Flanges

High Technology Valve & Flange & Fitting Series

SUPERLOK®

BMT Co., Ltd.
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SUPERLOK®
Instrument & Process Valves & Fittings

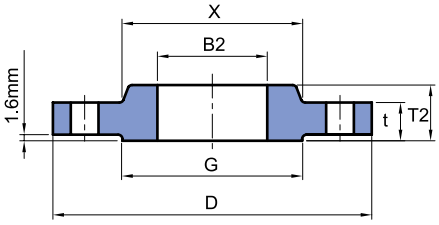
Contents

SUPERLOK®

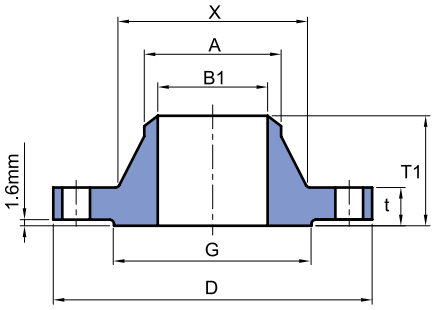
ANSI FLANGES

- Class 150 Flanges
- Class 300 Flanges
- Class 400 Flanges
- Class 600 Flanges
- Class 900 Flanges
- Class 1500 Flanges
- Class 2500 Flanges

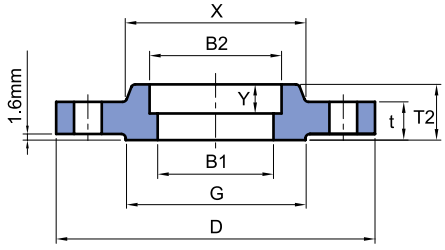
CLASS 150 FLANGES



SLIP-ON



WELDING NECK



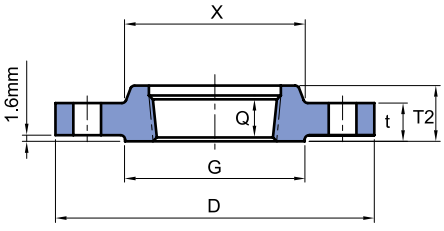
SOCKET WELDING

ANSI B 16.5 Forged Flanges

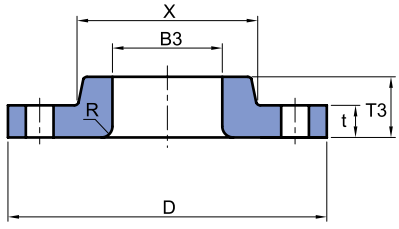
Unit : mm

Nominal Pipe Size	Outside Diam.	Diam. at Base of Hub	O.D of Raised Face	Thickness	BORE			LENGTH THRU HUB			Diam. of Hub at Bevel	Radius of Fillet	Thread Length	Depth of Socket
					Welding Neck Socket Welding	Slip-on Socket Welding	Lap Joint	Welding Neck	Slip-on Threaded Socket Welding	Lap Joint				
	D	X	G	t	B1	B2	B3	T1	T2	T3	A	R	Q	Y
1/2	89	30.2	35.1	11.2	15.8	22.4	22.9	47.8	15.7	15.7	21.3	3.0	15.7	9.7
3/4	99	38.1	42.9	12.7	20.8	27.7	28.2	52.3	15.7	15.7	26.7	3.0	15.7	11.2
1	108	49.3	50.8	14.2	26.7	34.5	35.1	55.6	17.5	17.5	33.5	3.0	17.5	12.7
1 1/4	117	58.7	63.5	15.7	35.1	43.2	43.7	57.2	20.6	20.6	42.2	4.8	20.6	14.2
1 1/2	127	65.0	73.2	17.5	40.9	49.5	50.0	62.0	22.4	22.4	48.3	6.4	22.4	15.8
2	152	77.7	91.9	19.1	52.6	62.0	62.5	63.5	25.4	25.4	60.5	7.9	25.4	17.5
2 1/2	178	90.4	104.6	22.4	62.7	74.7	75.4	69.9	28.4	28.4	73.2	7.9	28.4	19.1
3	191	108.0	127.0	23.9	78.0	90.7	91.4	69.9	30.2	30.2	88.9	9.7	30.2	20.6
3 1/2	216	122.2	139.7	23.9	90.2	103.4	104.1	71.4	31.8	31.8	101.6	9.7	31.8	22.4
4	229	134.9	157.2	23.9	102.4	116.1	116.8	76.2	33.3	33.3	114.3	11.2	33.3	23.9
5	254	163.6	185.7	23.9	128.3	143.8	144.5	88.9	36.6	36.6	141.2	11.2	36.6	23.9
6	279	192.0	215.9	25.4	154.2	170.7	171.5	88.9	39.6	39.6	168.4	12.7	39.6	26.9
8	343	246.1	269.7	28.4	202.7	221.5	222.3	101.6	44.5	44.5	219.2	12.7	44.5	31.8
10	406	304.8	323.9	30.2	254.5	276.4	277.4	101.6	49.3	49.3	273.1	12.7	49.3	33.3
12	483	365.3	381.0	31.8	304.8	327.2	328.2	114.3	55.6	55.6	323.9	12.7	55.6	39.6
14	533	400.1	412.8	35.1	336.6	359.2	360.2	127.0	57.2	79.2	355.6	12.7	57.2	41.4
16	597	457.2	469.9	36.6	387.4	410.5	411.2	127.0	63.5	87.4	406.4	12.7	63.5	44.5
18	635	505.0	533.4	39.6	438.2	461.8	462.3	139.7	68.3	96.8	457.2	12.7	68.3	49.3
20	699	558.8	584.2	42.9	489.0	513.1	514.4	144.5	73.2	103.1	508.0	12.7	73.2	54.1
24	813	663.4	692.2	47.8	590.6	616.0	616.0	152.4	82.6	111.3	609.6	12.7	82.6	63.5

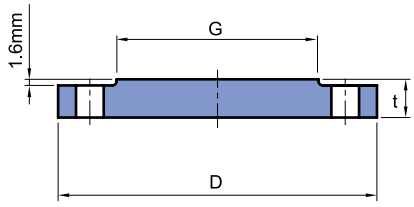
NOTE :
1. For the 'Bore' (B1) other Standard Wall Thickness, refer to page 46,47
2. Class 150 flanges except Lap Joint will be furnished with 0.06˝ (1.6mm) raised face, which is included in 'Thickness' (t) and 'Length through Hub' (T1), (T2).
3. For Slip-on, Threaded, Socket Welding and Lap Joint Flanges, the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.



THREADED



LAP JOINT



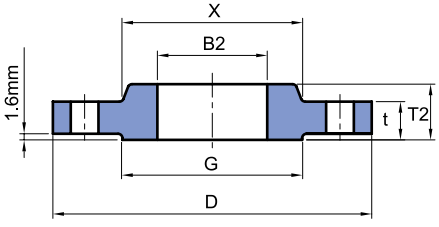
BLIND

Unit : mm

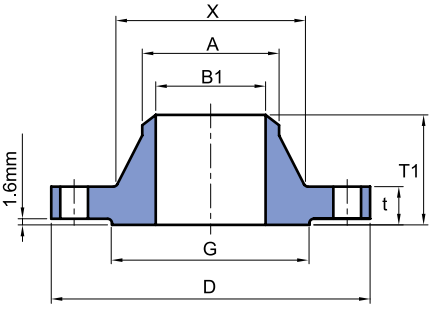
Nominal Pipe Size	DRILLING			BOLTING				APPROXIMATE WEIGHT									
	Bolt Circle Diam.	Number of Holes	Diam. of Holes	Diam. of Bolts (inch)	Machine Bolt Length	Stud Bolt Length		Welding Neck		Slip-on and Threaded		Lap Joint		Blind		Socket Welding	
					Raised Face	Raised Face	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb	Kg	lb
1/2	60.5	4	15.7	1/2	50.8	57.2	-	0.51	1.10	0.47	1.00	0.51	1.00	0.47	1.00	0.47	1.00
3/4	69.9	4	15.7	1/2	50.8	63.5	-	0.73	1.60	0.58	1.30	0.64	1.40	0.63	1.40	0.59	1.30
1	79.3	4	15.7	1/2	57.2	63.5	76.2	1.07	2.40	0.86	1.90	0.93	1.80	0.94	2.10	0.87	1.90
1 1/4	88.9	4	15.7	1/2	57.2	69.9	82.6	1.40	3.10	1.08	2.40	1.16	2.00	1.23	2.70	1.11	2.40
1 1/2	98.6	4	15.7	1/2	63.5	69.9	82.6	1.81	4.00	1.41	3.10	1.51	3.30	1.62	3.60	1.45	3.20
2	120.7	4	19.1	5/8	69.9	82.6	95.3	2.59	5.70	2.26	5.00	2.38	5.20	2.64	5.80	2.33	5.00
2 1/2	139.7	4	19.1	5/8	76.2	88.9	101.6	4.28	9.40	3.43	7.60	3.60	7.90	4.06	9.00	3.55	7.80
3	152.4	4	19.1	5/8	76.2	88.9	101.6	5.18	11.40	3.87	8.50	4.04	8.90	4.90	10.80	4.02	8.90
3 1/2	177.8	8	19.1	5/8	76.2	88.9	101.6	5.45	12.00	4.99	11.00	4.99	11.00	5.90	13.00	4.99	11.00
4	190.5	8	19.1	5/8	76.2	88.9	101.6	7.32	16.10	5.75	12.70	5.96	13.00	7.41	16.30	5.99	13.20
5	215.9	8	22.4	3/4	82.6	95.3	108.0	8.91	19.60	6.22	13.70	6.44	14.00	8.76	19.30	6.68	14.70
6	241.3	8	22.4	3/4	82.6	101.6	114.3	11.26	24.80	7.38	16.30	7.59	16.70	11.31	24.90	7.99	17.60
8	298.5	8	22.4	3/4	88.9	108.0	120.7	17.68	39.00	12.36	27.30	12.66	27.90	19.92	43.90	13.29	29.30
10	362.0	12	25.4	7/8	101.6	114.3	127.0	24.79	54.70	17.10	37.70	16.78	37.00	29.39	64.80	19.50	43.00
12	431.8	12	25.4	7/8	101.6	120.7	133.4	38.98	85.90	27.68	61.00	28.30	62.40	43.70	96.30	29.03	64.00
14	476.3	12	28.5	1	114.3	133.4	146.1	51.71	114.00	35.20	77.60	41.50	91.50	59.42	140.00	38.56	85.00
16	539.8	16	28.5	1	114.3	133.4	146.1	64.41	142.00	42.18	93.00	52.98	116.80	77.11	170.00	44.49	98.00
18	577.9	16	31.8	1 1/8	127.0	146.1	158.8	74.84	165.00	49.71	109.60	59.00	130.00	94.80	209.00	54.43	120.00
20	635.0	20	31.8	1 1/8	139.7	158.8	171.5	89.36	197.00	65.50	140.00	72.12	159.00	123.38	272.00	70.31	155.00
24	749.3	20	35.1	1 1/4	152.4	171.5	184.2	119.66	263.80	90.50	199.50	99.02	218.30	188.24	415.00	95.25	210.00

4. Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.
5. The gasket surface and backside (bearing surface for bolting) are made parallel within 1 degree. To accomplish parallelism, spot facing is carried out according to MSS SP-9, without reducing thickness (t).
6. Depth of Socket (Y) is covered by ANSI B 16.5 only in sizes through 3 inch, over 3 inch is at the manufacturer's option.

