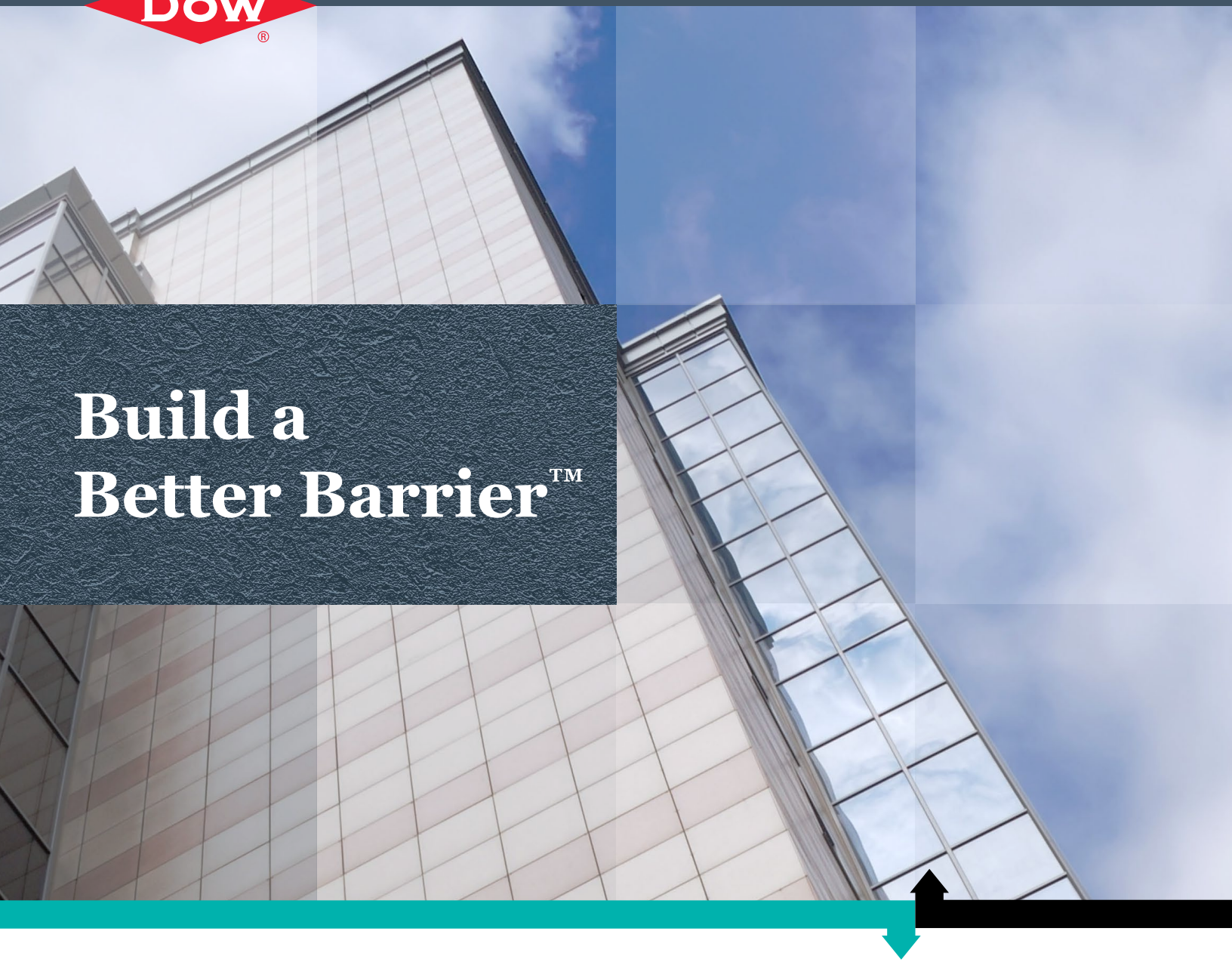
HIGH PERFORMANCE BUILDING SOLUTIONS



Build a Better Barrier™

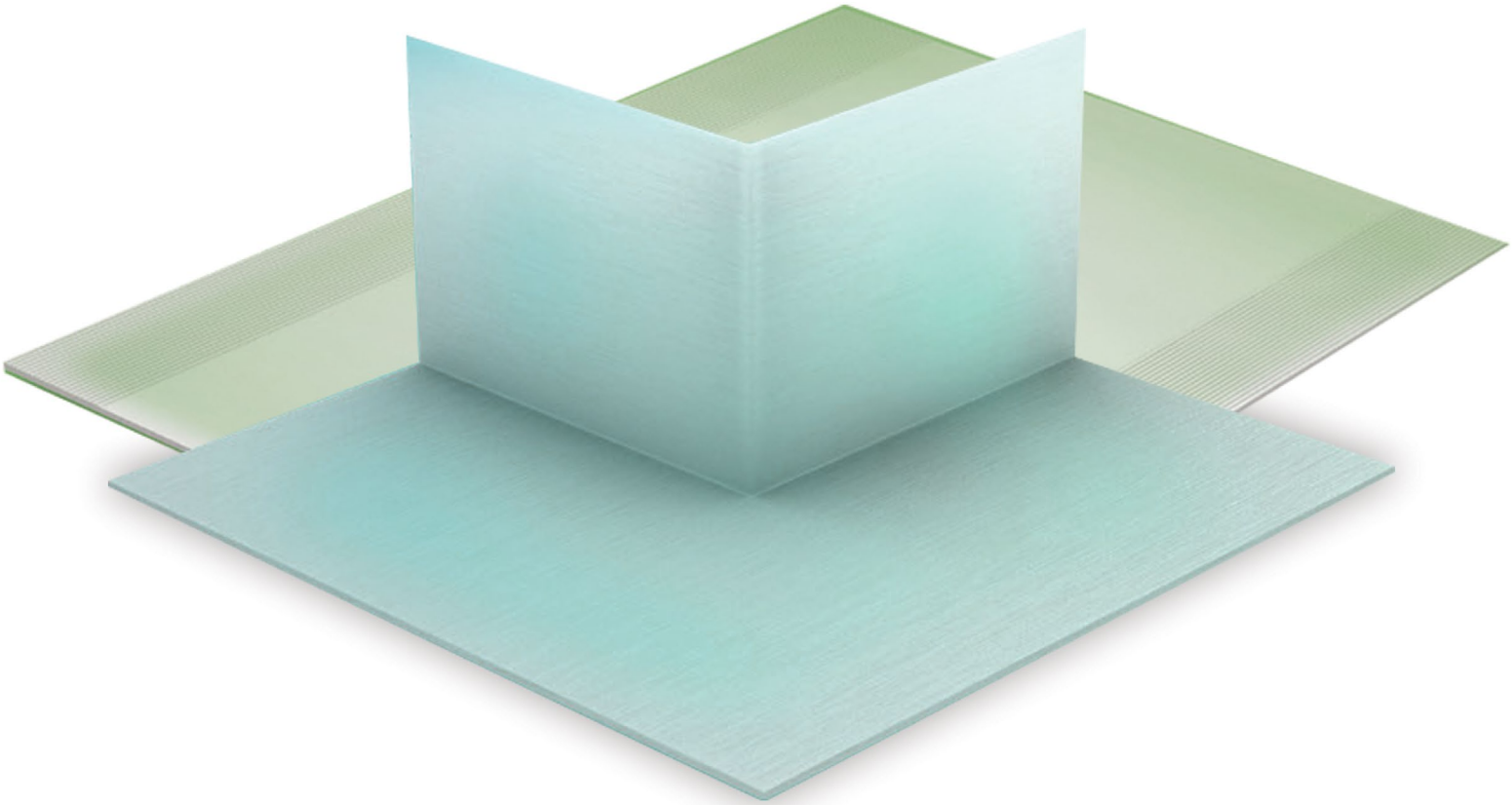
DOWSIL™ Silicone Transition System

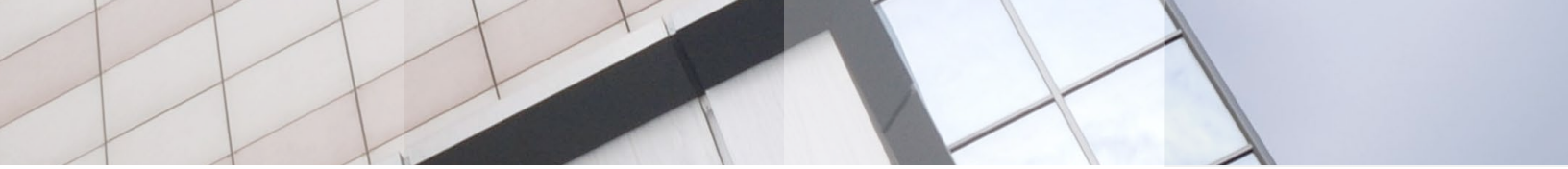
