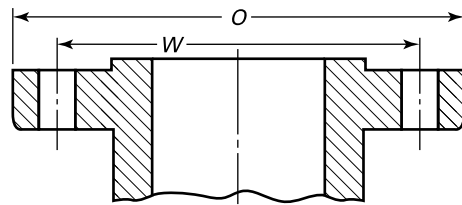
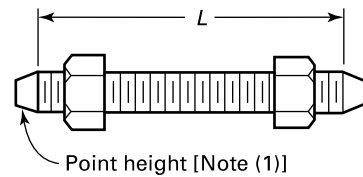


Table 19 Templates for Drilling Class 1500 Pipe Flanges

(20)



Flange



Stud Bolt With Nuts

1	2	3	4	5	6	7	8	9
Nominal Pipe Size, NPS	Outside Diameter of Flange, O	Drilling (2), (3)				Length of Bolts, L (1), (4)		
		Diameter of Bolt Circle, W	Diameter of Bolt Holes, in.	Number of Bolts	Diameter of Bolts, in.	6.4-mm Raised Face	Male and Female/ Tongue and Groove	Ring Joint
1/2	121	82.6	7/8	4	3/4	110	100	110
3/4	130	88.9	7/8	4	3/4	115	110	115
1	149	101.6	1	4	7/8	125	120	125
1 1/4	159	111.1	1	4	7/8	125	120	125
1 1/2	178	124.0	1 1/8	4	1	140	135	140
2	216	165.1	1	8	7/8	145	140	145
2 1/2	244	190.5	1 1/8	8	1	160	150	160
3	267	203.2	1 1/4	8	1 1/8	180	170	180
4	311	241.3	1 3/8	8	1 1/4	195	190	195
5	375	292.1	1 5/8	8	1 1/2	250	240	250
6	394	317.5	1 1/2	12	1 3/8	260	255	265
8	483	393.7	1 3/4	12	1 5/8	290	285	300
10	584	482.6	2	12	1 7/8	335	330	345
12	673	571.5	2 1/8	16	2	375	370	385
14	749	635.0	2 3/8	16	2 1/4	405	400	425
16	826	704.8	2 5/8	16	2 1/2	445	440	470
18	914	774.7	2 7/8	16	2 3/4	495	490	525
20	984	831.8	3 1/8	16	3	540	535	565
24	1 168	990.6	3 5/8	16	3 1/2	615	610	650

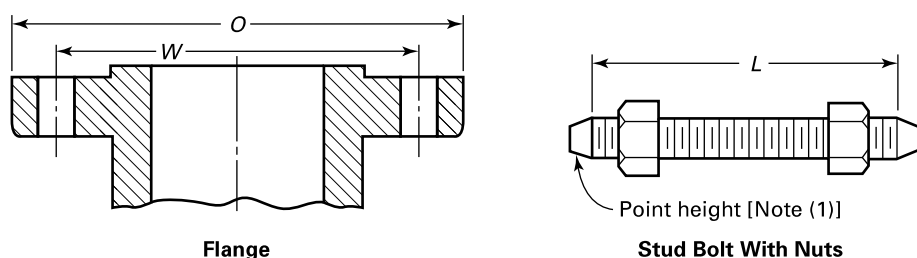
GENERAL NOTES:

- (a) Dimensions are in millimeters, except for the diameters of the bolts and bolt holes, which are in inches.
 (b) For other dimensions, see Table 20.

NOTES:

- (1) The length of the 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 19C Templates for Drilling Class 1500 Pipe Flanges



1	2	3	4	5	6	7	8	9
Nominal Pipe Size	Outside Diameter of Flange, <i>O</i>	Drilling (2), (3)				Length of Bolts, <i>L</i> (1), (4)		
		Diameter of Bolt Circle, <i>W</i>	Diameter of Bolt Holes	Number of Bolts	Diameter of Bolts	Raised Face 0.25 in.	Male and Female/ Tongue and Groove	Ring Joint
1/2	4.75	3.25	7/8	4	3/4	4.25	4.00	4.25
3/4	5.12	3.50	7/8	4	3/4	4.50	4.25	4.50
1	5.88	4.00	1	4	7/8	5.00	4.75	5.00
1 1/4	6.25	4.38	1	4	7/8	5.00	4.75	5.00
1 1/2	7.00	4.88	1 1/8	4	1	5.50	5.25	5.50
2	8.50	6.50	1	8	7/8	5.75	5.50	5.75
2 1/2	9.62	7.50	1 1/8	8	1	6.25	6.00	6.25
3	10.50	8.00	1 1/4	8	1 1/8	7.00	6.75	7.00
4	12.25	9.50	1 3/8	8	1 1/4	7.75	7.50	7.75
5	14.75	11.50	1 5/8	8	1 1/2	9.75	9.50	9.75
6	15.50	12.50	1 1/2	12	1 3/8	10.25	10.00	10.50
8	19.00	15.50	1 3/4	12	1 5/8	11.50	11.25	11.75
10	23.00	19.00	2	12	1 7/8	13.25	13.00	13.50
12	26.50	22.50	2 1/8	16	2	14.75	14.50	15.25
14	29.50	25.00	2 3/8	16	2 1/4	16.00	15.75	16.75
16	32.50	27.75	2 5/8	16	2 1/2	17.50	17.25	18.50
18	36.00	30.50	2 7/8	16	2 3/4	19.50	19.25	20.75
20	38.75	32.75	3 1/8	16	3	21.25	21.00	22.25
24	46.00	39.00	3 5/8	16	3 1/2	24.25	24.00	25.50