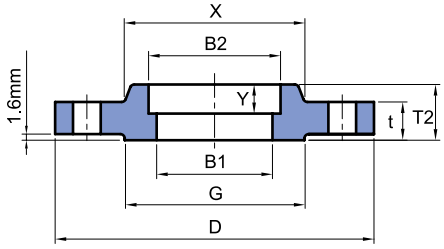
CLASS 300 FLANGES



SLIP-ON



WELDING NECK



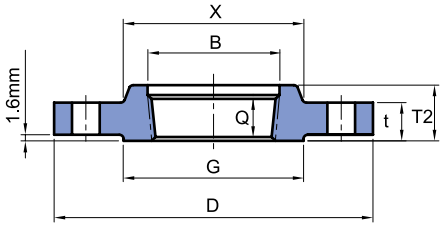
SOCKET WELDING

ANSI B 16.5 Forged Flanges

Unit : mm

Nominal Pipe Size	Outside Diam.	Diam. at Base of Hub	O.D of Raised Face	Thickness	BORE				LENGTH THRU HUB			Diam. of Hub at Bevel	Radius of Fillet	Thread Length	Depth of Socket
					Welding Neck Socket Welding	Slip-on Socket Welding	Lap Joint	Counter Bore Min.	Welding Neck	Slip-on Threaded Socket Welding	Lap Joint				
	D	X	G	t	B1	B2	B3	B	T1	T2	T3	A	R	Q	Y
1/2	95	38.1	35.1	14.2	15.7	22.4	22.9	23.6	52.3	22.4	22.4	21.3	3.0	15.7	9.7
3/4	117	47.8	42.9	15.7	20.8	27.7	28.2	29.0	57.2	25.4	25.4	26.7	3.0	15.7	11.2
1	124	53.8	50.8	17.5	26.7	34.5	35.1	35.8	62.0	26.9	26.9	33.5	3.0	17.5	12.7
1 1/4	133	63.5	63.5	19.1	35.1	43.2	43.7	44.5	65.0	26.9	26.9	42.2	4.8	20.6	14.2
1 1/2	155	69.9	73.2	20.6	40.9	49.5	50.0	50.5	68.3	30.2	30.2	48.3	6.4	22.4	15.7
2	165	84.1	91.9	22.4	52.6	62.0	62.5	63.5	69.9	33.3	33.3	60.5	7.9	28.4	17.5
2 1/2	191	100.1	104.6	25.4	62.7	74.7	75.4	76.2	76.2	38.1	38.1	73.2	7.9	31.8	19.1
3	210	117.3	127.0	28.4	78.0	90.7	91.4	92.2	79.2	42.9	42.9	88.9	9.7	31.8	20.6
3 1/2	229	133.4	139.7	30.2	90.2	103.4	104.1	104.9	81.0	44.5	44.5	101.6	9.7	36.6	22.4
4	254	146.1	157.2	31.8	102.4	116.1	116.8	117.6	85.9	47.8	47.8	114.3	11.2	36.6	23.9
5	279	177.8	185.7	35.1	128.3	143.8	144.5	144.5	98.6	50.8	50.8	141.2	11.2	42.9	23.9
6	318	206.2	215.9	36.6	154.2	170.7	171.5	171.5	98.6	52.3	52.3	168.4	12.7	46.0	26.9
8	381	260.4	269.7	41.1	202.7	221.5	222.3	222.3	111.3	62.0	62.0	219.2	12.7	50.8	31.8
10	445	320.5	323.9	47.8	254.5	276.4	277.4	276.4	117.3	66.5	95.3	273.1	12.7	55.6	33.3
12	521	374.7	381.0	50.8	304.8	327.2	328.2	328.7	130.0	73.2	101.6	323.9	12.7	60.5	39.6
14	584	425.5	412.8	53.8	336.6	359.2	360.2	360.4	142.7	76.2	111.3	355.6	12.7	63.5	41.4
16	648	482.6	469.9	57.2	387.4	410.5	411.2	411.2	146.1	82.6	120.7	406.4	12.7	68.3	44.5
18	711	533.4	533.4	60.5	438.2	461.8	462.3	462.0	158.8	88.9	130.0	457.2	12.7	69.9	49.3
20	775	587.2	584.2	63.5	489.0	513.1	514.4	512.8	162.1	95.3	139.7	508.0	12.7	73.2	54.1
24	914	701.5	692.2	69.9	590.6	616.0	616.0	614.4	168.1	106.4	152.4	609.6	12.7	82.6	63.5

NOTE :
1. For the 'Bore' (B1) other Standard Wall Thickness, refer to page 46,47
2. Class 300 flanges except Lap Joint will be furnished with 0.06″ (1.6mm) raised face, which is included in 'Thickness' (t) and 'Length through Hub' (T1), (T2).
3. For Slip-on, Threaded, Socket Welding and Lap Joint Flanges, the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.



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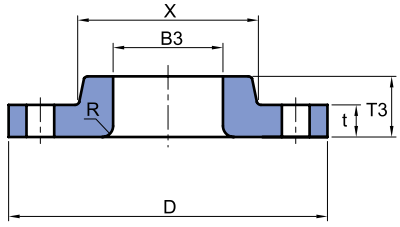
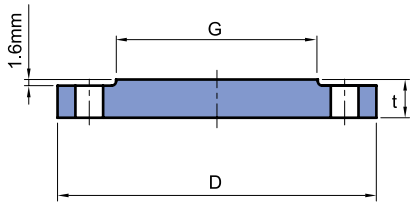


LAP JOINT



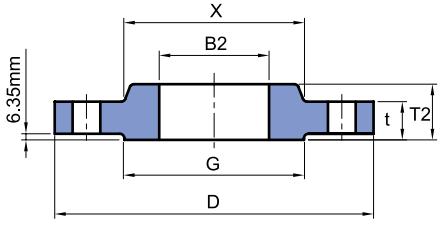
BLIND

Unit : mm

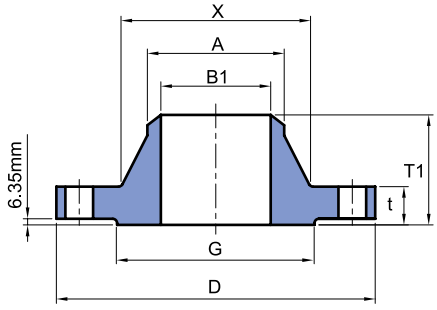
Nominal Pipe Size	DRILLING			BOLTING				APPROXIMATE WEIGHT									
	Bolt Circle Diam.	Number of Holes	Diam. of Holes	Diam. of Bolts (inch)	Machine Bolt Length	Stud Bolt Length		Welding Neck		Slip-on and Threaded		Lap Joint		Blind		Socket Welding	
					Raised Face	Raised Face	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb	Kg	lb
1/2	66.5	4	15.7	1/2	57.2	63.5	76.2	0.78	1.70	0.62	1.40	0.61	1.30	0.62	1.40	0.62	1.40
3/4	82.6	4	19.1	5/8	63.5	76.2	88.9	1.34	3.00	1.15	2.50	1.15	2.50	1.16	2.50	1.19	2.60
1	88.9	4	19.1	5/8	63.5	76.2	88.9	1.64	3.60	1.39	3.10	1.38	3.00	1.42	3.00	1.44	3.20
1 1/4	98.6	4	19.1	5/8	69.9	82.6	95.3	2.06	4.50	1.67	3.70	1.66	3.70	1.79	3.90	1.73	3.80
1 1/2	114.3	4	22.4	3/4	76.2	88.9	101.6	3.06	6.70	2.53	5.60	2.52	5.60	2.68	5.90	2.62	5.80
2	127.0	8	19.1	5/8	76.2	88.9	101.6	3.40	7.50	2.80	6.20	2.79	6.20	3.09	6.80	2.94	6.50
2 1/2	149.4	8	22.4	3/4	82.6	101.6	114.3	5.31	11.70	4.25	9.40	4.22	9.30	4.75	10.50	4.49	9.90
3	168.1	8	22.4	3/4	88.9	108.0	120.7	7.32	16.10	5.81	12.80	5.78	12.70	6.79	14.90	6.20	13.70
3 1/2	184.2	8	22.4	3/4	95.3	108.0	127.0	8.17	18.00	7.72	17.00	7.72	17.00	9.53	21.00	-	-
4	200.2	8	22.4	3/4	95.3	114.3	127.0	11.30	24.90	10.13	22.30	10.07	22.20	12.00	26.50	-	-
5	235.0	8	22.4	3/4	108.0	120.7	133.4	15.12	33.30	12.58	27.70	12.52	27.60	15.96	35.20	-	-
6	269.7	12	22.4	3/4	108.0	120.7	139.7	19.68	43.40	16.04	35.40	15.95	35.20	21.20	46.70	-	-
8	330.2	12	25.4	7/8	120.7	139.7	152.4	30.48	67.20	24.50	54.00	24.37	53.70	34.60	76.30	-	-
10	387.4	16	28.4	1	139.7	158.8	171.5	43.74	96.40	34.16	75.30	39.92	88.00	55.34	122.00	-	-
12	450.9	16	31.8	1 1/8	146.1	171.5	184.2	64.41	142.00	51.26	113.00	58.70	129.40	78.90	174.00	-	-
14	514..4	20	31.8	1 1/8	158.8	177.8	190.5	88.30	194.70	72.12	159.00	83.46	184.00	107.05	236.00	-	-
16	571.5	20	35.1	1 1/4	165.1	190.5	203.2	112.94	249.00	90.40	199.30	106.14	234.00	139.25	307.00	-	-
18	628.7	24	35.1	1 1/4	171.5	196.9	209.6	138.34	305.00	109.00	240.30	133.95	295.30	176.90	396.00	-	-
20	685.8	24	35.1	1 1/4	184.2	203.2	222.3	167.37	369.00	136.00	300.00	157.65	347.60	223.17	492.00	-	-
24	812.8	24	41.1	1 1/2	203.2	228.6	254.0	235.41	519.00	204.00	449.70	240.40	530.00	342.00	754.00	-	-

4. Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.
5. The gasket surface and backside (bearing surface for bolting) are made parallel within 1 degree. To accomplish parallelism, spot facing is carried out according to MSS SP-9, without reducing thickness (t).
6. Depth of Socket (Y) is covered by ANSI B 16.5 only in sizes through 3 inch, over 3 inch is at the manufacturer's option.

