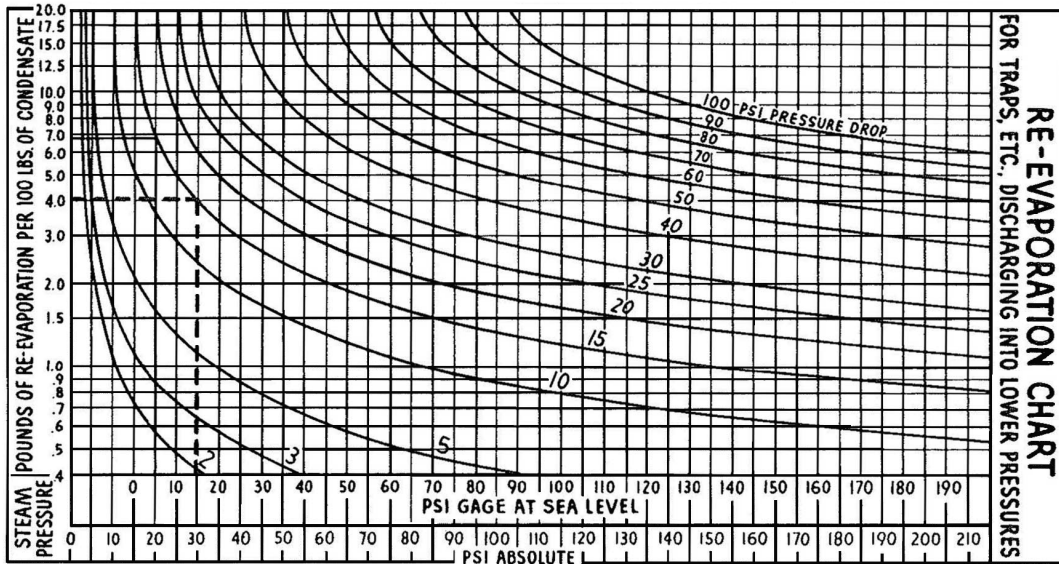


Basic Steam Pipe Sizing Charts



Bell & Gossett

a xylem brand



Re-Evaporation Chart

Example of Use of Basic and Velocity Multiplier Charts.

Given:

- a. Weight - Flow Rate = 6700 lb per hr.
- b. Initial Steam Pressure = 100 psig.
- c. Pressure Drop = 11 psi per 100 ft.

Find:

- a. Size of Schedule 40 pipe required.
- b. Velocity of steam in pipe.

Solution: The following steps are illustrated by the broken line in fig. 22:

Step 1. Enter Fig. 22 at a weight-flow rate of 6700 lb per hr and move vertically to the horizontal line at 100 psig.

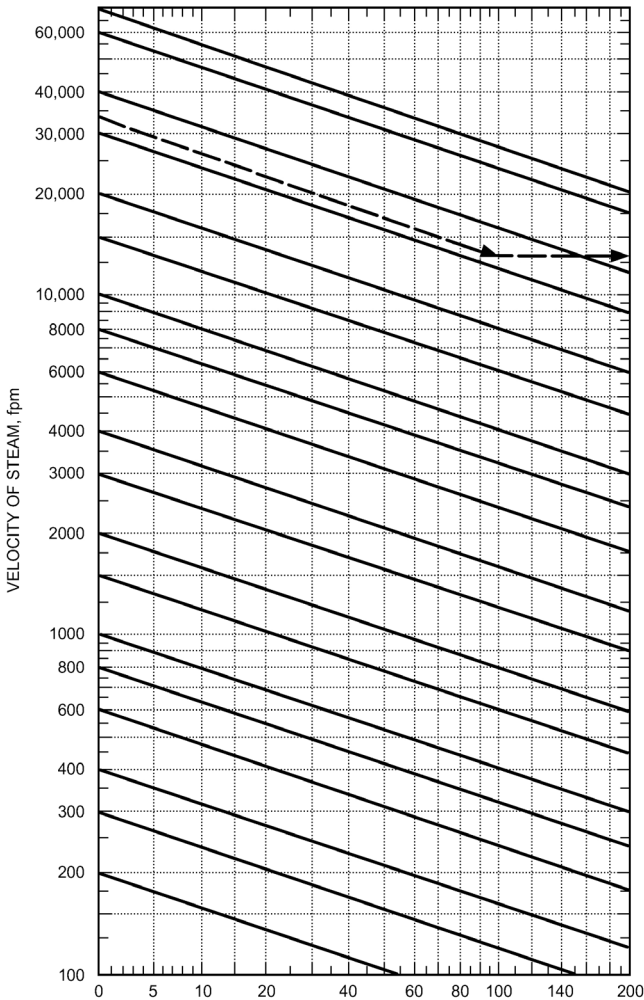
Step 2. Follow along inclined multiplier line (upward and to the left) to horizontal 0 psig line. The equivalent weight flow at 0 psig is about 2500 lb per hr.

