

AMCA Publication 501-09

Application Manual for Air Louvers



**AIR MOVEMENT AND CONTROL
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AMCA Publication 501-09

Application Manual for Louvers



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Related AMCA Documents

AMCA Standard 500-L	<i>Laboratory Methods of Testing Louvers for Rating</i>
AMCA Publication 511	<i>Certified Ratings Program for Air Control Devices</i>
AMCA Standard 540	<i>Test Method for Louvers Impacted by Wind Borne Debris</i>
AMCA Standard 550	<i>Test Method for High Velocity Wind Driven Rain Resistant Louvers</i>
AMCA Publication 111	<i>Laboratory Accreditation Program</i>

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Application Manual for Louvers

1. Purpose

The intent of this publication is to provide information and important points to be considered when designing or specifying installations requiring louvers. It is not the purpose of this manual to be used for detailed specifications. However, it serves as a guide toward understanding the various types of louvers available and includes items to be considered to ensure their proper use.

2. Scope

This publication outlines the application of louvers including selection for pressure drop, air leakage, water penetration, and sound reduction. Examples of louver selection are included. An important section, System Effects, should not be overlooked when applying performance data (see Section 7). For information on testing, see Section 6.1; for information on certified ratings, see Section 6.2.

Common industry practices in louver construction, mounting, and suggested fastening methods for typical structures have been included to assist the installer.

3. Definitions

Actuator (Operator)

A mechanical accessory item attached to an adjustable or combination louver that moves the blade(s) to either the open or closed position, or to an intermediate position for flow modulation. Actuators may be manually, electrically, pneumatically or hydraulically powered.

Blades

A bar, slat, or vane in a louver assembly usually mounted within a frame; normally provided in multiple quantities. Blades are installed parallel to each other so that they restrict passage of water, sound, airborne materials, and/or sightlines through the louver.

Certified rating

A published performance rating which AMCA International has licensed to bear the AMCA International Seal. Certifications available include, but are not limited to: air performance, sound performance, air leakage, water penetration, wind driven rain, airflow measurement performance, or any combination thereof.

Continuous line (continuous blade)

A louver constructed with blades that present uninterrupted horizontal or vertical lines to complement or enhance archi-

tectural features.

Core area

The product of the minimum height and minimum width of the front opening in the louver assembly with the louver blades removed.

Decibel

A dimensionless number expressing, in logarithmic terms, the levels of sound power or sound pressure.

Discharge loss coefficient

A comparison of the actual flow through the louver vs. the theoretical flow through an opening the same size as the louver.

Frame

The outermost structure of a louver assembly comprising the head, sill, and jambs joined together to support the blades.

Free area velocity

Rate of airflow through the free area of the louver.

Head

The upper or highest horizontal frame member of a louver.

Jackshaft

A common shaft used to operate blades in one or more louvers.

Jamb

The vertical frame member on the sides of a louver.

Louver

A device comprising multiple blades, which, when mounted in an opening, permits the flow of air but inhibits the entrance of water or other elements.

Louver (fixed)

A louver in which the blades are firmly secured in an open position.

Louver (adjustable)

A louver in which the blades may be rotated either manually or by mechanical means.

Louver gross area (face area)

Overall width times overall height of the louver frame.

Penthouse

A roofed structure incorporating louvers or louver blades in all or part of the walls and usually designed to be installed on the roof of a building.

Pressure drop/differential

The difference between the pressure on each side of the louver.

Shaped louver

A non-rectangular louver whose sides are not perpendicular, such as round, oval, triangular, etc.

Sightproof louver

A louver that cannot be seen through from any direction.

Sill

The bottom or lowest horizontal frame member of a louver.

Static pressure

That portion of air pressure that exists by virtue of the degree of compression only.

Stormproof louver and weatherproof louver.

Misleading terms - not used by AMCA International member companies; therefore, not standard in the industry and should not be used.

Volume airflow rate

The measurement of airflow through the louver; normally expressed in m³/s (cfm).

4. Application

General descriptive information is provided in this section to help the reader relate to the application of louvers. The data are divided into segments covering air movement, aesthetics, and code compliance for hurricane resistance.

4.1 Air moving systems

Louvers are used in many air moving applications; most commonly HVAC intake and exhaust systems, or general ventilation. They are usually installed in openings of interior or exterior walls, roof penthouses, and ductwork.

Louvers for these systems may be a fixed blade, adjustable blade, or a combination of fixed and adjustable blade louvers (see Figure 4.1).

The designer should select a louver to perform efficiently within the system parameters. The design may call for fitting a louver into a fixed opening while still requiring the louver to perform within the system design for pressure drop, water penetration, etc.

Louver manufacturers offer a variety of blade designs to meet system requirements. Various frame depths and blade angles accommodate different types of building construction, such as thin wall, curtain wall, steel and masonry openings.