CLASS 400 FLANGES



SLIP-ON



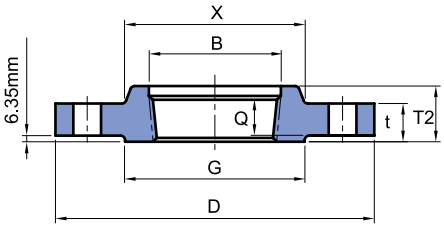
WELDING NECK

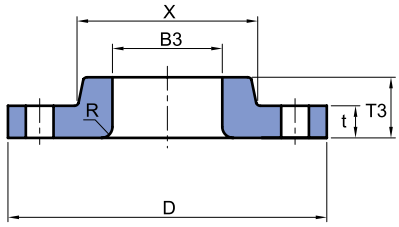
ANSI B 16.5 Forged Flanges

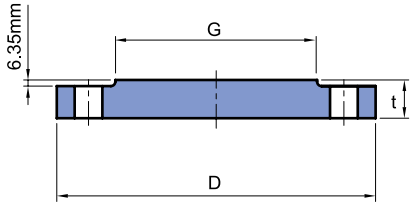
Unit : mm

Nominal Pipe Size	Outside Diam.	Diam. at Base of Hub	O.D of Raised Face	Thickness	BORE				LENGTH THRU HUB			Diam. of Hub at Bevel	Radius of Fillet	Thread Length
					Welding Neck	Slip-on	Lap Joint	Counter Bore Min.	Welding Neck	Slip-on Threaded	Lap Joint			
	D	X	G	t	B1	B2	B3	B	T1	T2	T3	A	R	Q
1/2	95	38.1	35.1	14.2	See Note (1) To be specified by purchaser.	22.4	22.9	23.6	52.3	22.4	22.4	21.3	3.0	15.7
3/4	117	47.8	42.9	15.7		27.7	28.2	29.0	57.2	25.4	25.4	26.7	3.0	15.7
1	124	53.8	50.8	17.5		34.5	35.1	35.8	62.0	26.9	26.9	33.5	3.0	17.5
1 1/4	133	63.5	63.5	20.6		43.2	43.7	44.5	66.5	28.4	28.4	42.2	4.8	20.6
1 1/2	155	69.9	73.2	22.4		49.5	50.0	50.5	69.9	31.8	31.8	48.3	6.4	22.4
2	165	84.1	91.9	25.4		62.0	62.5	63.5	73.2	36.6	36.6	60.5	7.9	28.4
2 1/2	191	100.1	104.6	28.4		74.7	75.4	76.2	79.2	41.1	41.1	73.2	7.9	31.8
3	210	117.3	127.0	31.8		90.7	91.4	92.2	82.6	46.0	46.0	88.9	9.7	35.1
3 1/2	229	133.4	139.7	35.1		103.4	104.1	104.9	85.9	49.3	49.3	101.6	9.7	39.6
4	254	146.1	157.2	35.1		116.1	116.8	117.6	88.9	50.8	50.8	114.3	11.2	36.6
5	279	177.8	185.7	38.1		143.8	144.5	144.5	101.6	53.8	53.8	141.2	11.2	42.9
6	318	206.2	215.9	41.1		170.7	171.5	171.5	103.1	57.2	57.2	168.4	12.7	46.0
8	381	260.4	269.7	47.8		221.5	222.3	222.3	117.3	68.3	68.3	219.2	12.7	50.8
10	445	320.5	323.9	53.8		276.4	277.4	276.4	124.0	73.2	101.6	273.1	12.7	55.6
12	521	374.7	381.0	57.2		327.2	328.2	328.7	136.7	79.2	108.0	323.9	12.7	60.5
14	584	425.5	412.8	60.5		359.2	360.2	360.4	149.4	84.1	117.3	355.6	12.7	63.5
16	648	482.6	469.9	63.5		410.5	411.2	411.2	152.4	93.7	127.0	406.4	12.7	68.3
18	711	533.4	533.4	66.5		461.8	462.3	462.0	165.1	98.6	136.7	457.2	12.7	69.9
20	775	587.2	584.2	69.9		513.1	514.4	512.8	168.1	101.6	146.1	508.0	12.7	73.2
24	914	701.5	692.2	76.2		616.0	616.0	614.4	174.8	114.3	158.8	609.6	12.7	82.6

NOTE :
1. For the 'Bore' (B1) other Standard Wall Thickness, refer to page 46,47
2. Class 400 flanges except Lap Joint will be furnished with 0.25″ (6.35mm) raised face, which is included in 'Thickness' (t) and 'Length through Hub' (T1), (T2).
3. For Slip-on, Threaded, Socket Welding and Lap Joint Flanges, the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.







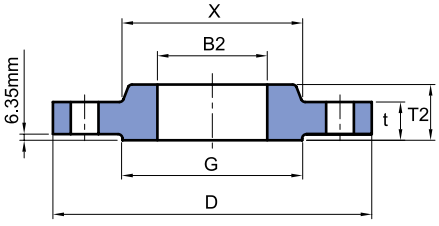
THREADED LAP JOINT BLIND

Unit : mm

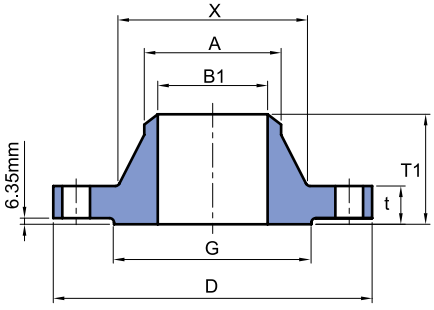
Nominal Pipe Size	DRILLING			BOLTING				APPROXIMATE WEIGHT							
	Bolt Circle Diam.	Number of Holes	Diam. of Holes	Diam. of Bolts (inch)	Stud Bolt Length			Welding Neck		Slip-on and Threaded		Lap Joint		Blind	
					0.25″ Raised Face	Male-Female Tongue-Groove	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb
1/2	66.5	4	15.7	1/2	76.2	69.9	76.2	1.36	3.00	0.91	2.00	0.80	1.80	0.91	2.00
3/4	82.6	4	19.1	5/8	88.9	82.6	88.9	1.59	3.50	1.36	3.00	1.36	3.00	1.40	3.00
1	88.9	4	19.1	5/8	88.9	82.6	88.9	1.81	4.00	1.59	3.50	1.59	3.50	1.70	3.80
1 1/4	98.6	4	19.1	5/8	95.3	88.9	95.3	2.50	5.50	2.10	4.60	2.04	4.50	2.27	5.00
1 1/2	114.3	4	22.4	3/4	108.0	101.6	108.0	3.63	8.00	3.10	6.80	2.95	6.50	3.40	7.50
2	127.0	8	19.1	5/8	108.0	101.6	108.0	4.54	10.00	3.63	8.00	3.63	8.00	4.40	9.70
2 1/2	149.4	8	22.4	3/4	120.7	114.3	120.7	6.35	14.00	5.44	12.00	4.99	11.00	6.80	15.00
3	168.1	8	22.4	3/4	127.0	120.7	127.0	8.17	18.00	7.26	16.00	6.35	14.00	8.90	19.60
3 1/2	184.2	8	25.4	7/8	139.7	133.4	139.7	11.80	26.00	9.53	21.00	9.08	20.00	13.17	29.00
4	200.2	8	25.4	7/8	139.7	133.4	139.7	13.61	30.00	10.89	24.00	9.98	22.00	14.40	31.70
5	235.0	8	25.4	7/8	146.1	139.7	146.1	17.69	39.00	14.07	31.00	13.15	29.00	19.50	43.00
6	269.7	12	25.4	7/8	152.4	146.1	152.4	22.23	49.00	19.98	44.00	16.78	37.00	27.67	61.00
8	330.2	12	28.4	1	171.5	165.1	171.5	35.38	78.00	30.40	67.00	26.16	59.00	45.36	100.00
10	387.4	16	31.8	1 1/8	190.5	184.2	190.5	49.89	110.00	41.28	91.00	43.09	95.00	68.00	150.00
12	450.9	16	35.1	1 1/4	203.2	196.9	203.2	72.57	160.00	59.02	130.00	68.95	152.00	98.00	216.00
14	514..4	20	35.1	1 1/4	209.6	203.2	209.6	105.69	233.00	81.72	180.00	95.25	210.00	131.66	290.00
16	571.5	20	38.1	1 3/8	222.3	215.9	222.3	133.30	294.00	106.69	235.00	127.00	280.00	167.00	368.00
18	628.7	24	38.1	1 3/8	228.6	222.3	228.6	158.90	350.30	129.39	285.30	156.49	345.00	206.57	455.40
20	685.8	24	41.1	1 1/2	241.3	235.0	247.7	193.00	425.50	152.00	335.00	190.51	420.00	261.00	575.40
24	812.8	24	47.8	1 3/4	266.7	260.4	279.4	281.48	620.50	231.54	510.50	278.96	615.00	395.00	870.80

4. Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.
5. The gasket surface and backside (bearing surface for bolting) are made parallel within 1 degree. To accomplish parallelism, spot facing is carried out according to MSS SP-9, without reducing thickness (t).
6. Dimensions of size 1/2″ through 3 1/2″ are the same as for Class 600 Flanges.

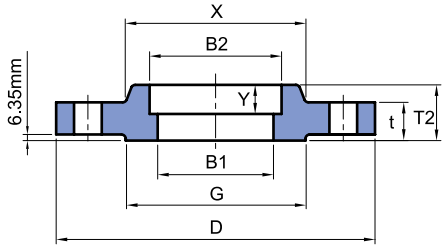
CLASS 600 FLANGES



SLIP-ON



WELDING NECK



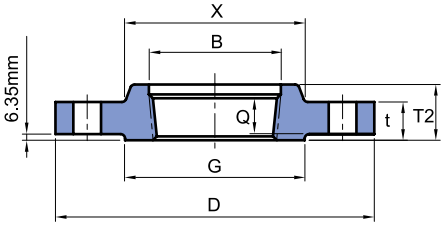
SOCKET WELDING

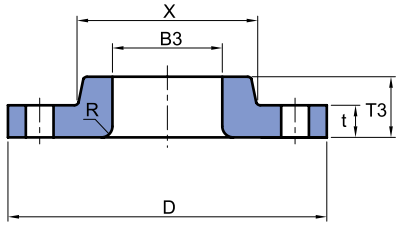
ANSI B 16.5 Forged Flanges

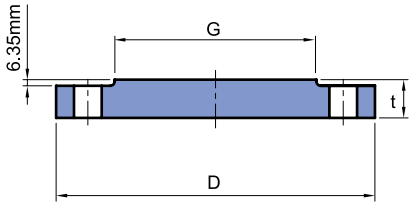
Unit : mm

Nominal Pipe Size	Outside Diam.	Diam. at Base of Hub	O.D of Raised Face	Thickness	BORE				LENGTH THRU HUB			Diam. of Hub at Bevel	Radius of Fillet	Thread Length	Depth of Socket
					Welding Neck Socket Welding	Slip-on Socket Welding	Lap Joint	Counter Bore Min.	Welding Neck	Slip-on Threaded Socket Welding	Lap Joint				
	D	X	G	t	B1	B2	B3	B	T1	T2	T3	A	R	Q	Y
1/2	95	38.1	35.1	14.2	See Note (1) To be specified by purchaser.	22.4	22.9	23.6	52.3	22.4	22.4	21.3	3.0	15.7	9.7
3/4	117	47.8	42.9	15.7		27.7	28.2	29.0	57.2	25.4	25.4	26.7	3.0	15.7	11.2
1	124	53.8	50.8	17.5		34.5	35.1	35.8	62.0	26.9	26.9	33.5	3.0	17.5	12.7
1 1/4	133	63.5	63.5	20.6		43.2	43.7	44.5	66.5	28.4	28.4	42.2	4.8	20.6	14.2
1 1/2	155	69.9	73.2	22.4		49.5	50.0	50.5	69.9	31.8	31.8	48.3	6.4	22.4	15.7
2	165	84.1	91.9	25.4		62.0	62.5	63.5	73.2	36.6	36.6	60.5	7.9	28.4	17.5
2 1/2	191	100.1	104.6	28.4		74.7	75.4	76.2	79.2	41.1	41.1	73.2	7.9	31.8	19.1
3	210	117.3	127.0	31.8		90.7	91.4	92.2	82.6	46.0	46.0	88.9	9.7	35.1	20.6
3 1/2	229	133.4	139.7	35.1		103.4	104.1	104.9	85.9	49.3	49.3	101.6	9.7	39.6	22.4
4	273	152.4	157.2	38.1		116.1	116.8	117.6	101.6	53.8	53.8	114.3	11.2	41.1	23.9
5	330	189.0	185.7	44.5		143.8	144.5	144.5	114.3	60.5	60.5	141.2	11.2	47.8	23.9
6	356	222.3	215.9	47.8		170.7	171.5	171.5	117.3	66.5	66.5	168.4	12.7	50.8	26.9
8	419	273.1	269.7	55.6		221.5	222.3	222.3	133.4	76.2	76.2	219.2	12.7	57.2	31.8
10	508	342.9	323.9	63.5		276.4	277.4	276.4	152.4	85.9	111.3	273.1	12.7	65.0	33.3
12	559	400.1	381.0	66.5		327.2	328.2	328.7	155.4	91.9	117.3	323.9	12.7	69.9	39.6
14	603	431.8	412.8	69.9		359.2	360.2	360.4	165.1	93.7	127.0	355.6	12.7	73.2	41.4
16	686	495.3	469.9	76.2		410.5	411.2	411.2	177.8	106.4	139.7	406.4	12.7	77.7	44.5
18	743	546.1	533.4	82.6		461.8	462.3	462.0	184.2	117.3	152.4	457.2	12.7	79.2	49.3
20	813	609.6	584.2	88.9		513.1	514.4	512.8	190.5	127.0	165.1	508.0	12.7	82.6	54.1
24	940	717.6	692.2	101.6		616.0	616.0	614.4	203.2	139.7	184.2	609.6	12.7	91.9	63.5

