry standards
- Long-term UV resistance
- Passes NFPA 285 assembly testing
- Improved shelf life
- New, aesthetically pleasing charcoal gray color
- Reduced appearance of dirt pickup
- Complete offering of compatible accessory materials
- Vapor-permeable and breathable
- One-coat spray application; may also be roller applied
- Water-based, low-VOC formulation is an excellent choice for green constructions
- Can be applied at temperatures as low as 20°F (-6°C)
- Primerless adhesion to most construction substrates

Transition system

The DOWSIL™ Silicone Transition System features high-performance precured 100 percent silicone rubber strips and corners – DOWSIL™ Silicone Transition Strips and DOWSIL™ Silicone Transition Corners.

Applications:
- Sealing transitions from curtain wall, storefront and punched windows to the façade opening
- For inboard, outboard and in-plane designs

Features/Benefits:
- Continuous airtight transition from the window to the wall
- Easy to install using Dow approved silicone sealants – no mechanical fasteners required
- In-shop or onsite installation

DEFENDAIR™ 200C Coating applies easily over construction substrates to help ensure airtight performance
Weatherproofing sealants

**DOWSIL™ 758 Silicone Weather Barrier Sealant** addresses the adhesion challenge posed by flashing materials, adhering to the most demanding substrates without need for a primer.

**Applications:**
- A sealing material for self-adhered and nonwoven spunbound weather-resistant barrier materials

**Features/Benefits:**
- Used to establish continuous, airtight protection
- Robust adhesion to a wide variety of materials, including fluid-applied air barriers, HDPE and other polyolefin materials used in sheet-applied air barriers

**DOWSIL™ 791 Silicone Weatherproofing Sealant** provides exceptional silicone weatherproofing performance.

**Applications:**
- Airtight sealing of seams and joints when using DensGlass or other sheathing material
- Perimeter sealing of windows, doors and other building penetrations

**Features/Benefits:**
- Excellent for adhering DOWSIL™ Silicone Transition System to DEFENDAIR™ 200C Air and Weather Barrier Coating
- Excellent weatherability – virtually unaffected by sunlight, rain, snow, ozone

Through cavity flashing

**DOWSIL™ 778 Silicone Liquid Flashing** is a trowel-applied compound with a long open time that helps enable a durable, weatherproofing seal at building penetrations and complex transitions.

**Applications:**
- Window and door flashing
- General purpose sealing requirements for transition details behind the exterior façade

**Features/Benefits:**
- Compatible with DEFENDAIR™ 200C Coating
- Can also be used with other weather barrier types, including self-adhering and liquid-applied membranes
- Long tooling time to facilitate workflow of prepping a whole window opening
- High durometer for abrasion resistance
- Durable, flexible silicone chemistry
- Available in a new, aesthetically pleasing charcoal gray color as well as the traditional light green color

A Dow system warranty

The DOWSIL™ Silicone Air Barrier System is backed by high-quality limited warranty protection options of up to 15 years when installed per Dow published guidelines. Shorter-term warranty protection is available for system components used separately. Contact your Dow sales representative for full details.
DEFENDAIR™ 200C Air and Weather Barrier Coating application guide
Contents

This document is intended to provide installation and field testing guidance for DEFENDAIR™ 200C Air and Weather Barrier Coating. The information contained herein is offered in good faith and is believed to be accurate. This information should not be substituted for engineering or architectural advice and is provided for your guidance only. 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 help ensure that our products are safe, effective and fully satisfactory for the intended end use.

Product descriptions

DEFENDAIR™ 200C Air and Weather Barrier Coating

DEFENDAIR™ 200C Coating is a 100 percent silicone liquid-applied air and weather barrier designed to protect against uncontrolled air infiltration and water penetration. The vapor-permeable, one-component, water-based coating dries 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. It is a one-part, water-based silicone elastomer that can be brush-, roller- or spray-applied.

The coating offers long-term protection from air infiltration and water penetration and the elements while allowing for normal movement imposed by seasonal thermal contraction and expansion. The coating maintains its air and water protection properties even when exposed to sunlight, rain, snow or temperature extremes.

DOWSIL™ Silicone Transition System

DOWSIL™ Silicone Transition System (STS) is comprised of a preformed silicone strip and molded pieces designed for flashing and transition applications to weatherproof against air and water infiltration.

DOWSIL™ 791 Silicone Weatherproofing Sealant

DOWSIL™ 791 Silicone Weatherproofing Sealant is a one-part, medium-modulus, neutral-curing silicone sealant for general weathersealing applications. Available in a wide variety of colors.

DOWSIL™ 758 Silicone Weather Barrier Sealant

DOWSIL™ 758 Silicone Weather Barrier Sealant is a neutral, one-part silicone sealant designed for adhering to low-energy surfaces common in sheet or self-adhered air and weather-resistant barriers. Available in white.

DOWSIL™ 778 Silicone Liquid Flashing

DOWSIL™ 778 Silicone Liquid Flashing is a one-part, liquid silicone flashing that can be trowel applied to weatherproof at window and door openings and other through cavity penetrations. Available in charcoal gray and light green.
UV exposure
DEFENDAIR™ 200C Air and Weather Barrier Coating does not have a limit on exposure time before being covered by the exterior cladding if applied in strict accordance with the requirements of this application guide. After the coating is installed, any delays in the construction schedule that will result in the coating being exposed longer than expected will not affect the performance of the material. Open-joint rainscreen applications where sections of the coating will remain exposed will not affect the performance of the material. When using in conjunction with DOWSIL™ silicone sealants and transition materials, most components are approved for long-term UV exposure.

Availability
DEFENDAIR™ 200C Coating is available in 4.5 gal (16.9 L) pails (44 lb [20 kg]) and 51.5 gal (195 L) drums (507 lb [230 kg]). DEFENDAIR™ 200C Coating is supplied in charcoal gray.

If a different color coating is desired, one 10-mil wet (5-mil dry) coat of DOWSIL™ AllGuard Silicone Elastomeric Coating can be applied. DOWSIL™ AllGuard Silicone Elastomeric Coating and DEFENDAIR™ 200C Coating are compatible and will adhere to each other. DEFENDAIR™ 200C Coating should be installed to the required 15-mil dry film thickness and all quality control performed before any DOWSIL™ AllGuard Silicone Elastomeric Coating is applied.

Coverage rates
Table 1. Estimated application rates\textsuperscript{(1)} (15-mil [0.38 mm] minimum dry-film thickness)

<table>
<thead>
<tr>
<th>Texture/substrate</th>
<th>Estimated rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smooth (sheathing, precast concrete)</td>
<td>45-55 ft²/gal 1.1-1.3 m²/L</td>
</tr>
<tr>
<td>Medium (plywood)</td>
<td>30-45</td>
</tr>
<tr>
<td>Coarse (CMU)</td>
<td>20-30</td>
</tr>
</tbody>
</table>

\textsuperscript{(1)} Application rates vary tremendously with porosity and degree of texture of the substrate. These values are estimated and should be confirmed at the job site prior to bidding the project.

Specific brands of the substrates (especially exterior grade sheathing) listed above may absorb more or less of the air barrier than is listed in Table 1. See the Tech Talk at the back of this guide for more information on specific substrates that have been tested. DEFENDAIR™ 200 Primer may be required for some substrates. It is available in 5-gallon (19 L), 42 lb (19.1 kg) pails. See Table 4 for information on substrate preparation.

Shelf life
DEFENDAIR™ 200C Coating has a shelf life of 12 months from the date of manufacture.

Compatibility and adhesion between DOWSIL™ products
DEFENDAIR™ 200C Coating is compatible with many DOWSIL™ sealant and precured silicone components.

