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Table II-4 Dimensions of Facings (Other Than Ring Joints, All Pressure Rating Classes)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Nominal Pipe Size	Outside Diameter				Inside Diameter of Large and Small Tongue, U	Inside Diameter of Small Male [Note (1)]	Outside Diameter			Inside Diameter of Large and Small Groove, Z	Height		Depth of Groove or Female [Notes (2), (5)]	Minimum Outside Diameter of Raised Portion [Notes (6), (7)]	
	Raised Face Large Male and Large Tongue, R	Small Male, S [Note (1)]	Small Tongue, T	Large Female and Large Groove, W			Small Female, X [Note (1)]	Small Groove, Y	Raised Face [Notes (2), (3)]		Large and Small Tongue [Notes (2), (4)]	Small Female and Groove, K		Large Female and Groove, L	
	1/2	1.38	0.72	1.38			1.00	...	1.44		0.78	1.44		0.94	...
3/4	1.69	0.94	1.69	1.31	...	1.75	1.00	1.75	1.25	...	...	...	2.06	2.12
1	2.00	1.19	1.88	1.50	...	2.06	1.25	1.94	1.44	...	...	...	2.25	2.44
1 1/4	2.50	1.50	2.25	1.88	...	2.56	1.56	2.31	1.81	...	...	...	2.62	2.94
1 1/2	2.88	1.75	2.50	2.12	...	2.94	1.81	2.56	2.06	...	...	...	2.88	3.31
2	3.62	2.25	3.25	2.88	...	3.69	2.31	3.31	2.81	...	...	...	3.62	4.06
2 1/2	4.12	2.69	3.75	3.38	...	4.19	2.75	3.81	3.31	...	...	...	4.12	4.56
3	5.00	3.31	4.62	4.25	...	5.06	3.38	4.69	4.19	...	...	...	5.00	5.44
3 1/2	5.50	3.81	5.12	4.75	...	5.56	3.88	5.19	4.69	...	...	...	5.50	5.94
4	6.19	4.31	5.69	5.19	...	6.25	4.38	5.75	5.12	...	...	...	6.19	6.62
5	7.31	5.38	6.81	6.31	...	7.38	5.44	6.88	6.25	...	...	...	7.31	7.75
6	8.50	6.38	8.00	7.50	...	8.56	6.44	8.06	7.44	...	...	...	8.50	8.94
8	10.62	8.38	10.00	9.38	...	10.69	8.44	10.06	9.31	...	...	...	10.62	11.06
10	12.75	10.50	12.00	11.25	...	12.81	10.56	12.06	11.19	...	...	...	12.75	13.19
12	15.00	12.50	14.25	13.50	...	15.06	12.56	14.31	13.44	...	...	...	15.00	15.44
14	16.25	13.75	15.50	14.75	...	16.31	13.81	15.56	14.69	...	...	...	16.25	16.69
16	18.50	15.75	17.62	16.75	...	18.56	15.81	17.69	16.69	...	...	...	18.50	18.94
18	21.00	17.75	20.12	19.25	...	21.06	17.81	20.19	19.19	...	...	...	21.00	21.44
20	23.00	19.75	22.00	21.00	...	23.06	19.81	22.06	20.94	...	...	...	23.00	23.44
22	25.25	...	...	...	...	...	...	...	...	...	...	...	...	...
24	27.25	23.75	26.25	25.25	...	27.31	23.81	26.31	25.19	...	...	...	27.25	27.69

GENERAL NOTES:

- (a) Dimensions are in inches.
 (b) For facing requirements for flanges and flanged fittings, see paras. 6.3 and 6.4 and Figure II-6.
 (c) For facing requirements for lapped joints, see para. 6.4.3 and Figure II-6.
 (d) For facing tolerances, see para. 7.3.

