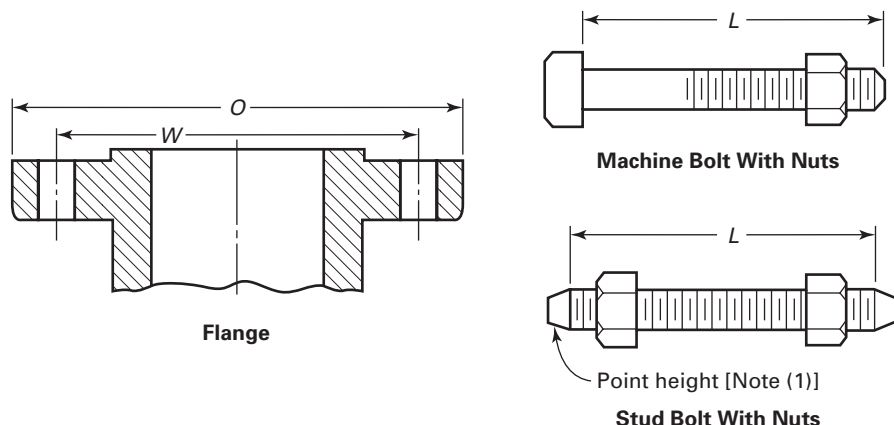


Table 10 Templates for Drilling Class 300 Pipe Flanges and Flanged Fittings



Nominal Pipe Size, NPS	Outside Diameter of Flange, O	Drilling [Notes (2), (3)]				Length of Bolts, L [Notes (1), (4)]		
		Diameter of Bolt Circle, W	Diameter of Bolt Holes, in.	Number of Bolts	Diameter of Bolts, in.	Stud Bolts [Note (1)]		Machine Bolts
						2-mm Raised Face	Ring Joint	2-mm Raised Face
1/2	95	66.7	5/8	4	1/2	65	75	55
3/4	115	82.6	3/4	4	5/8	75	90	65
1	125	88.9	3/4	4	5/8	75	90	65
1 1/4	135	98.4	3/4	4	5/8	85	95	70
1 1/2	155	114.3	7/8	4	3/4	90	100	75
2	165	127.0	3/4	8	5/8	90	100	75
2 1/2	190	149.2	7/8	8	3/4	100	115	85
3	210	168.3	7/8	8	3/4	110	120	90
3 1/2	230	184.2	7/8	8	3/4	110	125	95
4	255	200.0	7/8	8	3/4	115	125	95
5	280	235.0	7/8	8	3/4	120	135	110
6	320	269.9	7/8	12	3/4	120	140	110
8	380	330.2	1	12	7/8	140	150	120
10	445	387.4	1 1/8	16	1	160	170	140
12	520	450.8	1 1/4	16	1 1/8	170	185	145
14	585	514.4	1 1/4	20	1 1/8	180	190	160
16	650	571.5	1 3/8	20	1 1/4	190	205	165
18	710	628.6	1 3/8	24	1 1/4	195	210	170
20	775	685.8	1 3/8	24	1 1/4	205	220	185
24	915	812.8	1 3/8	24	1 1/2	230	255	205

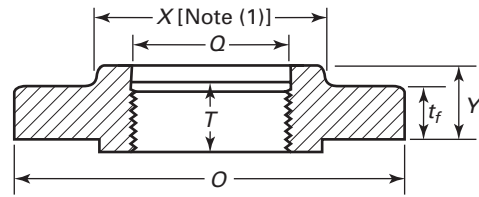
GENERAL NOTES:

- (a) Dimensions of Table 10 are in millimeters, except for diameters of bolts and bolt holes, which are in inch units. For dimensions in inch units, refer to Mandatory Appendix II, Table II-10.
- (b) For other dimensions, see Tables 11 and 12.

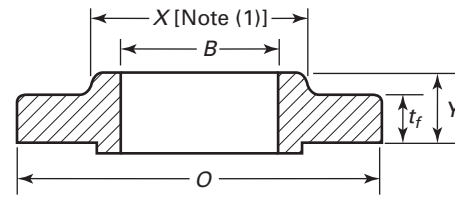
NOTES:

- (1) Length of stud bolt does not include the height of the points (see para. 6.10.2).
- (2) For flange bolt holes, see para. 6.5.
- (3) For spot facing, see para 6.6.
- (4) Bolt lengths not shown in the table may be determined in accordance with Nonmandatory Appendix C (see para. 6.10.2).

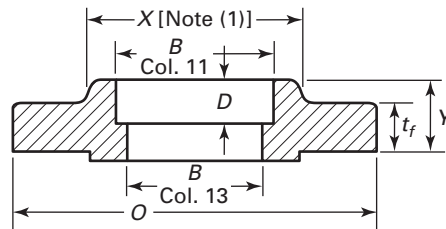
Table 11 Dimensions of Class 300 Flanges



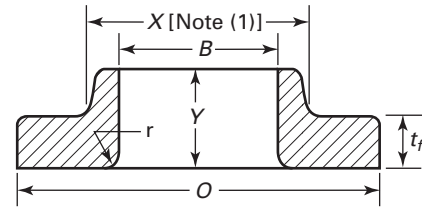
Threaded



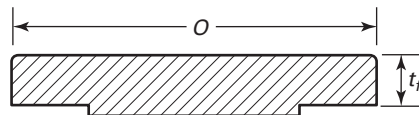
Slip-On Welding



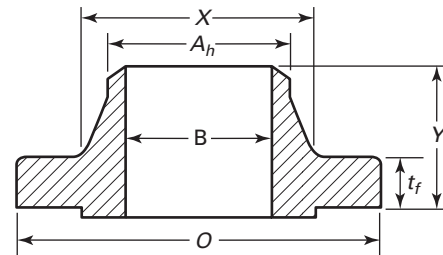
Socket Welding (NPS 1/2 to 3 Only)



Lapped



Blind



Welding Neck

Table 11 Dimensions of Class 300 Flanges (Cont'd)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Nominal Pipe Size, NPS	Outside Diameter of Flange, <i>O</i>	Minimum Thickness of Flange, <i>t_f</i> [Notes (2), (3)]	Minimum Thickness of Lap Joint, <i>t_f</i>	Diameter of Hub, <i>X</i>	Hub Diameter Beginning of Chamfer Welding, Neck, <i>A_h</i> [Note (4)]	Length Through Hub			Minimum Thread Length Threaded, <i>T</i> [Note (5)]	Bore			Corner Radius of Bore of Lapped Flange and Pipe, <i>r</i>	Minimum Counter-bore Threaded Flange, <i>Q</i>	Depth of Socket, <i>D</i>
						Threaded/ Slip-On/ Socket Welding, <i>Y</i>	Lapped, <i>Y</i>	Welding Neck, <i>Y</i>		Minimum Slip-On/ Socket Welding, <i>B</i>	Minimum Lapped, <i>B</i>	Welding Neck/ Socket Welding, <i>B</i> [Note (6)]			
1/2	95	12.7	14.3	38	21.3	21	22	51	16	22.2	22.9	15.8	3	23.6	10
3/4	115	14.3	15.9	48	26.7	24	25	56	16	27.7	28.2	20.9	3	29.0	11
1	125	15.9	17.5	54	33.4	25	27	60	18	34.5	34.9	26.6	3	35.8	13
1 1/4	135	17.5	19.1	64	42.2	25	27	64	21	43.2	43.7	35.1	5	44.4	14
1 1/2	155	19.1	20.7	70	48.3	29	30	67	23	49.5	50.0	40.9	6	50.3	16
2	165	20.7	22.3	84	60.3	32	33	68	29	61.9	62.5	52.5	8	63.5	17
2 1/2	190	23.9	25.4	100	73.0	37	38	75	32	74.6	75.4	62.7	8	76.2	19
3	210	27.0	28.6	117	88.9	41	43	78	32	90.7	91.4	77.9	10	92.2	21
3 1/2	230	28.6	30.2	133	101.6	43	44	79	37	103.4	104.1	90.1	10	104.9	...
4	255	30.2	31.8	146	114.3	46	48	84	37	116.1	116.8	102.3	11	117.6	...
5	280	33.4	35.0	178	141.3	49	51	97	43	143.8	144.4	128.2	11	144.4	...
6	320	35.0	36.6	206	168.3	51	52	97	47	170.7	171.4	154.1	13	171.4	...
8	380	39.7	41.3	260	219.1	60	62	110	51	221.5	222.2	202.7	13	222.2	...
10	445	46.1	47.7	321	273.0	65	95	116	56	276.2	277.4	254.6	13	276.2	...
12	520	49.3	50.8	375	323.8	71	102	129	61	327.0	328.2	304.8	13	328.6	...
14	585	52.4	54.0	425	355.6	75	111	141	64	359.2	360.2	Note (7)	13	360.4	...
16	650	55.6	57.2	483	406.4	81	121	144	69	410.5	411.2	Note (7)	13	411.2	...
18	710	58.8	60.4	533	457.0	87	130	157	70	461.8	462.3	Note (7)	13	462.0	...
20	775	62.0	63.5	587	508.0	94	140	160	74	513.1	514.4	Note (7)	13	512.8	...
24	915	68.3	69.9	702	610.0	105	152	167	83	616.0	616.0	Note (7)	13	614.4	...

