

PIPE THREADS

All threaded pipe for heating and ventilating installations uses the American Standard taper pipe thread which is made with a taper of 1 in 16 measured on the diameter of the pipe so as to secure a tight joint. Threads of fittings are tapped to the same taper. The number of threads per inch varies with the different pipe sizes. All threaded pipe should be made up with a thread paste suitable for the service under which the pipe is to be used.

TABLE 4. NOMINAL WEIGHTS OF WELDED WROUGHT-IRON PIPE

NOMINAL PIPE SIZE (INCHES)	SCHED. 10	SCHED. 20	SCHEDULE 30		SCHEDULE 40		SCHEDULE 60	SCHEDULE 80
	Plain Ends	Plain Ends	Plain Ends	Threads and Couplings	Plain Ends	Threads and Couplings	Plain Ends	Plain Ends
1/8	-----	-----	-----	-----	0.25*	0.25*	-----	0.32*
1/4	-----	-----	-----	-----	0.43*	0.43*	-----	0.54*
3/8	-----	-----	-----	-----	0.57*	0.57*	-----	0.74*
1/2	-----	-----	-----	-----	0.86*	0.86*	-----	1.09*
3/4	-----	-----	-----	-----	1.14*	1.14*	-----	1.48*
1	-----	-----	-----	-----	1.68*	1.69*	-----	2.18*
1 1/4	-----	-----	-----	-----	2.28*	2.29*	-----	3.00*
1 1/2	-----	-----	-----	-----	2.72*	2.74*	-----	3.64*
2	-----	-----	-----	-----	3.66*	3.68*	-----	5.03*
2 1/2	-----	-----	-----	-----	5.80*	5.82*	-----	7.67*
3	-----	-----	-----	-----	7.58*	7.62*	-----	10.3*
3 1/2	-----	-----	-----	-----	9.11*	9.21*	-----	12.5*
4	-----	-----	-----	-----	10.8*	10.9*	-----	15.0*
5	-----	-----	-----	-----	14.7*	14.9*	-----	20.8*
6	-----	-----	-----	-----	19.0*	19.2*	-----	28.6*
8	-----	-----	24.7*	25.0*	28.6*	28.8*	-----	43.4*
10	-----	-----	34.3*	35.0*	40.5*	41.2*	54.8*	54.4
12	-----	-----	43.8*	45.0*	53.6	55.0	73.2	88.6
14 O. D.	36.0	44.8	53.6	-----	62.2	-----	87.6	104.0
16 O. D.	41.3	51.4	61.4	-----	81.2	-----	111.0	-----
18 O. D.	46.5	57.9	80.5	-----	103.0	-----	136.0	-----
20 O. D.	-----	77.0	103.0	-----	115.0	-----	-----	-----

Weights are given in pounds per linear foot and are for pipe with plain ends except for sizes which are commercially available with threads and couplings for which both weights are listed.

*Weights marked with an asterisk in Schedules 30 and 40 are identical with weights for standard-weight pipe in former lists; those in Schedules 60 and 80 are identical with weights for extra-strong pipe in former lists.

The Schedule Numbers indicate approximate values of the expression $1000 \times P/S$.

HANGERS

Heating system piping requires careful and substantial support. Where changes in temperature of the line are not large, such simple methods of support may be utilized as hanging the line by means of rods or perforated strip from the building structure, or supporting it by brackets or on piers.

When fluids are conveyed at temperatures of 150 F or above, however, hangers or supporting equipment must be fabricated and assembled to permit free expansion or contraction of the piping. This can be accomplished by the use of long rod hangers, spring hangers, chains, hangers or

supports fitted with rollers, machined blocks, elliptical or circular rings of larger diameter than the pipe giving contact only at the bottom, or trolley hangers. In all cases, allowance should be made for rod clearance to permit swinging without setting up severe bending action in the rods.

For pipes of small size, perforated metal strip is often used. For horizontal mains, the rod or strip usually is attached to the joists or steel work of the floor above. For long runs of vertical pipe subject to considerable thermal expansion, either the hangers should be designed to prevent excessive load on the bottom support when expansion takes place, or the bottom support should be designed to withstand the entire load.

FITTINGS

Fittings for joining the separate lengths of pipe together are made in a variety of forms, and are either screwed or flanged, the former being generally used for the smaller sizes of pipe up to and including 3 1/2 in.,

TABLE 5. STANDARD DIMENSIONS, WEIGHTS, AND DIAMETER AND WALL THICKNESS TOLERANCES FOR COPPER WATER TUBES*

(All Tolerances Plus and Minus)

NOMINAL SIZE, IN.	ACTUAL OUTSIDE DIAM- ETER, IN.	PERMISSIBLE VARIATION IN MEAN OUTSIDE DIAMETER, IN.		WALL THICKNESS, IN.						WEIGHT PER FT LB		
				Class K		Class L		Class M				
				Annealed	Hard Drawn	Nominal	Per- missible Variation	Nominal	Per- missible Variation	Nominal	Per- missible Variation	Class K
3/8	0.500	0.0025	0.001	0.049	0.004	0.035	0.0035	0.025	0.0025	0.269	0.198	0.144
1/2	0.625	0.0025	0.001	0.049	0.004	0.040	0.0035	0.028	0.0025	0.344	0.285	0.203
3/4	0.875	0.003	0.001	0.065	0.0045	0.045	0.004	0.032	0.003	0.641	0.455	0.328
1	1.125	0.0035	0.0015	0.065	0.0045	0.050	0.004	0.035	0.0035	0.839	0.655	0.464
1 1/4	1.375	0.004	0.0015	0.065	0.0045	0.055	0.0045	0.042	0.0035	1.04	0.884	0.681
1 1/2	1.625	0.0045	0.002	0.072	0.005	0.060	0.0045	0.049	0.004	1.36	1.14	0.94
2	2.125	0.005	0.002	0.083	0.005	0.070	0.005	0.058	0.0045	2.06	1.75	1.46
2 1/2	2.625	0.005	0.002	0.095	0.005	0.080	0.005	0.065	0.0045	2.92	2.48	2.03
3	3.125	0.005	0.002	0.109	0.005	0.090	0.005	0.072	0.0045	4.00	3.33	2.68
3 1/2	3.625	0.005	0.002	0.120	0.005	0.100	0.005	0.083	0.005	5.12	4.29	3.58
4	4.125	0.005	0.002	0.134	0.006	0.110	0.005	0.095	0.005	6.51	5.38	4.66
5	5.125	0.005	0.002	0.160	0.006	0.125	0.006	0.109	0.005	9.67	7.61	6.65
6	6.125	0.005	0.002	0.192	0.006	0.140	0.006	0.122	0.005	13.87	10.20	8.91

*From Standard Specifications for Copper Water Tube of the American Society for Testing Materials, A.S.T.M. Designation B88-33.

and the latter for the larger sizes, 4 in. and above. Screwed fittings of large size as well as flanged fittings of small size are also made and are used for certain classes of work at the proper pressure.

The material used for fittings is generally cast-iron, but in addition to this malleable iron, steel and steel alloys are also used, as well as various grades of brass or bronze. The material to be used depends on the character of the service and the pressure.

As in the case of pipe, there are several weights of fittings manufactured. Recognized American Standards for the various weights are as follow: