

On large installations, however, it may generally be assumed that welding is less costly than threading.

It is to be remembered that a considerable saving in weight is made where welding is used, due to the elimination of heavy cast iron fittings. An indirect saving due to welding is that resulting from the lighter supports and hangers required.

Non-Ferrous Piping

A recent development in the pipe trades is the use of copper tubing with compression fittings.

No threads are cut on the tubing, but the ends are expanded so as to fit against smooth spherical surfaces in the fittings, and are clamped there by a sleeve which may be screwed over the fitting, but which has no contact with the transported material inside the tube. The tube is thin enough to be bent readily, so that no elbow-fittings ordinarily are required. A typical example of this sort of piping and fittings is evidenced in the gasoline piping of any automobile.

It is possible that piping and fittings of the non-ferrous type may prove most satisfactory for comparatively large sizes and for heavy pressures and for rather high temperatures.

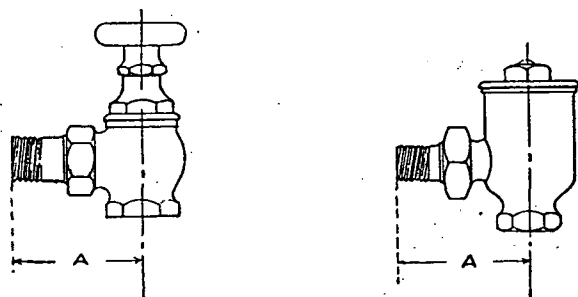


TABLE 3. STANDARD ROUGHING-IN DIMENSIONS
Angle Type Valves

SIZE OF VALVE	DIMENSION A STEAM AND HOT WATER ANGLE VALVES AND UNION ELBOWS EFFECTIVE JAN. 1, 1926	DIMENSION A MODULATING VALVES EFFECTIVE JAN. 1, 1926	DIMENSION A RETURN LINE VACUUM VALVES EFFECTIVE JAN. 1, 1925
1/2"	2 1/4"	2 3/4"	3 1/4"
3/4"	2 3/4"	2 3/4"	
1"	3"	3"	
1 1/4"	3 1/2"	3 1/2"	
1 1/2"	3 3/4"	3 3/4"	
2"	4 1/4"	4 1/4"	
Tolerance	± 1/8"	± 1/8"	

The standardization of the Roughing-in Dimensions of Angle Steam and Hot Water, and Modulating Radiator Valves was made possible by the cooperation of the Manufacturers Standardization Society of the Valves and Fittings Industry.

Expansion and Contraction

In all piping systems which are subject to temperature variation provision must be made for adequate anchorages with expansion and contraction arrangements between them.

In designing any system of steam or hot water piping the expansion for each straight run should be calculated and allowed for.

All risers must be anchored and safeguarded so that the difference in length when hot from the length when cold shall not disarrange the normal and orderly provisions for drainage of the branches.

It is especially necessary with ultra-modern light-weight radiators so

125 LB. CAST IRON SCREWED FITTINGS

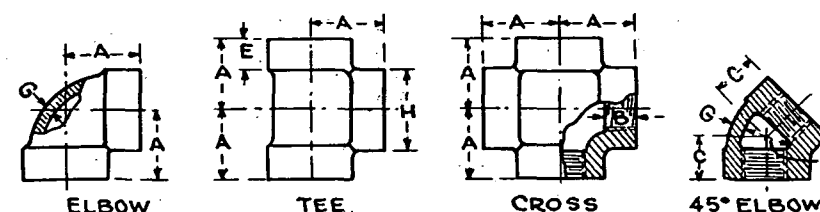


TABLE 4. DIMENSIONS OF ELBOWS, 45 DEG. ELBOWS, TEES, AND CROSSES
(STRAIGHT SIZES)

NOMINAL PIPE SIZE	A CENTER TO END, ELBOWS, TEES AND CROSSES	C CENTER TO END, 45 DEG. ELBOWS	B LENGTH OF THREAD MIN.	E WIDTH OF BAND, MIN.	F INSIDE DIAMETER OF FITTING		G METAL THICKNESS, MIN.	H OUTSIDE DIAMETER OF BAND, MIN.
					Min.	Max.		
1/4	0.81	0.73	0.32	0.38	0.540	0.584	0.110	0.93
3/8	0.95	0.80	0.36	0.44	0.675	0.719	0.120	1.12
1/2	1.12	0.88	0.43	0.50	0.840	0.897	0.130	1.34
3/4	1.31	0.98	0.50	0.56	1.050	1.107	0.155	1.63
1	1.50	1.12	0.58	0.62	1.315	1.385	0.170	1.95
1 1/4	1.75	1.29	0.67	0.69	1.660	1.730	0.185	2.39
1 1/2	1.94	1.43	0.70	0.75	1.900	1.970	0.200	2.68
2	2.25	1.68	0.75	0.84	2.375	2.445	0.220	3.28
2 1/2	2.70	1.95	0.92	0.94	2.875	2.975	0.240	3.86
3	3.08	2.17	0.98	1.00	3.500	3.600	0.260	4.62
3 1/2	3.42	2.39	1.03	1.06	4.000	4.100	0.280	5.20
4	3.79	2.61	1.08	1.12	4.500	4.600	0.310	5.79
5	4.50	3.05	1.18	1.18	5.563	5.663	0.380	7.05
6	5.13	3.46	1.28	1.28	6.625	6.725	0.430	8.28
8	6.56	4.28	1.47	1.47	8.625	8.725	0.550	10.63
10	8.08	5.16	1.68	1.68	10.750	10.850	0.690	13.12
12	9.50	5.97	1.88	1.88	12.750	12.850	0.800	15.47
14 O.D.	10.40		2.00	2.00	14.000	14.100	0.880	16.94
16 O.D.	11.82		2.20	2.20	16.000	16.100	1.000	19.30

All dimensions given in inches.

Dimensions for reducing elbows and reducing tees are given in Table 2 and Table 3, respectively.