Table 2. Adhesion between DEFENDAIR™ 200C Coating and DOWSIL™ sealants

<table>
<thead>
<tr>
<th>Sealant</th>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOWSIL™ 791 Silicone Weatherproofing Sealant</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DOWSIL™ 756 SMS Building Sealant</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DOWSIL™ 795 Silicone Building Sealant</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>DOWSIL™ 758 Silicone Weather Barrier Sealant</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DOWSIL™ 790 Silicone Building Sealant</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Please contact your local Dow representative for information regarding the use of DOWSIL™ products not listed here.

Application and service temperature and humidity
DEFENDAIR™ 200C Coating can be applied at ambient air temperatures between 20°F (-6°C) and 100°F (38°C). Do not apply the coating when the relative humidity is greater than 90 percent, or when there is a threat of rain within 8 hours. Reference the Tech Talk at the back of this guide for more information on damp substrate and rain applications.

There is no lower-limit temperature specifically for the substrate, but the surface must remain free of bulk water and frost. Do not apply DEFENDAIR™ 200C Air and Weather Barrier Coating to surfaces above 120°F (49°C).

DEFENDAIR™ 200C Coating has a service temperature range of -20°F to 300°F (-29°C to 149°C).
Chemical resistance

DEFENDAIR™ 200Coating has passed ASTM D543 (Alkalinity Resistance) in a solution of sodium carbonate with a pH of 12. The elongation and tensile properties of DEFENDAIR™ 200C Coating were minimally affected after being submerged in the solution for 28 days. High pH exposure will not affect the expected performance characteristics of the material. A 15-mil sample of the air and weather barrier passes ASTM D970 (Fastener Sealability) after being submerged in the pH 12 solution for 28 days.

DEFENDAIR™ 200C Coating should not be applied to cast-in-place/precast concrete that has cured for less than 28 days. Thinner applications of cementitious-based patching materials, such as, but not limited to, grouts and patch compounds, should be allowed to cure for 10 days prior to coating.

Substrate compatibility and adhesion

DEFENDAIR™ 200C Coating has been tested according to ASTM D4541 for adhesion on the substrates in Table 3. Where DEFENDAIR™ 200 Primer is not required in the table below, it optionally may be used for more robust adhesion. There are numerous other substrates that will come into contact with the air and weather barrier. Please contact your local Dow representative for information on substrates not listed here.

Table 3. Substrate adhesion: primer requirements when tested per ASTM D4541 (new substrates)

<table>
<thead>
<tr>
<th>Substrates that do NOT require primer</th>
<th>Substrates that require primer</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSB</td>
<td>Plywood*</td>
</tr>
<tr>
<td>DensGlass Gold(2)</td>
<td>Damp OSB</td>
</tr>
<tr>
<td>EZXP Sheathing</td>
<td></td>
</tr>
<tr>
<td>SECURock</td>
<td></td>
</tr>
<tr>
<td>PermaBase</td>
<td></td>
</tr>
<tr>
<td>Concrete – Small Aggregate</td>
<td></td>
</tr>
<tr>
<td>Concrete Masonry Unit</td>
<td></td>
</tr>
<tr>
<td>Stainless Steel</td>
<td></td>
</tr>
<tr>
<td>Galvanized</td>
<td></td>
</tr>
</tbody>
</table>

(2) ASTM E2357 was completed using DensGlass Gold as a substrate without DEFENDAIR™ 200 Primer.

* Results on plywood have been found to be variable. Project-specific adhesion testing is strongly recommended.

Workmanship considerations

It is important to protect adjacent surfaces and surroundings that are not to be coated with the air and weather barrier.

Application instructions

Step 1. Surface preparation and evaluation

All surfaces must be clean and free of excessive dirt, dust, oil, grease, mold, fungus, efflorescence, laitance, peeling coating and any other foreign material. Green concrete must be allowed to cure 28 days before application of DEFENDAIR™ 200C Coating. Large amounts of dust and dirt should be removed from the substrate through a light dusting of the surface using either a brush or dry cloth. If other substances are found on the substrate, refer to Table 4 for recommendations to help ensure proper cleaning and preparation of the substrate prior to coating. If other parts of the air barrier system, such as sealant, liquid flashing or precured strips, have accumulated dirt prior to the installation of the air barrier, the substrate should be cleaned using a solvent and two-cloth cleaning method.

When installing the DOWSIL™ Silicone Transition System or another window transition system as part of the air and weather barrier system, follow the recommendations of the system manufacturer. For the DOWSIL™ Silicone Transition System, clean the substrate where the sealant is to be installed using a solvent and two-cloth cleaning method. Refer to the Americas Technical Manual (Form No. 62-1112) for more information on general sealant installation recommendations.

Note: All system tests such as ASTM E2357 were performed using DOWSIL™ sealants and the DOWSIL™ Silicone Transition System and are recommended to help ensure the published system performance.

Table 4. Substrate preparation

<table>
<thead>
<tr>
<th>Surface conditions</th>
<th>Detection method</th>
<th>Removal method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efflorescence</td>
<td>Wipe with dark cloth</td>
<td>Wire brush; then clean with high-pressure water.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On stubborn deposits, mix 1 part muriatic acid (or similar) to 12 parts water, then clean with high-pressure water.</td>
</tr>
<tr>
<td>Laitance</td>
<td>Scrape with putty knife, looking for powdery material</td>
<td>Scrape with steel scraping tool followed by high-pressure water cleaning.</td>
</tr>
<tr>
<td>Mildew</td>
<td>Visual</td>
<td>Scrub with 5 percent bleach solution followed by high-pressure water cleaning.</td>
</tr>
<tr>
<td>Grease/oil</td>
<td>Visual; sprinkle water on surface</td>
<td>Trisodium phosphate (TSP) solution in hot water and high-pressure water cleaning.</td>
</tr>
<tr>
<td>Form release, curing or surface-hardening compounds</td>
<td>Visual; sprinkle water on surface</td>
<td>Must be removed by mechanical abrasion or abrasive water cleaning.</td>
</tr>
</tbody>
</table>
Step 2. Sealing joints and penetrations

Substrate joints, defects and holes

All joints between substrates or between sheets of exterior sheathing (such as those found in exterior grade gypsum or plywood sheets) should be sealed using a DOWSIL™ brand sealant as listed in Column B of Table 2. The sealant should be tooled flush to the surface. No bond breaker is required for these joints provided they are static joints (Figure 1). To reduce the amount of sealant used, a backer rod can be inserted into gaps greater than ¼ inch (6.3 mm) and sealed as a traditional sealant joint (Figure 6). Any unused nail holes as well as any countersunk or protruding nails and screws must be sealed (using the same sealant used to seal the joints) and struck flush to the surface of the substrate prior to the installation of DEFENDAIR™ 200C Air and Weather Barrier Coating. Screw and nail heads that are installed flush to the substrate and remain in the substrate do not need to be sealed separately prior to the installation of the air and weather barrier. Defects in the substrate can be repaired flush to the surface using the same sealant as used for joints and penetrations (Figure 2) or a patching material recommended by the substrate manufacturer. Cementitious patches should be allowed to cure for a minimum of 10 days prior to installing the coating.

Changes in the substrate (Figure 3) and control joints (Figure 4) should be sealed as a traditional weatherseal joint. There are five basic steps for proper joint preparation and sealant application:

1. **Clean** – Joint surfaces must be clean, dry, dust-free and frost-free.
2. **Prime** – If required, primer is applied to the clean surface(s).
3. **Pack** – Backer rod or bond breaker is applied.
4. **Seal** – Sealant such as DOWSIL™ 791 Silicone Weatherproofing Sealant is applied into the joint cavity.
5. **Tool** – Dry-tooling techniques are used to create a flush joint and to make certain the sealant has the proper configuration and fully contacts the joint walls.