Application Guide

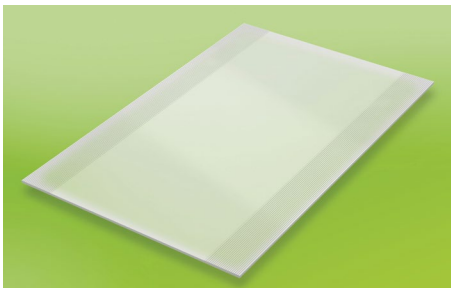
DOWSIL™

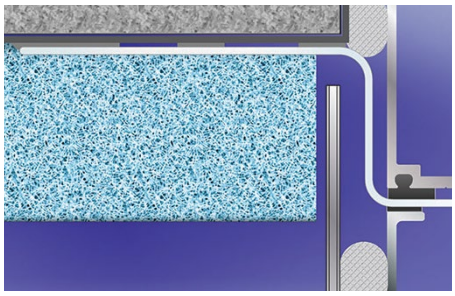
silicones by Dow

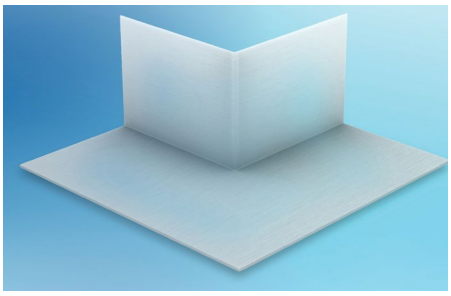
DOWSIL™ Silicone Transition System application guide











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.

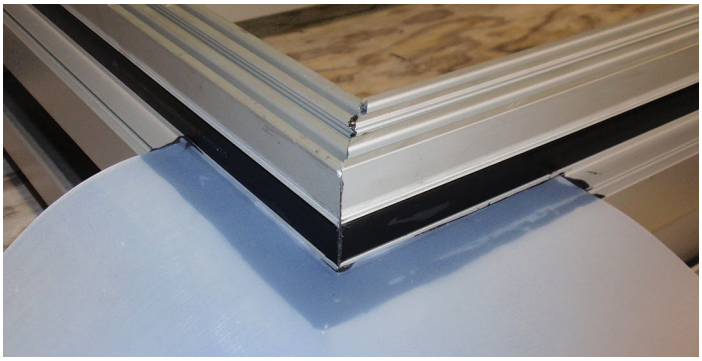


Figure 1: Corner piece installed

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.

