

PIPE, PIPE FITTINGS & ACCESSORY WEIGHTS, AND THERMAL EXPANSION



HANGER SELECTION

When selecting pipe hangers or supports, allowances must be made for Pipe Fittings or Accessories such as valves, strainers, etc. Larger capacities must be used in these locations. Approximate piping component weights are given in Pipe Fitting and Accessory Weight table.

WATER PIPE WEIGHTS (85% MAGNESIA INSULATION) - AMERICAN UNITS

Pipe Size (in)	Max Hanger Spacing (ft)	Pipe Schedule	Insul Thickness (in)	Water per Foot (lb)				Weight per Length (lb)														
				Pipe Only	Water	Insulation	Total	6 ft	8 ft	10 ft	12 ft	14 ft	16 ft	18 ft	20 ft	22 ft	24 ft	26 ft	28 ft	30 ft	32 ft	
1	7	40	1	1.7	0.4	0.7	2.8	17	22	28	—	—	—	—	—	—	—	—	—	—	—	—
1 1/4	7	40	1	2.3	0.7	0.8	3.8	28	30	38	—	—	—	—	—	—	—	—	—	—	—	—
1 1/2	9	40	1	2.7	0.9	0.9	4.5	27	36	45	—	—	—	—	—	—	—	—	—	—	—	—
2	10	40	1	3.7	1.5	1.0	6.2	37	50	62	—	—	—	—	—	—	—	—	—	—	—	—
2 1/2	11	40	1	5.8	2.1	1.2	9.1	55	73	91	109	—	—	—	—	—	—	—	—	—	—	—
3	12	40	1	7.6	3.2	1.3	12.1	—	97	121	145	—	—	—	—	—	—	—	—	—	—	—
4	14	40	1	11.0	5.2	1.8	18.0	—	144	180	216	252	—	—	—	—	—	—	—	—	—	—
5	16	40	1 1/2	15.0	8.7	2.9	26.6	—	213	266	319	372	426	—	—	—	—	—	—	—	—	—
6	17	40	1 1/2	19.0	12.4	3.1	34.5	—	276	345	414	483	552	621	—	—	—	—	—	—	—	—
8	19	40	1 1/2	29.0	22.0	4.1	55.1	—	440	551	661	771	882	992	1102	—	—	—	—	—	—	—
10	22	40	1 1/2	41.0	34.0	5.2	80.2	—	642	802	962	1123	1283	1444	1604	1764	—	—	—	—	—	—
12	23	40	1 1/2	54.0	49.0	6.0	109.0	—	872	1090	1308	1526	1744	1962	2180	2398	2616	—	—	—	—	—
14	25	30	1 1/2	55.0	60.0	7.0	122.0	—	—	1220	1464	1708	1952	2196	2440	2684	2928	3172	—	—	—	—
16	27	30	1 1/2	63.0	79.0	7.5	150.0	—	—	1500	1800	2100	2400	2700	3000	3300	3600	3900	4200	—	—	—
18	28	30	1 1/2	82.0	100.0	8.0	190.0	—	—	1900	2280	2660	3040	3420	3800	4180	4560	4940	5320	—	—	—
20	30	20	1 1/2	79.0	126.0	8.5	214.0	—	—	2140	2568	2996	3424	3852	4280	4708	5136	5564	5992	6420	—	—
24	32	20	1 1/2	95.0	184.0	10.0	289.0	—	—	2890	3468	4046	4624	5202	5780	6358	6936	7514	8092	8670	9248	—