ASME

ASME B16.5-2009

Table 11 Dimensions of Class 300 Flanges (Cont'd)

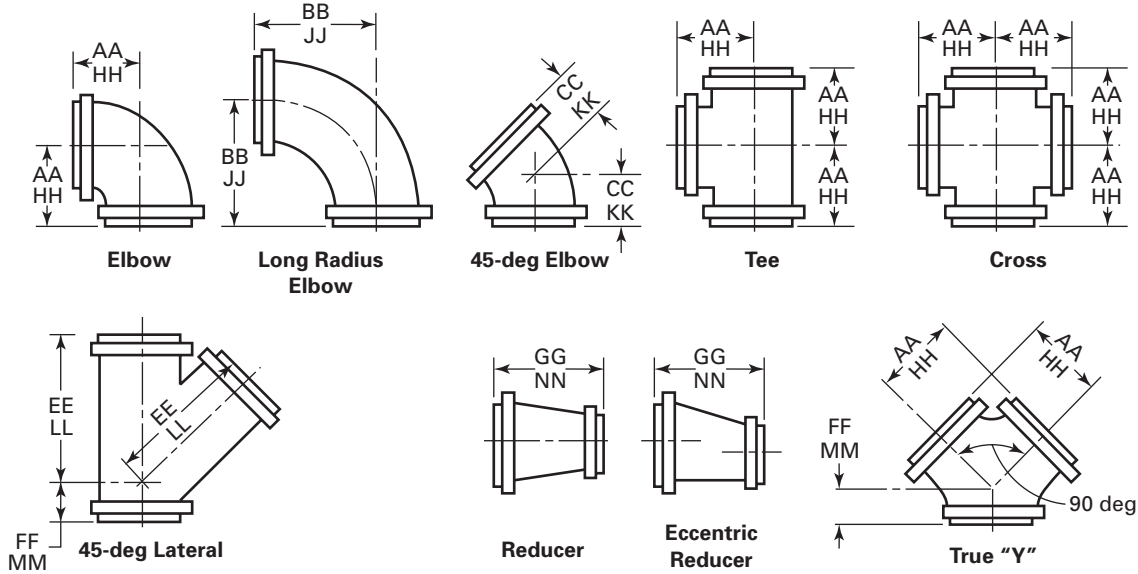
GENERAL NOTES:

- (a) Dimensions of Table 11 are in millimeters. For dimensions in inch units, refer to Mandatory Appendix II, Table II-11.
- (b) For tolerances, see section 7.
- (c) For facings, see para. 6.4.
- (d) For flange bolt holes, see para. 6.5 and Table 10.
- (e) For spot facing, see para. 6.6.
- (f) For reducing threaded and slip-on flanges, see Table 6.
- (g) Blind flanges may be made with or without hubs at the manufacturer's option.
- (h) For reducing welding neck flanges, see para. 6.8.

NOTES:

- (1) This dimension is for the large end of the hub, which may be straight or tapered. Taper shall not exceed 7 deg on threaded, slip-on, socket-welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and back face of the flange.
- (2) These flanges may be supplied with a flat face. The flat face may be either the full t_f dimension thickness plus 2-mm or the t_f dimension thickness without the raised face height. See para. 6.3.2 for additional restrictions.
- (3) The flange dimensions illustrated are for regularly furnished 2-mm raised face (except lapped); for requirements of other facings, see Fig. 7.
- (4) For welding end bevel, see para. 6.7.
- (5) For thread of threaded flanges, see para. 6.9.
- (6) Dimensions in Column 13 correspond to the inside diameters of pipe as given in ASME B36.10M for standard wall pipe. Standard wall dimensions are the same as Schedule 40 in sizes NPS 10 and smaller. Tolerances in para. 7.5.2 apply. These bore sizes are furnished unless otherwise specified by the purchaser.
- (7) To be specified by the Purchaser.

Table 9 Dimensions of Class 150 Flanged Fittings



1	2	3	4	5	6	7	8	9	10	11	12
2-mm Raised Face [Note (4)]											
Nominal Pipe Size, NPS	Outside Diameter of Flange, O	Minimum Thickness of Flange, t_f [Notes (1)–(3)]	Minimum Wall Thickness of Fitting, t_m	Inside diameter of Fitting, d	Center-to-Contact Surface of Raised Face Elbow, Tee, Cross, and True "Y,"	Center-to-Contact Surface of Raised Face Long Radius Elbow,	Center-to-Contact Surface of Raised Face 45-deg Elbow,	Long Center-to-Contact Surface of Raised Face Lateral,	Short Center-to-Contact Surface of Raised Face Lateral and True "Y,"	Contact Surface-to-Contact Surface of Raised Face Reducer, GG	Ring Joint [Note (4)] Center-to-End Elbow, Tee, Cross, and True "Y," HH
					AA	BB	CC	EE	FF	[Note (5)]	[Note (6)]
1/2	90	8.0	2.8	13	...	...	...	...	...	...	...
3/4	100	8.9	3.2	19	...	...	...	...	...	...	...
1	110	9.6	4.0	25	89	127	44	146	44	114	95
1 1/4	115	11.2	4.8	32	95	140	51	159	44	114	102
1 1/2	125	12.7	4.8	38	102	152	57	178	51	114	108
2	150	14.3	5.6	51	114	165	64	203	64	127	121
2 1/2	180	15.9	5.6	64	127	178	76	241	64	140	133
3	190	17.5	5.6	76	140	197	76	254	76	152	146
3 1/2	215	19.1	6.4	89	152	216	89	292	76	165	159
4	230	22.3	6.4	102	165	229	102	305	76	178	171