

TABLE 43. FLOW OF STEAM IN POUNDS PER MINUTE THROUGH STANDARD PIPES AND PRESSURE DROP IN POUNDS PER 100 FT.—VELOCITY, 4000 FT. PER MINUTE*

PIPE SIZE INCHES	GAGE PRESSURE IN POUNDS PER SQUARE INCH—STANDARD PIPE													
	1	3	5	10	15	25	35	50	75	100	125	150	175	Flow Drop
1/4	0.340	0.381	0.420	0.518	0.614	0.805	0.993	1.270	1.727	2.175	2.620	3.072	3.515	28.42
3/8	0.597	0.668	0.737	0.908	1.077	1.411	1.740	2.225	3.029	3.814	4.593	5.382	6.160	16.06
1	0.968	1.083	1.195	1.473	1.746	2.287	2.821	3.608	4.908	6.182	7.448	8.730	9.990	10.99
1 1/4	1.675	1.873	2.068	2.548	3.023	3.958	4.882	6.241	8.490	10.70	12.88	15.11	17.28	17.28
1 1/2	2.281	2.551	2.816	3.471	4.113	5.388	6.650	8.500	11.57	14.457	17.56	20.56	23.53	23.53
2	3.760	4.208	4.641	5.721	6.782	8.880	10.96	14.02	19.06	24.02	28.92	33.90	38.80	38.80
2 1/2	5.365	6.000	6.621	8.165	9.680	12.68	15.64	20.00	27.20	34.26	41.28	48.36	55.35	55.35
3	8.280	9.260	10.22	12.60	14.93	19.57	24.13	30.85	42.00	52.88	63.70	74.62	85.45	85.45
4	14.26	15.96	17.61	21.70	25.73	33.70	41.58	53.15	72.33	91.10	109.8	128.6	147.2	147.2
5	22.43	25.08	27.68	34.12	40.45	52.96	65.32	83.60	113.7	143.2	172.4	202.2	231.3	231.3
6	32.36	36.22	39.95	49.25	58.38	76.48	94.30	120.7	164.2	206.7	249.0	291.8	334.0	334.0
8	57.30	64.10	70.72	87.15	103.4	135.4	166.9	213.6	291.0	365.9	440.8	516.6	591.0	591.0
10	90.40	101.1	111.6	137.6	163.1	213.6	263.4	336.8	438.5	577.2	695.0	815.0	932.8	932.8
12	128.6	143.8	158.8	195.7	232.0	303.9	374.6	479.3	632.0	821.5	989.0	1159.0	1327.0	1327.0
	0.027	0.031	0.034	0.042	0.049	0.064	0.079	0.101	0.137	0.172	0.208	0.280	0.313	0.313

*Courtesy Crane Company.

RESULTS OF LABORATORY EXPERIMENTS

The Research Laboratory of the AMERICAN SOCIETY HEATING AND VENTILATING ENGINEERS has investigated this subject¹, and has found the critical velocity for quiet operation to be about 22 in. per second for the sizes of pipe investigated and apparently increasing with the size of pipe. The maximum velocity, however, with counter flow of condensate where noise is not objectionable is considerably higher and increases rapidly with size of pipe. In the case of horizontal runs both the critical velocity for quiet operation and the maximum velocity where noise is not objectionable, depend upon the pitch of the pipe. The maximum capacity and velocity where noise is not objectionable for horizontal pipes with various pitches are given in Table 44.

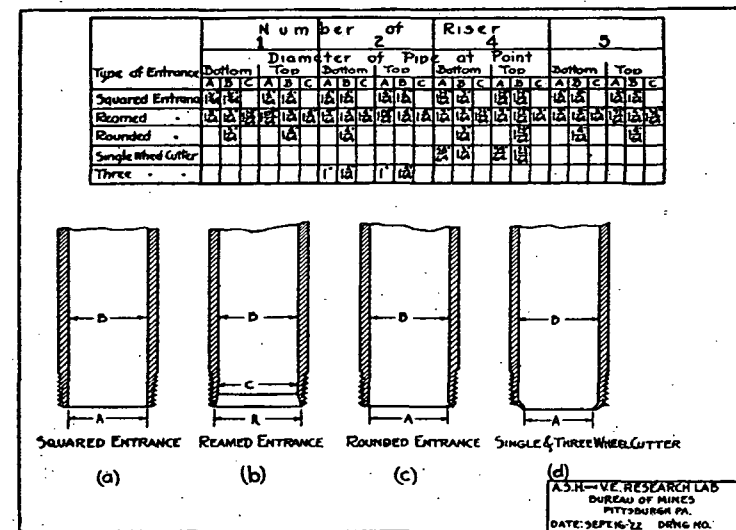


FIG. 22. EFFECT OF REAMING ENTRANCE TO ONE-PIPE RISERS

The capacity of risers with various shaped entrances is very important and those shown in Fig. 22 gave the following maximum capacities:—

	Per Cent Decrease
Reamed entrances.....	24.7 lb. per hr. 0.0
Rounded entrances.....	23.9 lb. per hr. 3.2
Squared entrances.....	22.2 lb. per hr. 10.1
Three wheel cutter.....	19.2 lb. per hr. 22.2
Single wheel cutter.....	17.6 lb. per hr. 28.7

Where the velocity of steam is the limiting factor of the capacity of a pipe, care must be taken that this velocity is not exceeded in any part of

¹Reports by Houghten & Ebin, TRANSACTIONS, AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS, Vols. 28-32, incl.