WATER PIPE WEIGHTS (85% MAGNESIA INSULATION) - METRIC

Pipe Size (in)	Max Hanger Spacing (m)	Pipe Schedule	Insul Thickness (mm)	Water per Meter (kg)				Weight per Length (kg)														
				Pipe Only	Water	Insulation	Total	1m	1.5m	2m	2.5m	3m	3.5m	4m	4.5m	5m	6m	7m	8m	9m	10m	
1	2.1	40	25	2.5	0.6	1	4.2	4	6	8	—	—	—	—	—	—	—	—	—	—	—	—
1 1/4	2.1	40	25	3.4	1.0	1.2	5.7	6	9	11	—	—	—	—	—	—	—	—	—	—	—	—
1 1/2	2.7	40	25	4.0	1.3	1.3	6.7	7	10	13	—	—	—	—	—	—	—	—	—	—	—	—
2	3.0	40	25	5.5	2.2	1.5	9.2	9	14	18	—	—	—	—	—	—	—	—	—	—	—	—
2 1/2	3.4	40	25	8.6	3.1	1.8	13.5	14	20	27	34	—	—	—	—	—	—	—	—	—	—	—
3	3.7	40	25	11.3	4.8	1.9	18	—	27	36	45	—	—	—	—	—	—	—	—	—	—	—
4	4.3	40	25	16.4	7.7	2.7	26.8	—	40	54	67	80	—	—	—	—	—	—	—	—	—	—
5	4.9	40	38	22.3	12.9	4.3	39.6	—	59	79	99	119	139	—	—	—	—	—	—	—	—	—
6	5.2	40	38	28.3	18.4	4.6	51.3	—	77	103	128	154	180	205	—	—	—	—	—	—	—	—
8	5.8	40	38	43.1	32.7	6.1	82	—	123	164	205	246	287	328	369	—	—	—	—	—	—	—
10	6.7	40	38	61.0	50.6	7.7	119.3	—	179	239	298	358	418	477	530	597	—	—	—	—	—	—
12	7.0	40	38	80.3	72.9	8.9	162.2	—	243	324	405	487	568	649	730	811	973	—	—	—	—	—
14	7.6	30	38	81.8	89.3	10.4	181.5	—	—	363	454	545	635	726	817	908	1089	1271	—	—	—	—
16	8.2	30	38	93.7	117.5	11.2	222.4	—	—	445	556	667	779	890	1001	1112	1335	1557	1780	—	—	—
18	8.5	30	38	122.0	148.8	11.9	282.7	—	—	565	707	848	989	1131	1272	1413	1696	1979	2262	—	—	—
20	9.1	20	38	117.5	187.5	12.6	317.6	—	—	635	794	953	1112	1271	1429	1588	1906	2224	2541	2859	—	—
24	9.8	20	38	141.3	273.8	14.9	430	—	—	860	1075	1290	1505	1720	1935	2150	2580	3010	3440	3870	4300	—

STEAM PIPE WEIGHTS (85% MAGNESIA INSULATION) - AMERICAN UNITS

Pipe Size (in)	Max Hanger Spacing (ft)	Pipe Schedule	Insul Thickness (in)	Water per Foot (lb)			Weight per Length (lb)														
				Pipe Only	Insulation	Total	6 ft	8 ft	10 ft	12 ft	14 ft	16 ft	18 ft	20 ft	22 ft	24 ft	26 ft	28 ft	30 ft	32 ft	
1	7	40	11/2	1.7	1.2	2.9	17	23	29	—	—	—	—	—	—	—	—	—	—	—	—
1 1/4	7	40	11/2	2.3	1.5	3.8	23	30	38	—	—	—	—	—	—	—	—	—	—	—	—
1 1/2	9	40	11/2	2.7	1.8	4.5	27	36	45	—	—	—	—	—	—	—	—	—	—	—	—
2	10	40	11/2	3.7	2.0	5.7	34	46	57	—	—	—	—	—	—	—	—	—	—	—	—
2 1/2	11	40	11/2	5.8	2.3	8.1	49	65	81	97	—	—	—	—	—	—	—	—	—	—	—
3	12	40	11/2	7.6	2.1	9.7	—	78	97	116	—	—	—	—	—	—	—	—	—	—	—
4	14	40	11/2	11.0	2.8	13.8	—	110	138	166	193	—	—	—	—	—	—	—	—	—	—
5	16	40	11/2	15.0	3.0	18.0	—	144	180	216	252	288	—	—	—	—	—	—	—	—	—
6	17	40	2	19.0	4.6	23.6	—	189	236	283	330	378	425	—	—	—	—	—	—	—	—
8	19	40	2	29.0	5.6	34.6	—	278	346	415	484	554	623	692	—	—	—	—	—	—	—
10	22	40	2	41.0	7.1	48.2	—	386	482	578	675	771	868	964	1060	—	—	—	—	—	—
12	23	40	2	54.0	8.1	62.1	—	497	621	745	869	994	1118	1242	1366	1490	—	—	—	—	—
14	25	30	2	55.0	8.4	63.4	—	—	634	761	888	1014	1141	1268	1395	1522	1648	—	—	—	—
16	27	30	2	63.0	9.3	72.3	—	—	723	868	1012	1157	1301	1446	1591	1735	1880	2169	—	—	—
18	28	30	2	82.0	10.4	92.4	—	—	924	1109	1294	1478	1663	1848	2033	2218	2402	2587	—	—	—
20	30	20	2	79.0	11.6	90.6	—	—	906	1087	1268	1450	1631	1812	1993	2174	2356	2356	2718	—	—
24	32	20	2	95.0	13.4	108.0	—	—	1080	1296	1512	1728	1944	2160	2376	2592	2808	3024	3240	3456	—