Wall offsets or changes in plane can be sealed using a fillet bead of sealant (Figure 5). Bond breaker material does not need to be used unless greater than 15 percent movement is expected in the joint.

Penetrations

Gaps around penetrations should be sealed in a similar manner using a sealant listed in Table 2. To reduce the amount of sealant used, a backer rod can be inserted into gaps greater than ¼ inch (6.3 mm) and sealed as a traditional sealant joint (Figure 6). For information on fasteners installed after the air barrier, refer to page 16.
Window and door openings

Window openings must be flashed with an approved through-wall flashing material such as DOWSIL™ 778 Silicone Liquid Flashing. DOWSIL™ 778 Silicone Liquid Flashing should be trowel-applied in a 20-mil (0.63 mm) wet-film thickness for this application. Best practice is to trowel apply the liquid flashing around the entire opening. At minimum, DOWSIL™ 778 Silicone Liquid Flashing should be applied on the entire sill and a minimum of 6 inches (203.2 to 304.8 mm) up both vertical jambs. The flashing should be applied around the front corner of the sill and jambs, covering a minimum of 3 inches' (76.2 to 101.6 mm) perimeter on the face of the sheathing. The depth of the flashing into the window opening should be a minimum of 3 inches or 1 inch (76.2 to 25.4 mm) behind where the primary air and water seal is to be installed, whichever is greater.

If liquid flashing is only used at the sill and lower jambs of the opening, a 15-mil (0.38 mm) dry film thick layer of DEFENDAIR™ 200C Air and Weather Barrier Coating should then be used to flash the remainder of the jambs and the head of all openings. DEFENDAIR™ 200C Coating should always overlap the DOWSIL™ 778 Silicone Liquid Flashing by at least 1 inch (25.4 mm). When the distance between materials in the window opening (i.e., the distance between the sheathing and the window framing) is greater than 1/8 inch (3.175 mm), a bead of sealant must be used to bridge the gap.
DOWSIL™ 791 Silicone Weatherproofing Sealant can also be used in lieu of DOWSIL™ 778 Silicone Liquid Flashing in this application at a 25-mil (0.63 mm) wet-film thickness.

The sealing of window openings to the curtain wall or window system can be completed with a liquid-applied sealant (Figure 8) or DOWSIL™ Silicone Transition System (Figure 9). This step can be completed before or after DEFENDAIR™ 200C Air and Weather Barrier Coating is installed. When the DOWSIL™ Silicone Transition System is installed after the air and weather barrier, DEFENDAIR™ 200C Coating should be allowed to dry for a minimum of 48 hours before the DOWSIL™ Silicone Transition System is installed. A primer is not required when one of the recommended sealants in Table 2, Column A is used to adhere the DOWSIL™ Silicone Transition System to DEFENDAIR™ 200C Coating.

It is important to seal the absolute edge of the DOWSIL™ Silicone Transition System. This most often requires a second line of sealant to be applied along the edge of the strip after it has been initially installed. This additional step will help ensure that no area of the substrate is left exposed once the air and weather barrier is installed and will help to prevent unwanted water penetration into the system.

For more information on detailing window openings, reference the Tech Talk section of this guide.

Example of flashing at window opening

**Figure 8. Curtain wall jamb at flush condition – DEFENDAIR™ 200C Coating**

- Continuous bead of DOWSIL™ 791 Silicone Weatherproofing Sealant with backer rod as air seal between window frame and membrane flashing
- Provide finished GWB edge
- Exterior insulation – two layers staggered to minimize gap in thermal barrier
- Metal closure flashing
- DEFENDAIR™ 200C Air and Weather Barrier Coating lapped over flashing coat min. 1”
- Apply DOWSIL™ 778 Silicone Liquid Flashing or DEFENDAIR™ 200C Air and Weather Barrier Coating with DOWSIL™ 778 Silicone Liquid Flashing at air only, extending up jambs 6” and 3” onto face of sheathing
- Continuous bead of DOWSIL™ 791 Silicone Weatherproofing Sealant with backer rod
- Exterior insulation – two layers staggered to minimize gap in thermal barrier

**Figure 9. Curtain wall jamb at flush condition – STS flashing**

- Exterior insulation – two layers staggered to minimize gap in thermal barrier
- Continuous DOWSIL™ 791 Silicone Weatherproofing Sealant along edge of STS
- Continuous bead of DOWSIL™ 791 Silicone Weatherproofing Sealant with backer rod
- Exterior insulation – two layers staggered to minimize gap in thermal barrier
- Close flashing as required

Example of using DOWSIL™ 778 Silicone Liquid Flashing
Foundation and roof transitions

Foundation and roof transitions are best sealed using the DOWSIL™ Silicone Transition System. When installing the DOWSIL™ Silicone Transition System, it is important to choose a sealant that adheres well to the substrate(s). In the case of most roofing and foundation membranes, the recommended sealant is DOWSIL™ 758 Silicone Weather Barrier Sealant. See Figures 10 and 11. A fillet bead of DOWSIL™ 758 Silicone Weather Barrier Sealant may be adequate to bridge the transition between the air barrier and the foundation or roof membrane. A minimum 1 inch sealant bite on both substrates and ⅛ inch sealant thickness is recommended. DEFENDAIR™ 200C Air and Weather Barrier Coating is not approved to transition to other membranes without use of a sealant or precured strip.

Example of bridging from below grade waterproofing to air barrier using DOWSIL™ 758 Silicone Weather Barrier Sealant

Figure 10. Stud wall to concrete wall

Figure 11. DOWSIL™ Silicone Transition System at parapet
**Step 3. DEFENDAIR™ 200 Primer**

DEFENDAIR™ 200C Air and Weather Barrier Coating does not require a primer on most substrates. Refer to Table 2 for primer recommendations for common substrates. To determine if primer is required on other materials or on substrates that may have been contaminated by other substances, it is recommended to perform a project-specific adhesion test. The procedure for this test can be found in the “Adhesion Test Procedure” section of this guide (page 17).

When required, DEFENDAIR™ 200 Primer is applied in one coat using either a ½- to ¾-inch (13 to 19 mm) nap roller or an airless sprayer. The primer should only be installed when temperatures are above 20°F (-6°C) and when there is no chance of rain within four hours. The expected coverage rate of DEFENDAIR™ 200 Primer is approximately 300 square feet per gallon (7.4 square meters per liter).

Allow the primer to “dry to the touch” (30 minutes to two hours) before applying DEFENDAIR™ 200C Coating. After priming, before installing the air and weather barrier, the spray equipment should be fully cleaned or a new roller used.

**Step 4. Installing DEFENDAIR™ 200C Coating**

DEFENDAIR™ 200C Coating must be applied to a minimum total 15-mil (0.38 mm) dry-film thickness on the surface of the substrate (approximately 30-mil (0.76 mm) wet-film thickness) to attain air and water tightness and to qualify for a project-specific warranty. (See the “Coverage Rates” section on page 9 of this guide for more information.) DEFENDAIR™ 200C Coating can be applied using a brush, roller (hand or power) or airless sprayer.

Prior to installing DEFENDAIR™ 200C Coating, it is important that all sealants and primers that have been installed during the wall preparation process are allowed to “dry to touch” (15-30 minutes for sealant and 30 minutes to two hours for DEFENDAIR™ 200 Primer). Apply one coat of material around all penetrations and openings prior to the installation of the air barrier on the entire surface. This will help ensure complete coverage of these details. DEFENDAIR™ 200C Coating should overlap the liquid flashing and all window opening detailing by a minimum of 1 inch (25.4 mm).