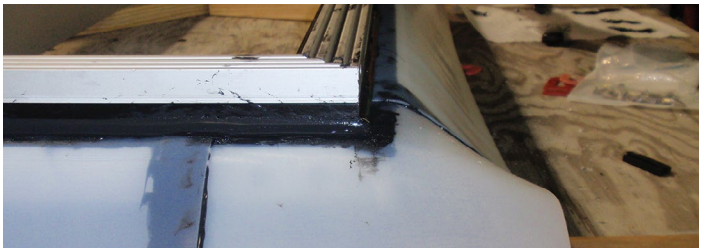


Figure 2: Corner and strip pieces installed in-shop

Figure 3: Tab adhesion test procedure

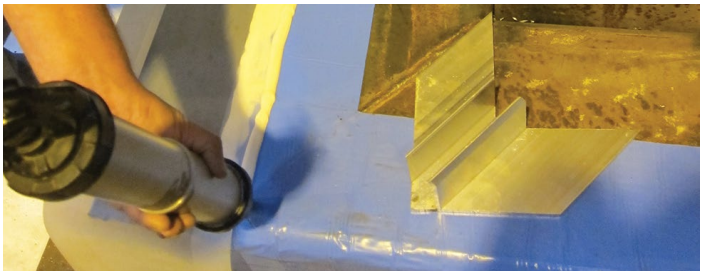
Field installation

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.

Figure 4: Sealant attaching strip and corner to air barrier in-field. Lap joints sealed.



Figures 5 and 6: Strip installed with sealant under strip and over lap joint

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.

Figure 7: DOWSIL™ Silicone Transition System-wrapped opening

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).

