



Simple Supply Sizing

There are three main things to consider when sizing a supply: flow rate, noise and static pressure. The easiest way to bring all three variables into a reasonable range is to focus on face velocity.

In cases where stringent design criteria don't have to be met, you can rely on this rule of thumb: Keep face velocity at 700 FPM (feet per minute) – give or take 150 FPM.

Manual D – Residential Duct Systems from the Air Conditioning Contractors of America (ACCA) suggests a maximum face velocity of 700 FPM unless the Noise Criteria (NC) value will remain at or beneath 30.

Keep in mind that this is also subject to the type of room being conditioned: 30 NC might be too loud for a library, but well within reason for an active reception area.

When using general guidelines like these, it is important to consider the current trends relating to flow rate and velocity. Lower velocities can be advantageous because they are quieter and create less static pressure. On the other hand, they have shorter throw and less mixing in the room being conditioned. Higher velocities are appealing because of the longer throws and better mixing, but the downside can be higher noise and static pressures.

Glossary

Face Velocity: a measurement of the air velocity at the face of the inlet or outlet in an HVAC system; it's obtained by dividing the air flow rate by the component effective area (Ak).

Effective Area (Ak): the calculated area of an outlet based on flow rate and face velocity * effective area. Ak is published in units of square feet and can be used in place of free area. which is a similar term and has a slightly smaller value but only used when measuring slow moving air, as in a natural draft situation.

Flow Rate: the volume of air moved over time, measured in cubic feet per minute (CFM).

Static Pressure: the stable pressure in an HVAC air duct that occurs when the system is on, the fan blower is running and the pressure reaches an equilibrium point with the air flow and pressure remaining constant.

Throw: distance (in feet) the air stream travels from the outlet to the point of terminal velocity.

Example

Suppose a room will require 300 CFM in order to be adequately conditioned. A618MS has already been chosen as the supply register, and it will be used in deflection setting "A," which throws the air straight out with minimal spread. Time is tight and design criteria isn't, so sizing can and must be done right away.

The solution is simple: Check our catalog for the engineering data on A618MS and you will see a more detailed version of the table below.

A618MS (deflection 'A')

Width	Height	Ak	CFM @ 700 FPM
8	4	0.156	110
10	4	0.198	140
12	4	0.240	170
10	6	0.313	220
12	6	0.379	265
10	8	0.425	300
14	6	0.446	310
12	8	0.530	370
14	8	0.620	435

Scan down the right column for the 300 CFM value, then match that number with the width and height at left. Because their Ak (area in square feet) values are so close, either a 10x8 or 14x6 size could be used. Both would deliver similar flow rates at 700 FPM face velocity.