An adjustable, or combination, louver serves the same purpose as a fixed blade louver, but adds the feature of blade adjustment for greater flexibility for air control and weather protection. These louvers may be operated manually or with powered actuators.

4.2 Architectural aesthetics

Louvers are often installed in exterior walls visible to the public. Besides providing the design function, the louver must also be visually appealing. Many shapes and styles are available in both horizontal and vertical line construction to blend with the building aesthetics.

Louvers may be produced in maximum single section sizes as dictated by shipping, handling, or finishing limitations. When multiple louver sections are required to fit an opening, the framework of the joined louver sections in the opening would normally be visible. Continuous line construction, which offers an uninterrupted blade line, is available for most louvers. Blade braces and a vertical support fastened to the louver blades replace the visible mullion at the support point, leaving only a minimal visible joint (see Figure 4.2). Often louvers are required to have a mitered corner if they are to be used for a louvered penthouse, enclosure, or a building corner. If box corners are objectionable, some blades and frames can be mitered to provide a continuous line effect (see Figure 4.3).

5. Louver Designs

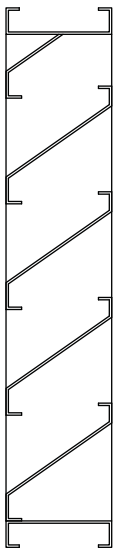
5.1 Frames

Louver frames can generally be classified as channel, flange, or curtain wall type (see Figure 5.1). All frame types are generally fabricated smaller than the clear opening for ease of installation (see Section 12). The channel type is usually mounted flush or slightly recessed to the face of the building, while the flange type overlaps the opening. Frames for curtain walls should be designed to fit the specific wall system. All types should be caulked/sealed around the perimeter to prevent leakage between the louver and the adjacent wall construction.

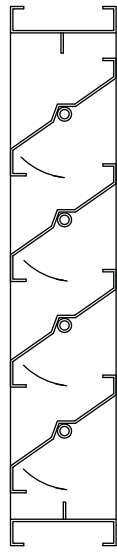
5.2 Blades

5.2.1 Non-drainable fixed blades

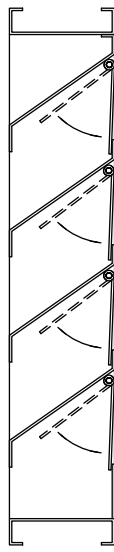
J- and K-blades (Figure 5.2) are positioned at various angles and blade spacings within the frame. These blades



Fixed Blade Louver

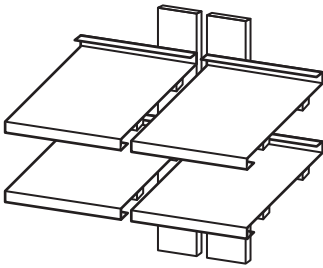


Adjustable Louver

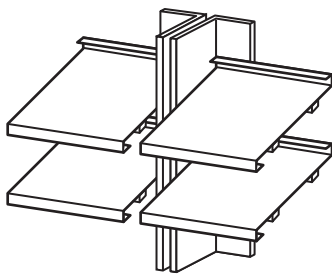


Combination Louver

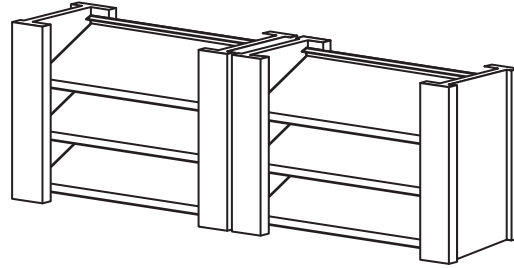
Figure 4.1
Basic Louver Types



Architectural Mullion

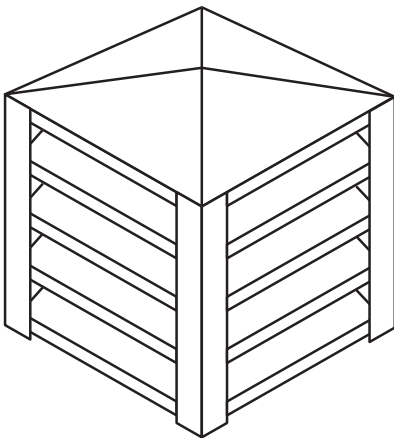


Recessed Mullion

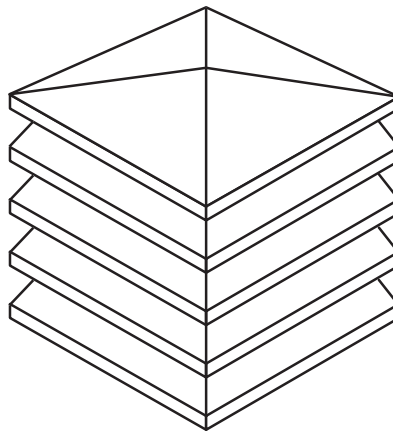


Visible Mullion

Figure 4.2
Basic Mullion Types



Box Corners
(Penthouse shown)