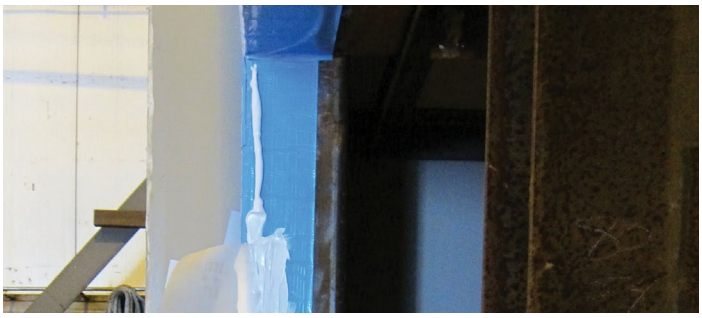


Figure 8: Keep splices a minimum of at least 12 inches (300 mm) from corner

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

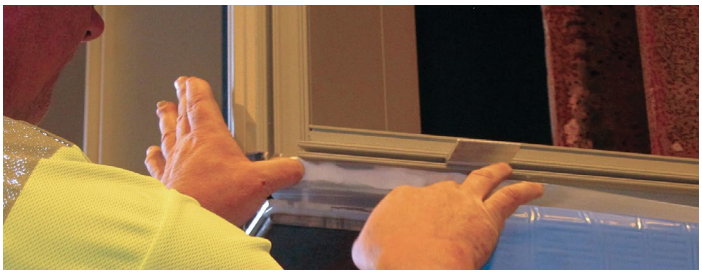


Figure 13: Folding strip onto mullion and attaching with sealant

Figure 14: Finished strip installation

Inboard DOWSIL™ Silicone Transition System detail

Figure 15: Jamb at inboard condition, metal panel

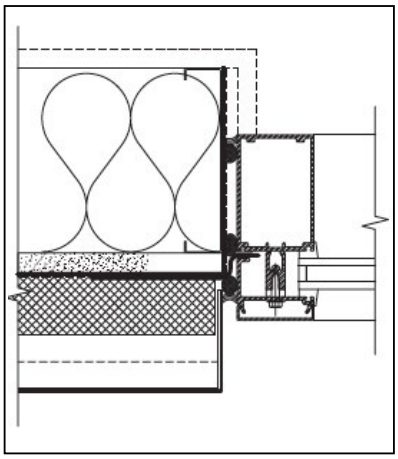


Figure 16: Head at inboard condition, metal panel

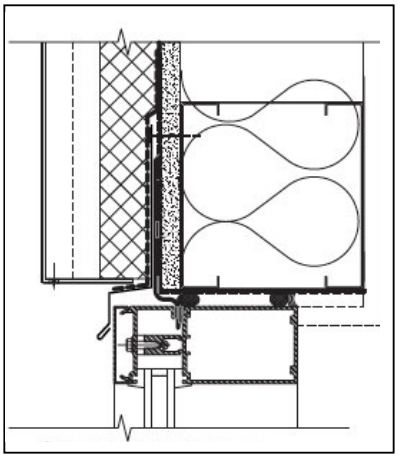
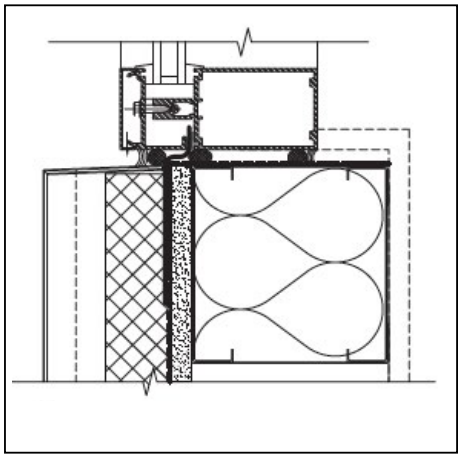


Figure 17: Sill at inboard condition, metal panel



Flush DOWSIL™ Silicone Transition System detail

Figure 18: Jamb at flush condition, metal panel

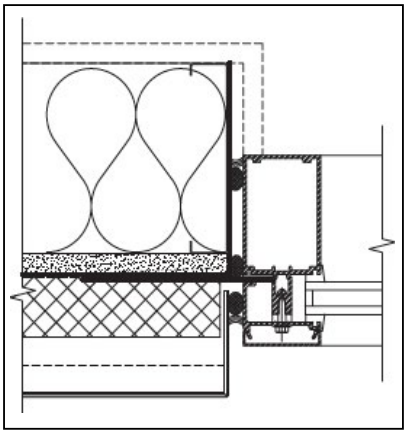


Figure 19: Head at flush condition, metal panel

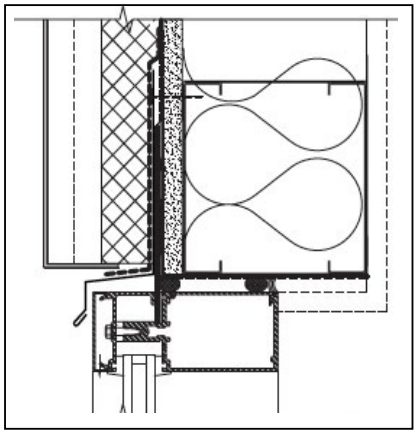
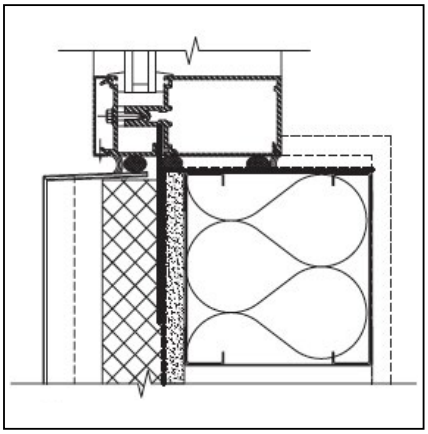
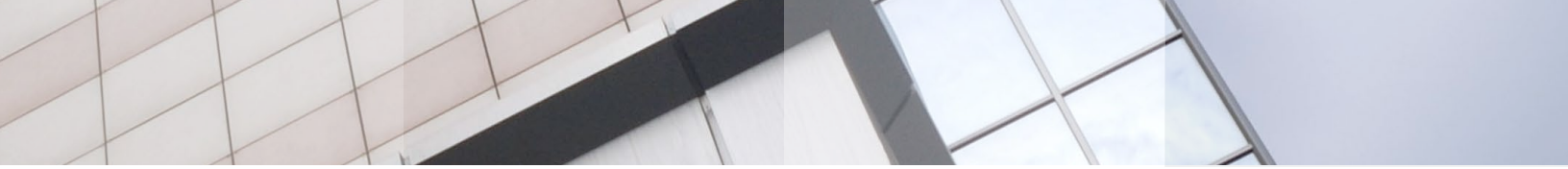