NOTE :
1. For the 'Bore' (B1) other Standard Wall Thickness, refer to page 46,47
2. Class 600 flanges except Lap Joint will be furnished with 0.25″ (6.35mm) raised face, which is included in 'Thickness' (t) and 'Length through Hub' (T1), (T2).
3. For Slip-on, Threaded, Socket Welding and Lap Joint Flanges, the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.







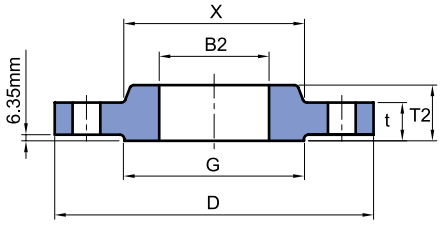
THREADED LAP JOINT BLIND

Unit : mm

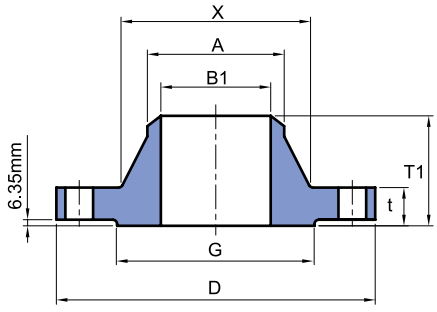
Nominal Pipe Size	DRILLING			BOLTING				APPROXIMATE WEIGHT									
					STUD BOLT LENGTH			Welding Neck		Slip-on and Threaded		Lap Joint		Blind		Socket Welding	
	Bolt Circle Diam.	Number of Holes	Diam. of Holes	Diam. of Bolts (inch)	0.25˝ Raised Face	Male - Female Tongue - Groove	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb	Kg	lb
1/2	66.5	4	15.7	1/2	76.2	69.9	76.2	0.90	2.00	0.91	2.00	0.80	1.80	0.91	2.00	0.91	2.00
3/4	82.6	4	19.1	5/8	88.9	82.6	88.9	1.59	3.50	1.40	3.00	1.36	3.00	1.40	3.00	1.36	3.00
1	88.9	4	19.1	5/8	88.9	82.6	88.9	1.90	4.00	1.70	3.70	1.59	3.50	1.81	4.00	1.81	4.00
1 1/4	98.6	4	19.1	5/8	95.3	88.9	95.3	2.49	5.50	2.27	5.00	2.04	4.50	2.40	5.30	2.60	5.70
1 1/2	114.3	4	22.4	3/4	108.0	101..6	108.0	3.63	8.00	3.10	6.80	2.95	6.50	3.40	7.50	3.18	7.00
2	127.0	8	19.1	5/8	108.0	101.6	108.0	4.54	10.00	3.63	8.00	3.63	8.00	4.40	9.70	3.90	8.60
2 1/2	149.4	8	22.4	3/4	120.7	114.3	120.7	6.35	14.00	5.44	12.00	4.99	11.00	6.80	15.00	5.90	13.00
3	168.1	8	22.4	3/4	127.0	120.7	127.0	8.16	18.00	7.26	16.00	6.35	14.00	8.90	19.60	7.40	16.30
3 1/2	184.2	8	25.4	7/8	139.7	133.4	139.7	11.80	26.00	9.53	21.00	9.08	20.00	13.17	29.00	-	-
4	215.9	8	25.4	7/8	146.1	139.7	146.1	16.78	37.00	14.97	33.00	14.06	31.00	18.60	41.00	-	-
5	266.7	8	28.4	1	165.1	158.8	165.1	30.87	68.00	28.50	62.80	27.50	60.60	30.84	68.00	-	-
6	292.1	12	28.4	1	171.5	165.1	171.5	36.77	80.00	36.32	80.00	35.38	78.00	38.00	83.80	-	-
8	349.3	12	31.8	1 1/8	190.5	184.2	196.9	50.80	112.00	44.00	97.00	50.80	112.00	62.20	137.00	-	-
10	431.8	16	35.1	1 1/4	215.9	209.6	215.9	86.26	190.00	76.20	168.00	74.00	163.00	102.00	224.90	-	-
12	489.0	20	35.1	1 1/4	222.3	215.9	222.3	102.51	226.00	97.52	215.00	108.86	240.00	132.00	291.00	-	-
14	527.1	20	38.1	1 3/8	235.0	228.6	235.0	121.56	268.00	102.00	224.80	111.00	244.70	158.00	348.30	-	-
16	603.3	20	41.1	1 1/2	254.0	247.7	254.0	177.06	290.00	149.82	330.20	165.71	365.30	224.73	495.40	-	-
18	654.1	20	44.5	1 5/8	273.1	266.7	273.1	215.65	475.40	180.10	412.30	194.00	427.70	285.00	628.30	-	-
20	723.9	24	44.5	1 5/8	285.8	279.4	292.1	267.86	590.50	231.54	510.50	258.78	570.50	365.00	804.70	-	-
24	838.2	24	50.8	1 7/8	330.2	323.9	336.6	372.00	820.00	330.00	725.50	362.00	798.00	533.45	1176.00	-	-

4. Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.
5. The gasket surface and backside (bearing surface for bolting) are made parallel within 1 degree. To accomplish parallelism, spot facing is carried out according to MSS SP-9, without reducing thickness (t).
6 Dimensions of sizes 1/2˝ through 3 1/2˝ are the same as for Class 400 Flanges.
7. Depth of Socket (Y) is covered by ANSI B 16.5 only in sizes through 3 inch, over 3 inch is at the manufacturer's option.

CLASS 900 FLANGES



SLIP-ON



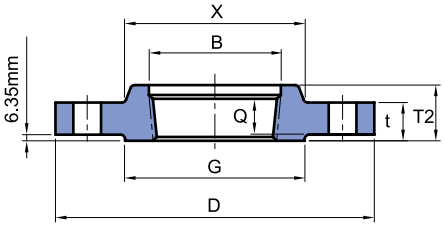
WELDING NECK

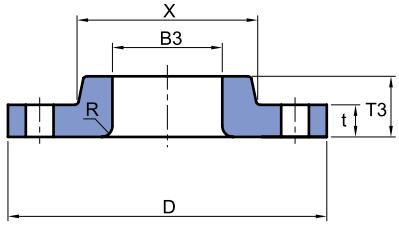
ANSI B 16.5 Forged Flanges

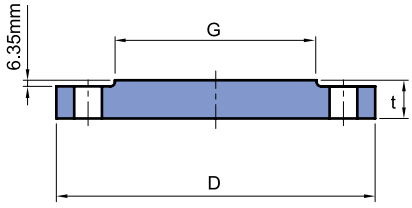
Unit : mm

Nominal Pipe Size	Outside Diam.	Diam. at Base of Hub	O.D of Raised Face	Thickness	BORE				LENGTH THRU HUB			Diam. of Hub at Bevel	Radius of Fillet	Thread Length
					Welding Neck	Slip-on	Lap Joint	Counter Bore Min.	Welding Neck	Slip-on Threaded	Lap Joint			
	D	X	G	t	B1	B2	B3	B	T1	T2	T3	A	R	Q
1/2	121	38.1	35.1	22.4	See Note (1) To be specified by purchaser.	22.4	22.9	23.6	60.5	31.8	31.8	21.3	3.0	22.4
3/4	130	44.5	42.9	25.4		27.7	28.2	29.0	69.9	35.1	35.1	26.7	3.0	25.4
1	149	52.3	50.8	28.4		34.5	35.1	35.8	73.2	41.1	41.1	33.5	3.0	28.4
1 1/4	159	63.5	63.5	28.4		43.2	43.7	44.5	73.2	41.1	41.1	42.2	4.8	30.2
1 1/2	178	69.9	73.2	31.8		49.5	50.0	50.5	82.6	44.5	44.5	48.3	6.4	31.8
2	216	104.6	91.9	38.1		62.0	62.5	63.5	101.6	57.2	57.2	60.5	7.9	38.1
2 1/2	244	124.0	104.6	41.1		74.7	75.4	76.2	104.6	63.5	63.5	73.2	7.9	47.8
3	241	127.0	127.0	38.1		90.7	91.4	92.2	101.6	53.8	53.8	88.9	9.7	41.1
4	292	158.8	157.2	44.5		116.1	116.8	117.6	114.3	69.9	69.9	114.3	11.2	47.8
5	349	190.5	185.7	50.8		143.8	144.5	144.5	127.0	79.2	79.2	141.2	11.2	53.8
6	381	235.0	215.9	55.6		170.7	171.5	171.5	139.7	85.9	85.9	168.4	12.7	57.2
8	470	298.5	269.7	63.5		221.5	222.3	222.3	162.1	101.6	114.3	219.2	12.7	63.5
10	546	368.3	323.9	69.9		276.4	277.4	276.4	184.2	108.0	127.0	273.1	12.7	71.4
12	610	419.1	381.0	79.2		327.2	328.2	328.7	200.2	117.3	142.7	323.9	12.7	76.2
14	641	450.9	412.8	85.9		359.2	360.2	360.4	212.9	130.0	155.4	355.6	12.7	82.6
16	705	508.0	469.9	88.9		410.5	411.2	411.2	215.9	133.4	165.1	406.4	12.7	85.9
18	787	565.2	533.4	101.6		461.8	462.3	462.0	228.6	152.4	190.5	457.2	12.7	88.9
20	857	622.3	584.2	108.0		513.1	514.4	512.8	247.7	158.8	209.6	508.0	12.7	91.9
24	1041	749.3	692.2	139.7		616.0	616.0	614.4	292.1	203.2	266.7	609.6	12.7	101.6

NOTE :
1. For the 'Bore' (B1) other Standard Wall Thickness, refer to page 46,47
2. Class 900 flanges except Lap Joint will be furnished with 0.25″ (6.35mm) raised face, which is included in 'Thickness' (t) and 'Length through Hub' (T1), (T2).
3. For Slip-on, Threaded, Socket Welding and Lap Joint Flanges, the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.