Do not thin or cut back DEFENDAIR™ 200C Coating. Allow the coating to dry to the touch (typically two to four hours) before applying a second coat.

**Power roller application**

Apply DEFENDAIR™ 200C Coating using a ½- to 1½-inch (12.7 to 38 mm) nap, polyester or 50/50 polyester/wool blend roller cover. The coating should be applied in two 15- to 18-mil (0.38 to 0.46 mm) wet-thickness coats. Typically, two 15- to 18-mil (0.38 to 0.46 mm) wet coats will result in the required 15-mil dry-coating thickness; however, thicker coats may be required depending on surface texture or porosity. Up to a 25-mil (0.63 mm) wet-thickness coat can be applied in one pass using a power roller.

A low air pressure is needed to pump the material to the roller head. Pull the application trigger often to apply more material to the roller. There is too much material being applied in one coat when the roller slides instead of rolling.

Allow the coating to dry to the touch (typically two to four hours) before applying a second coat.

**Spray application**

DEFENDAIR™ 200C Coating can be installed on most substrates, in one 30-mil (0.76 mm) wet coat using an airless sprayer. Two 18- to 20-mil (0.46 to 0.51 mm) wet coats may be required to achieve the required thickness on some extremely porous substrates. There is no maximum installation thickness for DEFENDAIR™ 200C Coating, but the air barrier will start to sag when approximately 60- mil (1.52 mm) wet-film thickness is achieved in one coat. (For information on how the applied thickness of DEFENDAIR™ 200C Coating affects the vapor permeability of the air barrier, please see the Tech Talk section of this manual.)

Refer to the equipment manual for your spray equipment for detailed information on tip size selection, tip wear and optimal pressure. A minimum of 0.021-inch (0.53 mm) tip is recommended to spray DEFENDAIR™ 200C Coating. The optimal tip sizes range from 0.025 inch to 0.031 inch (0.63 mm to 0.79 mm). The larger the tip size, the more pressure will be required to spray the material – and the faster the application of the air and weather barrier. Ensure that your spray equipment is able to accommodate the tip size you wish to use before starting the application.

When spraying DEFENDAIR™ 200C Coating, start with a low pressure and increase the pressure until a uniform pattern is sprayed. Increase the size of the tip if more material is desired. As the tip wears, the pressure on the sprayer will need to be increased to...
maintain an even application of material. If the air and weather barrier begins to exhibit pinholing or fisheyes, reduce the pressure of the sprayer and/or move the sprayer head farther away from the substrate.

A respirator is not required when spraying DEFENDAIR™ 200C Air and Weather Barrier Coating. Personal preference may be to wear a mask.

**Drying time**

After the final coat of the air barrier has been applied, the average drying time of DEFENDAIR™ 200C Coating is four to 12 hours, depending on coat thickness, temperature, humidity and wind conditions. DEFENDAIR™ 200C Coating will attain full adhesion and physical properties in seven to 14 days.

**Cold temperature considerations**

DEFENDAIR™ 200C Coating can be applied at temperatures as low as 20°F (-6°C). If temperatures drop below 20°F (-6°C) after DEFENDAIR™ 200C Coating is applied, the coating will freeze on the surface until the temperature increases. This will not affect the cured properties of the air barrier but will extend the drying time. DEFENDAIR™ 200C Coating requires temperatures higher than 20°F (-6°C) for a cumulative total of 24 hours to dry. DEFENDAIR™ 200C Coating will attain full adhesion and physical properties in seven to 14 days.

Roller application of the air barrier at low temperature will require two coats. The air barrier should “dry to touch,” not simply freeze, between coats. Application equipment such as rollers and the tips of spraying equipment should be kept above 32°F (0°C) when not in use. When the temperatures are consistently below 40°F (4°C), allow the air barrier to dry a minimum of three days prior to applying other materials to the surface of the air barrier.

**Fasteners installed after air barrier**

DEFENDAIR™ 200C Coating successfully passes ASTM D1970 for Nail Sealability when applied at 15 mils. In addition, DEFENDAIR™ 200C Coating has been tested in full wall assemblies with a number of different fasteners installed through the air barrier for air infiltration (ASTM E283) and water infiltration (ASTM E330) both before and after structural loading (ASTM E331). This testing included fasteners that were installed through panel furring strips and through foam insulation. None of the fasteners tested affected the air leakage rate of the wall assembly. The following recommendations are for maintaining a watertight building envelope.

All fasteners with a diameter less than ¼ inch (6.4 mm) passed this testing without any extra preparation or post-sealing. For fasteners greater than ¼ inch (6.4 mm) in diameter, some pre- or post-sealing of the fastener was required. The best practice for larger fasteners is to tool a thin layer (25 mils [0.64 mm]) of sealant onto the air barrier prior to installation of fastener (see Table 2, Column B for options). The fastener can be installed at any time after the sealant. The amount of cure of the sealant does not affect the performance. This method worked for all fasteners tested, but other options may be available for specific hardware. For detailed preparation recommendations for the specific fasteners tested, refer to the Tech Talk section of this manual.

If fasteners miss the stud during installation, best practice is to remove the fastener from the wall and seal the hole with a sealant from Table 2, Column B.

**Quality control**

Wet-film thickness can be measured using a wet mil gauge. When measuring the thickness of DEFENDAIR™ 200C Coating that has been installed on porous substrates, wait five minutes before measuring the coating thickness. This measures the amount of material that remains on the surface of the substrate, after any material has been absorbed. Document the location and thickness from the testing in a quality control form (an example can be found in the Tech Talk section). Wet-film thicknesses should be measured on every floor and elevation to help ensure proper air barrier thickness is being applied. As a guideline, measure at least every 10 feet during application.

At the beginning of the project, it is recommended to measure the dry film thickness of the air barrier in the same area as where the wet-film thickness was measured. This will determine the actual absorption rate of the air barrier into the project substrate. A full 15-mil (0.38 mm) dry thickness must remain on the surface of the substrate.

At least one day after the air barrier is applied, visual inspection should be performed on the entire wall area that has been coated to assess that the wall has an adequate coating thickness. Any areas where the text on the underlying sheathing is visible, there is insufficient air barrier material and an additional coat of DEFENDAIR™ 200C Coating should be applied. The visual assessment should also look at seams between sheathing panels, mortar joints and screw heads to help ensure that they have all been covered. After DEFENDAIR™ 200C Coating has been installed and allowed to dry, the charcoal gray color of the coating allows joints and deficiencies in the substrate that were not sealed before or during the application of the air and weather barrier to become visible. Screw heads and joints that did not receive enough material...
can be sealed over the air barrier using DOWSIL™ 791 Silicone Weatherproofing Sealant or another sealant found in Column B of Table 2 or by touching up the area with DEFENDAIR™ 200C Air and Weather Barrier Coating.

Equipment cleanup
DEFENDAIR™ 200C Coating is a water-based material. Any equipment that is used to install the air and weather barrier can be cleaned using water; no solvents are required. Spray equipment can be cleaned by running water through the sprayer. It is recommended to clean the equipment at least every five working days. If a longer period between cleanings is needed, sprayability of the material should be verified by the contractor.

Disposal
See the Material Safety Data Sheet (MSDS) for disposal information.

Adhesion test procedure
For uncommon materials or substrates that may have been contaminated by other materials, it is recommended an adhesion test be performed to determine whether a primer is required.

The most reliable method for testing adhesion of an air barrier to a substrate is to follow ASTM D4541. This test requires the use of specialized equipment and a metal loading fixture (dolly) to be adhered to the air barrier (Figure 12). Loctite Hysol 907 adhesive can be used to adhere the dolly to DEFENDAIR™ 200C Coating. Current air barrier standards state that the air barrier should have an adhesive strength of greater than 16 psi (110 kPa).

Another option available for adhesion testing is to perform a “cheesecloth” test (Figure 13). This test is ideal for concrete and masonry substrates. Some substrates, especially gypsum sheathing, may produce a false-negative result when using this test method.

1. Prepare surfaces as described in the section on Substrate Preparation and Evaluation (page 10).
2. Use of a primer is optional, but testing is required to help ensure sufficient adhesion in primerless applications. If primer is used, apply per the application method and allow it to dry.
3. Apply the first coat of DEFENDAIR™ 200C Coating at a rate of 15-mil (0.38 mm) wet-film thickness. Embed a cheesecloth strip (1 x 12 inch [25 x 305 mm]) in the wet coating with a paintbrush.
4. Apply the second coat over the cheesecloth at the same 15-mil (0.38 mm) wet-film thickness and allow to fully dry for seven to 14 days. This is an adhesion test only; additional coats may be required to achieve thickness requirements.
5. Test adhesion of the coating by pulling the uncoated part of the cheesecloth at a 180° angle at a slow, steady rate.
6. Inspect and note the percent cohesive failure (percentage of coating material left on the wall surface). At least 80 percent of the coating should remain on the substrate.
7. If 80 percent retention is not achieved, the test should be repeated using DEFENDAIR™ 200 Primer. If necessary, contact Dow Technical Service for further instruction.

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Figure 12. Adhesion test using ASTM D4541

Figure 13. Adhesion test procedure diagram

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Post application inspection shows sheathing joint not properly sealed. Reseal with sealant.
Product limitations
DEFENDAIR™ 200C Air and Weather Barrier Coating is not designed for use on horizontal surfaces or in below-grade applications.
DEFENDAIR™ 200C Coating should not be installed on newly applied or green cementitious materials; industry guidelines recommend at least 28 days of cure before painting or coating the substrates.
DEFENDAIR™ 200C Coating does not adhere to high-density polyethylene-backed materials. When using these materials in conjunction with DEFENDAIR™ 200C Coating, please contact Dow for assistance.

Appendix I – Material compatibility
DEFENDAIR™ 200C Coating has been tested with a selection of materials offered by other manufacturers in the industry. For information on compatibility with the materials provided by other manufacturers, please contact your local Dow representative. Project-specific testing typically is recommended. Please reference the Tech Talk section on page 47 for more information on material compatibility.

Appendix II – Referenced ASTM standards
ASTM E2178 Standard Test Method for Air Permeance of Building Materials
ASTM E2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
ASTM E283 Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

Health and environmental information
To support customers in their product safety needs, Dow has an extensive Product Stewardship organization and a team of Product Safety and Regulatory Compliance (PS&RC) specialists available in each area.

For further information, please see our website, dow.com/construction, or consult your local Dow representative.
DOWSIL™ Silicone Transition System application guide
The DOWSIL™ Silicone Transition System (STS) is a flexible solution for sealing transitions from curtain wall, storefront and punched windows to the façade opening. It can be installed with inboard, outboard and in-plane designs, as Figures 15 through 23 illustrate.

The silicone strip may be installed in-shop or in the field, depending on the desired sequence of installation.

The information contained herein is offered in good faith and is believed to be accurate. This information should not be substituted for engineering or architectural advice and is provided for your guidance only. 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 help ensure that our products are safe, effective and fully satisfactory for the intended end use.
In-Shop

Installation of strip

For in-shop installations, Dow recommends attaching the strip to the mullion using DOWSIL™ 791 Silicone Weatherproofing Sealant or DOWSIL™ 795 Silicone Building Sealant. Other sealants (DOWSIL™ 756 SMS Building Sealant, DOWSIL™ 758 Silicone Weather Barrier Sealant or DOWSIL™ 983 Structural Glazing Sealant) may be used, but generally DOWSIL™ 791 Silicone Weatherproofing Sealant and DOWSIL™ 795 Silicone Building Sealant are the products on hand. For best air infiltration and water penetration results, Dow recommends two strips of silicone be used for the attachment. Clean the mullion using the two-rag wipe method and solvent. Apply two parallel beads of sealant ¼ inch to ⅜ inch (6 to 9 mm) in diameter to either the strip or the mullion, and then press the silicone strip to the mullion. The compressed bead width should be ½ inch (13 mm) or larger and can be visually checked by viewing through the translucent strip. It has been found that two beads help to eliminate any air infiltration through areas that may not be completely wetted out using hand pressure. A single bead of sealant may be used when there is insufficient space for two beads and full contact can be assured.

Corners may also be installed in-shop. When shop-installed, two beads of sealant (or one ensuring full contact) should be applied using the techniques previously mentioned. Corners shall be installed such that reverse lapping is avoided once the unit is installed.

This is most readily accomplished by installing the sill corners first; then the vertical DOWSIL™ Silicone Transition Strip pieces will lie over the corners. The head corners can then be installed lapping over the vertical strip pieces, achieving the appropriate shingling. However, this order can be changed provided the appropriate pieces are laid over/under as needed to avoid reverse lapping.

Figure 1: Corner piece installed

System considerations

When installing the strip – and corners if applicable – it may be found that a mechanical fastener is desired to keep the strip in place when moving units in the shop before sealant has cured. A screw can be punched through the strip, sealed over by installing a dollop of sealant over the screw head and tooling the sealant over the screw head. It is critical for air infiltration performance that any area where a mechanical fastener is used be completely covered with sealant, and the sealant must be tooled over the fastener.

When the fenestration unit is taken to the field, the opposing edge of the strip and corner are attached to the building façade using two strips of sealant. If the free edge is being attached to an air barrier, which would be expected (dependent on sequence of trades), the appropriate sealant for adhering to the air barrier should be chosen. When adhering to DEFENDAIR™ 200C Air and Weather Barrier Coating, DOWSIL™ 791 Silicone Weatherproofing Sealant is an excellent sealant choice. When adhering to other air barriers, particularly self-adhered membranes with a polyethylene facing and spun bound polyolefin sheet membranes, DOWSIL™ 758 Silicone Weather Barrier Sealant is the preferred sealant because of its adhesive properties to low energy surfaces. Depending on the substrate, be it an air barrier or other building material, alternate sealants may be used. A method for identifying a DOWSIL™ brand sealant with suitable adhesion is described in the following section. Additionally Dow can be contacted for guidance at dow.com/construction.

Once the appropriate sealant has been identified, clean the air barrier surface using a solvent and gentle two-rag wipe so as not to burnish the surface of the air barrier.

Apply two parallel beads of sealant of ¼ inch to ⅜ inch in diameter to the surface. Press the silicone strip to the surface. The compressed bead width should be ½ inch or larger, and it can be visually checked by viewing through the translucent strip. It has been found that two beads help in eliminating any air infiltration through areas that may not be completely wetted out using hand pressure.

If a roller is used and full contact can be assured, a single bead of sealant may be used.

For best air infiltration and water penetration performance, it is critical to install and tool sealant at every lap edge of the strip and every lap transition between pieces of the strip, or between strip and corners (Figure 4).
Peel-in-adhesion test procedure (tab adhesion)

DOWSIL™ Silicone Transition System is to be installed using a sealant that adheres to the substrates the STS is being applied to. As previously noted, many sealants may function as the STS adhesive. In order to determine which sealant to use for STS installation, establishing the sealants’ adhesion to the substrates is important. A simple screening test can be done on a flat test surface. A test piece like that shown in Figure 3 is recommended.