Figure 20: Sill at flush condition, metal panel





Outboard DOWSIL™ Silicone Transition System detail

Figure 21: Jamb at outboard condition, metal panel

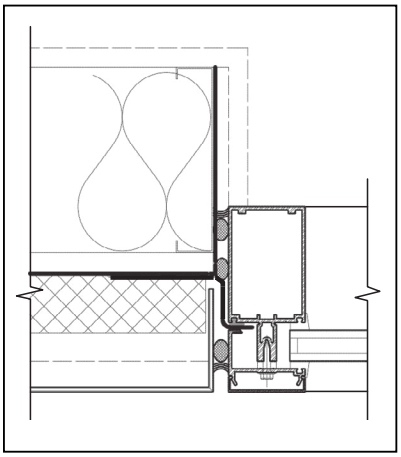


Figure 22: Head at outboard condition, metal panel

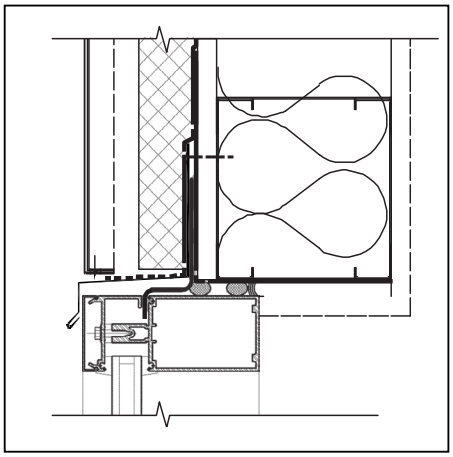
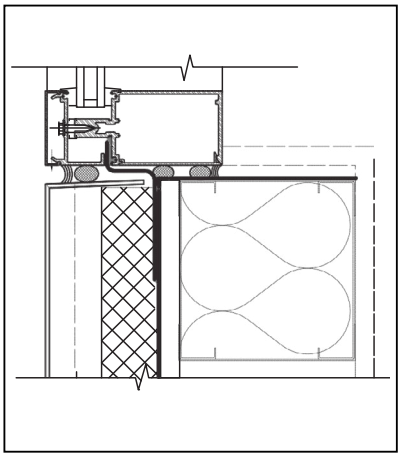
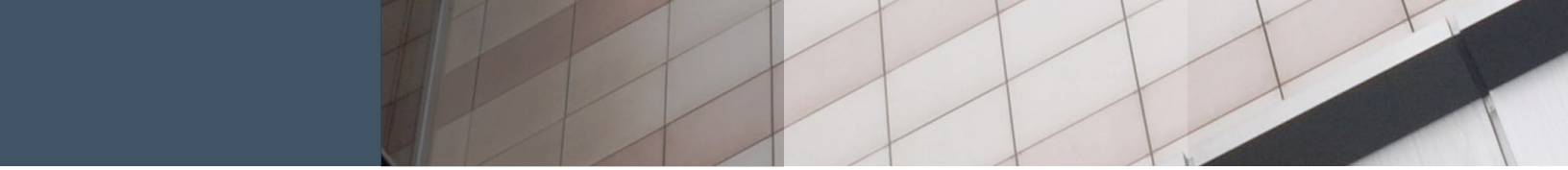


Figure 23: Sill at outboard condition, metal panel





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