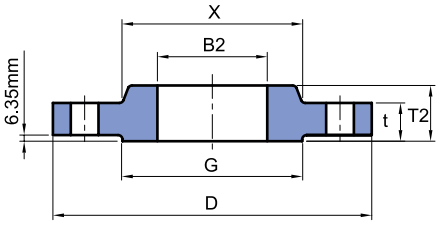
THREADED LAP JOINT BLIND

Unit : mm

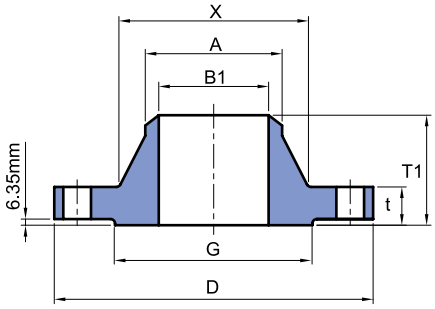
Nominal Pipe Size	DRILLING			BOLTING				APPROXIMATE WEIGHT							
				Diam. of Bolts (inch)	STUD BOLT LENGTH			Welding Neck		Slip-on and Threaded		Lap Joint		Blind	
	Bolt Circle Diam.	Number of Holes	Diam. of Holes		0.25˝ Raised Face	Male - Female Tongue - Groove	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb
1/2	82.6	4	22.4	3/4	108.0	101.6	108.0	2.10	4.60	1.81	4.00	1.81	4.00	1.90	4.20
3/4	88.9	4	22.4	3/4	114.3	108.0	114.3	2.72	6.00	2.40	5.30	2.30	5.00	2.70	6.00
1	101.6	4	25.4	7/8	127.0	120.7	127.0	3.86	8.50	3.41	7.50	3.40	7.50	4.09	9.00
1 1/4	111.3	4	25.4	7/8	127.0	120.7	127.0	4.54	10.00	4.10	9.00	4.09	9.00	4.54	10.00
1 1/2	124.0	4	28.4	1	139.7	133.4	139.7	5.90	13.00	5.45	12.00	5.40	11.90	5.90	13.00
2	165.1	8	25.4	7/8	146.1	139.7	146.1	10.89	24.00	9.98	22.00	9.53	21.00	11.34	25.00
2 1/2	190.5	8	28.4	1	158.8	152.4	158.8	16.33	36.00	15.80	34.80	13.15	29.00	16.00	35.30
3	190.5	8	25.4	7/8	146.1	139.7	146.1	15.00	33.00	11.80	26.00	11.34	25.00	13.17	29.00
4	235.0	8	31.8	1 1/8	171.5	165.1	171.5	23.13	51.00	23.20	51.00	22.60	48.50	24.50	54.00
5	279.4	8	35.1	1 1/4	190.5	184.2	190.5	38.50	84.90	37.65	83.00	36.74	81.00	39.46	87.00
6	317.5	12	31.8	1 1/8	190.5	184.2	196.9	49.89	110.00	48.30	106.50	47.50	104.70	51.50	113.50
8	393.7	12	38.1	1 3/8	222.3	215.9	222.3	79.45	175.00	75.00	166.30	86.00	189.60	89.00	106.20
10	469.9	16	38.1	1 3/8	235.0	228.6	235.0	118.04	260.00	111.13	245.00	125.64	277.00	131.54	290.00
12	533.4	20	38.1	1 3/8	254.0	247.7	254.0	157.00	346.00	146.00	321.80	167.00	368.00	187.00	412.30
14	558.8	20	41.1	1 1/2	273.1	266.7	279.4	181.60	400.40	172.36	380.00	180.07	397.00	224.07	494.00
16	616.0	20	44.5	1 5/8	285.8	279.4	292.1	224.73	495.50	192.95	425.40	211.11	465.40	272.40	600.50
18	685.8	20	50.8	1 7/8	323.9	317.5	336.6	308.72	680.60	272.40	600.50	295.10	650.60	385.90	850.80
20	749.3	20	53.8	2	349.3	342.9	362.0	376.82	830.70	331.42	730.60	367.74	810.70	488.00	1076.00
24	901.7	20	66.5	2 1/2	438.2	431.8	457.2	685.00	1510.00	632.00	1393.30	700.00	1543.00	905.00	1995.00

4. Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.
5. The gasket surface and backside (bearing surface for bolting) are made parallel within 1 degree. To accomplish parallelism, spot facing is carried out according to MSS SP-9, without reducing thickness (t).
6. Dimensions of size 1/2˝ through 2 1/2˝ are the same as for Class 1500 Flanges.

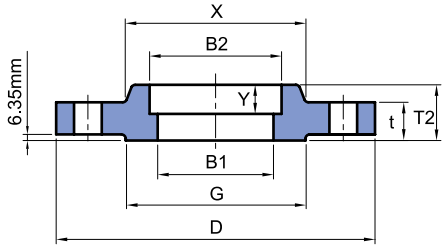
CLASS 1500 FLANGES



SLIP-ON



WELDING NECK



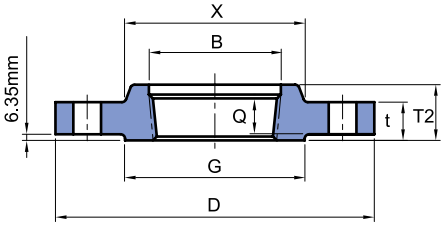
SOCKET WELDING

ANSI B 16.5 Forged Flanges

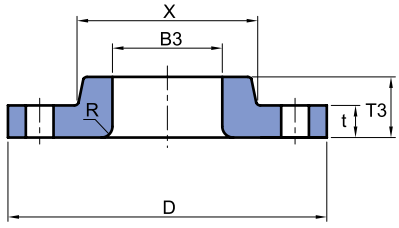
Unit : mm

Nominal Pipe Size	Outside Diam.	Diam. at Base of Hub	O.D of Raised Face	Thickness	BORE				LENGTH THRU HUB			Diam. of Hub at Bevel	Radius of Fillet	Thread Length	Depth of Socket
					Welding Neck Socket Welding	Slip-on Socket Welding	Lap Joint	Counter Bore Min.	Welding Neck	Slip-on Threaded Socket Welding	Lap Joint				
	D	X	G	t	B1	B2	B3	B	T1	T2	T3	A	R	Q	Y
1/2	121	38.1	35.1	22.4	See Note (1) To be specified by purchaser.	22.4	22.9	23.6	60.5	31.8	31.8	21.3	3.0	22.4	9.7
3/4	130	44.5	42.9	25.4		27.7	28.2	29.0	69.9	35.1	35.1	26.7	3.0	25.4	11.2
1	149	52.3	50.8	28.4		34.5	35.1	35.8	73.2	41.1	41.1	33.5	3.0	28.4	12.7
1 1/4	159	63.5	63.5	28.4		43.2	43.7	44.5	73.2	41.1	41.1	42.2	4.8	30.2	14.2
1 1/2	178	69.9	73.2	31.8		49.5	50.0	50.5	82.6	44.5	44.5	48.3	6.4	31.8	15.7
2	216	104.6	91.9	38.1		62.0	62.5	63.5	101.6	57.2	57.2	60.5	7.9	38.1	17.5
2 1/2	244	124.0	104.6	41.1		74.7	75.4	76.2	104.6	63.5	63.5	73.2	7.9	47.8	19.1
3	267	133.4	127.0	47.8		90.7	91.4	92.2	117.3	73.2	73.2	88.9	9.7	50.8	20.6
4	311	162.1	157.2	53.8		116.1	116.8	117.6	124.0	90.4	90.4	114.3	11.2	57.2	23.9
5	375	196.9	185.7	73.2		143.8	144.5	144.5	155.4	104.6	104.6	141.2	11.2	63.5	23.9
6	394	228.6	215.9	82.6		170.7	171.5	171.5	171.5	119.1	119.1	168.4	12.7	69.9	26.9
8	483	292.1	269.7	91.9		221.5	222.3	222.3	212.9	142.7	142.7	219.2	12.7	76.2	31.8
10	584	368.3	323.9	108.0		276.4	277.4	276.4	254.0	158.8	177.8	273.1	12.7	84.1	33.3
12	673	450.9	381.0	124.0		327.1	328.2	328.7	282.4	180.8	218.9	323.9	12.7	91.9	39.6
14	749	495.3	412.8	133.4		359.2	360.2	360.4	298.5	-	241.3	355.6	12.7	-	41.4
16	826	552.5	469.9	146.1		410.5	411.2	411.2	311.2	-	260.4	406.4	12.7	-	44.5
18	914	596.9	533.4	162.1		461.8	462.3	462.0	327.2	-	276.4	457.2	12.7	-	49.3
20	984	641.4	584.2	177.8		513.1	514.4	512.8	355.6	-	292.1	508.0	12.7	-	54.1
24	1168	762.0	692.2	203.2		616.0	616.0	614.4	406.4	-	330.2	609.6	12.7	-	63.5

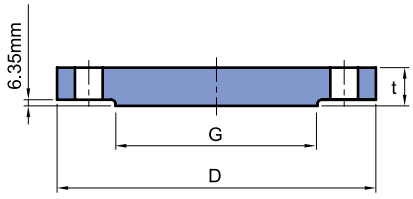
NOTE :
1. For the 'Bore' (B1) other Standard Wall Thickness, refer to page 46,47
2. Class 1500 flanges except Lap Joint will be furnished with 0.25″ (6.35mm) raised face, which is included in 'Thickness' (t) and 'Length through Hub' (T1), (T2).
3. For Slip-on, Threaded, Socket Welding and Lap Joint Flanges, the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.



