

TABLE 45. MAXIMUM CAPACITY OF ONE PIPE LINES AT VARIOUS PITCHES

Pitch of Pipe in Inches per 10 Ft.

NOMINAL DIAM. OF PIPE IN IN.	$\frac{1}{4}$ "			$\frac{1}{2}$ "		
	COND. LB. PER HR.	B.T.U. LOSS PER HR.	SQ. FT. RAD. BASED ON 240 B.T.U.	COND. LB. PER HR.	B.T.U. LOSS PER HR.	SQ. FT. RAD. BASED ON 240 B.T.U.
$\frac{3}{4}$	6.19	6,010	25.0	7.48	7,260	30.3
1	11.32	10,990	45.8	13.02	12,630	52.6
$1\frac{1}{4}$	25.95	25,180	104.9	29.00	28,140	117.2
$1\frac{1}{2}$	35.25	34,210	142.6	39.30	38,140	159.0
2	58.40	56,670	236.0	65.20	63,270	263.5
1"						
$\frac{3}{4}$	9.22	8,950	37.3	10.00	9,700	40.4
1	15.58	15,110	63.0	17.30	16,790	70.0
$1\frac{1}{4}$	32.93	31,950	133.0	35.75	34,690	144.5
$1\frac{1}{2}$	44.80	43,470	181.0	48.60	47,160	196.5
2	74.10	71,910	299.5	80.50	78,120	325.5
2"						
$\frac{3}{4}$	10.50	10,190	42.5	11.40	11,060	46.1
1	18.60	18,050	75.2	20.55	19,940	83.0
$1\frac{1}{4}$	38.10	36,970	154.0	40.80	39,500	165.0
$1\frac{1}{2}$	51.80	50,270	209.3	55.50	53,860	224.0
2	85.70	83,160	346.5	91.90	89,180	371.5
3"						
$\frac{3}{4}$	11.74	11,390	47.5	12.19	11,830	49.3
1	21.75	21,110	87.9	22.31	21,650	90.2
$1\frac{1}{4}$	42.68	41,420	172.6	44.07	42,760	178.2
$1\frac{1}{2}$	58.10	56,350	234.8	60.00	58,220	242.6
2	96.80	93,240	388.4	99.21	96,270	401.1
4"						
$\frac{3}{4}$	11.74	11,390	47.5	12.19	11,830	49.3
1	21.75	21,110	87.9	22.31	21,650	90.2
$1\frac{1}{4}$	42.68	41,420	172.6	44.07	42,760	178.2
$1\frac{1}{2}$	58.10	56,350	234.8	60.00	58,220	242.6
2	96.80	93,240	388.4	99.21	96,270	401.1
5"						

The accompanying tables are all for low pressure steam, that is, with the radiator at atmospheric pressure.

Table 46 gives the maximum capacity of various sized pipes for steam pressures up to 1 lb., and also the velocity for the same pipe with the radiator at atmospheric pressure.

TABLE 46. RESULTS OF TESTS USING HIGH PRESSURE STEAM

NOMINAL SIZE OF PIPE IN.	PITCH OF PIPE IN DEGREES	HEADER PRESSURE LB. PER SQ. IN.	RADIATOR PRESSURE LB. PER SQ. IN.	MAXIMUM CONDENSATE LB. PER HR.	MAXIMUM VELOCITY FT. PER SEC.	MAXIMUM VELOCITY WITH RADIATOR OPEN TO ATMOSPHERE	PER CENT CHANGE FROM MAXIMUM
1	90	0.25	0.25—	24.49	30.1	30.1	00.0
1	90	0.50	0.50—	26.35	31.8	30.1	+5.8
$1\frac{1}{4}$	90	0.50	0.50—	49.90	34.2	35.2	-2.8
$1\frac{1}{2}$	90	1.00	1.00—	72.58	36.4	38.5	-5.4
$1\frac{1}{2}$	-0.05	1.00	1.00—	27.27	13.7	14.6	-6.2
$1\frac{1}{4}$	0.0833	1.00	1.00—	21.30	14.2	15.8	-10.1
1	18.0833	1.00	1.00—	31.63	37.2	36.5	+1.9

Table 47 gives the capacity of various sized lines with and without an angle valve. It will be noted that the valves used in these tests had a seat opening smaller than the internal area of the pipe. The capacity of such lines containing a valve varies from 63 to 95 per cent of the same line without the valve.

TABLE 47. RESULTS OF TESTS ON ANGLE VALVES

NOMINAL SIZE OF PIPE IN.	AREA OF PIPE SQ. IN.	AREA VALVE SEAT OPENING SQ. IN.	PER CENT OF AREA OF PIPE	MAXIMUM PIPE AND VALVE	CAPACITY PIPE ALONE	PER CENT OF CAPACITY OF PIPE ALONE
$\frac{3}{4}$	0.537	0.4418	82.2	9.68	13.52	71.6
1	0.835	0.822	98.4	22.10	23.30	95.0
$1\frac{1}{4}$	1.459	1.258	86.2	30.00	47.5	63.1
$1\frac{1}{2}$	1.927	1.773	92.2	46.13	68.5	67.4

The capacity of various sized lines with a globe valve is given in Table 48, with the valve stem both in a vertical and horizontal position. It will be noted that with the stem in the vertical position the capacity of such a line varies from 11 to 35 per cent of the capacity of the same line without such a valve. With the valve stem in the horizontal position the capacity of the line varies from 54 to 76 per cent of the capacity of the same line without the valve. In other words, the capacity of a globe valve is somewhat less than the capacity of a pipe of the same nominal

TABLE 48. RESULTS OF TESTS ON GLOBE VALVES

PITCH = 0.4 IN. PER FT.

NOMINAL SIZE IN.	VALVE STEM—VERTICAL		VALVE STEM—HORIZONTAL	
	Capacity of Pipe and Valve Lb. per Hr.	Per Cent of Capacity of Pipe Alone	Capacity of Pipe and Valve Lb. per Hr.	Per Cent of Capacity of Pipe Alone
$\frac{3}{4}$	1.38	11.8	8.83	76.3
1	7.73	35.7	14.06	66.1
$1\frac{1}{4}$	13.20	31.2	22.88	54.3
$1\frac{1}{2}$	18.81	33.0	32.00	56.7

TABLE 49. RESULTS OF TESTS ON GATE VALVES

NOMINAL SIZE OF PIPE AND VALVE IN.	AREA OF PIPE SQ. IN.	AREA OF VALVE SQ. IN.	PITCH = 0.4 IN. PER FT.		PITCH = 90 DEG. FAHR.	
			Capacity of Pipe and Valve Lb. per Hr.	Per Cent of Capacity of Same Pipe Without Valve	Capacity of Pipe and Valve Lb. per Hr.	Per Cent of Capacity of Same Pipe Without Valve
$\frac{3}{4}$	0.5373	0.4418	10.15	85.9	10.55	78.0
1	0.860	0.809	22.50	94.0	18.78	78.0
$1\frac{1}{4}$	1.459	1.208	33.13	100.	32.50	68.6
$1\frac{1}{2}$	1.927	1.743	50.93	90.4	52.00	75.9