Louvers and Glazed Applications

Louvers historically mount into openings in walls for the primary purpose of providing airflow in and out of a building while providing a measure of water protection. Louvers have become a desirable decorative architectural element of the building's façade. This has increasingly involved integrating louver products into glazed aluminum curtain wall systems and storefronts. Louvers installed into glazed applications can be challenging without knowing critical louver characteristics or understanding how these products integrate. However, having this understanding ensures successful product selection.

Understanding the performance characteristics used in glazed applications should include three steps:

1. Knowledge of the performance criteria required for airflow and water protection.
2. Evaluating local building codes and how the codes may affect model selection and integration.
3. Knowledge of the specific curtain wall product having the louver installed.

Performance and Codes

Some projects may have specific airflow requirements. However, most glazed-in louver applications prioritize water rejection capabilities as the most important factors. Curtain wall systems cannot typically withstand large amounts of water infiltration. Unwanted water infiltration can destroy interior materials such as ceilings and present problems for the installing contractor.

For this reason, Airolite does not recommend standard fixed blade or drainable blade louver models. Storm class (wind-driven rain) products always are the best choice in these applications.



Storm class louvers are tested per AMCA 500-L wind-driven rain standards and are designed to minimize water infiltration during adverse weather, and more specifically, during windy rain events. Louvers are tested per AMCA procedures and rated for performance at 29mph and 50mph wind velocities. Testing involves no pass/fail criteria, AMCA rates each louver on a scale, meaning some louver models will outperform others. Certified storm class louvers bear the AMCA wind-driven rain seal and list performance in their product datasheets.

The International Mechanical Code requires AMCA 550 compliance for all intake and exhaust louvers in the Hurricane-Prone Region as defined by the International Building Code. AMCA 550, or High Velocity Wind Driven Rain certification, provides greater water protection since these louvers test to a much higher standard. While standard wind-driven rain louvers are rated at various intake velocities, and their water performance can vary, the stringent AMCA 550 test is strictly pass/fail. This class of louver products offers the highest levels of wind-driven rain protection on the market and is a great choice where reducing water infiltration is critical.

We advise you to review all local building codes, and carefully inspect specifications to ensure compliance where required.

Glazing Systems

Many different types of glazing systems exist and understanding which type of system is being proposed ensures the louver can be integrated. Generally, there are two main categories: Pressure plate and cover cap systems, and flush glazed storefront systems.

- Pressure plate and cover cap systems use a continuous screw applied pressure plate to hold the glass in place. The glass is installed from the exterior side and an extruded aluminum cover cap is then snapped in place. These are most often referred to as "Curtain Wall Systems" or "Pressure Wall" (Figure 1).
- Flush glazed systems (often called "Storefront") (Figure 2) do not have a removable exterior pressure plate and are characterized by fixed deep and shallow glass pockets located near the center of the system depth. Glass can be installed from the interior side and is "slipped" in place. They are typically only 4 ½" deep.

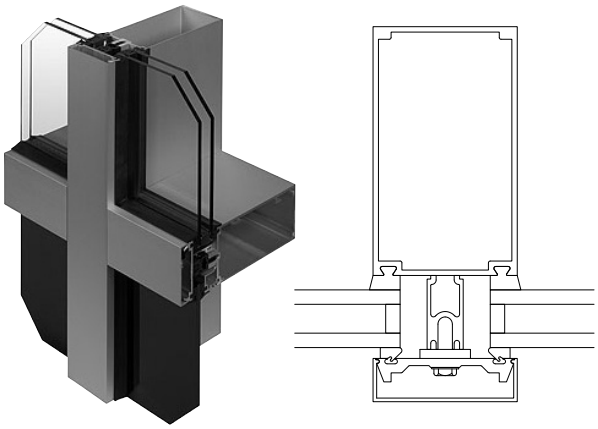


Figure 1 - Curtain Wall

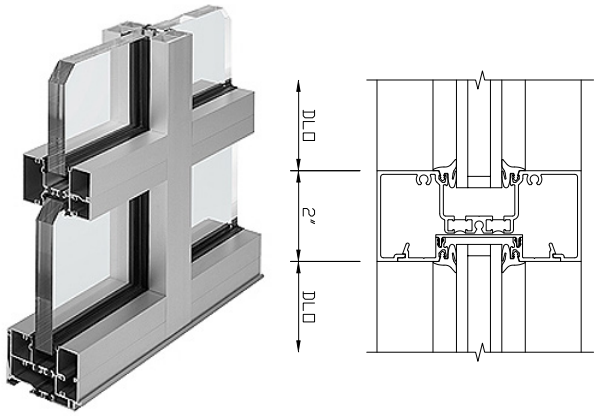


Figure 2 - Storefront

Glazing Adapters

Airolite offers glazing adapter options (Figure 3) on most models. This option utilizes frame-mounted components that mimic the thickness of a piece of glass and can be used to fill the glazing pocket of a pressure wall system.

