

Wheatland Tube Co. Schedule 40 Pipe

Table-1

Schedule 40 (See Note 1 Table 1) Pipe Properties

Pipe NPS In.	Pipe 't' In.	Pipe ID 'd' In.	Pipe OD 'D' In.	Inside Area 'Ai' In. ²	Metal Area 'Am' In. ²	Wt Per ft. 'w ₁ ' Lb.	Wt of Water. 'w ₂ ' Lb.	Moment of Intertia 'I' In ⁴	Section Mod. 'S' In ³	Radius of Gyration 'r' In	Weight 'w' Lb/Ft w ₁ +w ₂	Hanger Span Ft. (max)	Trapeze Load P Lb. = w+250
1	0.133	1.049	1.315	0.864	0.494	1.68	0.37	0.09	0.13	0.42	2.05	15	281
1 1/4	0.140	1.380	1.660	1.496	0.669	2.27	0.65	0.19	0.23	0.54	2.92	15	294
1 1/2	0.145	1.610	1.900	2.036	0.799	2.72	0.88	0.31	0.33	0.62	3.60	15	304
2	0.154	2.067	2.375	3.356	1.075	3.66	1.45	0.67	0.56	0.79	5.11	15	327
2 1/2	0.203	2.469	2.875	4.788	1.704	5.80	2.07	1.53	1.06	0.95	7.87	15	368
3	0.216	3.068	3.500	7.393	2.228	7.58	3.20	3.02	1.72	1.16	10.78	15	412
3 1/2	0.226	3.548	4.000	9.887	2.680	9.12	4.28	4.79	2.39	1.34	13.40	15	451
4	0.237	4.026	4.500	12.730	3.174	10.80	5.51	7.23	3.21	1.51	16.31	15	495
5	0.258	5.047	5.563	20.006	4.300	14.63	8.66	15.16	5.45	1.88	23.29	15	599
6	0.280	6.065	6.625	28.890	5.581	18.99	12.50	28.14	8.50	2.25	31.49	15	722
8	0.322	7.981	8.625	50.027	8.399	28.58	21.65	72.49	16.81	2.94	50.23	15	1003
10	0.365	10.020	10.750	78.854	11.908	40.52	34.12	160.73	29.90	3.67	74.64	15	1370

Note 1: Pipe diameter 1"-2" Material A795
 Pipe diameter 1"-4" Material A53, Type F, Grade A
 Pipe diameter 5"-10" Material A53, Type E, Grade B

Table-2

NFPA 13 (2022) Table 17.3.1(a) Schedule 40 Section Modulus Required (minimum) for Trapeze Members (in³)

Nominal Diameter of Schedule 40 Pipe Being Supported												
Span of Trapeze 'a' ↓	1 In.	1 1/4 In.	1 1/2 In.	2 In.	2 1/2 In.	3 In.	3 1/2 In.	4 In.	5 In.	6 In.	8 In.	10 In.
	Section Modulus Required (Minimum)											
1'-6"	0.08	0.09	0.09	0.10	0.11	0.12	0.14	0.15	0.18	0.22	0.30	0.41
2'-0"	0.11	0.11	0.12	0.13	0.15	0.16	0.18	0.20	0.24	0.29	0.40	0.55
2'-6"	0.14	0.14	0.15	0.16	0.17	0.18	0.20	0.21	0.25	0.30	0.43	0.56
3'-0"	0.16	0.17	0.18	0.20	0.22	0.25	0.27	0.30	0.36	0.43	0.60	0.82
4'-0"	0.22	0.23	0.24	0.26	0.29	0.33	0.36	0.40	0.48	0.58	0.80	1.10
5'-0"	0.27	0.29	0.30	0.33	0.37	0.41	0.45	0.49	0.60	0.72	1.00	1.37
6'-0"	0.33	0.34	0.36	0.39	0.44	0.49	0.54	0.59	0.72	0.87	1.20	1.64
7'-0"	0.38	0.40	0.43	0.46	0.52	0.58	0.63	0.69	0.84	1.01	1.41	1.92
8'-0"	0.44	0.46	0.49	0.52	0.59	0.66	0.72	0.79	0.96	1.16	1.61	2.19
9'-0"	0.49	0.51	0.55	0.59	0.66	0.74	0.81	0.89	1.08	1.30	1.81	2.47
10'-0"	0.55	0.57	0.61	0.65	0.74	0.82	0.90	0.99	1.20	1.45	2.01	2.74

The Table is based on a maximum bending stress of 15 ksi and a midspan concentrated load from 15 ft of water-filled pipe, plus 250 lb.



