MEDIA CONVERSION FACTORS

Capacity curves are for water at +70°F. For water at higher temperature, see page 26. Most other media can be converted to equivalent gpm water at +70°F. by the use of an appropriate formula with the following constants.

Constants:

1.0 gpm water at +70°F. is approximately equal to:

Air (C_a) = 3.8 SCFM AT 0 PSIG & +70°F.

Steam (C_s) = 12.25 PPH at 0 PSIG saturated (+212°F.)

Gas (C_g) = $\frac{3.8}{\sqrt{S_g}}$ SCFM at 0 PSIG & +70°F.

Legend:

Q_1 = given quantity of fluid.
Q_2 = sizing quantity equivalent gpm +70°F. water.
F_{pa} = pressure correction factor for air.
F_{ta} = temperature correction factor for air.
F_{ps} = pressure correction factor for steam.
SCFM = a cubic foot of air at 14.7 PSIA and +70°F.
PPH = pounds per hour.
S_g = specific gravity of gas relative to air.

1. Water

Read directly from capacity curves which are designed to read gpm water at +70°F. For other temperatures, see correction factors on page 26.

2. Air (use for sizing venturi)*

To find the equivalent gpm water at +70°F. use the following formula:

$$Q_2 = \frac{Q_1}{C_a} \times F_{pa} \times F_{ta}$$

Example: 500 SCFM Air at 100 psig and +150°F.

$$Q_2 = \frac{500}{3.8} \times .36 \times 1.07 = 51 \text{ gpm}$$

Solution: Use 2"-636 to read 25.5" ΔP

3. Saturated Steam (use for sizing venturi)*

Use the following formula:

$$Q_2 = \frac{Q_1}{C_s} \times F_{ps}$$

Example: 5000 PPH at 100 psig

$$Q_2 = \frac{5000}{12.25} \times .38 = 155 \text{ gpm}$$

Solution: Use 3"-750 to read 21" ΔP

4. Other Liquids

Use the following formula:

$$Q_2 = Q_1 \sqrt{S_g}$$

Example: 100 gpm, specific gravity 1.21, viscosity 1.0 centistokes

$$Q_2 = Q_1 \sqrt{S_g}$$

$$Q_2 = 100 \times 1.1 = 110 \text{ gpm}$$

Solution: 2½"-750 to read 25" ΔP

5. Gas (use for sizing venturi)*

Use the following formula:

$$Q_2 = \frac{Q_1}{C_g} \times F_{pa} \times F_{ta}$$

Example: 24,000 SCFM natural gas with specific gravity of 0.6 and measured at 15 psig and +70°F.

$$Q_2 = 24{,}000 \div \frac{3.8}{\sqrt{0.6}} \times .70 \times 1.0 = 3425 \text{ gpm}$$

Solution: Use 14"-756 to read 30.0" ΔP

Temperature		Pressure		
Deg. F	Air/Gas Temp. F_{ta}	PSIG	Air/Gas Press. F_{pa}	Sat. Steam Press. F_{ps}
0	0.932	0	1.000	1.000
2	0.933	2	.938	.934
4	0.936	4	.886	.887
6	0.938	6	.843	.846
8	0.940	8	.805	.811
10	0.942	10	.771	.780
12	0.944	12	.742	.752
14	0.946	14	.716	.727
16	0.948	16	.692	.705
18	0.950	18	.670	.685
20	0.952	20	.651	.666
25	0.956	25	.608	.626
30	0.961	30	.573	.592
35	0.966	35	.544	.564
40	0.971	40	.518	.539
50	0.981	50	.477	.498
60	0.990	60	.443	.466
70	1.000	70	.416	.439
80	1.009	80	.394	.416
90	1.019	90	.375	.397
100	1.028	100	.358	.380
120	1.046	120	.330	.352
140	1.064	140	.308	.331
160	1.081	160	.290	.312
180	1.099	180	.275	.296
200	1.116	200	.261	.282
225	1.137	225	.247	.267
250	1.157	250	.235	.255
275	1.177	275	.225	.244
300	1.197	300	.216	.234
325	1.217	325	.208	.226
350	1.236	350	.201	.218
375	1.255	375	.194	.211
400	1.274	400	.188	.204
425	1.292	425	.183	.198
450	1.310	450	.178	.193
475	1.328	475	.173	.188
500	1.346	500	.169	.183