1. Clean and prime the surface following the project-specific recommendations.
2. Place a piece of polyethylene sheet or bond breaker tape across the flat test surface.
3. Apply a bead of sealant and tool it to form a strip approximately 7.8 inches (200 mm) long, 1 inch (25 mm) wide and ⅛ inch (3 mm) thick. At least 2 inches (50 mm) of the sealant should be applied over the polyethylene sheet or bond breaker tape.
4. After allowing the sealant to cure, pull the free tab up and away at 180 degrees.
5. Pass/Fail criteria can be found in the Dow Americas Technical Manual; however, a sealant that easily (with little extension) releases adhesively from the substrate may indicate inadequate adhesion.

If the entire STS strip assembly is desired to be tested, the sealant adhering the strip can be undercut and the strip pulled on. This is a very inexact test to perform, particularly on sheathing, as the facing of the sheathing many times separates and the sealant and STS do not end up being directly tested (see Figure 3). A potential problem could be detected in this way, however, if the sealant and strip were observed to easily release from the substrate when pulled on. Please note when adhering STS to DEFENDAIR™ 200C Air and Weather Barrier Coating, the assembly must cure a minimum of seven days before testing it.

Field installation

For field installation, the same guidelines apply, but the order of installation is reversed, adhering the STS to the air barrier first, then to the mullion.

Installation of strip

For field installations, Dow recommends attaching the strip to the building surface (generally an air barrier) with DOWSIL™ 758 Silicone Weather Barrier Sealant. Depending on the air barrier surface, other sealants may be used (please consult Dow for guidance as needed at dow.com/construction). Field adhesion testing by “tab adhesion” should be completed prior to installing the DOWSIL™ Silicone Transition System (Figure 3). Once the appropriate sealant has been identified, clean the air barrier surface using a solvent and gentle two-rag wipe, so as not to burnish the surface of the air barrier. Apply two parallel beads of sealant of ¼ inch to ⅜ inch (6 to 9 mm) in diameter to the surface, and then press the silicone strip to the surface. The compressed bead width should be ½ inch (13 mm) or larger, and it can be visually assessed by viewing through the translucent strip.

It has been found that two beads help in mitigating any air infiltration through areas that may not be completely wetted out using hand pressure. Provided full contact can be assured, a single bead of sealant may be used. For best air infiltration and water penetration performance, it is recommended to install and tool sealant at every lap edge of the strip and every lap transition between pieces of the strip, or between strip and corners (Figures 5 and 6). The free edge can be folded and kept out of the way of window installation by folding the flaps into the building and taping them down, if needed.

When a strip is hung vertically, it has been found that 10 to 15 foot vertical runs can be attached with sealant without slump. Longer runs may be possible but may require one mechanical fastener at the top to hold the strip in place. Sealant should be tooled over any mechanical fasteners. It has been found that one floor at a time is most feasible for installation.
Openings also may be “wrapped” with the DOWSIL™ Silicone Transition System prior to the fenestration unit installation, meaning the DOWSIL™ Silicone Transition System would run vertically and horizontally around the opening (Figure 7). Using this method, it is recommended that the splice joints be located at the mid span of the fenestration unit opening, at least 12 inches (300 mm) away from a corner (Figure 8). At sills, the strip may be attached with sealant only. At head conditions, the strip, depending on the width being used and length of the run, may be attached with sealant only (Figure 9). If the strip begins to sag, use a mechanical fastener to hold it in place. Ensure there is sealant under the mechanical fastener and also applied over the fastener and tooled.

When installing the strip – and corners if applicable – it may be found that to keep the strip in place, a mechanical fastener is desired. A screw can be used to punch through the strip and then sealed over by installing a dollop of sealant over the screw head and mechanically tooling the sealant over the screw head. It is critical for air infiltration performance that any area in which a mechanical fastener is used be completely covered with sealant, and the sealant must be tooled over the fastener (Figure 10).

Figure 7: DOWSIL™ Silicone Transition System-wrapped opening

Figure 8: Keep splices a minimum of at least 12 inches (300 mm) from corner

Figure 9: Installing strip at head of fenestration unit using sealant

Figure 10: Mechanical fasteners may be used with DOWSIL™ Silicone Transition System (sealant also must be applied over this fastener and tooled)
Installation of corners

Molded corners may be difficult to use in field installations depending on sequence of construction. If the exterior façade material is already in place at the time the opening is wrapped with the DOWSIL™ Silicone Transition System, the corner may not have sufficient building face available to adhere to. In these cases, the strip (installed in the opening) can be spliced and folded around the corner and attached to the fenestration unit using sealant. It is critical to apply sealant at every splice joint and ensure full sealant contact at least ½ inch (13 mm) to either side of the splice and along the entire length of the splice (Figures 11 and 12).

When the exterior façade material is not yet in place, molded corners may be installed at the opening before the fenestration unit is installed. Sealant should be applied using the cleaning and installation techniques previously described; it is critical to seal the lap joints between the DOWSIL™ Silicone Transition System strip and molded corner as shown in Figure 4.

Corners shall be installed such that reverse lapping once the unit is installed is avoided. This is most easily accomplished by installing the sill corners first; then the vertical DOWSIL™ Silicone Transition Strip pieces will lie over the corners. The head corners can then be installed lapping over the vertical strip pieces, achieving the appropriate shingling. However, this order can be changed provided the appropriate pieces are laid over/under as needed to avoid reverse lapping.

System considerations

Once the fenestration unit is installed in the field, the opposing edge of the strip and corner are attached to the mullion using silicone sealant. Dow recommends attaching the strip to the mullion using DOWSIL™ 791 Silicone Weatherproofing Sealant or DOWSIL™ 795 Silicone Building Sealant. Other sealants (DOWSIL™ 756 SMS Building Sealant or DOWSIL™ 758 Silicone Weather Barrier Sealant) may be used. For best air infiltration results, Dow recommends two strips of silicone sealant be used for the attachment. Clean the mullion using the two-rag wipe method and solvent. Apply two parallel beads of sealant of ¼ inch to ⅜ inch (6 to 9 mm) in diameter to either the strip or the mullion, and then press the silicone strip to the mullion. The compressed bead width should be ½ inch (13 mm) or larger, and it can be visually checked by viewing through the translucent strip (Figures 13 and 14). It has been found that two beads help mitigate any air infiltration through areas that may not be completely wetted out using hand pressure. Provided full contact can be assured, a single bead of sealant may be used; often, there is only space for one sealant bead on the mullion. Achieving full contact between the strip, sealant and mullion is critical.

When installing the strip – and corners if applicable – it may be found that to keep the strip in place through the installation process, a mechanical fastener is desired. A screw can be used to punch through the strip and then sealed over by installing a dollop of sealant over the screw head and mechanically tooling the sealant over the screw head. It is critical for air infiltration performance that any area in which a mechanical fastener is used be completely covered with sealant, and the sealant must be tooled over the fastener.