STEAM PIPE WEIGHTS (85% MAGNESIA INSULATION) - METRIC

Pipe Size (in)	Max Hanger Spacing (m)	Pipe Schedule	Insul Thickness (mm)	Water per Meter (kg)			Weight per Length (kg)														
				Pipe Only	Insulation	Total	1m	1.5m	2m	2.5m	3m	3.5m	4m	4.5m	5m	6m	7m	8m	9m	10m	
1	2.1	40	38	2.5	1.8	4.3	4	7	9	—	—	—	—	—	—	—	—	—	—	—	—
1 1/4	2.1	40	38	3.4	2.2	5.7	6	9	11	—	—	—	—	—	—	—	—	—	—	—	—
1 1/2	2.7	40	38	4.0	2.7	6.7	7	11	13	—	—	—	—	—	—	—	—	—	—	—	—
2	3.0	40	38	5.5	3.0	8.5	9	13	17	—	—	—	—	—	—	—	—	—	—	—	—
2 1/2	3.4	40	38	8.6	3.4	12.1	12	18	24	30	—	—	—	—	—	—	—	—	—	—	—
3	3.7	40	38	11.3	3.1	14.4	—	22	29	36	—	—	—	—	—	—	—	—	—	—	—
4	4.3	40	38	16.4	4.2	20.5	—	31	41	51	62	—	—	—	—	—	—	—	—	—	—
5	4.9	40	38	22.3	4.5	26.8	—	40	54	67	80	94	—	—	—	—	—	—	—	—	—
6	5.2	40	50	28.3	6.8	35.1	—	53	70	88	105	123	140	—	—	—	—	—	—	—	—
8	5.8	40	50	43.1	8.3	51.5	—	77	103	129	154	180	206	232	—	—	—	—	—	—	—
10	6.7	40	50	61.0	10.6	71.6	—	107	143	179	215	251	286	322	358	—	—	—	—	—	—
12	7.0	40	50	80.3	12.1	92.4	—	139	185	231	277	323	370	416	462	554	—	—	—	—	—
14	7.6	30	50	81.8	12.5	94.3	—	—	189	236	283	330	377	425	472	566	660	—	—	—	—
16	8.2	30	50	93.7	13.8	107.6	—	—	215	269	323	377	430	484	538	645	753	861	—	—	—
18	8.5	30	50	122.0	15.5	137.5	—	—	275	344	412	481	550	619	687	825	962	1100	—	—	—
20	9.1	20	50	117.5	17.3	134.8	—	—	270	337	404	472	539	607	674	809	944	1078	1213	—	—
24	9.8	20	50	141.3	19.9	161.3	—	—	323	403	484	565	645	726	806	968	1129	1290	1452	1613	—



FLANGED 125LB CAST IRON PIPE FITTINGS & ACCESSORY WEIGHTS (APPROXIMATE)