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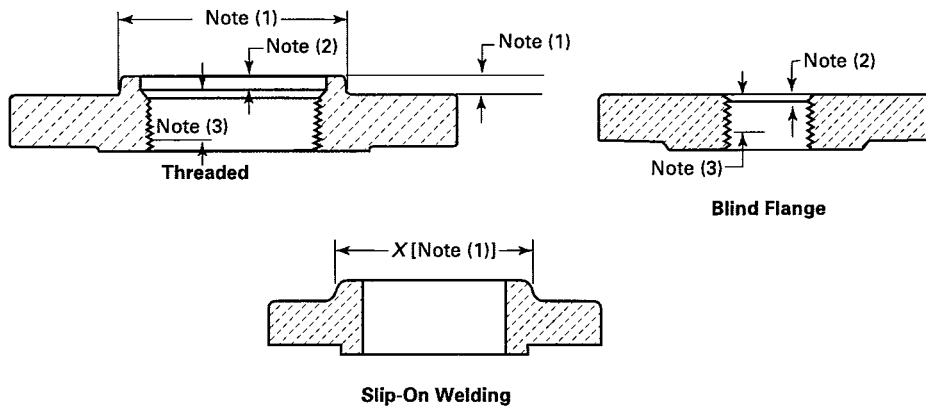
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Table II-4 Dimensions of Facings (Other Than Ring Joints, All Pressure Rating Classes) (Cont'd)

NOTES:

- (1) For small male and female joints, care should be taken in the use of these dimensions to ensure that the inside diameter of fitting or pipe is small enough to permit sufficient bearing surface to prevent the crushing of the gasket. This applies particularly where the joint is made on the end of the pipe. The inside diameter of the fitting should match the inside diameter of the pipe as specified by the purchaser. Threaded companion flanges for small male and female joints are furnished with plain face and are threaded with American National Standard Locknut Thread (NPSL).
- (2) See para. 6.4.3 and Figure II-6 for thickness and outside diameters of laps.
- (3) The height of the raised face is either 0.06 in. or 0.25 in. (see para. 6.4.1).
- (4) The height of the large and small male and tongue is 0.25 in.
- (5) The depth of the groove or female is 0.19 in.
- (6) The raised portion of the full face may be furnished unless otherwise specified on order.
- (7) Large male and female faces and large tongue and groove are not applicable to Class 150 because of potential dimensional conflicts.

Table II-6 Reducing Threaded and Slip-On Flanges for Classes 150 Through 2500 Pipe Flanges



1	2	3	4	5	6
Nominal Pipe Size [Note (4)]	Smallest Size of Reducing Outlet Requiring Hub Flanges [Note (1)]	Nominal Pipe Size [Note (4)]	Smallest Size of Reducing Outlet Requiring Hub Flanges [Note (1)]	Nominal Pipe Size [Note (4)]	Smallest Size of Reducing Outlet Requiring Hub Flanges [Note (1)]
1	1/2	3 1/2	1 1/2	12	3 1/2
1 1/4	1/2	4	1 1/2	14	3 1/2
1 1/2	1/2	5	1 1/2	16	4
2	1	6	2 1/2	18	4
2 1/2	1 1/4	8	3	20	4
3	1 1/4	10	3 1/2	24	4

NOTES:

- (1) The hub dimensions shall be at least as large as those of the standard flanges of the size to which the reduction is being made, except flanges reducing to a size smaller than those of columns 2, 4, and 6 may be made from blind flanges (see Example B).
- (2) Class 150 flanges do not have a counterbore. Class 300 and higher pressure flanges will have a depth of counterbore of 0.25 in. for NPS 2 and smaller tapping and 0.38 in. for NPS 2 1/2 and larger. The diameter *Q* of counterbore is the same as that given in the tables of the threaded flanges for the corresponding tapping.
- (3) The minimum length of effective threads shall be at least equal to dimension *T* of the corresponding pressure class threaded flange as shown in the tables but does not necessarily extend for the face of the flange. For thread of threaded flanges, see para. 6.9.
- (4) For the method of designating reducing threaded and reducing slip-on flanges, see para. 3.3 and the example below.

