

Conversion Information

Chart Calculations and Flow Meter Sizing (ACFM Applications)

Example:

Operating Parameters

Fluid ~ Air

Line Pressure ~ 35 psig

Temperature ~ 70°F

Desired Maximum Flow ~ 20 acfm

Since acfm measurements are not relative to the standard 1 atmosphere condition (14.7 psia), the volume of a cubic foot at 35 psig must first be related to the volume it would occupy at 1 Atmosphere. The two volumes are related through Boyle's Law.

Since, $V \propto \frac{1 \text{ Atm}}{x \text{ Atm}}$, then $V_1 P_1 = V_2 P_2$, and

$$V_1 = 20 \text{ acfm}$$

$$P_1 = 35 \text{ psig} + 14.7 \text{ psig}$$

$$V_2 = \text{scfm}$$

$$P_2 = 14.7 \text{ psia}$$

$$V_2 = \frac{V_1 P_1}{P_2} = \frac{20 \times (35 + 14.7)}{14.7} = 67.62 \text{ scfm}$$

To correct for density at 35 psig; Use figure 3 (tables 1, 2 & 3)

$$f_1 = \sqrt{\frac{114.7}{14.7 + 35}} = 1.52$$

$$f_2 = 1.0$$

$$f_3 = 1.0$$

$$f_1 \times f_2 \times f_3 = 1.52 \times 1.0 \times 1.0 = 1.52 = f_{\text{total}}$$

$$V_2 \times f_{\text{total}} = \text{Hedland indicated flow}$$

$$67.62 \times 1.52 = 102.78 \text{ scfm indicated}$$

A Hedland meter installed in this system would indicate 103 scfm. Hedland can also supply a custom calibrated scale for higher or lower fixed pressures in any measurement unit, and other fluid specific gravities. Consult factory for details.



Fatigue Rating: per NFPA/T2.6.1 R1 - 1991, C/90

The method of verifying rated fatigue pressure (or establishing the rated burst pressure: or both) of the pressure containing envelope conforms to NFPA/T2.6.1 R1, Fluid power systems and products – Method for verifying the fatigue and establishing the burst pressure ratings of the pressure containing envelope of a metal fluid power component.

Meter	Aluminum		Brass		Stainless Steel	
	RFP*	Cycles	RFP*	Cycles	RFP*	Cycles
1/4	2000	1 x 10 ⁶	**		3000	1 x 10 ⁶
1/2	2000	1 x 10 ⁶	**		3000	1 x 10 ⁶
3/4	1500	1 x 10 ⁶	**		3000	1 x 10 ⁶
1	1500	1 x 10 ⁶	**		3000	1 x 10 ⁶
1 - 1/4	1000 1500	1 x 10 ⁶ 70 x 10 ³	**		3000	1 x 10 ⁶
1 - 1/2	1000 1500	1 x 10 ⁶ 70 x 10 ³	**		3000	1 x 10 ⁶

* RFP = Rated Fatigue Pressure, psi

** Consult Factory