

Formulas

Use the π button for calculations.

Only round off the final answers.

Pythagorean theorem: $a^2 + b^2 = c^2$

Apex height = $\frac{\text{large diameter} \times \text{vertical height}}{\text{large diameter} - \text{small diameter}}$

Area of a circle = πr^2

Bend allowance = degrees (0.01743R + 0.0078t)

Belt length = $\frac{\pi \times \text{diameter} \times \text{degrees}}{360^\circ}$

BTU/h = 1.08 \times cfm \times temperature difference

C = $\pi \times$ diameter

cfm = area sq. ft. \times fpm

$$\frac{\text{cfm}_2}{\text{cfm}_1} = \frac{\text{rpm}_2}{\text{rpm}_1}$$

$$\frac{D_2}{D_1} = \frac{\text{rpm}_1}{\text{rpm}_2}$$

$$\text{Elbow cut size} = \tan(\text{mitre angle}) \times \text{centre line radius} \times (2 \times \# \text{ of gores} - 2)$$

$$\text{Grille measurement area cfm} = \frac{(\text{length} \times \text{width})}{144} \times \frac{\% \text{ free area}}{100} \times \text{velocity}$$

$$\text{Grille size area} = \frac{\text{cfm}}{\text{fpm}} \times \frac{100}{\% \text{ free area}}$$

$$\text{Mitre angle} = \frac{\text{angle of elbow}}{2 \times \text{number of gores} - 2}$$

$$\text{New rpm} = \text{rpm} \times \text{percent increase}$$

$$\text{Pattern angle} = \frac{\text{base} \times 180^\circ}{\text{slant side}}$$

$$\text{Rain cap notch} = \frac{R}{C\angle} \times 2\pi - \pi D$$

$$S\angle = \frac{O}{H}$$

$$C\angle = \frac{A}{H}$$

$$T\angle = \frac{O}{A}$$

$$\frac{\text{Static pressure}_2}{\text{Static pressure}_1} = \left[\frac{\text{cu. ft./rpm}_2}{\text{cu. ft./rpm}_1} \right]^2$$

$$\text{Swing point radius} = \frac{\text{offset}^2 + \text{length}^2}{4 \times \text{offset}}$$

$$\text{Unknown duct side} = \frac{100\% \text{ free area} \times \text{duct area}}{\text{known duct side}}$$

$$\text{Volume} = r^2h$$

$$\text{Wrapper/ belt length} = \frac{4\sqrt{[\text{offset}^2 + \text{length}^2]} - \text{length}}{3}$$