Figure 11: One example of folding corner

Figure 12: Folded and sealed corner

Figure 13: Folding strip onto mullion and attaching with sealant

Figure 14: Finished strip installation
Inboard DOWSIL™ Silicone Transition System detail

Figure 15: Jamb at inboard condition, metal panel
Figure 16: Head at inboard condition, metal panel
Figure 17: Sill at inboard condition, metal panel

Flush DOWSIL™ Silicone Transition System detail

Figure 18: Jamb at flush condition, metal panel
Figure 19: Head at flush condition, metal panel
Figure 20: Sill at flush condition, metal panel
Outboard DOWSIL™ Silicone Transition System detail

Figure 21: Jamb at outboard condition, metal panel
Figure 22: Head at outboard condition, metal panel
Figure 23: Sill at outboard condition, metal panel
Details

For more details visit: dow.com/construction

Figure 01. Stud wall to concrete wall

Figure 02. Control joint

Figure 02a. Control joint – alternate

Figure 02b. Control joint – alternate 2

DOWSIL™ Silicone Air Barrier System Details
Figure 03. DOWSIL™ Silicone Transition System at parapet

Figure 03a. DEFENDAIR™ 200C Air and Weather Barrier Coating with self-adhered membrane at parapet

ANY COMMENTS, MARK-UP TO DESIGN DETAILS, OR ILLUSTRATIONS ARE PROVIDED TO SUGGEST HOW DOW SILICONES' BUILD A BETTER BARRIER™ PRODUCTS MAY BE INCORPORATED INTO A PROJECT. DOW SILICONES DOES NOT OFFER DESIGN SERVICES. ALL INFORMATION AND ILLUSTRATIONS ARE PROVIDED ON AN "AS-IS" BASIS WITHOUT ANY WARRANTY WHATSOEVER, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.
Figure 04. Change in wall substrate

Figure 04a. Change in wall substrate – alternate

Figure 04b. Change in wall substrate – alternate 2
Figure 10. Storefront window head

Figure 11a. Storefront window sill DOWSIL™ 778 Silicone Liquid Flashing

Figure 12. Storefront window jamb

Figure 13. Curtain wall jamb at outboard condition – STS Flashing
Figure 14. Curtain wall head at outboard condition – STS Flashing

Figure 15. Curtain wall sill at outboard condition – STS Flashing

Figure 16. Flanged window head – metal panel

Figure 17a. Storefront window sill – DOWSIL™ 778 Silicone Liquid Flashing

DOWSIL™ Silicone Air Barrier System Details
Figure 18. Flanged window jamb – metal panel

Figure 20. Deflection joint where wall passes in front of slab

Figure 20a. Deflection joint where wall passes in front of slab – alternate

Figure 21. Deflection joint where slab interrupts wall (through wall flashing)
Figure 36. Base of wall at 2-ply roofing termination

Figure 37. Electrical box/fixture DEFENDAIR™ 200C Coating with sealant

Figure 38. Electrical box/fixture/FSAM

DOWSIL™ Silicone Air Barrier System Details
Figure 45. Vented eaves

Figure 47. Horizontal projections, knife plate, after DEFENDAIR™ 200C Coating
Figure 47a. Horizontal projections, knife plate, before DEFENDAIR™ 200C Coating

Figure 47b. Horizontal projections, concrete embed assembly
Figure 50. Target flashing at knife plate isometric

1. CONTINUOUS FILLET BEAD OF DOWSIL™ 791 SILICONE WEATHERPROOFING SEALANT (WPS) TO EXTEND 1" MIN. BEYOND FLANGE OF DUCTING
2. FILL ANY PRE-DRILLED HOLES WITH DOWSIL™ 791 SILICONE WEATHERPROOFING SEALANT
3. APPLY A FULL BEAD OF DOWSIL™ 791 SILICONE WEATHERPROOFING SEALANT BEFORE KNIFE PLATE
4. DEFENDAIR™ 200C AIR AND WEATHER BARRIER COATING FIELD LAYER OR PRE-STRIP
5. COVER ALL FASTENERS WITH DOWSIL™ 791 SILICONE WEATHERPROOFING SEALANT BEFORE APPLYING DEFENDAIR COLLAR
6. DEFENDAIR™ 200C AIR AND WEATHER BARRIER COATING COLLAR LAPPED 3/4" OVER FIELD LAYER OR PRE-STRIP

Figure 50a. Lapped DEFENDAIR™ 200C Coating at knife plate isometric

1. CONTINUOUS FILLET BEAD OF DOWSIL™ 791 SILICONE WEATHERPROOFING SEALANT (WPS) ALL SIDES
2. COVER ALL FASTENERS WITH DOWSIL™ 791 WPS BEFORE APPLYING DEFENDAIR
3. DEFENDAIR™ 200C AIR AND WEATHER BARRIER COATING LAPPED OVER KNIFE PLATE
Figure 51. Vent shroud flashing isometric

1. Apply a full bead of DowSil™ 791 silicone weatherproofing sealant before shroud.
2. Continuous fillet bead of DowSil™ 791 silicone weatherproofing sealant all sides.
3. Duct opening.
4. DOWSil™ 791 silicone weatherproofing sealant to extend 1" min. beyond flange of ducting.
5. Shroud flange.
7. Apply 6" strips of Defendair™ 200C air and weather barrier coating over flange.
8. Cover all fasteners with DowSil™ 791 silicone weatherproofing sealant before applying Defendair strips.

Figure 52. Minor penetration flashing isometric

1. Continuous DowSil™ 791 silicone weatherproofing sealant fillet bead around pipe or conduit - sealant to have min. 2" bite onto substrates.
2. Defendair™ 200C air and weather barrier coating.
3. Detail is conceptual and describes design intent; it does not purport to show all conditions.
Figure 122. Window opening – isometric sequencing DOWSIL™ 778 Silicone Liquid Flashing

OVERLAP DEFENDAIR™ 200C AIR AND WEATHER BARRIER COATING ONTO WINDOW FLASHING MINIMUM 1”

DOWSIL™ 778 SILICONE LIQUID ISOMETRIC WINDOW FLASHING SEQUENCING "C"

FIELD COAT DEFENDAIR™ 200C AIR-AND-WEATHER BARRIER COATING
DEFENDAIR™ 200C Coating is a liquid applied thin mil air barrier coating. As such, it is important to achieve the specified 15 mil dry film thickness on the surface of the substrate to help ensure a robust application of the air barrier. There are industry concerns surrounding achieving the appropriate mil thickness on different substrates when using these thin mil systems. Dow has completed absorption testing on different substrates and found that the absorption rates of DEFENDAIR™ 200C Coating can change by substrate and even substrate manufacturer.

In general, a 30 mil wet coating results in the required 15 mil dry film thickness. However, some substrates do absorb more coating, and may require a higher wet mil application thickness to achieve the appropriate thickness on the surface of the substrate. Here is a summary of the wet mil vs. dry film thicknesses for a variety of substrates that were tested:

<table>
<thead>
<tr>
<th>Substrate</th>
<th>Wet Mil</th>
<th>24 Hour Dry Mil</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP DensGlass Gold</td>
<td>30</td>
<td>13.8</td>
</tr>
<tr>
<td>National Gypsum Purple</td>
<td>30</td>
<td>14.2</td>
</tr>
<tr>
<td>USG Green SECURock</td>
<td>40</td>
<td>12.7</td>
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<tr>
<td>Large Aggregate Concrete</td>
<td>30</td>
<td>14</td>
</tr>
</tbody>
</table>

Coverage rates for your specific substrate may differ and should be verified by completing a mockup.

Please contact your local Dow sales development professional for further assistance.
DEFENDAIR™ 200C Air and Weather Barrier Coating NFPA 285 testing

DEFENDAIR™ 200C Coating has been tested to NFPA 285 using a wall system as follows: 2" Dow THERMAX™ Insulation, 1" airspace and aluminum composite panels. The panel joints were sealed with DOWSIL™ 795 Silicone Building Sealant. The DOWSIL™ Silicone Transition System was installed at the window opening, using DOWSIL™ 791 Silicone Weatherproofing Sealant.