GENERAL NOTES:

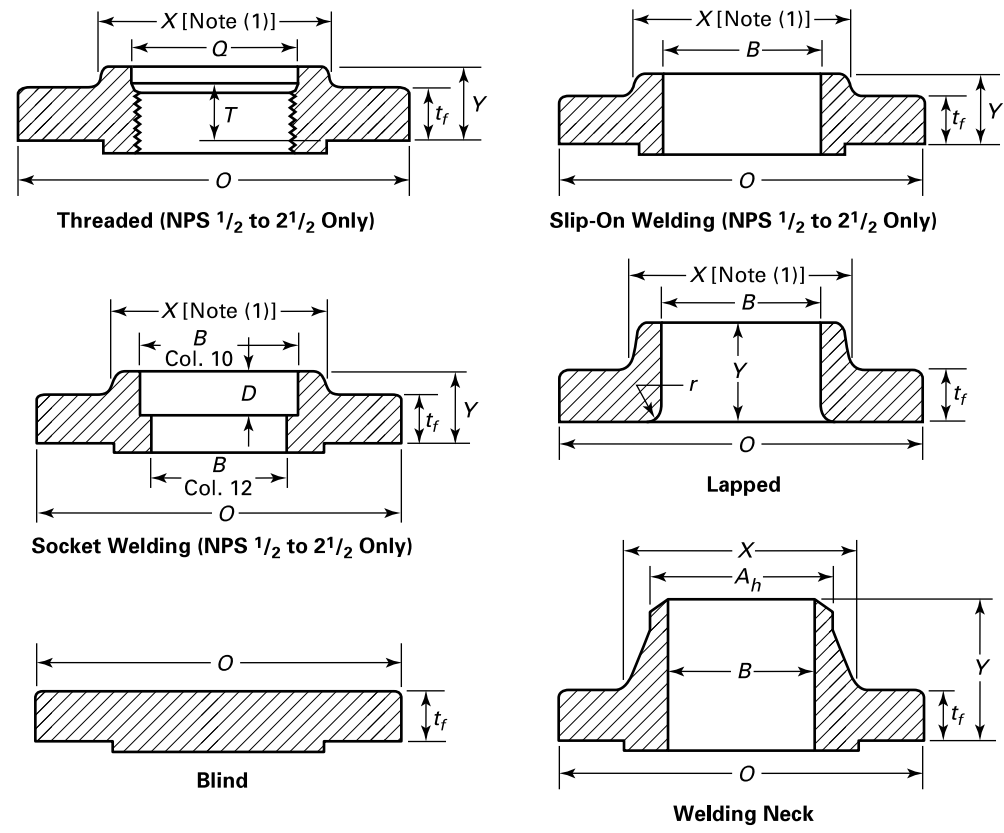
- (a) Dimensions are in inches.
 (b) For other dimensions, see Table 20C.

NOTES:

- (1) The length of the 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).

(20)

Table 20 Dimensions of Class 1500 Flanges



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Nominal Pipe Size, NPS	Outside Diameter of Flange, O	Minimum Thickness of Flange, t _f	Diameter of Hub, X	Hub Diameter Beginning of Chamfer Welding Neck, A _h (2)	Length Through Hub			Minimum Thread Length Threaded Flange, T (3)	Bore			Corner Bore Radius of Lapped Flange and Pipe, r	Minimum Counterbore Threaded Flange, Q	Depth of Socket, D
					Threaded/ Slip-On/ Socket Welding, Y	Lapped, Y	Welding Neck, Y		Minimum Slip-On/ Socket Welding, B	Minimum Lapped, B	Welding Neck/ Socket Welding, B			
1/2	121	22.4	38	21.3	32	32	60	22	22.4	22.9	(4)	3	23.6	10
3/4	130	25.4	44	26.7	35	35	70	25	27.7	28.2	(4)	3	29.0	11
1	149	28.4	52	33.5	41	41	73	28	34.5	35.4	(4)	3	35.8	13
1 1/4	159	28.4	64	42.2	41	41	73	30	43.2	43.7	(4)	5	44.4	14
1 1/2	178	31.8	70	48.3	44	44	83	32	49.5	50.0	(4)	6	50.5	16

