Louver Selection and Application

Understanding equipment makes product choice easier

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With the wide selection of louvers available today, choosing the proper louver for your application may appear to be a difficult task. However, by considering the requirements of the application and understanding what models are available, louver selection can be much easier. In this article, we will examine factors that affect louver selection and some of the more common louver styles available.

Selection generally starts with a desired airflow. Practically any louver style will handle any amount of airflow if it is large enough. However, system designers usually have to deal with size constraints. The task then becomes finding a louver that will handle the desired volume while providing adequate rain-resistance and airflow characteristics. Here are some considerations:

• Rain resistance: Rain penetration through louvers usually is undesirable. When louvers are close to water-sensitive surfaces or devices, rain can be extremely harmful. Are there provisions, such as floor or plenum drains, in the building for managing rain that may penetrate the louver during storms? If not, will rain infiltration during storms create significant problems for the building? If rain penetration can be managed or is not harmful, a standard louver may be suitable. If the application cannot accept rain penetration, wind-driven-rain-resistant louvers should be utilized.

• Pressure drop: How much pressure drop is acceptable? This may be the deciding factor in louver selection. Most standard louvers are designed to provide good air performance within their intended airflow ranges. While the airflow capacity of wind-driven-rain-resistant models usually is higher, additional airflow may create more pressure drop than with standard louvers. Published Air Movement and Control Association (AMCA)-certified pressure-drop performance does not include the effects of a bird or insect screen. This can add from 5 to 15 percent of pressure drop depending on the screen type.

• Sound: Is the louver going to be supplying air to a noisy area, such as a generator or pump room? If so, acoustical designs are available to reduce sound penetration through the louver.

• Security and/or sight restriction: Louver applications in areas subject to frequent human contact may benefit from sight-proof louvers. Sight-proof models restrict "see through" and provide fewer opportunities for vandals to penetrate the louver wall.

• Airflow shutoff: For applications that require airflow only at certain times, operable or combination louvers that completely close the opening are available. These are good choices for emergency-generator or warehouse applications.

• Appearance: Is a particular louver design or appearance desired? Does the louver need to blend with or match other elements in the building? For architectural-louver applications, appearance sometimes is the most important feature. The appearance of louvers can be changed to fit a variety of needs with visible or hidden mullions, blade orientation and spacing, and type of finish applied.

• Structural integrity: Wind loads have a considerable effect on louver construction, especially with louvers that are tall or in hurricane-prone areas. High wind loads may make the use of certain types of louvers impractical, particularly thin-line models, because of their lightweight design.

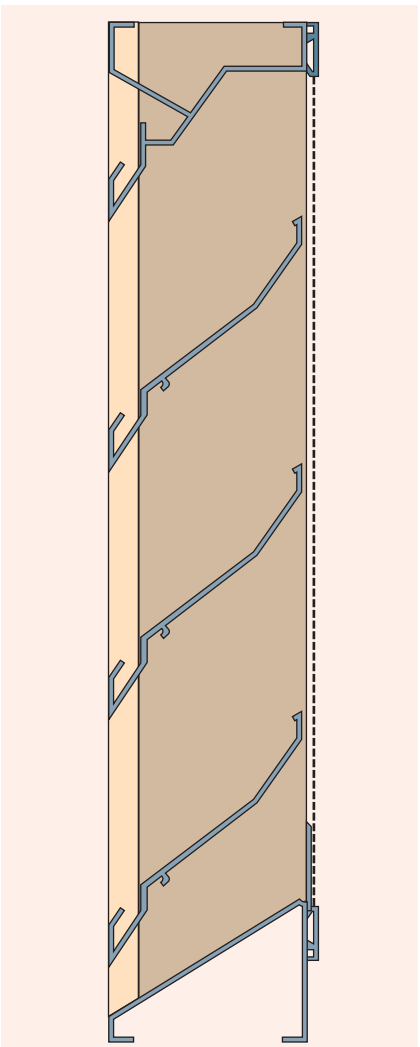

FIGURE 1. Standard drainable louver.

Now that we have looked at some of the considerations for louver selection, let us review some of the common louver styles available today.

• Standard louvers: These are the standard horizontal blade models that have

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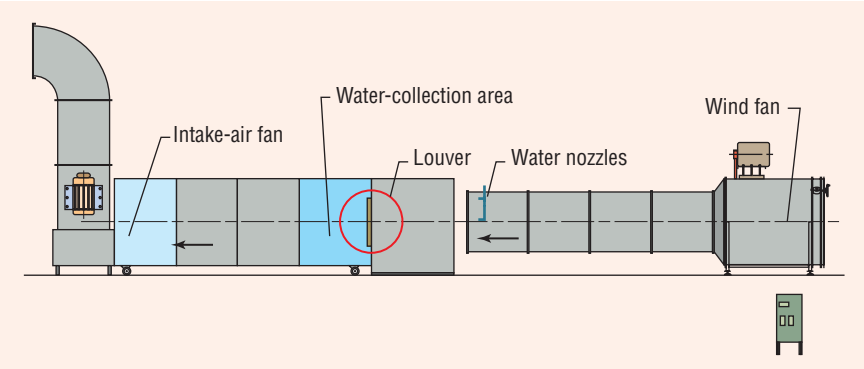

FIGURE 2. Wind-driven-rain-penetration test chamber.

been available for many years. Typically, they are 4 to 6 in. deep and are examined in the AMCA "still-air" water-penetration test. These models feature fairly wide blade spacing that can provide good free area and pressure-drop performance. However, their wide blade spacing makes them far less effective at rain protection than wind-driven-rain-resistant models. To give an idea of airflow capacity, a popular 4-in.-deep standard louver with drainable blades can handle approximately 400 cfm per foot of louver face in a 4-sq-ft size and generate roughly 0.15-in. pressure drop. Common standard louver styles include non-drainable blade louvers. The louver blades of non-drainable blade louvers do not collect water; therefore, rain water cascades from blade to blade. These are used most often in weather-protected areas and continuous-blade applications.