THREADED



LAP JOINT



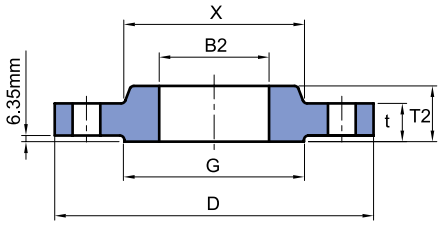
BLIND

Unit : mm

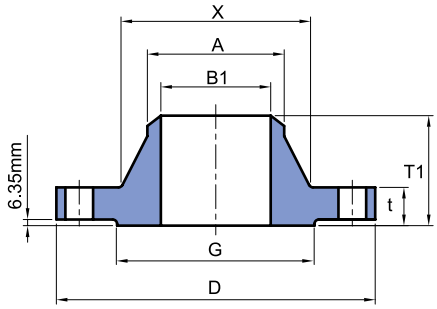
Nominal Pipe Size	DRILLING			BOLTING				APPROXIMATE WEIGHT									
					STUD BOLT LENGTH			Welding Neck		Slip-on and Threaded		Lap Joint		Blind		Socket Welding	
	Bolt Circle Diam.	Number of Holes	Diam. of Holes	Diam. of Bolts (inch)	0.25˝ Raised Face	Male - Female Tongue - Groove	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb	Kg	lb
1/2	82.6	4	22.4	3/4	108.0	101.6	108.0	2.10	4.60	1.80	4.00	1.80	4.00	1.90	4.00	1.81	4.00
3/4	88.9	4	22.4	3/4	114.3	108.0	114.3	2.72	6.00	2.27	5.00	2.27	5.00	2.72	6.00	2.81	6.20
1	101.6	4	25.4	7/8	127.0	120.7	127.0	3.86	8.50	3.40	7.50	3.40	7.50	4.08	9.00	3.61	8.00
1 1/4	111.3	4	25.4	7/8	127.0	120.7	127.0	4.54	10.00	4.10	9.00	4.09	10.80	4.30	9.50	4.99	11.00
1 1/2	124.0	4	28.4	1	139.7	133.4	139.7	5.90	13.00	5.45	12.00	5.40	11.90	5.90	13.00	6.76	14.90
2	165.1	8	25.4	7/8	146.1	139.7	146.1	10.89	24.00	10.50	23.00	9.53	21.00	11.30	25.00	10.89	24.00
2 1/2	190.5	8	28.4	1	158.8	152.4	158.8	16.34	36.00	15.80	34.80	13.15	29.00	16.00	35.30	16.34	36.00
3	203.2	8	31.8	1 1/8	177.8	171.5	177.8	21.79	48.00	21.77	48.00	17.24	38.00	21.79	48.00	-	-
4	241.3	8	35.1	1 1/4	196.9	190.5	196.9	31.30	69.00	31.00	68.40	29.00	63.90	33.11	73.00	-	-
5	292.1	8	41.1	1 1/2	247.7	241.3	247.7	59.02	130.00	58.80	129.60	54.00	119.00	60.00	132.30	-	-
6	317.5	12	38.1	1 3/8	260.4	254.0	266.7	74.91	165.00	74.00	163.00	62.00	136.70	75.00	165.30	-	-
8	393.7	12	44.5	1 5/8	292.1	285.8	323.9	123.83	273.00	117.73	258.00	129.73	236.00	136.98	302.00	-	-
10	482.6	12	50.8	1 7/8	336.6	330.2	342.9	205.93	454.00	197.49	435.40	220.19	485.40	229.97	507.00	-	-
12	571.5	16	53.8	2	374.7	368.3	387.4	306.00	674.60	264.00	582.00	286.02	630.60	316.00	696.70	-	-
14	635.0	16	60.5	2 1/4	406.4	400.1	425.5	416.00	917.00	-	-	404.06	890.80	421.00	928.00	-	-
16	704.9	16	66.5	2 1/2	444.5	438.2	469.9	567.50	1250.00	-	-	522.10	1151.00	559.00	1232.70	-	-
18	774.7	16	73.2	2 3/4	495.3	489.0	527.1	736.00	1622.60	-	-	669.65	1476.30	761.00	1677.70	-	-
20	831.9	16	79.2	3	539.8	533.4	565.2	929.00	2048.00	-	-	805.85	1776.60	967.00	2131.80	-	-
24	990.6	16	91.9	3 1/2	616.0	609.6	647.7	1504.00	3315.70	-	-	1285.55	2834.00	1568.00	3456.80	-	-

4. Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.
5. The gasket surface and backside (bearing surface for bolting) are made parallel within 1 degree. To accomplish parallelism, spot facing is carried out according to MSS SP-9, without reducing thickness (t).
6 Dimensions of sizes 1/2˝ through 2 1/2˝ are the same as for Class 900 Flanges.
7. Depth of Socket (Y) is covered by ANSI B 16.5 only in sizes through 2 1/2 inch, over 2 1/2 inch is at the manufacturer's option.

CLASS 2500 FLANGES



SLIP-ON



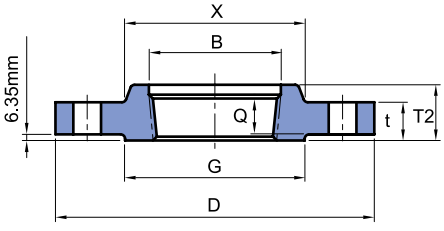
WELDING NECK

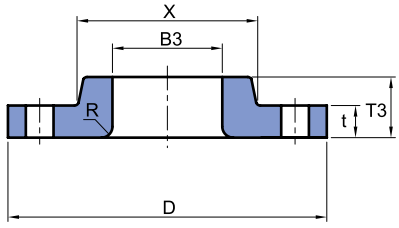
ANSI B 16.5 Forged Flanges

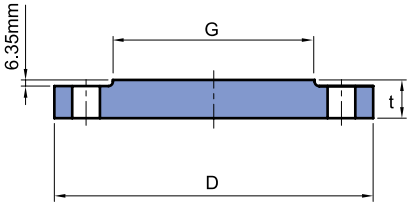
Unit : mm

Nominal Pipe Size	Outside Diam.	Diam. at Base of Hub	O.D of Raised Face	Thickness	BORE				LENGTH THRU HUB			Diam. of Hub at Bevel	Radius of Fillet	Thread Length
					Welding Neck	Slip-on	Lap Joint	Counter Bore Min.	Welding Neck	Slip-on Threaded	Lap Joint			
	D	X	G	t	B1	B2	B3	B	T1	T2	T3	A	R	Q
1/2	133	42.9	35.1	30.2	To be specified by purchaser.	22.4	22.9	23.6	73.2	39.6	39.6	21.3	3.0	28.4
3/4	140	50.8	42.9	31.8		27.7	28.2	29.0	79.2	42.9	42.9	26.7	3.0	31.8
1	159	57.2	50.8	35.1		34.5	35.1	35.8	88.9	47.8	47.8	33.5	3.0	35.1
1 1/4	184	73.2	63.5	38.1		43.2	43.7	44.5	95.3	52.3	52.3	42.2	4.8	38.1
1 1/2	203	79.2	73.2	44.5		49.5	50.0	50.5	111.3	60.5	60.5	48.3	6.4	44.5
2	235	95.3	91.9	50.8		62.0	62.5	63.5	127.0	69.9	69.9	60.5	7.9	50.8
2 1/2	267	114.3	104.6	57.2		74.7	75.4	76.2	142.7	79.2	79.2	73.2	7.9	57.2
3	305	133.4	127.0	66.5		90.7	91.4	92.2	168.1	91.9	91.9	88.9	9.7	63.5
4	356	165.1	157.2	76.2		116.1	116.8	117.6	190.5	108.0	108.0	114.3	11.2	69.9
5	419	203.2	185.7	91.9		143.8	144.5	144.5	228.6	130.0	130.0	141.2	11.2	76.2
6	483	235.0	215.9	108.0		170.7	171.5	171.5	273.1	152.4	152.4	168.4	12.7	82.6
8	552	304.8	269.7	127.0		221.5	222.3	222.3	317.5	177.8	177.8	219.2	12.7	95.3
10	673	374.7	323.9	165.1		276.4	277.4	276.4	419.1	228.6	228.6	273.1	12.7	108.0
12	762	441.5	381.0	184.2		327.2	328.2	328.7	463.6	254.0	254.0	323.9	12.7	120.7

NOTE :
1. For the 'Bore' (B1) other Standard Wall Thickness, refer to page 46,47
2. Class 2500 flanges except Lap Joint will be furnished with 0.25˝ (6.35mm) raised face, which is included in 'Thickness' (t) and 'Length through Hub' (T1), (T2).
3. For Slip-on, Threaded, Socket Welding and Lap Joint Flanges, the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.





