

TECH TALK

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Louver Performance and How to Size Them

by Dave Fetters

Regular readers of this publication have seen the mathematical relationship:

$$\text{CFM} = \text{Velocity} \times \text{Area}$$

(Oh no, here he goes again!)

This equation will always apply whenever we speak of moving an amount of air through one of our products. As before, the volume flow rate (cubic feet per minute or CFM) equals the velocity (feet per minute or FPM) times the area (square feet or FT²) of the product it is flowing through. Let's apply this to the Hart & Cooley line of extruded aluminum stationary louvers.

Customers generally have an idea of how much air (CFM) needs to be transferred through a louver and ask for assistance with sizing. "Sizing" a louver means to find a size that has

an area in square feet sufficient to pass the required quantity of air. Therefore, we need to solve the equation for area to determine the size. The equation above requires two out of three factors to be "known" to calculate a value for the third "unknown." In order to find the correct "size," the CFM and velocity must be known for us to determine the required area. When a customer wants to size a louver and only tells us the CFM, we have to ask "At what velocity?" Since velocity is related to pressure loss, we could arrive at a suitable velocity based on a planned pressure loss. (We will save this discussion for another issue of *Tech Talk*.) Hopefully you get the idea that somehow we have to determine a face velocity.

The rest is easy.

$$\text{CFM/Velocity} = \text{Area}$$

Some recommended velocities for air intake, exhaust, or transfer are:

Exterior

500 – 700 FPM, up to 1,000 FPM if noise and water infiltration are not considerations

Interior

200 – 400 FPM for low pressure drop and low noise

Example: Size a 1½" thick louver to exhaust 2,000 CFM from a mechanical room at 500 FPM.

Solution: $\frac{2,000 \text{ CFM}}{500 \text{ FPM}} = 4 \text{ FT}^2$

So, from an area chart for a 1530 louver (1½ inch thick with a 30° blade angle), a 42 x 30 is the proper size that provides at least 4 FT².

If noise is not a factor, maybe a 900 FPM velocity would work.

$\frac{2,000 \text{ CFM}}{900 \text{ FPM}} = 2.22 \text{ FT}^2$

For the same louver, a 30 x 24 is the correct size corresponding to this area.

Different louvers will have different areas for the same size because of differences in blade angle and depth of the blades.

The area (in square feet) for the various louvers we offer, can be found in our **Registers, grilles & diffusers** product catalog and on our web site at:

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