Several different sizes and options (Figure 4) can accommodate differing infill thicknesses and heights to suit almost all applications. These glazing adapters work well for most pressure-plate type curtainwall systems since the louver is installed from the exterior and simply pushed into place.

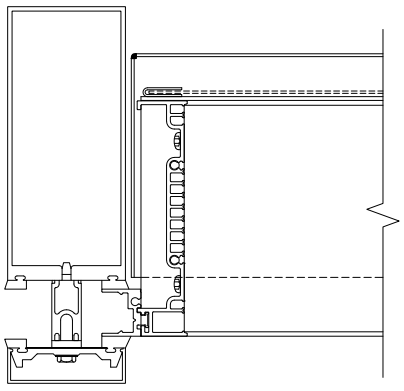


Figure 3 -Louver Jamb with Glazing Adapter

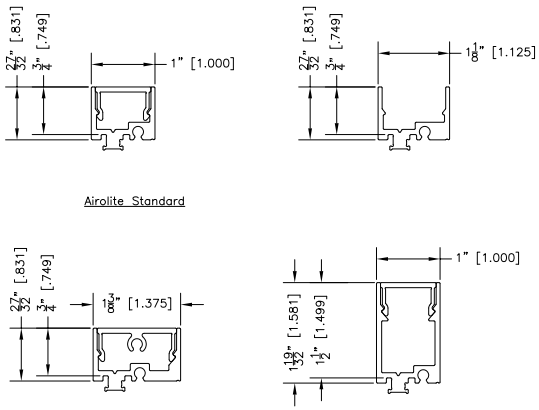


Figure 4 - Example Glazing Adapter Options

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Structurally Glazed Curtain Wall

An adaptation of the curtain wall is the "Structurally Glazed Mullion" system. These systems are similar to the standard curtain wall but eliminate the exterior cover cap and pressure plate to provide a smooth, uninterrupted appearance. The glass is held in place by a structural silicone seal to the mullion, and an installed weather seal prevents water from entering the edges of the glass. Airolite offers special glazing adapters with edge caps that allow the installation of a weather seal around the edges of the adapter, making them compatible with the structurally glazed system. Note that louvers typically cannot be retained in place with the structural seal alone. Anchorage must be put in place using anchor clips installed at the interior.

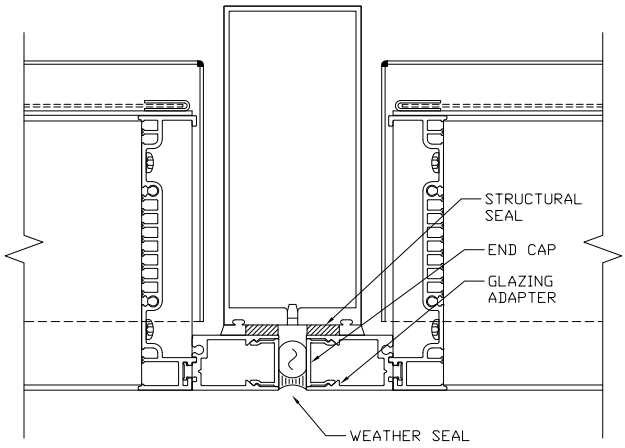


Figure 5
Structurally Glazed Mullion (SG) with Special Adapters

Continuous Blade Appearance

The architect frequently wants a continuous blade appearance similar to the concealed mullion option offered on many standard louvers. Always check the design drawings carefully to determine if this feature is illustrated. If a single line appears to delineate one louver from the louver next to it, there is a good possibility that the architect wants a continuous blade appearance. Always asking is the best policy when in doubt.

This design can present challenges since the curtain wall mullion is located between the louver jambs, thus creating interference. The two louver jambs cannot push against one another; the curtain wall mullion is in the way. The solution is to notch the louver blades (Figure 6) and use a specially designed jamb extrusion that allows the blades to pass in front of the curtain wall mullion. This option is not available on all models, and only applies to horizontal blade louvers. Please check with Airolite for availability and detail review.