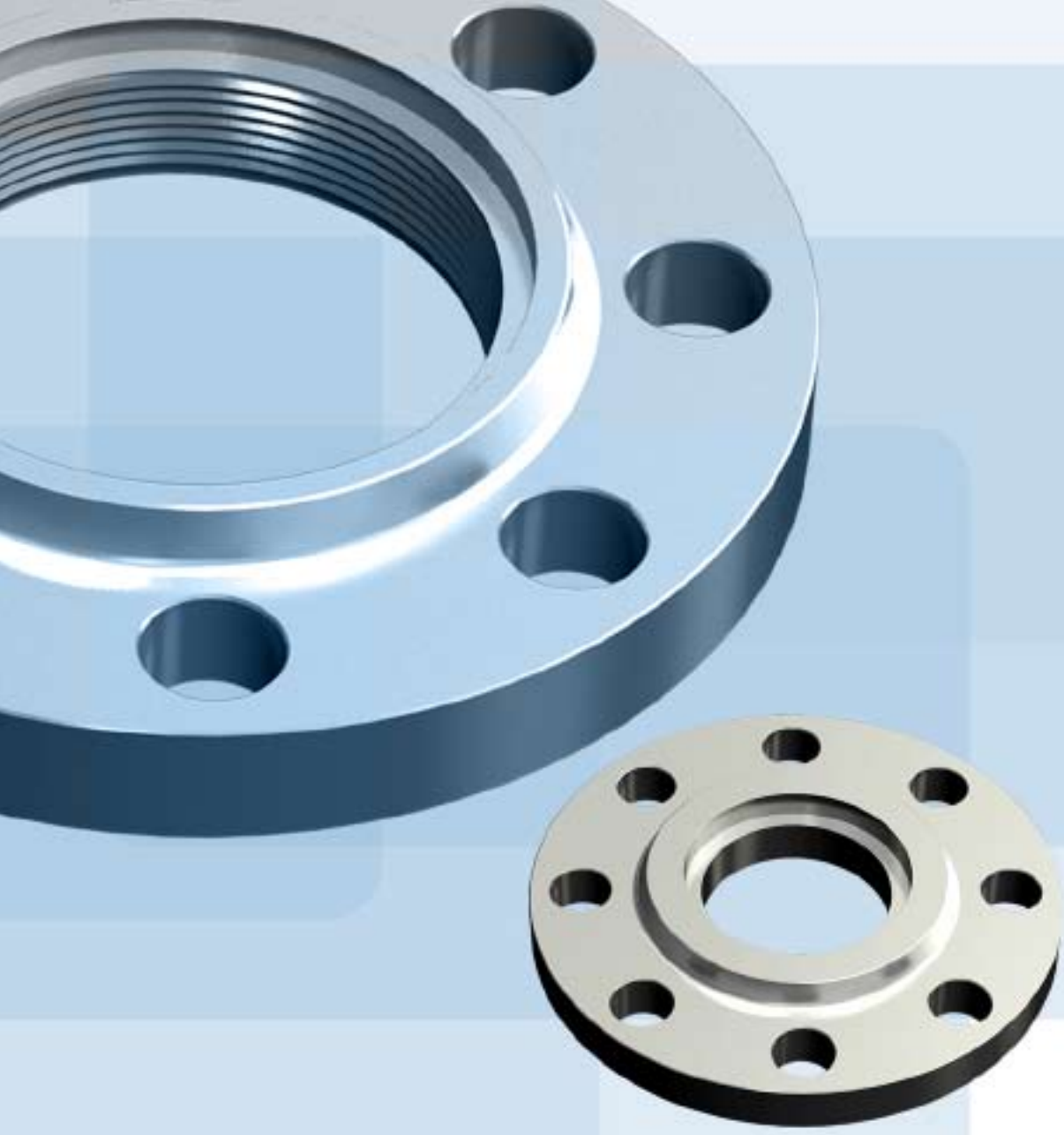


THREADED LAP JOINT BLIND

Unit : mm

Nominal Pipe Size	DRILLING			BOLTING				APPROXIMATE WEIGHT							
					STUD BOLT LENGTH			Welding Neck		Slip-on and Threaded		Lap Joint		Blind	
	Bolt Circle Diam.	Number of Holes	Diam. of Holes	Diam. of Bolts (inch)	0.25˝ Raised Face	Male - Female Tongue - Groove	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb
1/2	88.9	4	22.4	3/4	120.7	114.3	120.7	3.18	7.00	3.18	7.00	3.00	6.60	3.18	7.00
3/4	95.3	4	22.4	3/4	127.0	120.7	127.0	4.08	9.00	4.08	9.00	3.63	8.00	4.54	10.00
1	108.0	4	25.4	7/8	139.7	133.4	139.7	5.45	12.00	5.44	12.00	4.99	11.00	5.44	12.00
1 1/4	130.0	4	28.4	1	152.4	146.1	152.4	9.07	20.00	8.16	18.00	7.26	16.00	8.16	18.00
1 1/2	146.1	4	31.8	1 1/8	171.5	165.1	171.5	11.35	25.00	11.00	24.30	9.99	22.00	10.44	23.00
2	171.5	8	28.4	1	177.8	171.5	177.8	19.07	42.00	17.25	38.00	16.80	37.00	17.71	39.00
2 1/2	196.9	8	31.8	1 1/8	196.9	190.5	203.2	23.61	52.00	24.97	55.00	24.06	53.00	25.42	56.00
3	228.6	8	35.1	1 1/4	222.3	215.9	228.6	42.68	94.00	37.68	83.00	36.32	80.00	39.04	86.00
4	273.1	8	41.1	1 1/2	254.0	247.7	260.4	64.00	141.00	58.00	127.90	54.48	120.00	60.38	133.00
5	323.9	8	47.8	1 3/4	298.5	292.1	311.2	110.68	244.00	95.25	210.00	92.53	204.00	101.15	223.00
6	368.3	8	53.8	2	342.9	336.6	355.6	176.46	378.00	146.51	323.00	143.01	315.30	156.63	345.30
8	438.2	12	53.8	2	381.0	374.7	393.7	261.27	576.00	219.99	485.00	213.38	470.40	240.62	530.50
10	539.8	12	66.5	2 1/2	489.0	482.6	508.0	484.43	1068.00	419.57	925.00	408.60	900.80	465.36	1026.00
12	619.3	12	73.2	2 3/4	539.8	533.4	558.8	692.35	1526.30	590.20	1301.00	572.95	1263.00	664.06	1464.00

4. Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.
5. The gasket surface and backside (bearing surface for bolting) are made parallel within 1 degree. To accomplish parallelism, spot facing is carried out according to MSS SP-9, without reducing thickness (t).
7. Class 2500 Slip-on Flanges are not covered by ANSI B16.5, slip-on flanges are at the manufacture's option.



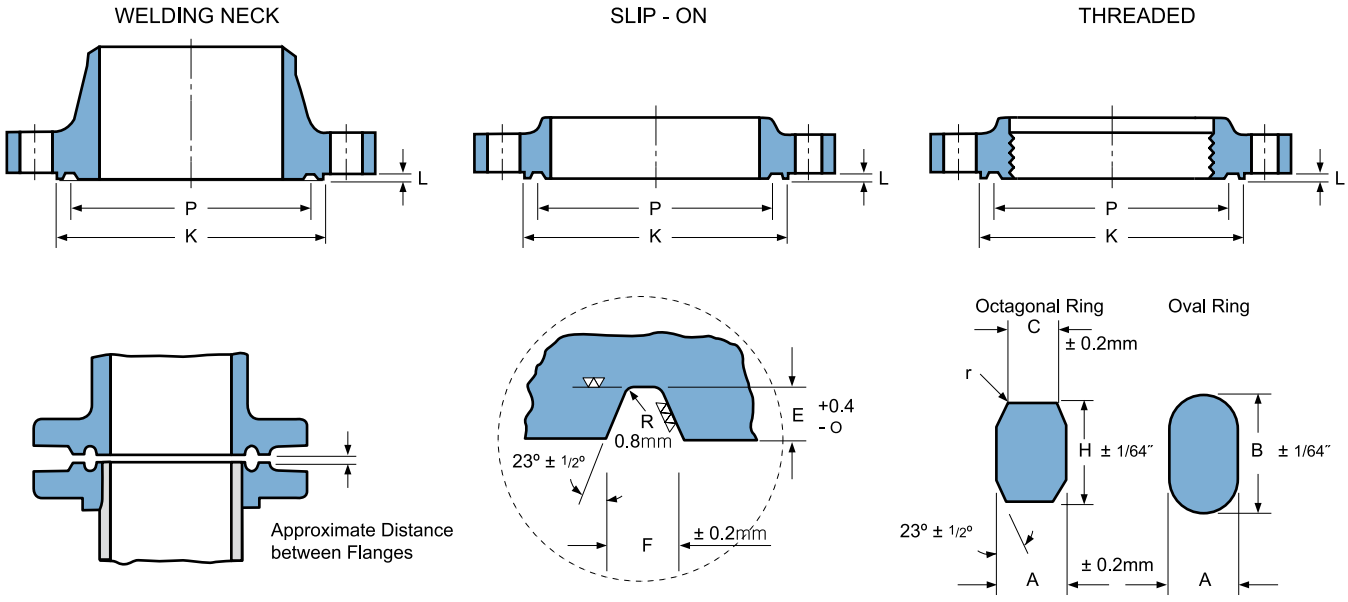
SUPERLOK®

RING JOINT FLANGES

- Class 150 Flanges
- Class 300 / 400 / 600 Flanges
- Class 900 Flanges
- Class 1500 Flanges
- Class 2500 Flanges

CLASS 150 FLANGES

Ring Joint Flanges Facing Dimensions



ANSI B 16.5 Forged Flanges

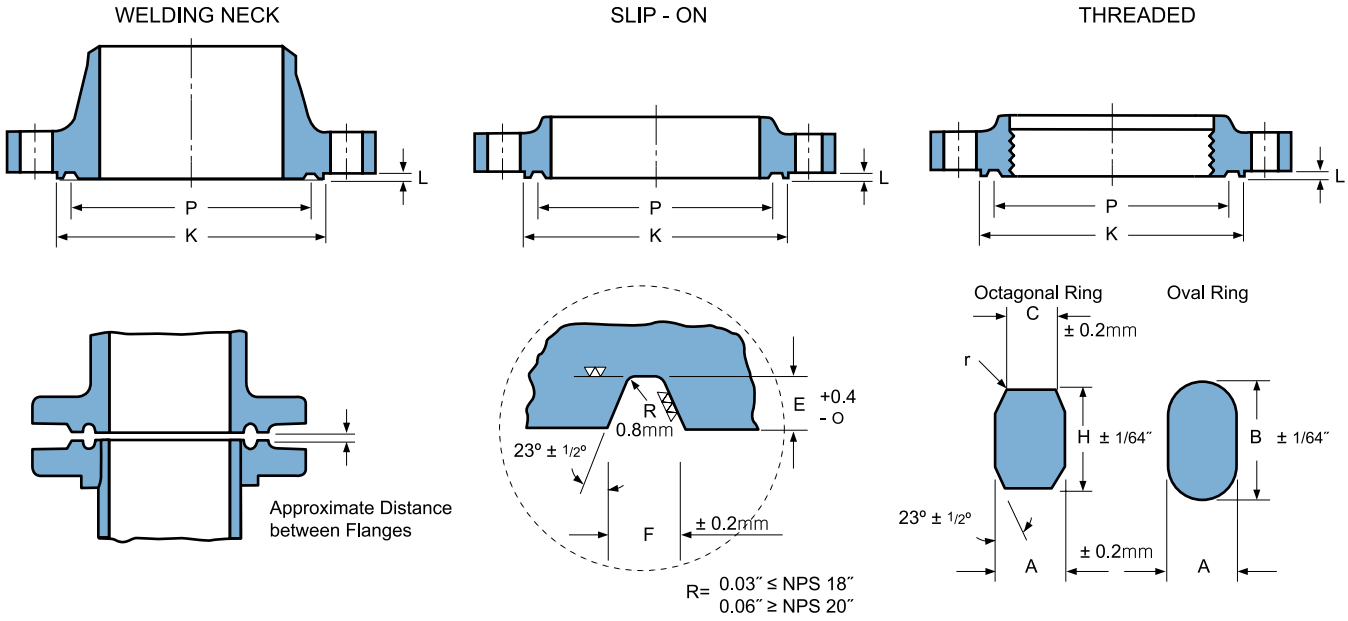
Unit : mm

Nominal Pipe Size	Pitch Diam. of Ring and Groove	Width of Ring	HEIGHT OF RING		Width of Flat on Octagonal Rings	Width of Groove	Depth of Groove	Diameter of Raised Face for Ring Joint or Lapped	Ring Number	Approximate Distande Between Flange of Ring Joints When Ring is Compressed
			OVal	Octagonal						
	P	A	B	H	C	F	E(L*)	K(Min)		
1	47.6	8.0	14.3	12.7	5.2	8.7	6.4	63.5	R15	4.1
1 1/4	57.2	8.0	14.3	12.7	5.2	8.7	6.4	73.2	R17	4.1
1 1/2	65.1	8.0	14.3	12.7	5.2	8.7	6.4	82.6	R19	4.1
2	82.6	8.0	14.3	12.7	5.2	8.7	6.4	101.6	R22	4.1
2 1/2	101.6	8.0	14.3	12.7	5.2	8.7	6.4	120.7	R25	4.1
3	114.3	8.0	14.3	12.7	5.2	8.7	6.4	133.4	R29	4.1
3 1/2	131.8	8.0	14.3	12.7	5.2	8.7	6.4	153.9	R33	4.1
4	149.2	8.0	14.3	12.7	5.2	8.7	6.4	171.5	R36	4.1
5	171.5	8.0	14.3	12.7	5.2	8.7	6.4	193.5	R40	4.1
6	193.7	8.0	14.3	12.7	5.2	8.7	6.4	218.9	R43	4.1
8	247.7	8.0	14.3	12.7	5.2	8.7	6.4	273.1	R48	4.1
10	304.8	8.0	14.3	12.7	5.2	8.7	6.4	330.2	R52	4.1
12	381.0	8.0	14.3	12.7	5.2	8.7	6.4	406.4	R56	4.1
14	396.9	8.0	14.3	12.7	5.2	8.7	6.4	425.5	R59	3.0
16	454.0	8.0	14.3	12.7	5.2	8.7	6.4	482.6	R64	3.0
18	517.5	8.0	14.3	12.7	5.2	8.7	6.4	546.1	R68	3.0
20	558.8	8.0	14.3	12.7	5.2	8.7	6.4	596.9	R72	3.0
24	673.1	8.0	14.3	12.7	5.2	8.7	6.4	711.2	R76	3.0

NOTE :
1. Unless other wise specified by the customer, Ring Type Joint Flanges will be furnished in accordance with these details.
2. The depth of groove is added to the minimum flange thickness.
   * Raised face " L" is equal to groove dimension " E " but is not subjedt to tolerances for " E "
   * A plus tolerance of 3/64 in, for heights B and H is permitted providing the variation in the height of any given ring does not exceed 1/64 in, throughout its entire cirkcumference.
3. Dimension " R " is max.
4. Radius " r " is 1/16″ for ring widths 7/8″ and less and 3/32″ for ring widths 1″(25.4mm) and over.

