

Typical and Recommended Air Velocities

The typical and the recommended range of duct design air velocities are contained in the following tables.

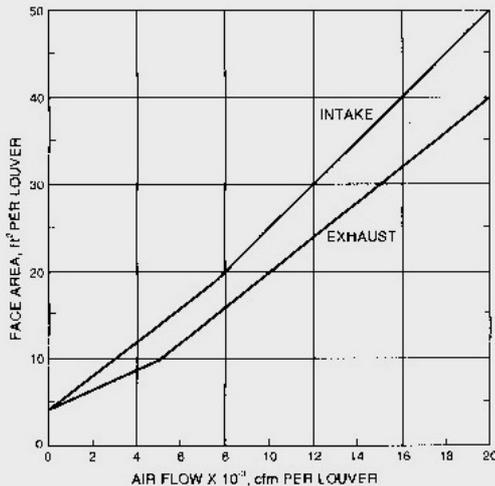
Typical Design Air Velocities

| Air Path Element | Face Velocities (FPM) | |
|---|-------------------------------|--|
| Outdoor Air Intake* | 400 (7000 cfm and greater)** | |
| Exhaust* | 500 (5000 cfm and greater)** | |
| Throw-Away Filter | 200-800*** | |
| Heating Coil (Steam or Hot Water) | 400-500 (200 Min., 1500 Max.) | |
| Cooling Coil | 500-600 | |
| Return Grille Above Occupied Zone | 800 up | Note: Lower grille velocities contribute to lower sound levels and a reduced fan horsepower requirement. |
| Return Grille Within Zone <i>Not</i> Near Seats | 600-800 | |
| Return Grille Within Zone Near Seats | 400-600 | |
| Return Grille In Door or Wall Louvers | 200-300 | |
| Return Through Undercutting of Door | 200-300 | |

*These velocities are for the louver net free area; the remaining velocities in the table are for total face area.

**For lesser air volumes, determine the velocities using the chart below.

***300 fpm typical upper limit for most inexpensive throw-away filters.



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Note: For each round duct dimension indicated on the Ductulator® "Round Duct Diameter" scale, equivalent rectangular duct dimensions, that produce equal friction losses for equal lengths of round and rectangular duct and equal flow rates (cfm), can be obtained from the "Rectangular Duct Dimensions" scale. While the friction loss of the equivalent rectangular duct equals that of the round duct, the air velocities within the rectangular ducts of various aspect ratios will differ and each will be less than that indicated on the "Velocity - Fpm" scale for the round duct. The velocity must be calculated manually for each individual rectangular duct selection, using the equation:

$$\text{Velocity (Fpm)} = \frac{\text{Air Quantity (Cfm)}}{\text{Duct Cross-Sectional Area (ft}^2\text{)}}$$

Recommended And Maximum Duct Velocities (FPM)

| Duct Type | Recommended Velocities | | | | Maximum Velocities | | | |
|--------------------|------------------------|---------------------|---------------|-------------------|--------------------|---------------------|---------------|-------------------|
| | Residences | Theaters, Libraries | Office Bldgs. | Industrial Bldgs. | Residences | Theaters, Libraries | Office Bldgs. | Industrial Bldgs. |
| Main Duct | | | | | | | | |
| Rectangular | 700 | 1000 | 2200 | 3000 | 800 | 1800 | 2500 | 3500 |
| Round | 900 | 1200 | 2400 | 4000 | 1200 | 2100 | 3200 | 6500 |
| Branch Duct | | | | | | | | |
| Rectangular | 500 | 500 | 1600 | 2500 | 700 | 800 | 2000 | 3000 |
| Round | 600 | 600 | 2000 | 3000 | 1000 | 1000 | 2500 | 4000 |

The duct velocity ranges shown provide preliminary duct sizing information for four categories of buildings. From experience, the recommended range of velocities, along with good duct design practice, generally produces sound levels

within the occupied spaces that are considered acceptably quiet for each of the 4 types of applications. The maximum velocities should be observed when the duct size must be reduced to pass through a space restricted area.