Table 20 Dimensions of Class 1500 Flanges (Cont'd)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Nominal Pipe Size, NPS	Outside Diameter of Flange, <i>O</i>	Minimum Thickness of Flange, <i>t_f</i>	Diameter of Hub, <i>X</i>	Hub Diameter Beginning of Chamfer Welding Neck, <i>A_h</i> (2)	Length Through Hub			Minimum Thread Length Threaded Flange, <i>T</i> (3)	Bore			Corner Bore Radius of Lapped Flange and Pipe, <i>r</i>	Minimum Counterbore 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>			
2	216	38.1	105	60.5	57	57	102	38	62.0	62.5	(4)	8	63.5	18
2½	244	41.1	124	73.2	64	64	105	48	74.7	75.4	(4)	8	76.2	19
3	267	47.8	133	88.9	...	73	117	...	...	91.4	(4)	10	...	...
4	311	53.8	162	114.3	...	90	124	...	...	116.8	(4)	11	...	...
5	375	73.2	197	141.2	...	105	155	...	...	144.5	(4)	11	...	...
6	394	82.6	229	168.4	...	119	171	...	...	171.4	(4)	13	...	...
8	483	91.9	292	219.2	...	143	213	...	...	222.2	(4)	13	...	...
10	584	108.0	368	273.0	...	178	254	...	...	277.4	(4)	13	...	...
12	673	124.0	451	323.8	...	219	282	...	...	328.2	(4)	13	...	...
14	749	133.4	495	355.6	...	241	298	...	...	360.2	(4)	13	...	...
16	826	146.0	552	406.4	...	260	311	...	...	411.2	(4)	13	...	...
18	914	162.1	597	457.2	...	276	327	...	...	462.3	(4)	13	...	...
20	984	177.8	641	508.0	...	292	356	...	...	514.4	(4)	13	...	...
24	1 168	203.2	762	609.6	...	330	406	...	...	616.0	(4)	13	...	...

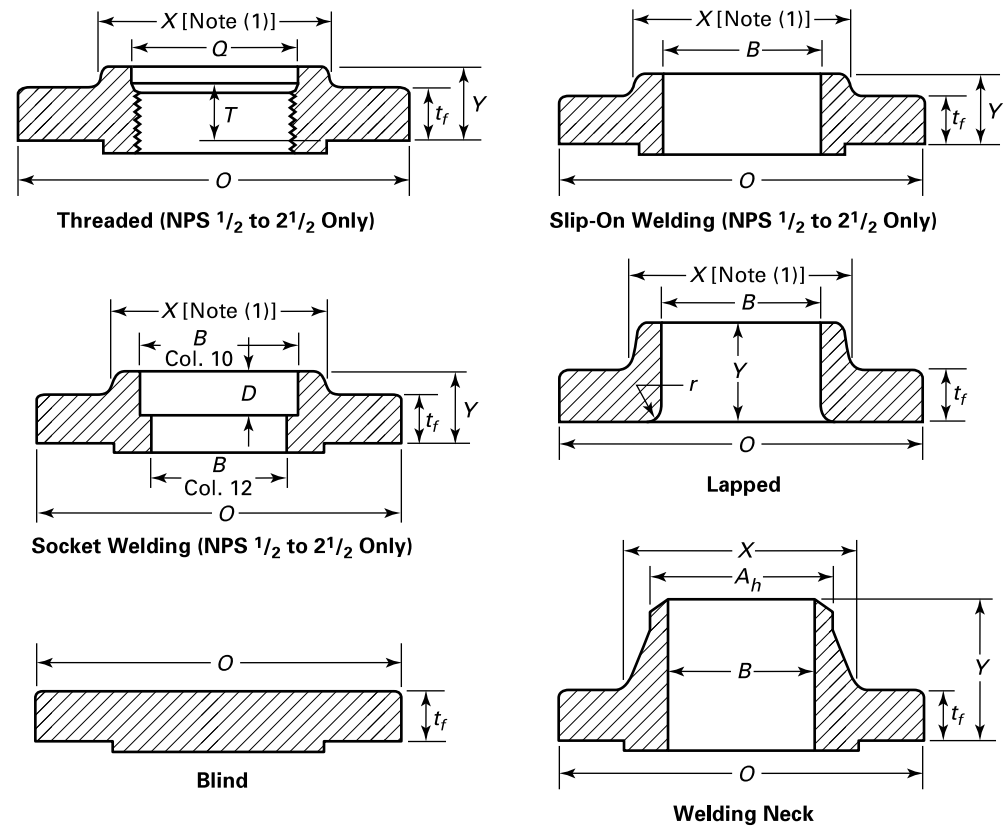
GENERAL NOTES:

- (a) Dimensions are in millimeters.
 (b) For tolerances, see [section 7](#).
 (c) For facings, see [para. 6.4](#).
 (d) For flange bolt holes, see [para. 6.5](#) and [Table 19](#).
 (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) For welding end bevel, see [para. 6.7](#).
 (3) For thread of threaded flanges, see [para. 6.9](#).
 (4) To be specified by the purchaser.