Step 3. Follow the 2500 lbs per hr line vertically until it intersects the horizontal line at 11 psi per 100 ft pressure drop. The nominal pipe size is 2 1/2 in. The equivalent steam velocity at 0 psig is about 32,700 fpm.

Step 4. To find the steam velocity at 100 psig, locate the value of 32,700 fpm on the ordinate of the velocity multiplier chart at 0 psig.

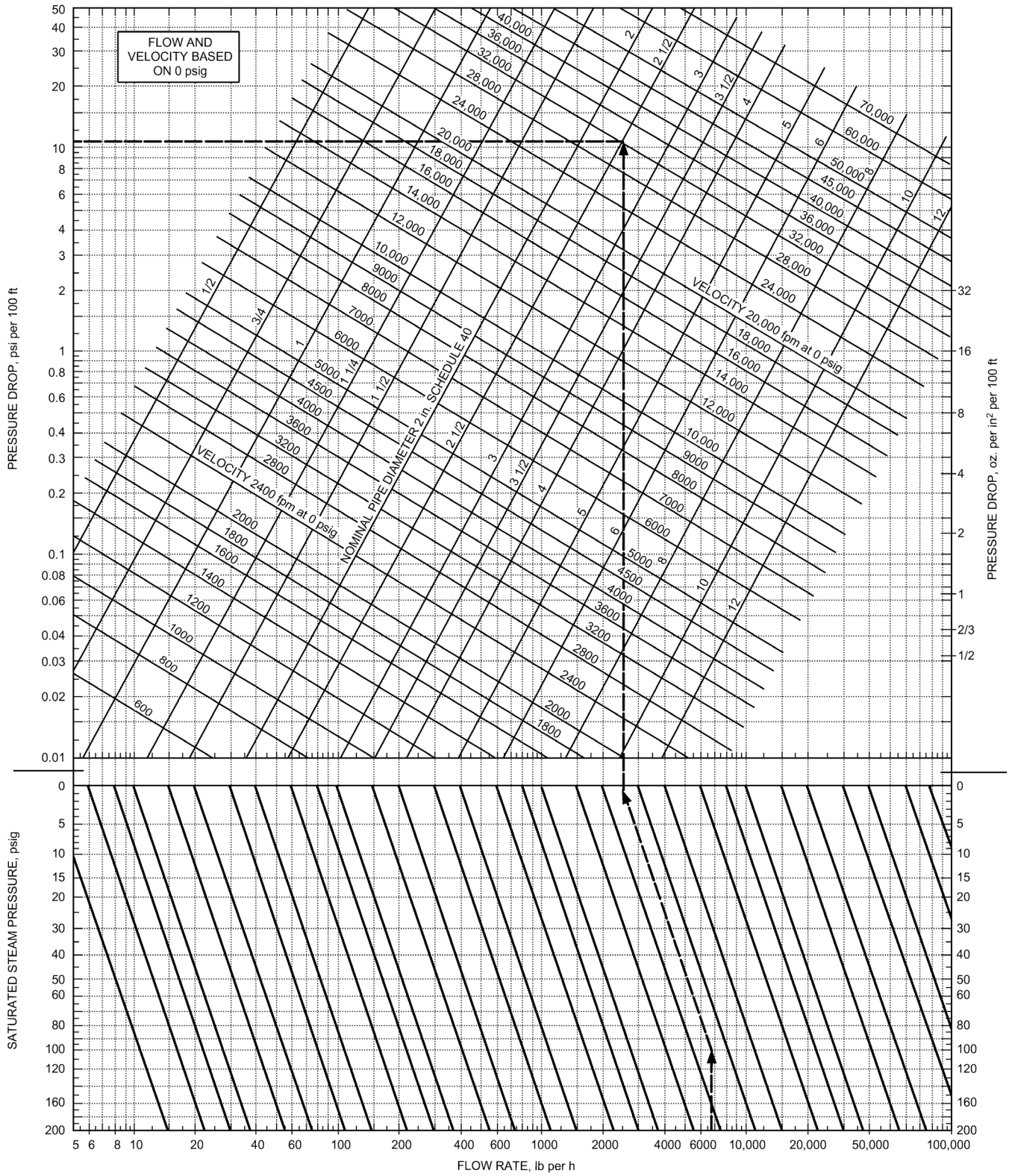
Step 5. Move along the inclined multiplier line (downward and to the right) until it intersects the vertical 100 psig pressure line. The velocity as read from the right (or left) scale is about 13,000 fpm.

