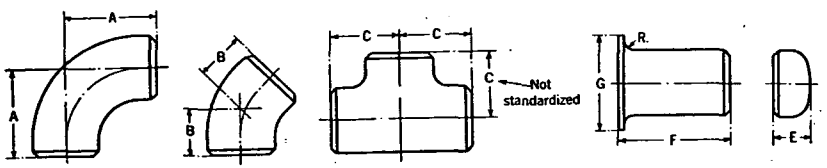
be included in the American Standard. Larger sizes also are available in some types of fittings. The welding bevel which is a straight 37½-deg V for wall thicknesses ¾ in. and below, and a U-bevel for thicknesses heavier than ¾ in., conforms to the recommended practice of *ASA* Standard B16e-1939, American Standard for Steel Pipe Flanges and Flanged Fittings. The latter also contains dimensions for steel welding-neck flanges for pressures up to 2500 lb per square inch. Tables 11 and 12 give these dimensions for welding-neck flanges suitable for 150 and 300 lb per square inch gage pressure.

Socket welding fittings are also commercially available. These fittings have a machined recess into which the pipe slips. A fillet weld between the pipe and socket edge provides a pressure-tight joint. This type of fitting has gained rapid acceptance due to its ease of installation, low cost, and ability to make a pressure tight joint without weakening the pipe as is the case with threading. Standard dimensions for socket welding fittings are being formulated under the procedure of the *American Standards Association.*

TABLE 10. PROPOSED AMERICAN STANDARD DIMENSIONS FOR BUTT-WELDING ELBOWS, TEES, CAPS, AND LAPPED-JOINT STUB ENDS



Nominal Pipe Size	Outside Diameter	Center-to-End			Caps Eb-c	Lapped-Joint Stub Ends		
		90-Deg Elbows A	45-Deg Elbows B	Of Run Tee Ca		Length Fb	Radius of Fillet R	Diam. of Lap Gd
1	1.315	1½	⅞	1½	1½	4	⅛	2
1¼	1.660	1⅞	1	1⅞	1½	4	3/16	2½
1½	1.900	2¼	1⅛	2¼	1½	4	¼	2⅞
2	2.375	3	1⅜	2½	1½	6	5/16	3⅝
2½	2.875	3¾	1¾	3	1½	6	5/16	4⅛
3	3.500	4½	2	3⅜	2	6	⅜	5
3½	4.000	5¼	2¼	3¾	2½	6	⅜	5½
4	4.500	6	2½	4⅛	2½	6	7/16	6 5/16
5	5.563	7½	3⅛	4⅞	3	8	7/16	7 5/16
6	6.625	9	3¾	5⅝	3½	8	½	8½
8	8.625	12	5	7	4	8	½	10⅝
10	10.750	15	6¼	8½	5	10	½	12¾
12	12.750	18	7½	10	6	10	½	15

All dimensions given in inches.

[a]The dimensions of welding tees cover those which have side outlets from one size less than half the size of the run-way opening of the tees to full size.

[b]Dimensions *E* and *F* are applicable only to these fittings in schedules up to and including Schedule 80, *ASA* Standard B36.10-1939.

[c]The shape of these caps shall be ellipsoidal and shall conform to the requirements of the *ASME* Boiler Construction Code.

[d]This dimension is for a regular lapped joint in accordance with *ASA* Standard B16e-1939. For ring-joint facing dimensions, see B16e-1939.

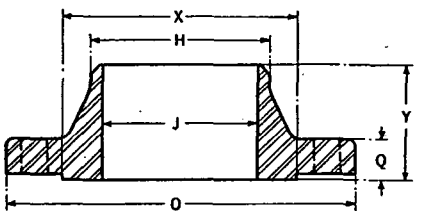
VALVES

Valves are made with both threaded and flanged ends for screwed and bolted connections just as are pipe fittings.

The material used for valves of small size is generally brass or bronze for low pressures and forged steel for high pressures, while in the larger sizes either cast-iron, cast-steel or some of the steel alloys are employed. Practically all iron or steel valves intended for steam or water work are bronze-mounted or trimmed.

Brass, bronze, and iron valves are generally designed for standard or extra heavy service, the former being used up to 125 lb and the latter up

TABLE 11. AMERICAN STANDARD DIMENSIONS OF STEEL WELDING NECK FLANGES FOR STEAM SERVICE PRESSURE RATING OF 150 LB PER SQ IN. (GAGE) AT A TEMPERATURE OF 500 F, AND 100 LB PER SQ IN. (GAGE) AT 750 F



Nominal Pipe Size	Diameter of Flange	Thickness of of Flg.[a] Min.	Diameter of Hub	Hub Diam. Beginning of Chamfer[b-c]	Length Thru Hub[a]	Inside Diam. of Pipe Schedule 40[c]	Diam. of Bolt Circle	No. of Bolts	Size of Bolts
	O	Q	X	H	Y	J			
½	3½	7/16	1 3/16	0.84	1⅞	0.62*	2⅜	4	½
¾	3⅞	½	1½	1.05	2 1/16	0.82*	2¾	4	½
1	4¼	9/16	1 5/16	1.32	2 3/16	1.05*	3⅛	4	½
1¼	4⅝	⅝	2 5/16	1.66	2¼	1.38*	3½	4	½
1½	5	11/16	2 9/16	1.90	2 7/16	1.61*	3⅞	4	½
2	6	¾	3 1/16	2.38	2½	2.07*	4¾	4	⅝
2½	7	⅞	3 9/16	2.88	2¾	2.47*	5½	4	⅝
3	7½	15/16	4¼	3.50	2¾	3.07*	6	4	⅝
3½	8½	15/16	4 13/16	4.00	2 13/16	3.55*	7	8	⅝
4	9	15/16	5 5/16	4.50	3	4.03*	7½	8	⅝
5	10	15/16	6 7/16	5.56	3½	5.05*	8½	8	¾
6	11	1	7 9/16	6.63	3½	6.07*	9½	8	¾
8	13½	1⅛	9 11/16	8.63	4	7.98*	11¾	8	¾
10	16	1 3/16	12	10.75	4	10.02*	14¼	12	⅞
12	19	1¼	14⅜	12.75	4½	.....	17	12	⅞
14 OD	21	1⅜	15¾	14.00	5	To Be	18¾	12	1
16 OD	23½	1 7/16	18	16.00	5	Specified	21¼	16	1
18 OD	25	1 9/16	19⅞	18.00	5½	by	22¾	16	1⅛
20 OD	27½	1 11/16	22	20.00	5 11/16	Purchaser	25	20	1⅛
24 OD	32	1⅞	26⅛	24.00	6		29½	20	1¼

All dimensions given in inches.

[a]A raised face of 1/16 in. is included in *thickness of flange minimum* and in *length through hub.*

[b]The outside surface of the welding end of the hub shall be straight or tapered at not more than 6 deg.

[c]Dimensions *H* and *J* correspond to the outside and inside diameters of pipe as given in *ASA* B36.10-1939, Schedule 40.

*These diameters are identical with the diameters of what was formerly designated as *Standard Weight Pipe* of the corresponding sizes.