DISCHARGE OF AIR THROUGH AN ORIFICE

In cubic feet of free air per minute at standard atmospheric pressure of 14.7 lb. Per sq. in. absolute and 70°F

Gauge Pressure before Orifice in Pounds per sq. in.	DIAMETER OF ORIFICE										
	1/64"	1/32"	1/16"	1/8"	¼"	3/8"	½"	5/8""	¾"	7/8"	1"
	Discharge in cubic feet of free air per minute										
1	.028	.112	.450	1.80	7.18	16.2	28.7	45.0	64.7	88.1	115
2	.040	.158	.633	2.53	10.1	22.8	40.5	63.3	91.2	124	162
3	.048	.194	.775	3.10	12.4	27.8	49.5	77.5	111	152	198
4	.056	.223	.892	3.56	14.3	32.1	57.0	89.2	128	175	228
5	.062	.248	.993	3.97	15.9	35.7	63.5	99.3	143	195	254
6	.068	.272	1.09	4.34	17.4	39.1	69.5	109	156	213	278
7	.073	.293	1.17	4.68	18.7	42.2	75.0	117	168	230	300
9	.083	.331	1.32	5.30	21.2	47.7	84.7	132	191	260	339
12	.095	.379	1.52	6.07	24.3	54.6	97.0	152	218	297	388
15	.105	.420	1.68	6.72	26.9	60.5	108	168	242	329	430
20	.123	.491	1.96	7.86	31.4	70.7	126	196	283	385	503
25	.140	.562	2.25	8.98	35.9	80.9	144	225	323	440	575
30	.158	.633	2.53	10.1	40.5	91.1	162	253	365	496	648
35	.176	.703	2.81	11.3	45.0	101	180	281	405	551	720
40	.194	.774	3.10	12.4	49.6	112	198	310	446	607	793
45	.211	.845	3.38	13.5	54.1	122	216	338	487	662	865
50	.229	.916	3.66	14.7	58.6	132	235	366	528	718	938
60	.264	1.06	4.23	16.9	67.6	152	271	423	609	828	1082
70	.300	1.20	4.79	19.2	76.7	173	307	479	690	939	1227
80	.335	1.34	5.36	21.4	85.7	193	343	536	771	1050	1371
90	.370	1.48	5.92	23.7	94.8	213	379	592	853	1161	1516
100	.406	1.62	6.49	26.0	104	234	415	649	934	1272	1661
110	.441	1.76	7.05	28.2	113	254	452	705	1016	1383	1806
120	.476	1.91	7.62	30.5	122	274	488	762	1097	1494	1951
125	.494	1.98	7.90	31.6	126	284	506	790	1138	1549	2023
150	.582	2.37	9.45	37.5	150	338	600	910	1315	1789	2338
200	.761	3.10	12.35	49.0	196	441	784	1225	1764	2401	3136
250	.935	3.80	15.18	60.3	241	542	964	1508	2169	2952	3856
300	.995	4.88	18.08	71.8	287	646	1148	1795	2583	3515	4592
400	1.220	5.98	23.81	94.5	378	851	1512	2360	3402	4630	6048
500	1.519	7.41	29.55	117.3	469	1055	1876	2930	4221	5745	7504
750	2.240	10.98	43.85	174.0	696	1566	2784	4350	6264	8525	11136
1000	2.985	14.60	58.21	231.0	924	2079	3696	5790	8316	11318	14784

Table is based on 100% coefficient of flow. For a well rounded entrance, multiply values by 0.97. For sharp edged orifices a multiplier of 0.61 may be used for approximate results. Values for pressures from 1 to 15 lbs. gauge calculated by standard adiabatic formula. Values for pressures above 15 lb. gauge calculated by approximate formula proposed by S.A. Moss Where:

$$W = 0.5303 \frac{ACp_1}{T_1}$$

Where: W = discharge in lbs. per sec.
A = Area of orifice in sq. in.
C = Coefficient of flow
p_1 = Upstream total pressure in lbs. per sq. in. absolute
T_1 = Upstream temperature in °F.

Values used in calculating above table were: C = 1.0, p_1=gauge pressure + 14.7 lbs./ sq. in., T_1 = 530°F. abs. Weights (W) were converted to volumes using density factor of 0.07494 lbs./cu. ft. This is correct for dry air at 14.7lbs. per sq. in. absolute pressure and 70°F. Formula cannot be used where P_1 is less that two times the downstream pressure.

Inches x 25.4 = mm; psi x 6.895 = kPa; chn x 0.02832 = rn^3/rnin; 70°F = 21.1°C