Note: The preceding Steps 1 to 5 would be rearranged or reversed if different data were given.



Velocity Multiplier Chart for Figure 22

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Based on Moody Friction Factor where flow of condensate does not inhibit the flow of steam.

Figure 22 - Basic Chart for Weight-Flow Rate and Velocity of Steam in Schedule 40 Pipe Based on Saturation Pressure of 0 Psig

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PROPERTIES OF SATURATED STEAM (APPROX.)

Absolute Pressure	Gage Reading at Sea Level	Temp. °F.	Heat in Water B.T.U. per Lb.	Latent Heat in Steam (Vaporization) B.T.U. per Lb.	Volume of 1 Lb. Steam Cu. Ft.	Wgt. of Water Lbs. per Cu. Ft.
0.18 ↑	29.7 ↑	32	0.0	1076	3306	62.4
0.50 ↑	29.4 ↑	59	27.0	1061	1248	62.3
1.0 ↑	28.9 ↑	79	47.0	1049	653	62.2
2.0 ↑	28 ↑	101	69	1037	341	62.0
4.0 ↑	26 ↑	125	93	1023	179	61.7
6.0 ↑	24 ↑	141	109	1014	120	61.4
8.0 ↑	22 ↑	152	120	1007	93	61.1
10.0 ↑	20 ↑	161	129	1002	75	60.9
12.0 ↑	18 ↑	169	137	997	63	60.8
14.0 ↑	16 ↑	176	144	993	55	60.6
16.0 ↑	14 ↑	182	150	989	48	60.5
18.0 ↑	12 ↑	187	155	986	43	60.4
20.0 ↑	10 ↑	192	160	983	39	60.3
22.0 ↑	8 ↑	197	165	980	36	60.2
24.0 ↑	6 ↑	201	169	977	33	60.1
26.0 ↑	4 ↑	205	173	975	31	60.0
28.0 ↑	2 ↑	209	177	972	29	59.9
29.0 ↑	1 ↑	210	178	971	28	59.9
30.0 ↑	0 ↑	212	180	970	27	59.8
14.7 ↑	0 ↑	212	180	970	27	59.8
15.7 ↑	1 ↑	216	184	968	25	59.8
16.7 ↑	2 ↑	219	187	966	24	59.7
17.7 ↑	3 ↑	222	190	964	22	59.6
18.7 ↑	4 ↑	225	193	962	21	59.5
19.7 ↑	5 ↑	227	195	960	20	59.4
20.7 ↑	6 ↑	230	198	958	19	59.4
21.7 ↑	7 ↑	232	200	957	19	59.3
22.7 ↑	8 ↑	235	203	955	18	59.2
23.7 ↑	9 ↑	237	205	954	17	59.2
25 ↑	10 ↑	240	208	952	16	59.2
30 ↑	15 ↑	250	219	945	14	58.8
35 ↑	20 ↑	259	228	939	12	58.5
40 ↑	25 ↑	267	236	934	10	58.3
45 ↑	30 ↑	274	243	929	9	58.1
50 ↑	35 ↑	281	250	924	8	57.9
55 ↑	40 ↑	287	256	920	8	57.7
60 ↑	45 ↑	293	262	915	7	57.5
65 ↑	50 ↑	298	268	912	7	57.4
70 ↑	55 ↑	303	273	908	6	57.2
75 ↑	60 ↑	308	277	905	6	57.0
85 ↑	70 ↑	316	286	898	5	56.8
95 ↑	80 ↑	324	294	892	5	56.5
105 ↑	90 ↑	332	302	886	4	56.3
115 ↑	100 ↑	338	309	881	4	56.0
140 ↑	125 ↑	353	325	868	3	55.5



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