

Cylinder Speed vs. Flow Chart

		CYLINDER BORE IN INCHES																											
		1/4	3/8	1/2	5/8	3/4	1	1-1/2	2	2-1/2	3-1/4	4	5	6	8														
INCHES PER SECOND	1	.0004	.009	.0009	.019	.002	.035	.003	.054	.004	.08	.007	.14	.015	.31	.026	.55	.042	.87	.07	1.46	.11	2.2	.17	3.5	.24	5.0	.43	8.9
	2	.0006	.017	.002	.039	.003	.069	.005	.108	.008	.16	.013	.28	.030	.62	.053	1.1	.082	1.7	.14	2.9	.21	4.4	.33	6.9	.48	10.0	.85	17.7
	3	.001	.026	.003	.058	.005	.104	.008	.162	.011	.23	.020	.42	.045	.94	.082	1.7	.125	2.6	.21	4.4	.32	6.7	.50	10.4	.72	15.0	1.3	26.6
	4	.002	.035	.004	.078	.007	.14	.011	.22	.015	.31	.026	.55	.058	1.2	.106	2.2	.17	3.5	.28	5.9	.43	8.9	.67	13.9	.96	20.0	1.7	35.5
	5	.002	.043	.005	.097	.008	.17	.013	.27	.019	.39	.033	.69	.077	1.6	.135	2.8	.21	4.3	.35	7.3	.53	11.1	.83	17.3	1.2	24.9	2.1	44.3
	6	.003	.052	.006	.117	.010	.21	.016	.33	.022	.39	.040	.83	.091	1.9	.16	3.3	.25	5.2	.42	8.8	.64	13.3	1.0	20.8	1.4	29.9	2.6	53.2
	7	.003	.061	.007	.136	.012	.24	.018	.38	.026	.55	.047	.97	.106	2.2	.19	3.9	.29	6.1	.49	10.2	.75	15.5	1.2	24.2	1.7	34.9	3.0	62.1
	8	.003	.069	.008	.156	.013	.28	.021	.43	.030	.62	.053	1.1	.120	2.5	.21	4.4	.33	6.9	.56	11.7	.85	17.7	1.3	27.7	1.9	39.9	3.4	70.9
	9	.004	.078	.009	.175	.015	.31	.024	.49	.034	.70	.058	1.2	.135	2.8	.24	5.0	.38	7.8	.63	13.2	.96	19.9	1.5	31.2	2.2	44.9	3.8	79.8
	10	.004	.087	.009	.195	.017	.35	.026	.54	.038	.78	.067	1.4	.15	3.1	.26	5.5	.42	8.7	.70	14.6	1.1	22.2	1.7	34.6	2.4	49.9	4.3	88.7
	11	.005	.095	.010	.214	.018	.38	.029	.60	.041	.86	.072	1.5	.16	3.4	.29	6.1	.46	9.5	.77	16.1	1.2	24.4	1.83	38.1	2.6	54.9	4.7	97.5
	12	.005	.104	.011	.234	.020	.42	.031	.65	.045	.94	.082	1.7	.18	3.7	.32	6.6	.50	10.4	.85	17.6	1.3	26.6	2.0	41.6	2.9	59.8	5.1	107
	13	.005	.113	.012	.253	.022	.45	.034	.70	.048	1.0	.087	1.8	.20	4.1	.35	7.2	.54	11.3	.91	19.0	1.4	28.8	2.2	45.0	3.1	64.8	5.6	115
	14	.006	.121	.013	.273	.024	.49	.037	.76	.053	1.1	.091	1.9	.21	4.4	.38	7.8	.58	12.1	.99	20.5	1.5	31.0	2.3	48.5	3.4	69.8	6.0	124
	15	.006	.130	.014	.292	.025	.52	.039	.81	.058	1.2	.101	2.1	.23	4.7	.40	8.3	.63	13.0	1.1	21.9	1.6	33.2	2.5	52.0	3.6	74.8	6.4	133
	16	.007	.139	.015	.312	.026	.55	.042	.87	.058	1.2	.106	2.2	.24	5.0	.43	8.9	.67	13.9	1.13	23.4	1.7	35.5	2.7	55.4	3.8	79.8	6.8	142
	17	.007	.147	.016	.331	.028	.59	.044	.92	.063	1.3	.115	2.4	.25	5.3	.45	9.4	.71	14.7	1.2	24.9	1.8	37.7	2.8	58.9	4.1	84.8	7.3	151
	18	.008	.156	.017	.351	.030	.62	.047	.97	.067	1.4	.120	2.5	.27	5.6	.48	10.0	.75	15.6	1.3	26.3	1.9	39.9	3.0	62.3	4.3	89.8	7.7	160
	19	.008	.165	.018	.370	.032	.66	.050	1.0	.072	1.5	.125	2.6	.28	5.9	.51	10.5	.79	16.5	1.3	27.8	2.0	42.1	3.2	65.8	4.6	94.8	8.1	169
	20	.008	.173	.019	.390	.033	.69	.052	1.1	.077	1.6	.135	2.8	.30	6.2	.53	11.0	.83	17.3	1.4	29.3	2.1	44.3	3.3	69.3	4.8	100	8.5	178
	22	.009	.191	.021	.429	.037	.76	.058	1.2	.082	1.7	.144	3.0	.33	6.9	.59	12.2	.92	19.1	1.6	32.2	2.3	48.8	3.7	76.2	5.3	110	9.4	195
	24	.010	.208	.023	.468	.040	.83	.063	1.3	.091	1.9	.159	3.3	.36	7.5	.64	13.3	1.0	20.8	1.7	35.1	2.6	53.2	4.0	83.1	5.8	120	10.2	213
	26	.011	.225	.024	.507	.043	.90	.067	1.4	.096	2.0	.173	3.6	.39	8.1	.69	14.4	1.1	22.5	1.8	38.0	2.7	57.6	4.3	90.1	6.2	130	11.1	231
	28	.012	.242	.026	.545	.047	.97	.072	1.5	.106	2.2	.188	3.9	.42	8.7	.75	15.5	1.2	24.2	2.0	41.0	3.0	62.1	4.7	97.0	6.7	140	11.9	249
	30	.013	.260	.028	.584	.050	1.04	.077	1.6	.111	2.3	.202	4.2	.45	9.4	.80	16.6	1.3	26.0	2.1	43.9	3.2	66.5	5.0	104	7.2	150	12.8	266

LEGEND

Cv	→ Cv is based on 70 PSI inlet pressure and 7 PSI pressure drop.
SCFM	→ SCFM is calculated for F.R.L. sizing.

Cv to .20
 Cv to .30
 Cv to .70
 Cv to 1.2
 Cv to 2.0
 Cv to 3.6
 Cv to 5.7
 Cv to 10
 Cv to >10

The purpose of this chart is to give a quick reference guide to sizing pneumatic components. It does not take into account other accessory components, which could affect results.

SCFM Formula

$$Q^* = \frac{A \cdot L}{T} \times C_R$$

** Multiply by $\frac{60}{1728}$ to convert inches to feet for SCFM.*

Q=SCFM	$C_R = \frac{P_2 + 14.7}{14.7}$
$A = \frac{\pi D^2}{4}$	$P_2 =$ Pressure at Cylinder
L= Length (Stroke)	D= Bore Diameter
$T = \frac{\text{Length}}{\text{Speed (in/s)}}$	P= Main Line Pressure
	$\Delta P = P \cdot P_2$

Cv Formula

$$Cv = \frac{1.024 \times Q}{\sqrt{\Delta P (P_2 + 14.7)}}$$