EXAMPLES:

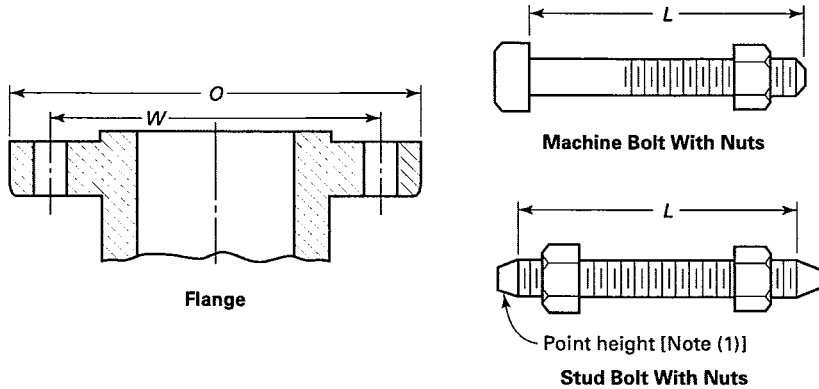
- (1) The size designation is NPS 6 × 2 1/2 — Class 300 reducing threaded flange. This flange has the following dimensions:
 NPS 2 1/2 = taper pipe thread tapping (ASME B1.20.1)
 12.5 in. = diameter of regular NPS 6 Class 300 threaded flange
 1.44 in. = thickness of regular NPS 6 Class 300 threaded flange
 7.0 in. = diameter of hub for regular NPS 5 Class 300 threaded flange. Hub diameter may be one size smaller to reduce machining. In this example, a hub diameter of NPS 2 1/2 would be the smallest acceptable.
 0.62 in. = height of hub for regular NPS 5 Class 300 threaded flange

Other dimensions the same as for regular NPS 6 Class 300 threaded flange, Table II-12.

- (2) The size designation is NPS 6 × 2 — Class 300 reducing threaded flange. Use regular NPS 6 Class 300 blind flange tapped with NPS 2 taper pipe thread (ASME B1.20.1).

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Table II-7 Templates for Drilling Class 150 Pipe Flanges and Flanged Fittings



Nominal Pipe Size, NPS	Outside Diameter of Flange, O	Drilling [Notes (2), (3)]				Length of Bolts, L [Note (4)]		
		Diameter of Bolt Circle, W	Diameter of Bolt Holes	Number of Bolts	Diameter of Bolts	Stud Bolts [Note (1)]		Machine Bolts
						Raised Face 0.06 in.	Ring Joint	Raised Face 0.06 in.
1/2	3.50	2.38	5/8	4	1/2	2.25	...	2.00
3/4	3.88	2.75	5/8	4	1/2	2.50	...	2.00
1	4.25	3.12	5/8	4	1/2	2.50	3.00	2.25
1 1/4	4.62	3.50	5/8	4	1/2	2.75	3.25	2.25
1 1/2	5.00	3.88	5/8	4	1/2	2.75	3.25	2.50
2	6.00	4.75	3/4	4	5/8	3.25	3.75	2.75
2 1/2	7.00	5.50	3/4	4	5/8	3.50	4.00	3.00
3	7.50	6.00	3/4	4	5/8	3.50	4.00	3.00
3 1/2	8.50	7.00	3/4	8	5/8	3.50	4.00	3.00
4	9.00	7.50	3/4	8	5/8	3.50	4.00	3.00
5	10.00	8.50	7/8	8	3/4	3.75	4.25	3.25
6	11.00	9.50	7/8	8	3/4	4.00	4.50	3.25
8	13.50	11.75	7/8	8	3/4	4.25	4.75	3.50
10	16.00	14.25	1	12	7/8	4.50	5.00	4.00
12	19.00	17.00	1	12	7/8	4.75	5.25	4.00
14	21.00	18.75	1 1/8	12	1	5.25	5.75	4.50
16	23.50	21.25	1 1/8	16	1	5.25	5.75	4.50
18	25.00	22.75	1 1/4	16	1 1/8	5.75	6.25	5.00
20	27.50	25.00	1 1/4	20	1 1/8	6.25	6.75	5.50
22	29.50	27.25	1 3/8	20	1 1/4	6.75	7.25	6.00
24	32.00	29.50	1 3/8	20	1 1/4	6.75	7.25	6.00

GENERAL NOTES:

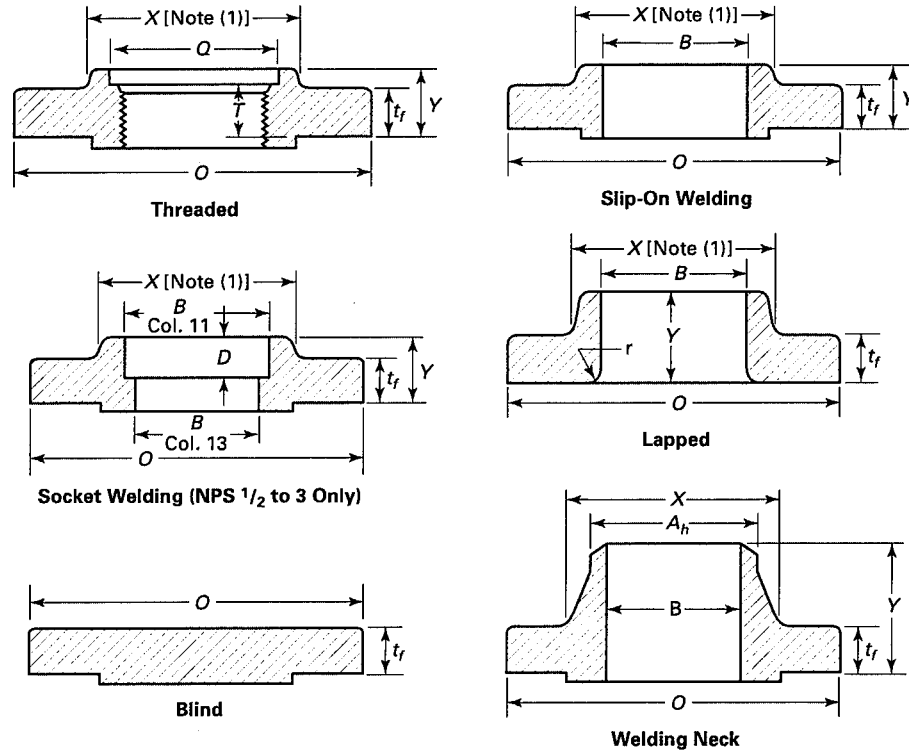
- (a) Dimensions are in inches.
- (b) For other dimensions, see Tables II-8 and II-9.

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).

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Table II-8 Dimensions of Class 150 Flanges



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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 [Notes (2)-(4)]	Minimum Thickness Lap Joint	Diameter of Hub, X	Diameter Beginning of Chamfer of Welding Neck, A_h [Note (5)]	Length Through Hub			Bore			Welding Neck/Socket Welding, B [Note (7)]	Corner Bore Radius of Lapped Flange and Pipe, r	Depth of Socket, D
						Threaded Slip-On Socket Welding, Y	Lapped, Y	Welding Neck, Y	Minimum Thread Length Threaded, T [Note (6)]	Minimum Slip-On Socket Welding, B	Minimum Lapped, B			
1/2	3.50	0.38	0.44	1.19	0.84	0.56	0.62	1.81	0.62	0.88	0.90	0.62	0.12	0.38
3/4	3.88	0.44	0.50	1.50	1.05	0.56	0.62	2.00	0.62	1.09	1.11	0.82	0.12	0.44
1	4.25	0.50	0.56	1.94	1.32	0.62	0.69	2.12	0.69	1.36	1.38	1.05	0.12	0.50
1 1/4	4.62	0.56	0.62	2.31	1.66	0.75	0.81	2.19	0.81	1.70	1.72	1.38	0.19	0.56
1 1/2	5.00	0.62	0.69	2.56	1.90	0.81	0.88	2.38	0.88	1.95	1.97	1.61	0.25	0.62
2	6.00	0.69	0.75	3.06	2.38	0.94	1.00	2.44	1.00	2.44	2.46	2.07	0.31	0.69

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Table II-8 Dimensions of Class 150 Flanges (Cont'd)