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Table-3

ZONE OF INFLUENCE LOAD CAPACITY (Lb) AT THE CENTER OF THE SPAN					
Lateral Sway Brace Spacing (Ft)^a on Schedule 40, (See Note 1 Table 1) Pipe, (Fy = 30 ksi)^f					
Pipe Diameter (In)	20^b	25^b	30^c	35^c	40^d
1	121	97	79	68	57
1 1/4	214	171	140	120	100
1 1/2	306	245	201	172	144
2	520	416	341	292	245
2 1/2	984	787	645	553	463
3	1597	1278	1047	897	751
3 1/2	2219	1775	1455	1247	1044
4	2981	2385	1954	1675	1402
5	5061	4049	3317	2843	2381
6^e	7893	6314	5173	4434	3713

Notes:

^a The Tables for the maximum load Fpw in zone of influence (ZOI) are based on specific configurations of mains and branch lines.

^b Assumes branch lines at center of pipe span and near each support.

^c Assumes branch lines at third-points of pipe span and near each support.

^d Assumes branch lines at quarter-points of pipe span and near each support.

^e Larger diameter pipe may be used when justified by engineering analysis.

^f ASTM A53 has minimum yield strength (Fy) = 30 ksi. Effect on overall stresses in the pipe due to operational stresses is not considered.

Table-4

Sway Brace Load Capacity (Ref NFPA 13 2022, Table 18.5.11.8(a))

Maximum Horizontal Loads for Sway Brace with kl/r = 100 for steel brace, Fy=30ksi Schedule 40 Pipe							
Pipe Diameter NPS In.	Metal Area 'Am' In²	Radius of Gyration 'r' In	Maximum Length for Kl/r=100 Ft	Fa Allowable Compressive Stress, psi	Max. Horizontal Load Lb.		
					Angle From 30° - 44°	Angle From 45° - 59°	Angle From 60° - 90°
1	0.49	0.42	3'-6"	11709	2891	4090	5007
1 1/4	0.67	0.54	4'-6"	11709	3914	5536	6777
1 1/2	0.80	0.62	5'-0"	11709	4680	6620	8105
2	1.07	0.79	6'-6"	11709	6291	8898	10893

Sway Brace Load Capacity (Ref NFPA 13 2022, Table 18.5.11.8(b))

Maximum Horizontal Loads for Sway Brace with kl/r = 200 for steel brace, Fy=30ksi Schedule 40							
Pipe Diameter NPS In.	Metal Area 'Am' In²	Radius of Gyration 'r' In	Maximum Length for Kl/r=100 Ft	Fa Allowable Compressive Stress, psi	Max. Horizontal Load Lb.		
					Angle From 30° - 44°	Angle From 45° - 59°	Angle From 60° - 90°
1	0.49	0.42	7'-0"	3733	922	1304	1596
1 1/4	0.67	0.54	9'-0"	3733	1248	1765	2161
1 1/2	0.80	0.62	10'-0"	3733	1492	2111	2584
2	1.07	0.79	13'-0"	3733	2006	2837	3473

Sway Brace Load Capacity (Ref NFPA 13 2022, Table 18.5.11.8c)

Maximum Horizontal Loads for Sway Brace with kl/r = 300 for steel brace, Fy=30ksi Schedule 40							
Pipe Diameter NPS In.	Metal Area 'Am' In²	Radius of Gyration 'r' In	Maximum Length for Kl/r=100 Ft	Fa Allowable Compressive Stress, psi	Max. Horizontal Load Lb.		
					Angle From 30° - 44°	Angle From 45° - 59°	Angle From 60° - 90°
1	0.49	0.42	10'-6"	1659	410	580	709
1 1/4	0.67	0.54	13'-6"	1659	555	784	960
1 1/2	0.80	0.62	15'-0"	1659	663	938	1148
2	1.07	0.79	19'-6"	1659	891	1261	1544