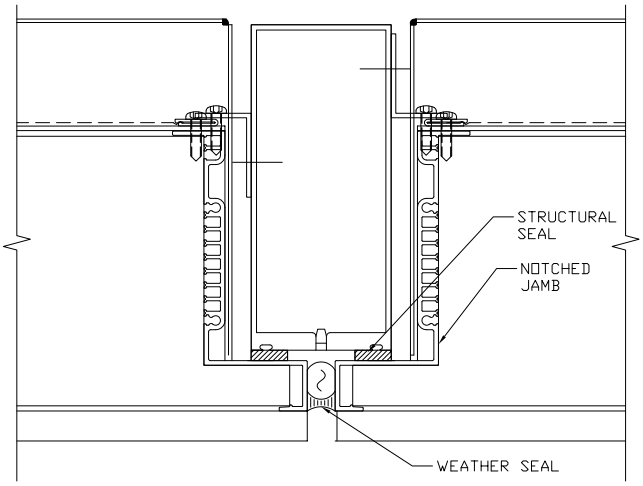


Figure 6 - Notched Continuous Blade Jamb

Flush Glazed Storefront

Flush glazed storefront systems are not compatible with glazing adapters. This compatibility issue is due to the location and nature of the glazing pockets. Flush glazed systems have a deeper pocket on one side that allows the glass to be slipped, or tucked in deeper than normal, thus allowing the other edge of the glass to rotate into the glass opening (Figure 7). The glass is slipped to the side, tucking the edge into the shallow pocket. This works well with 1" thick glass, but since the louver frame is much deeper, the louver frame will interfere with the storefront frame before it rotates into place. We do not recommend glazing adapters for use with storefront type glazing systems for this reason. The standard frame should install instead with a perimeter sealant joint (Figure 8).

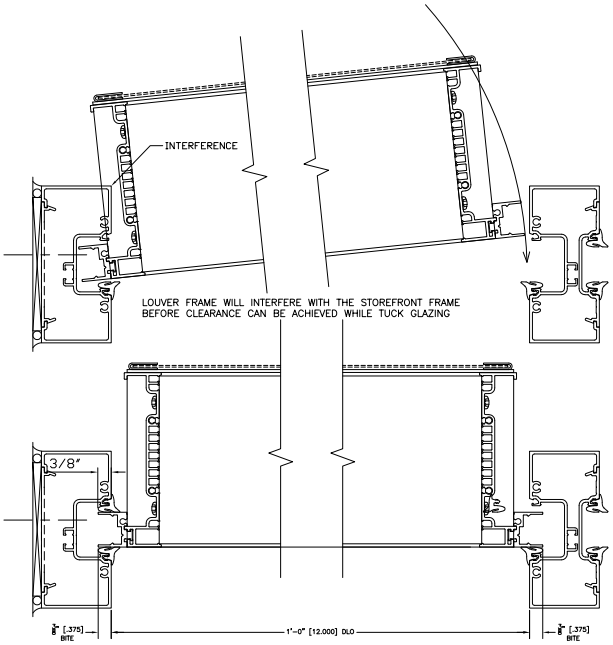


Figure 7 - Slip (or "Tuck") Glazing Louvers into Storefront

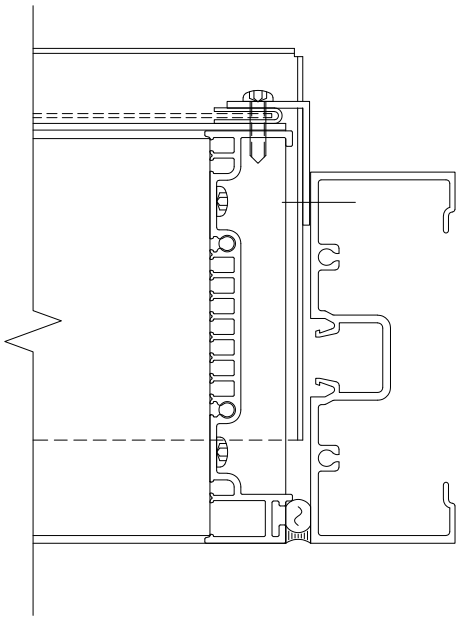


Figure 8 - Standard Frame Installation into Storefront

Sizing

It often is helpful to explain how we size louvers when working with glazing contractors/manufacturers. You will avoid confusion and get the most accurate pricing by discussing the definition of what the customer's sizes mean. The custom in the glass industry is the louver width is always listed first and then the height.

Airolite offers two different methods of glazed-in louver sizing:

a) DLO = The daylight opening of the window wall is used to size the louvers. The louver is downsized to create a ¼-inch gap at the louver frame and a ½-inch glass bite at the adapter. This is a common design and works for most applications.

b) Tip-to-Tip = This is the dimension from the tips of the glazing adapters. The tip-to-tip method equates to the glass size that the glazing contractor might be more familiar with.

There is no right or wrong way for glazed-in louver sizing. However, the primary consideration is ensuring that you and your customer have the same understanding, so the louvers are sized correctly. Airolite is happy to review all special conditions.

Anchorage

In most cases, the glazing adapters and the notched glazing frame are strong enough to hold the louver in place alone. That ability to withstand the loads is still dependent on the project wind load and louver size or a combination of both. When the wind loading and louver size result in a glazing adapter structural failure clips will be required to hold the louver in place. When this happens, we typically require anchorage at the interior of the louvers using standard anchor clips (Figure 9). Place these clips at the jambs on the horizontal bladed louver models and the head and sill of the vertical blade louvers. The clips can also be turned inwards if the curtain wall mullion depth is not great enough.