Table 20C Dimensions of Class 1500 Flanges



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Nominal Pipe Size	Outside Diameter of Flange, O	Minimum Thickness of Flange, t _f	Diameter of Hub, X	Hub Diameter Beginning of Chamfer Welding Neck, A _h (2)	Length Through Hub			Minimum Thread Length Threaded Flange, T (3)	Bore			Corner Bore Radius of Lapped Flange and Pipe, r	Minimum Counterbore Threaded Flange, Q	Depth of Socket, D
					Threaded Slip-On Socket Welding, Y	Lapped Y	Welding Neck, Y		Minimum Slip-On Socket Welding, B	Minimum Lapped, B	Welding Neck/ Socket Welding, B			
1/2	4.75	0.88	1.50	0.84	1.25	1.25	2.38	0.88	0.88	0.90	(4)	0.12	0.93	0.38
3/4	5.12	1.00	1.75	1.05	1.38	1.38	2.75	1.00	1.09	1.11	(4)	0.12	1.14	0.44
1	5.88	1.12	2.06	1.32	1.62	1.62	2.88	1.12	1.36	1.38	(4)	0.12	1.41	0.50
1 1/4	6.25	1.12	2.50	1.66	1.62	1.62	2.88	1.19	1.70	1.72	(4)	0.19	1.75	0.56
1 1/2	7.00	1.25	2.75	1.90	1.75	1.75	3.25	1.25	1.95	1.97	(4)	0.25	1.99	0.62
2	8.50	1.50	4.12	2.38	2.25	2.25	4.00	1.50	2.44	2.46	(4)	0.31	2.50	0.69

Table 20C Dimensions of Class 1500 Flanges (Cont'd)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Nominal Pipe Size	Outside Diameter of Flange, <i>O</i>	Minimum Thickness of Flange, <i>t_f</i>	Diameter of Hub, <i>X</i>	Hub Diameter Beginning of Chamfer Welding Neck, <i>A_h</i> (2)	Length Through Hub			Minimum Thread Length Threaded Flange, <i>T</i> (3)	Bore		Welding Neck/ Socket Welding, <i>B</i>	Corner Bore Radius of Lapped Flange and Pipe, <i>r</i>	Minimum Counterbore 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>				
2½	9.62	1.62	4.88	2.88	2.50	2.50	4.12	1.88	2.94	2.97	(4)	0.31	3.00	0.75
3	10.50	1.88	5.25	3.50	...	2.88	4.62	...	...	3.60	(4)	0.38	...	...
4	12.25	2.12	6.38	4.50	...	3.56	4.88	...	...	4.60	(4)	0.44	...	...
5	14.75	2.88	7.75	5.56	...	4.12	6.12	...	...	5.69	(4)	0.44	...	...
6	15.50	3.25	9.00	6.63	...	4.69	6.75	...	...	6.75	(4)	0.50	...	...
8	19.00	3.62	11.50	8.63	...	5.62	8.38	...	...	8.75	(4)	0.50	...	...
10	23.00	4.25	14.50	10.75	...	7.00	10.00	...	...	10.92	(4)	0.50	...	...
12	26.50	4.88	17.75	12.75	...	8.62	11.12	...	...	12.92	(4)	0.50	...	...
14	29.50	5.25	19.50	14.00	...	9.50	11.75	...	...	14.18	(4)	0.50	...	...
16	32.50	5.75	21.75	16.00	...	10.25	12.25	...	...	16.19	(4)	0.50	...	...
18	36.00	6.38	23.50	18.00	...	10.88	12.88	...	...	18.20	(4)	0.50	...	...
20	38.75	7.00	25.25	20.00	...	11.50	14.00	...	...	20.25	(4)	0.50	...	...
24	46.00	8.00	30.00	24.00	...	13.00	16.00	...	...	24.25	(4)	0.50	...	...

GENERAL NOTES:

- (a) Dimensions are in inches.
 (b) For tolerances, see [section 7](#).
 (c) For facings, see [para. 6.4](#).
 (d) For flange bolt holes, see [para. 6.5](#) and [Table 19C](#).
 (e) For spot facing, see [para. 6.6](#).
 (f) For reducing threaded and slip-on flanges, see [Table 6C](#).
 (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.
 (2) For welding end bevel, see [para. 6.7](#).
 (3) For threads in threaded flanges, see [para. 6.9](#).
 (4) To be specified by the purchaser.