Engineering judgments may be obtained for the following scenarios:

• A similar system using an aluminum composite panel system that has been successfully tested to NFPA 285
• A heavier façade such as precast panels or brick that includes the same insulation assembly
• A system using ACM panels with an alternate thickness of Dow THERMAX™ Insulation, provided THERMAX™ Insulation has passed NFPA 285 in another system
• NFPA 285 assemblies containing XPS

Engineering judgments may be available for other wall assemblies. Please contact your local Dow sales development professional for further assistance.

DEFENDAIR™ 200C Coating is a 100 percent silicone air barrier, offering distinct advantages for fire performance. It has passed NFPA 285 and is NFPA Class A/UBC Class 1 per ASTM E-84.
DEFENDAIR™ 200C Air and Weather Barrier Coating on damp substrates and in rain

Damp substrates

Dow has completed testing of DEFENDAIR™ 200C Coating on selected wet and damp substrates (on variety of sheathing, plywood, OSB and concrete). Our findings have consistently shown that damp substrates can be effectively coated with DEFENDAIR™ 200C Coating and adhesion is acceptable.

The adhesion of DEFENDAIR™ 200C Coating is not affected by the moisture content or “dampness” of most substrates. Testing has shown, however, that when OSB is damp, primer is required for the DEFENDAIR™ 200C Coating to achieve acceptable adhesion.

Dow always recommends field adhesion testing be completed for job site specific conditions, as not every brand of every substrate, especially sheathing, could be included in the study.

Dry time before precipitation

While damp substrates are acceptable, DEFENDAIR™ 200C Coating should not be applied when raining or when rain is imminent. Rain will wash the DEFENDAIR™ 200C Coating off the substrate if the coating is not at least partially dry. DEFENDAIR™ 200C Coating dry times will depend on the temperature and humidity at the time of application and while it is drying.

In our studies, we have found that if a 30 mil (wet) coating is applied and is allowed to dry for eight hours, rain after that time did not negatively affect the coating. When rain is expected sooner than eight hours, or the weather cannot be predicted, it is possible to apply one 15 mil (wet) coat of DEFENDAIR™ 200C Coating. At the thinner wet film thickness, rain will not negatively affect the DEFENDAIR™ 200C Coating after only a four hour drying time. A second coat can then be applied after four hours or when the rain has subsided. This technique allows the air barrier to be applied in more unpredictable weather conditions.

This testing was completed at 70°F and low relative humidity (15%RH) when the DEFENDAIR™ 200C Coating had potential to dry more quickly than would be seen in high humidity conditions. A higher humidity or lower temperature will lengthen the required drying time prior to the DEFENDAIR™ 200C Coating being unaffected by rain.

Importance of thickness of DEFENDAIR™ 200C Air and Weather Barrier Coating

When sealing the building envelope with DEFENDAIR™ 200C Coating, correct installation and proper material thickness is critical to final air barrier system performance. To this end, Dow has completed the most stringent air barrier testing and achieved airtight systems down to an air leakage level that was nearly beyond the test equipment’s capability to detect. Dow tested at multiple thicknesses (lower than our recommendations) to be conservative and ensure that our applied thickness recommendations are robust. Following are the system test results (a wall system with penetrations tested, not just a film of material):

ASTM E2357: <0.000007 cfm/ft² at 1.57 psf

We understand that a “thick mil” or even sheet applied materials may seem more comfortable, but in reality, the question is: What performs, and what can be installed over and over the same way, and still perform for many years?

Sheet applied materials help to achieve a certain thickness. But in application, there are joints, seams and folds to worry about, in addition to achieving 100 percent adhesion of the adhesive backing. Dow has shown, through our own testing, that not fully sealing the seams, or having a “fishmouth” such as shown below, may yield air infiltration results that do not pass current air barrier standards and/or exceed the infiltration rate of liquid applied membranes.

Thick mil applied liquid materials must still be applied at the thickness stated and validated for the correct thickness.

Taking care to assess progress, as Dow recommends with any sealant or coating application, is part of a quality installation; and it is not difficult. It is a matter of measuring the wet mil thickness during application using a hand held gauge. It is similar to other measurement or quality control methods in place for any number of construction products.

Please contact your local Dow sales development professional for further assistance with on-site and hands-on training regarding quality control.
DEFENDAIR™ 200C Air and Weather Barrier Coating certified applicators and warranty

DEFENDAIR™ 200C Coating is offered with a 10-year limited warranty. When DOWSIL™ brand sealants and transition materials are applied with DEFENDAIR™ 200C Coating, the system may qualify for a 15-year limited warranty.

When sealing the building envelope with DEFENDAIR™ 200C Coating, it is critical to choose and install the appropriate materials correctly.

Dow has completed extensive hands-on training seminars with our distributors and key contractors specifically for DEFENDAIR™ 200C Coating (and other associated sealants and materials used with it).

Please contact your local Dow sales development professional for further assistance.

Note: Not intended for use on single family residential dwellings.
DEFENDAIR™ 200C Air and Weather Barrier Coating compatibility with accessory building products

When sealing the building envelope, many different materials come into contact. DEFENDAIR™ 200C Coating adheres to and is compatible with a wide range of building substrates including, but not limited to: gypsum-based sheathing, plywood, OSB, brick, concrete, concrete masonry units (CMU), aluminum, and galvanized and stainless steel.

Other common building components that DEFENDAIR™ 200C Coating may come into contact with include self-adhering flashings, mechanical flashings, other liquid flashings, sealants, weatherstrips and insulation.

DEFENDAIR™ 200C Coating can be continuously sealed to other mechanical and self-adhering flashings by creating a bridge between the two materials using either DOWSIL™ Silicone Transition Strip or DOWSIL™ 758 Silicone Weather Barrier Sealant. This allows for adhesion between the differing products, creating a continuous air and water tight seal. Mechanically attached flashings do not negatively affect the performance of DEFENDAIR™ 200C Coating. Furthermore, the asphaltic and/or butyl backings of the self-adhering flashings do not negatively affect the performance of DEFENDAIR™ 200C Coating.

If a liquid flashing from a company other than Dow is used, it should be fully cured before DEFENDAIR™ 200C Coating is applied over it. If the liquid flashing is to be applied over the DEFENDAIR™ 200C Coating, allow the DEFENDAIR™ 200C Coating to cure a minimum of three days. Verify adhesion of the liquid flashing at the start of the project, as generally only silicone-based materials will adhere to DEFENDAIR™ 200C Coating. Dow is not aware of any liquid flashing currently in the industry that would negatively affect the performance of the DEFENDAIR™ 200C Coating when used either over or under the DEFENDAIR™ 200C Coating. Project-specific adhesion and compatibility testing can be performed.

DEFENDAIR™ 200C Coating is compatible with silicone sealants. It can also contact non-silicone sealants with no negative effects, but the non-silicone sealant should be allowed to cure prior to applying DEFENDAIR™ 200C Coating. In all cases, adhesion between the two materials should be verified with field adhesion testing. In general, DEFENDAIR™ 200C Coating will adhere to cured sealants of any chemistry. Only silicone sealants would be expected to adhere to DEFENDAIR™ 200C Coating.

DEFENDAIR™ 200C Coating is compatible with rigid foam board insulation.

Please contact your local Dow sales development professional for further assistance.
Example of quality control wet mil thickness form

Date ____________________________

Project Name ______________________________________________________

Project Address ___________________________________________________

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For more information
Learn more about Dow's full range of High Performance Building solutions, including service and support, by visiting us online at dow.com/construction.

Dow has sales offices, manufacturing sites and science and technology laboratories around the globe. Find local contact information at dow.com/contactus.