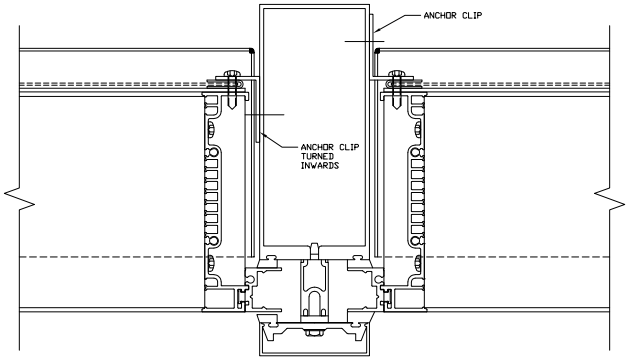


Figure 9 - Anchor Clips used at Glazed In Louvers

Sill Pans

Sill pans are an additional means of protection against unwanted water infiltration. For this reason, we advise the use of sill pans in all glazed-in applications. Even with the highest performing louvers, there is always some measure of water infiltration that occurs. The sill pan collects and directs the water to the exterior, turning any infiltration into "managed infiltration". There are three basic options to sill pan design (Figure 10).

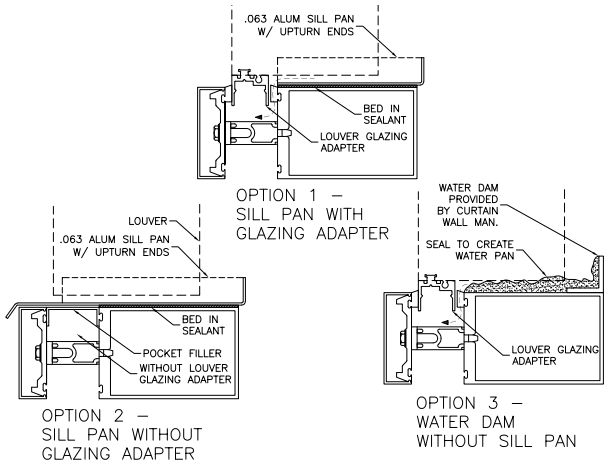


Figure 10 - Sill Pan Variations

- Design option #1 - The curtain wall manufacturer provides a water dam to manage unwanted infiltration. This option may use of a sealed shadow box panel, or a simple angle that provides a sealed dam at the horizontal frame member.
- Design option #2 - Full depth through the wall sill pans. Use these when there is no glazing adapter at the sill.
- Design option #3 - Glazing adapter sill pans. These pans are shortened sill pans that allow the sill glazing adapter to pass through.

The collected water is directed out to the wet glazing pocket area of the curtain wall system, where it drains to the curtain wall's normal weep system. It always is important to manage water infiltration with the use of a sill pan, regardless of the design used.

Active/Inactive Louvers

Louvers typically are active or inactive. Active louvers remain open to airflow, therefore provisions for water infiltration should already be in place. Inactive louvers will often feature blank off panels to close off the airflow. These usually are not sealed to the louver frame in a standard louver installation, but curtain wall installation can present new challenges. Inactive louvers become a decorative infill element and a part of the building's weather envelope. They protect the building from the elements and limit water in the interior space. The factory can install a silicone seal around the perimeter of the blank off panel to provide an added measure of water resistance. Eliminating the bird or insect screen at these locations can improve the effectiveness of this seal. Check to see if the louvers will be partially active, or active in the future, before deciding to eliminate the screens.

Testing

Most curtain wall installations are subject to ASTM testing criteria and field testing per ASTM procedures. This field testing is sometimes referred to as a "hose test" to check for leaks. A standard curtain wall should pass this testing. However, an active louver installed into a curtain wall system will not withstand this type of field testing.

Since a louver's primary purpose is to allow air to flow in or out, the louver naturally permits some measure of water infiltration. Louvers are tested and certified using the Air Movement and Control Association, International (AMCA), certified testing procedures performed under very controlled conditions. However, the testing criteria do not align with ASTM testing for curtain walls.

This hose test does not represent a failure of the louver. The louver was simply not designed to pass these types of tests where large amounts of water are directly injected into the louver. While a properly designed inactive louver with a sealed blank off panel may pass an ASTM field test, these products are not factory tested or certified to these standards.

Conclusion

Glazed-in louvers are more prevalent in today's building designs and knowing how louvers work with glazing systems can be keys to success. Airolite has a great deal of experience in glazing systems and should be your resource for preliminary design review and application guidance. We encourage you to contact Airolite with all of your glazed-in applications for a prompt review of your project.

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