1 Nominal Pipe Size	2 Outside Diameter of Flange, <i>O</i>	3 Minimum Thickness of Flange, <i>t_f</i> [Notes (2)- (4)]	4 Minimum Thickness Lap Joint	5 Diameter of Hub, <i>X</i>	6 Diameter Beginning of Chamfer Welding Neck, <i>A_h</i> [Note (5)]	7 Length Through Hub			10 Minimum Thread Length Threaded, <i>T</i> [Note (6)]	Bore			14 Corner Bore Radius of Lapped Flange and Pipe, <i>r</i>	15 Depth of Socket, <i>D</i>
						8 Threaded Slip-On Socket Welding, <i>Y</i>	9 Lapped, <i>Y</i>	9 Welding Neck, <i>Y</i>		11 Minimum Slip-On Socket Welding, <i>B</i>	12 Minimum Lapped, <i>B</i>	13 Welding Neck/ Socket Welding, <i>B</i> [Note (7)]		
2½	7.00	0.81	0.88	3.56	2.88	1.06	1.12	2.69	1.12	2.94	2.97	2.47	0.31	0.75
3	7.50	0.88	0.94	4.25	3.50	1.12	1.19	2.69	1.19	3.57	3.60	3.07	0.38	0.81
3½	8.50	0.88	0.94	4.81	4.00	1.19	1.25	2.75	1.25	4.07	4.10	3.55	0.38	...
4	9.00	0.88	0.94	5.31	4.50	1.25	1.31	2.94	1.31	4.57	4.60	4.03	0.44	...
5	10.00	0.88	0.94	6.44	5.56	1.38	1.44	3.44	1.44	5.66	5.69	5.05	0.44	...
6	11.00	0.94	1.00	7.56	6.63	1.50	1.56	3.44	1.56	6.72	6.75	6.07	0.50	...
8	13.50	1.06	1.12	9.69	8.63	1.69	1.75	3.94	1.75	8.72	8.75	7.98	0.50	...
10	16.00	1.12	1.19	12.00	10.75	1.88	1.94	3.94	1.94	10.88	10.92	10.02	0.50	...
12	19.00	1.19	1.25	14.38	12.75	2.12	2.19	4.44	2.19	12.88	12.92	12.00	0.50	...
14	21.00	1.31	1.38	15.75	14.00	2.19	3.12	4.94	2.25	14.14	14.18	Note (8)	0.50	...
16	23.50	1.38	1.44	18.00	16.00	2.44	3.44	4.94	2.50	16.16	16.19	Note (8)	0.50	...
18	25.00	1.50	1.56	19.88	18.00	2.62	3.81	5.44	2.69	18.18	18.20	Note (8)	0.50	...
20	27.50	1.62	1.69	22.00	20.00	2.81	4.06	5.62	2.88	20.20	20.25	Note (8)	0.50	...
22	29.50	1.75	1.81	24.00	22.00	3.06	4.25	5.82	...	22.22	22.25	Note (8)	0.50	...
24	32.00	1.81	1.88	26.12	24.00	3.19	4.38	5.94	3.25	24.25	24.25	Note (8)	0.50	...

GENERAL NOTES:

- Dimensions are in inches.
- For tolerances, see section 7.
- For facings, see para. 6.4.
- For flange bolt holes, see para. 6.5 and Table II-7.
- For spot facing, see para. 6.6.
- For reducing threaded and slip-on flanges, see Table II-6.
- Blind flanges may be made with or without hubs at the manufacturer's option.
- For reducing welding neck flanges, see para. 6.8.

NOTES:

- 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.
- The minimum thickness of these loose flanges, in sizes NPS 3½ and smaller, is slightly greater than the thickness of flanges on fittings, Table II-9, which are reinforced by being cast integral with the body of the fitting.
- When these flanges are required with flat face, the flat face may be either the full *t_f* dimension thickness plus 0.06 in. or the *t_f* dimension thickness without the raised face height. See para. 6.3.2 for additional restrictions.
- The flange dimensions illustrated are for regularly furnished 0.06-in. raised face (except lapped); for requirements of other facings, see Figure II-6.
- For welding end bevel, see para. 6.7.
- For thread of threaded flanges, see para. 6.9.

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Table II-8 Dimensions of Class 150 Flanges (Cont'd)

NOTES (Cont'd):

- (7) Dimensions in column 13 correspond to the inside diameters of pipe as given in ASME B36.10M for standard wall pipe. The thickness of standard wall is 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 specked by the purchaser.
- (8) To be specified by the purchaser.