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Performance of Weather Resistant Louvers

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Abstract: *Data Centres are the areas where, not a single droplet of water should penetrate inside the premises but on the other hand required opening area should be at least 50%, because of number of fan banks are present inside the premise. For this application, best suitable product is 'Weather Resistant Louvers.' Weather Resistant Louvers are also known as 'Performance Louvers.' A Louver is a ventilation product which allows enough air to enter and at the same time restricts Water Penetration. The most important considerations for selecting louvers are water penetration, free area and pressure loss. The main objective of this paper is to analyse the performance of Weather Resistant Louvers.*

Keywords: Weather Resistant Louver, Fan Banks, Water Penetration, Data Centre

I. INTRODUCTION

A louver is a ventilation product that allows air to pass through it while keeping out unwanted elements such as water, dirt, and debris. A few fixed or operable blades mounted in a frame can provide this functionality. The basic considerations for selecting louvers are free area, water penetration and resistance to airflow (pressure loss). Drainable louvers are characterized by gutters incorporated at the front edge of each blade to prevent water droplets from cascading from blade and becoming entrained in the intake air flow. Vertical gutters located in the jamb frames carry the water to the sill frame where it exits from the louver assembly between the sill frame and bottom blade. Drainable louvers generally outperform conventional architectural blade louvers and provide enhanced resistance to water penetration. Vertical gutters located in the jamb frames carry the water to the sill frame where it exits from the louver assembly between the sill frame and bottom blade. Drainable louvers generally outperform conventional architectural blade louvers and provide enhanced resistance to water penetration. The product is installed in Data Centre area. Due to this, by 'A' class Louver, at wind speed 45 km/h, by maintaining opening Area 50% (which is previously 25%), 0% water penetration is achieved. Hence in Areas like Data Centres where restriction of water but on the other hand, more opening area is needed, Louvers are more efficient.

Figure 1: Architectural Louver of Construction Specialties

II. BACKGROUND

2.1 Types of Louvers

- Performance or Weather Louvers: To allow the passage of air with protection from rain penetration.
- Standard Louvers: To provide the maximum airflow required with some degree of rain defence.
- Screening Louvers: Often used on the top of buildings to conceal HVAC systems.

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Free Area: The key reason for using louvers is to provide the area for air.

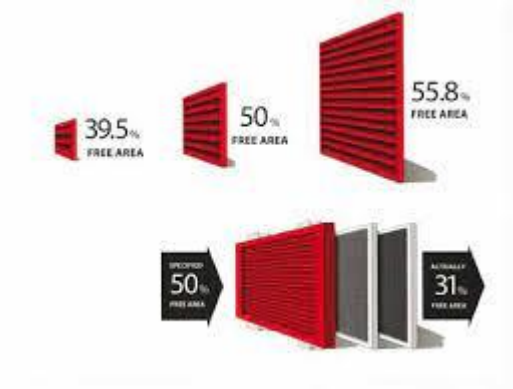

Figure 2: Free Area of Louvers of Construction Specialties

III. KEY REQUIREMENTS

Key requirements of weather louvers are:

Airflow: Airflow is the important parameter while selecting louver. Improved efficiency of louver design not only saves money but can also contribute to an improved energy rating.

Face Velocity (m/s) = Volume Flow Rate (m^3/s) / Face Area (m^2)

Water Penetration:

Class	Max Allowable Rain Penetration
A	0.75
B	3.75
C	15
D	>15

Table 1: Classification of Louvers according to Water Penetration

Water Penetration plays an important role while selecting performance louver. Since the main requirement of using louver as an application is water should not enter inside the premise. According to the rain rejection effectiveness performance louvers are classified into classes. Class 'A' louvers have rain rejection effectiveness in between 0.99-1. These louvers are highly efficient louvers. Class 'A' louvers are mainly used in applications like data centres where restriction on water penetration is needed on the other hand more opening area is required. Class 'B' louvers have rain rejection rate in between 0.95-0.989. These louvers are less efficient than Class 'A.' Class 'C' louvers have rain rejection rate in between 0.80-0.949 whereas Class 'D' louvers have rain rejection rate less than 0.80.

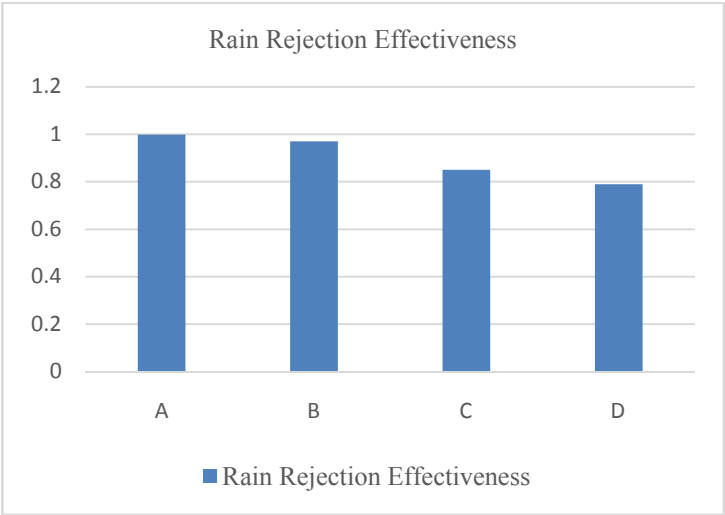

Figure 3: Rain Rejection Effectiveness

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IV. INSTALLATION

Installation of Weather Resistant Louvers comprises of six important components. Those are MS Vertical member, Louver having horizontal and vertical blade, installation of frame, bottom MS shoe bracket and pressure plate. First framing structure is completed by the façade associates in which vertical and horizontal framing structure is completed. Once framing structure gets completed, Louvers are installed with the help of structure.

Figure 4: Installation details

Sr. No.	Important components of installation
1	MS Vertical Member Design
2	Horizontal Louver Blade Design
3	Vertical Louver Blade Design
4	Frame Design
5	Bottom MS Shoe Bracket Design
6	Pressure Plate Design

Table 2: Important components of Design and Installation

V. TESTING

Figure 5: Complete installation of Louvers

Once the installation is completed, the most important aspect is testing the important parameters i.e. water should not come inside the premises and at the same time sufficient air should come from opening area. After completion on site, it is found that 0% water penetration is achieved and at the same time adequate opening area is maintained.

VI. CONCLUSION

The product installed in Data Centre area is weather resistant louver. Due to this, by 'A' class Louver, at wind speed 45 km/h, by maintaining opening Area 50% (which is previously 25%), 0% water penetration is achieved. Hence in Areas

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like Data Centres where restriction of water is there but on the other hand, more opening area is needed, Louvers are more efficient.

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