

## REFERENCES AND FORMULAS

Area:  $= \pi r^2$

Velocity:  $= \text{m/s}$

Duct Total Flow:  $= \text{Duct Area} \times \text{Velocity}$

$= \text{m}^2 \times \text{m/s}$

$= \text{m}^3/\text{s}$  (or  $\times 1000 = \text{L/s}$ )

Filter Area Required:  $= \frac{\text{Total Flow}}{\text{Air to Cloth Ratio}}$

$= \frac{\text{m}^3/\text{s}}{\text{m/s}}$

$= \text{m}^2$

Actual Air to Cloth Ratio:  $= \frac{\text{Total Flow}}{\text{Actual Filtration Area}}$

$= \frac{\text{m}^3/\text{s}}{\text{m}^2}$

$= \text{m/s}$

Valve Consumption  $= \frac{V_1 P_1}{P_{\text{amb}}} (1 - \frac{P_2}{P_1})^{1/\alpha}$

- $V_1$  = Header Volume ( $\text{m}^3$ )
- $P_1$  = Initial Header Pressure (*absolute*) (Pa)
- $P_{\text{amb}}$  = 101325 Pa
- $P_2$  = Final Header Pressure (*absolute*) (Pa)
- $\alpha$  = Ratio of Specific Heats
- $\alpha$  = 1.4 for air