Pipe Size (in)	Accessories						Fittings					
	Bonnet Check Strainer (lb) (kg)		Bonnet Gate Valve (lb) (kg)		Pipe Valve (lb) (kg)		Elbows (lb) (kg)		Tee (lb) (kg)		Flange (lb) (kg)	
1 1/2	20	9	25	11	30	14	15	7	20	9	3.5	2
2	30	14	25	11	40	18	20	9	25	11	6	3
2 1/2	40	18	35	16	50	23	25	11	35	16	8	4
3	50	23	45	20	70	32	30	14	40	18	9	4
4	85	39	80	36	110	50	55	25	70	32	16	7
5	110	50	120	54	140	63	70	32	90	41	20	9
6	140	63	155	70	175	79	90	41	115	52	25	11
8	205	93	305	138	250	113	120	54	175	79	34	15
10	330	149	455	206	475	215	245	111	295	134	53	24
12	440	199	675	306	690	312	375	170	405	183	71	32
14	615	278	885	401	930	421	495	224	565	256	93	42
16	875	396	1170	530	1255	568	700	317	750	339	120	54
18	1075	487	1375	622	1650	747	890	403	925	419	140	63
20	1380	625	1780	806	1950	883	1140	516	1180	534	176	80
24	2150	973	2960	1340	3065	1387	1720	779	1850	837	255	115

250 lb. Fittings can be established at approximately 1.8 times weights shown.

SATURATED STEAM TEMPERATURE

Pressure (psi) (kg/cm ²)		Degree (F) (C)	
0	0.0	212	100
25	1.7	267	131
50	3.4	298	148
75	5.2	320	160
100	6.9	338	170
125	8.6	353	178
150	10.3	366	186
175	12.1	378	192
200	13.8	388	198
225	15.5	397	203
250	17.2	406	208
275	19.0	414	212
300	20.7	421	216

THERMAL EXPANSION OF PIPE MATERIALS (INCHES PER 100 FT FROM 70°F) (CM PER 30M FROM 21°C)

Degrees (C) (F)	Carbon, Carbon-moly & Low Chrome Steel (in) (cm)		Austenitic Stainless Steels (304, 316, 347) (in) (cm)		Copper (in) (cm)		PVC (in) (cm)		
	-50	-46	-0.87	-2.35	-1.34	-3.58	-1.32	-3.38	-4.00
0	-18	-0.51	-1.37	-0.78	-2.08	-0.79	-1.97	-2.33	-5.90
50	10	-0.15	0.39	-0.22	0.59	-0.22	0.55	-0.67	1.66
70	21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	38	0.23	0.60	0.34	0.91	0.34	0.86	1.00	2.57
150	66	0.61	1.58	0.90	2.40	0.91	2.27	2.67	6.80
200	93	0.99	2.53	1.46	3.84	1.51	3.63	—	—
250	121	1.40	3.51	2.03	5.34	2.08	5.04	—	—
300	149	1.82	4.49	2.61	6.84	2.67	6.45	—	—
350	177	2.26	5.48	3.21	8.33	3.27	7.86	—	—
400	204	2.70	6.42	3.80	9.77	3.88	9.22	—	—
450	232	3.16	7.41	4.40	11.27	4.49	10.63	—	—
500	260	3.62	8.39	5.01	12.76	5.12	12.05	—	—
550	288	4.11	9.37	5.62	14.26	5.74	13.46	—	—
600	316	4.60	10.35	6.24	15.75	6.39	14.87	—	—

Inches per 100 ft per 100°F in Temperature Range 50 – 350°F:

- Carbon, Carbon-moly, Low Chrome Steel: 0.80"
- Austenitic Stainless Steels (304, 316, 347): 1.14"
- Copper: 1.16"
- PVC (varies with type): 3.40"

cm per 30m per °C in Temperature Range 10 – 177°C:

- Carbon, Carbon-moly, Low Chrome Steel: 0.0351
- Austenitic Stainless Steels (304, 316, 347): 0.0534
- Copper: 0.0504
- PVC (varies with type): 0.1512

