

TABLE 5
STEAM AND RETURN LINE SIZING CHART

All capacities are shown in pounds per hour and are based on steam and condensate flowing in the same direction.

Steam pipe capacity at 15 psi.

Pipe Size, in.	Pressure drop, psi per 100 ft. of pipe length					
	1/8	1/4	1/2	3/4	1	2
1	27	38	53	65	76	110
1 1/4	59	83	120	140	160	230
1 1/2	91	130	180	220	260	360
2	180	260	370	450	520	740
2 1/2	300	430	600	740	860	1,210
3	560	790	1,110	1,360	1,570	2,220
3 1/2	830	1,180	1,660	2,040	2,350	3,320
4	1,180	1,660	2,350	2,880	3,330	4,700
5	2,180	3,080	4,350	5,330	6,160	8,700
6	3,580	5,060	7,150	8,750	10,120	14,290
8	7,450	10,530	14,880	18,220	21,060	29,740
10	13,600	19,220	27,150	33,250	38,430	54,270
12	21,830	30,840	43,570	53,370	61,690	87,100

Steam pipe capacity at 50 psi.

Pipe Size, in.	Pressure drop, psi per 100 ft. of pipe length					
	1/4	1/2	3/4	1	2	5
3/4	27	38	47	54	76	120
1	54	77	94	110	150	240
1 1/4	120	170	210	240	340	530
1 1/2	180	260	320	370	520	830
2	370	530	650	750	1,060	1,680
2 1/2	620	870	1,070	1,240	1,750	2,760
3	1,130	1,600	1,960	2,270	3,200	5,060
3 1/2	1,690	2,390	2,930	3,390	4,780	7,560
4	2,390	3,380	4,150	4,790	6,760	10,690
5	4,420	6,250	7,670	8,860	12,500	19,780
6	7,260	10,260	12,590	14,540	20,520	32,470
8	15,120	21,360	26,210	30,280	42,720	67,590
10	27,580	38,980	47,840	55,250	77,960	123,300
12	44,270	62,560	76,780	88,680	125,100	197,900

Steam pipe capacity at 100 psi.

Pipe Size, in.	Pressure drop, psi per 100 ft. of pipe length				
	1/2	3/4	1	2	5
3/4	50	61	70	99	160
1	100	120	140	200	320
1 1/4	220	270	310	440	690
1 1/2	340	420	480	680	1,080
2	690	850	980	1,390	2,190
2 1/2	1,140	1,400	1,620	2,280	3,610
3	2,090	2,560	2,960	4,180	6,610
3 1/2	3,120	3,830	4,420	6,250	9,870
4	4,420	5,420	6,260	8,840	13,960
5	8,170	10,020	11,580	16,350	25,840
6	13,420	16,450	19,020	26,840	42,410
8	27,930	34,250	39,580	55,870	88,280
10	50,970	62,500	72,230	101,900	161,100
12	81,810	100,300	115,900	163,600	258,500

Steam pipe capacity at 150 psi.

Pipe Size, in.	Pressure drop, psi per 100 ft. of pipe length				
	1/2	3/4	1	2	5
3/4	59	73	84	120	190
1	120	150	170	240	370
1 1/4	260	320	370	520	830
1 1/2	400	500	570	810	1,280
2	820	1,010	1,170	1,650	2,610
2 1/2	1,360	1,660	1,920	2,720	4,300
3	2,480	3,050	3,520	5,090	7,870
3 1/2	3,710	4,550	5,260	7,430	11,760
4	5,250	6,440	7,440	10,510	16,630
5	9,720	11,920	13,770	19,450	30,780
6	15,950	19,560	22,600	31,930	50,520
8	33,210	40,720	47,050	66,470	105,100
10	60,590	74,310	85,860	121,300	191,900
12	97,250	119,260	137,800	194,700	308,000

Condensate return pipe capacity in lbs. per hr.

Pipe size, in.	Low pressure		High pressure return, steam pressure in psi					
	Gravity return	Vacuum return	25 50 100 150 200 250					
			25	50	100	150	200	250
3/4			236	312	419	560	682	1,074
1	200	350	474	617	823	1,120	1,385	2,150
1 1/4	400	600	989	1,306	1,755	2,330	2,880	4,450
1 1/2	700	950	1,610	2,126	2,850	3,800	4,710	7,350
2	1,200	2,000	3,280	4,325	5,785	7,700	9,550	14,875
2 1/2	1,650	3,350	5,400	7,160	9,640	12,800	15,850	24,600
3	2,600	5,350	9,890	13,070	17,550	23,300	28,850	34,750
3 1/2	3,800	8,000	14,700	19,400	25,900	34,500	42,700	51,350
4	6,500	11,000	20,800	27,360	36,550	49,200	60,900	73,350
5	10,400	19,400	38,850	52,925	70,000	91,500	114,500	127,600
6	18,000	31,000	61,200	83,700	112,700	150,000	185,500	223,100
Press. Drop*			1/4	1/2	3/4	1	1 1/4	1 1/2

*Pressure drop in psi per 100 ft. of equivalent length used in determining capacities given.

Equivalent length of pipe to be added for fittings.

Size of pipe, in.	Length in feet to be added to run				
	Standard elbow	Side outlet tee	Gate valve(*)	Globe valve(*)	Angle valve(*)
1/2	1.3	3	0.3	14	7
3/4	1.8	4	0.4	18	10
1	2.2	5	0.5	23	12
1 1/4	3.0	6	0.6	29	15
1 1/2	3.5	7	0.8	34	18
2	4.3	8	1.0	46	22
2 1/2	5.0	11	1.1	54	27
3	6.5	13	1.4	66	34
3 1/2	8.0	15	1.6	80	40
4	9.0	18	1.9	92	45
5	11.0	22	2.2	112	56
6	13.0	27	2.8	136	67
8	17.0	35	3.7	180	92
10	21.0	45	4.6	230	112
12	27.0	53	5.5	270	132

*Valve in full open position.

PROBLEM: Assume a Unit operates at 100 P.S.I. and requires 10 H.P.; what size steam and return line should be run if it is located 100 Ft. from the boiler?

- SOLUTION:**
- Determine the Pounds of Steam required.
10 x 34.5 = 345 Pounds of Steam per Hour.
 - Select Steam Line Size from 100 P.S.I. Table 5.
Note: For High Pressure Piping, use 2 P.S.I. Drop/100 Ft.
Read 440 Pounds from Table, therefore 1-1/4" Line required.
 - Select Return Line Size
Read 419 Pounds from Table; under 100 PSI High Pressure Return Column. Therefore, 3/4" Line required.