The louver blades of drainable-blade louvers feature small gutters in their profiles that collect water and drain them to downspouts in the jamb frames (Figure 1). They have better rain resistance than non-drainable models, but are not effective in storm conditions. These louvers often utilize visible vertical mullions to enclose the downspouts.

Sight-proof louvers most often utilize a chevron or inverted "Y"-shaped blade to prevent see through. This prevents objects from being passed through the louver wall. Free area is smaller and pressure-drop performance usually is worse than with other standard louvers, requiring larger louvers for the same amount of airflow.

Thinline louvers are 1 to 3 in. deep. They generally are made for packaged-terminal-air-conditioner or curtain-wall applications. Thinline louvers also are a good choice for small openings. They are not good for large sizes or high-wind-load situations.

• Wind-driven-rain-resistant louvers: This louver style has been developed over the last decade and utilizes new technology to minimize rain penetration. The louver depths typically range from 4 to 8 in. The blades may be positioned horizontally or vertically and generally feature complex profiles. Blade spacing is much closer than standard louvers, ranging from 1 to 3 in. center to center in most cases. Unlike standard louvers, these are tested in AMCA's wind-driven-rain-penetration test, which simulates storm conditions (Figure 2). Louvers are subjected to heavy rain and wind effects. Many models provide water penetration efficiency of 99 percent or higher. Looking at a 4-sq-ft size, a popular 6-in.-deep vertical-blade wind-driven-rain-resistant design will handle 900 cfm per foot of louver face and generate roughly 0.35-in. pressure drop. These louvers can be as much as two to three times the cost of standard louvers, but in many cases can be half the size. They offer rain protection not available with standard louvers in any size.

Horizontal-blade models look much like standard louvers, but with closer blade spacing (Figure 3). They perform well in the low-weather-condition test (3 in. per hour of rain and 29-mph wind). Some continuous-blade models are available.

Vertical-blade models provide the best performance. Some are 100-percent effective in the high-weather-condition test (8 in. per hour of rain and 50-mph wind).

• Acoustical louvers: The louver blades are filled with sound-deadening material, typically mineral wool or fiberglass. They usually are fairly deep, as much as 12 in. These models can provide 10- to 12-db noise reduction in the lower-octave bands in a free-field condition. Free area usually is very low compared with other louvers, so acoustical louvers must be larger to handle comparable airflow. For comparison, a common 12-in.-deep model handles 200 cfm per foot of louver face in a 4-sq-ft size and generates

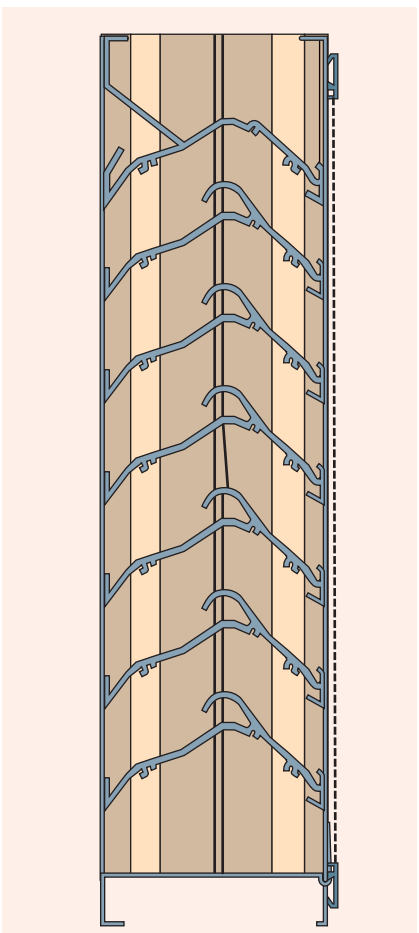

FIGURE 3. Horizontal-blade wind-driven-rain louver.

roughly 0.10-in. pressure drop. Acoustical louvers most often utilize visible mullion construction.

• Operable and combination louvers: These models feature operable blades that can be closed when airflow is not required. The airflow-shutoff capability prevents rain and humidity from entering the room when the louver is closed. Combination louvers feature a set of stationary blades in front of the operable blades that produce a consistent exterior appearance at all times. Airflow capacity per foot is similar to that of standard louvers.

The louver styles described in this article make up the majority of louvers available, but there are other louver products available. Hurricane-resistant louvers, penthouses, and equipment screens are some of the products available for specialized applications.

Even though there are many louver products to choose from, selection can be easier with a basic understanding of available styles and their applications. Whatever your application, a louver that will meet the requirements probably is available.

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