Mitered Corners
(Penthouse shown)

Figure 4.3
Corner Designs

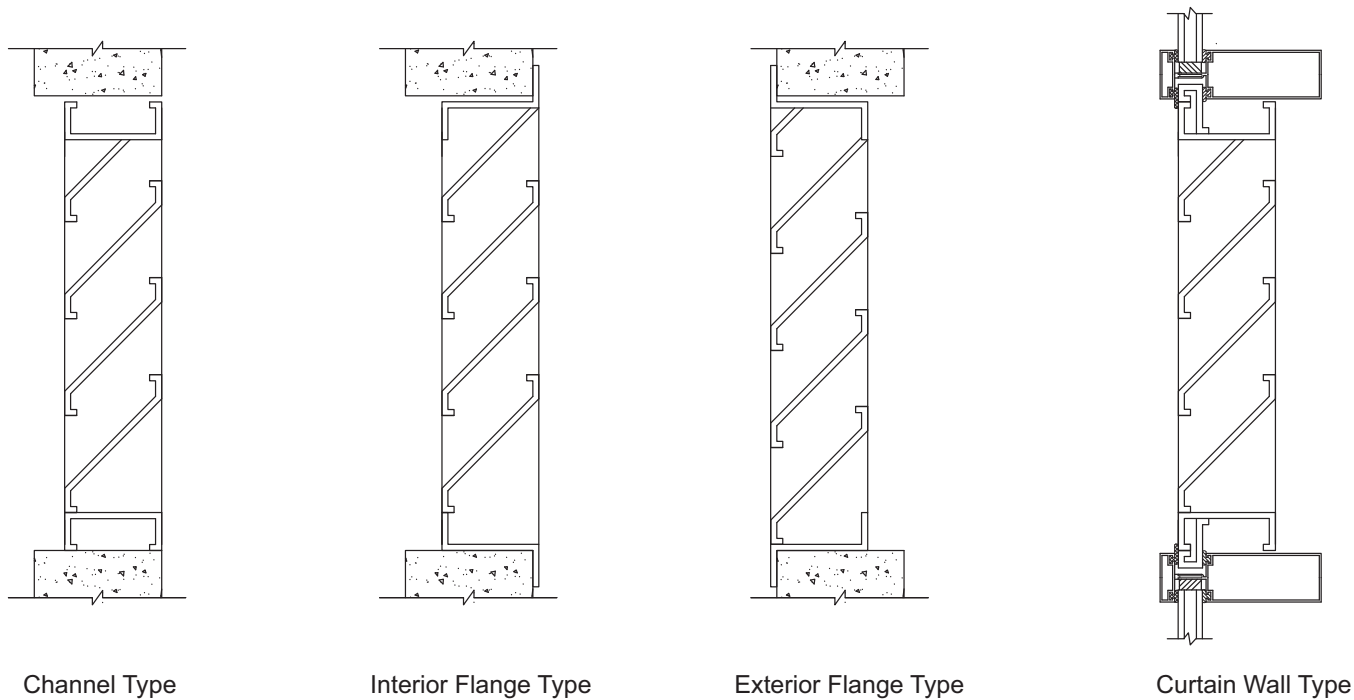


Figure 5.1
Louver Frame Design

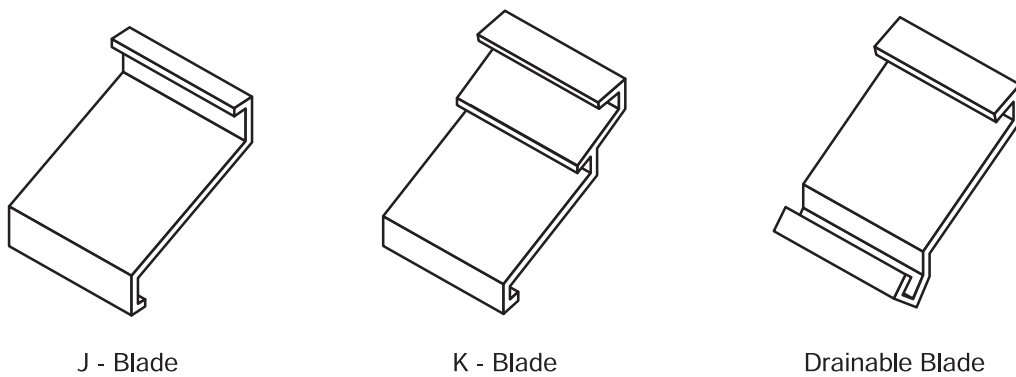


Figure 5.2
Blade Designs