

FLUID POWER DATA

FLOW DATA AND FORMULAS



FLOW DATA

| PIPE | | | | | | | HOSE | | | | | | |
|-----------|-----------------------|-------|--------|-----------------------------------|-------|--------|-----------|-----------------------|-----------------------------------|--------|--------|--------|--|
| PIPE SIZE | FLOW- GPM @ 15 FT/SEC | | | PRESSURE (PSI, 4:1 SAFETY FACTOR) | | | HOSE SIZE | FLOW- GPM @ 15 FT/SEC | PRESSURE (PSI, 4:1 SAFETY FACTOR) | | | | |
| | SCH40 | SCH80 | SCH160 | SCH40 | SCH80 | SCH160 | | | 1 WIRE | 2 WIRE | 4 WIRE | 6 WIRE | |
| 1/8 | 2.7 | 1.7 | | 3500 | 4800 | | 1/4 | 2.3 | 2750 | 5000 | | 11250 | |
| 1/4 | 4.9 | 3.4 | | 2100 | 4350 | | 3/8 | 5.2 | 2250 | 4000 | 4000 | 10000 | |
| 3/8 | 9.0 | 6.6 | | 1700 | 4800 | | 1/2 | 9.2 | 2000 | 3500 | 4000 | 7500 | |
| 1/2 | 12.0 | 11.0 | 8.0 | 2300 | 4100 | 7300 | 3/4 | 20.7 | 1250 | 2250 | 4000 | 6250 | |
| 3/4 | 25.1 | 20.3 | 12.7 | 2000 | 3500 | 6500 | 1 | 36.7 | 1000 | 2000 | 4000 | 5000 | |
| 1 | 40.6 | 33.8 | 24.5 | 2100 | 3500 | 5700 | 1-1/4 | 57.4 | 625 | 1625 | 3000 | 3500 | |
| 1-1/4 | 70.3 | 60.2 | 49.7 | 1800 | 3000 | 4400 | 1-1/2 | 82.7 | | 1250 | 2500 | 3000 | |
| 1-1/2 | 95.6 | 83.0 | 66.1 | 1700 | 2800 | 4500 | 2 | 147 | | 1125 | 2500 | 3000 | |
| 2 | 157 | 139 | 105 | 1500 | 2500 | 4600 | | | | | | | |
| 2-1/2 | 225 | 199 | 164 | 1900 | 2800 | 4200 | | | | | | | |
| 3 | 347 | 310 | 254 | 1600 | 2600 | 4100 | | | | | | | |

TUBING

| TUBE SIZE | FLOW- GPM @ 15 FT/SEC | | | | | | PRESSURE (PSI, 4:1 SAFETY FACTOR) | | | | | | | |
|-----------|-----------------------|-------|-------|-------|-------|-------|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|
| | WALL THICKNESS: | | | | | | WALL THICKNESS: | | | | | | | |
| | 0.035 | 0.049 | 0.065 | 0.083 | 0.095 | 0.109 | 0.120 | 0.035 | 0.049 | 0.065 | 0.083 | 0.095 | 0.109 | 0.120 |
| 1/4 | 1.20 | 0.85 | | | | | | 3850 | 5400 | | | | | |
| 3/8 | 3.44 | 2.84 | 2.21 | | | | | 2580 | 3600 | 4750 | | | | |
| 1/2 | 6.83 | 5.97 | 5.06 | 4.11 | | | | 1930 | 2700 | 3580 | 4560 | | | |
| 3/4 | | 15.7 | 14.2 | 12.6 | 11.6 | 10.4 | | 1800 | 2390 | 3050 | 3440 | 4000 | | |
| 1 | | 30 | 27.9 | 25.6 | 24.2 | 22.5 | 21.3 | 1350 | 1790 | 2280 | 2620 | 3000 | 3300 | |
| 1-1/4 | | | | 43.3 | 41.4 | 39.3 | 37.6 | | | 1830 | 2080 | 2400 | 2650 | |
| 1-1/2 | | | | | 63.3 | 60.6 | 58.7 | | | | 1740 | 2000 | 2200 | |
| 2 | | | | | | 120 | 114 | | | | 1300 | | 1650 | |

Fluid Power Data

PIPE FLOW DATA

| PIPE SIZE | PRESSURE DROP FOR PIPE OR ID | | | |
|-----------|------------------------------|-----------------|------|------|
| | ΔP/FT @ 15 FT/SEC | GPM @ 15 FT/SEC | ID | AREA |
| 1/8 | 2.67 | 3.16 | .269 | .057 |
| 1/4 | 1.92 | 4.96 | .364 | .104 |
| 3/8 | 1.05 | 8.94 | .493 | .191 |
| 1/2 | .68 | 14.22 | .622 | .304 |
| 3/4 | .78 | 25.00 | .824 | .533 |
| 1 | .57 | 40.00 | 1.05 | .863 |
| 1-1/4 | .39 | 70.00 | 1.38 | 1.50 |
| 1-1/2 | .33 | 95.00 | 1.61 | 2.05 |
| 2 | .24 | 159.00 | 2.38 | 3.35 |
| 2-1/2 | .20 | 224.00 | 2.87 | 4.79 |

| EQUIV LENGTH OF LINE FOR PRESS DROP THRU FITTING | | | | | | |
|--|-----|-----|-----|-----|-------|------|
| | 3/8 | 1/2 | 3/4 | 1 | 1 1/2 | 2 |
| ST | .8 | .9 | 1.4 | 1.7 | 2.8 | 3.5 |
| 90° | 2.7 | 3.5 | 4.5 | 5.7 | 7.5 | 11.0 |
| 45° | 1.2 | 1.5 | 2.1 | 2.6 | 4.3 | 5.5 |

| RATIO FOR VELOCITY VS PRESSURE DROP | |
|-------------------------------------|-----------------------------|
| FLUID FLOW IN FT/SEC | LINE PRESSURE DROP FACTOR * |
| 5 | 1.0 |
| 7 | 1.5 |
| 10 | 2.0 |
| 15 | 2.8 |
| 20 | 8.7 |
| 25 | 13.5 |
| 30 | 17.8 |

OIL VELOCITY IN PIPES

$$V = \frac{.408Q}{(ID)^2}$$

G = PRESSURE LOSS, PSI/FT
 H = VISCOSITY, SSU
 I.D = INSIDE DIA, IN
 Q = FLOW, GA/MIN
 V = VELOCITY, FT/SEC

PRESSURE DROP PER FOOT

$$G = \frac{HQ}{18,300 (ID)^4}$$

MAXIMUM RECOMMENDED VELOCITIES:

4 FT/SEC FOR SUCTION LINES
 15 FT/SEC FOR PRESSURE LINES