CLASS 300 / 400 / 600 FLANGES

Ring Joint Flanges Facing Dimensions



ANSI B 16.5 Forged Flanges

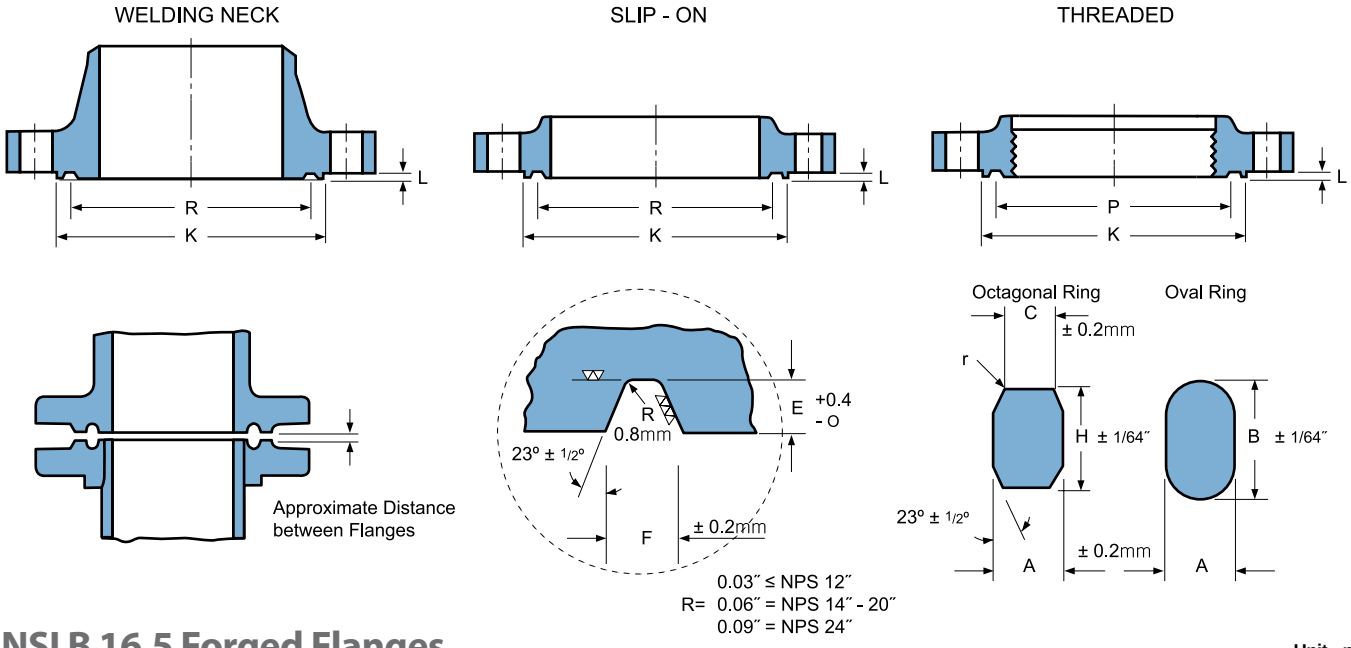
Unit : mm

Nominal Pipe Size	Pitch Diam. of Ring and Groove	Width of Ring	HEIGHT OF RING		Width of Flat on Octagonal Rings	Width of Groove	Depth of Groove	Diameter of Raised Face for Ring Joint or Lapped	Ring Number	Approximate Distande Between Flange of Ring Joints When Ring is Compressed		
			OVal	Octagonal						Class 300	Class 400	Class 600
	P	A	B	H	C	F	E(L*)	K(Min)				
1/2	34.1	6.4	11.1	9.5	4.3	7.1	5.6	50.8	R11	3.0	-	3.0
3/4	42.9	8.0	14.3	12.7	5.2	8.7	6.4	63.5	R13	4.1	-	4.1
1	50.8	8.0	14.3	12.7	5.2	8.7	6.4	69.9	R16	4.1	-	4.1
1 1/4	60.3	8.0	14.3	12.7	5.2	8.7	6.4	79.5	R18	4.1	-	4.1
1 1/2	68.3	8.0	14.3	12.7	5.2	8.7	6.4	90.4	R20	4.1	-	4.1
2	82.6	11.1	17.5	15.9	7.7	11.9	7.9	108.0	R23	5.6	-	4.8
2 1/2	101.6	11.1	17.5	15.9	7.7	11.9	7.9	127.0	R26	5.6	-	4.8
3	123.8	11.1	17.5	15.9	7.7	11.9	7.9	146.1	R31	5.6	-	4.8
3 1/2	131.8	11.1	17.5	15.9	7.7	11.9	7.9	158.8	R34	5.6	-	4.8
4	149.2	11.1	17.5	15.9	7.7	11.9	7.9	174.8	R37	5.6	5.6	4.8
5	181.0	11.1	17.5	15.9	7.7	11.9	7.9	209.6	R41	5.6	5.6	4.8
6	211.2	11.1	17.5	15.9	7.7	11.9	7.9	241.3	R45	5.6	5.6	4.8
8	269.9	11.1	17.5	15.9	7.7	11.9	7.9	301.8	R49	5.6	5.6	4.8
10	323.9	11.1	17.5	15.9	7.7	11.9	7.9	355.6	R53	5.6	5.6	4.8
12	381.0	11.1	17.5	15.9	7.7	11.9	7.9	412.8	R57	5.6	5.6	4.8
14	419.1	11.1	17.5	15.9	7.7	11.9	7.9	457.2	R61	5.6	5.6	4.8
16	469.9	11.1	17.5	15.9	7.7	11.9	7.9	508.0	R65	5.6	5.6	4.8
18	533.4	11.1	17.5	15.9	7.7	11.9	7.9	574.8	R69	5.6	5.6	4.8
20	584.2	12.7	19.1	17.5	8.7	13.5	9.5	635.0	R73	5.6	5.6	4.8
24	692.2	15.9	22.2	20.7	10.5	16.7	11.1	749.3	R77	6.4	6.4	5.6

NOTE :
1. Unless other wise specified by the customer, Ring Type Joint Flanges will be furnished in accordance with these details.
2. The depth of groove is added to the minimum flange thickness.
   * Raised face " L" is equal to groove dimension " E " but is not subjedt to tolerances for " E "
   * A plus tolerance of 3/64 in, for heights B and H is permitted providing the variation in the height of any given ring does not exceed 1/64 in, throughout its entire cirkcumference.
3. Dimension " R " is max.
4. Radius " r " is 1/16″ for ring widths 7/8″ and less and 3/32″ for ring widths 1″(25.4mm) and over.

CLASS 900 FLANGES

Ring Joint Flanges Facing Dimensions



ANSI B 16.5 Forged Flanges

Unit : mm

Nominal Pipe Size	Pitch Diam. of Ring and Groove	Width of Ring	HEIGHT OF RING		Width of Flat on Octagonal Rings	Width of Groove	Depth of Groove	Diameter of Raised Face for Ring Joint or Lapped	Ring Number	Approximate Distande Between Flange of Ring Joints When Ring is Compressed
			OVal	Octagonal						
	P	A	B	H	C	F	E(L*)	K(Min)		

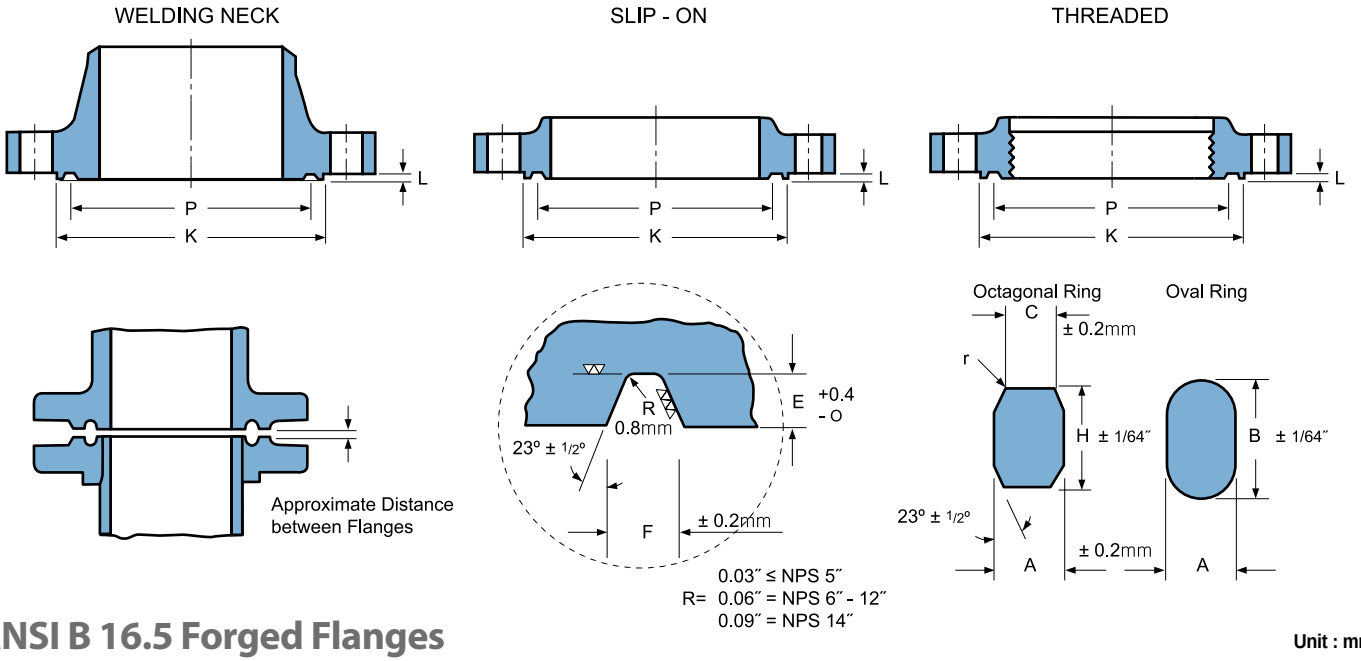
For size 2 1/2 and smaller, use Class 1500 Ring Joint Flanges

3	123.8	11.1	17.5	15.9	7.7	11.9	7.9	155.4	R31	4.1
4	149.2	11.1	17.5	15.9	7.7	11.9	7.9	180.8	R37	4.1
5	181.0	11.1	17.5	15.9	7.7	11.9	7.9	215.9	R41	4.1
6	211.2	11.1	17.5	15.9	7.7	11.9	7.9	241.3	R45	4.1
8	269.9	11.1	17.5	15.9	7.7	11.9	7.9	307.8	R49	4.1
10	323.9	11.1	17.5	15.9	7.7	11.9	7.9	362.0	R53	4.1
12	381.0	11.1	17.5	15.9	7.7	11.9	7.9	419.1	R57	4.1
14	419.1	15.9	22.2	20.7	10.5	16.7	11.1	466.9	R62	4.1
16	469.9	15.9	22.2	20.7	10.5	16.7	11.1	523.7	R66	4.1
18	533.4	19.1	25.4	23.8	11.1	19.8	12.7	593.9	R70	4.8
20	584.2	19.1	25.4	23.8	12.3	19.8	12.7	647.7	R74	4.8
24	692.2	25.4	33.4	31.8	17.3	27.0	15.9	771.7	R78	5.6

NOTE :
1. Unless other wise specified by the customer, Ring Type Joint Flanges will be furnished in accordance with these details.
2. The depth of groove is added to the minimum flange thickness.
   * Raised face " L" is equal to groove dimension " E " but is not subjedt to tolerances for " E "
   * A plus tolerance of 3/64 in, for heights B and H is permitted providing the variation in the height of any given ring does not exceed 1/64 in, throughout its entire cirkcumference.
3. Dimension " R " is max.
4. Radius " r " is 1/16″ for ring widths 7/8″ and less and 3/32″ for ring widths 1″(25.4mm) and over.

CLASS 1500 FLANGES

Ring Joint Flanges Facing Dimensions



ANSI B 16.5 Forged Flanges

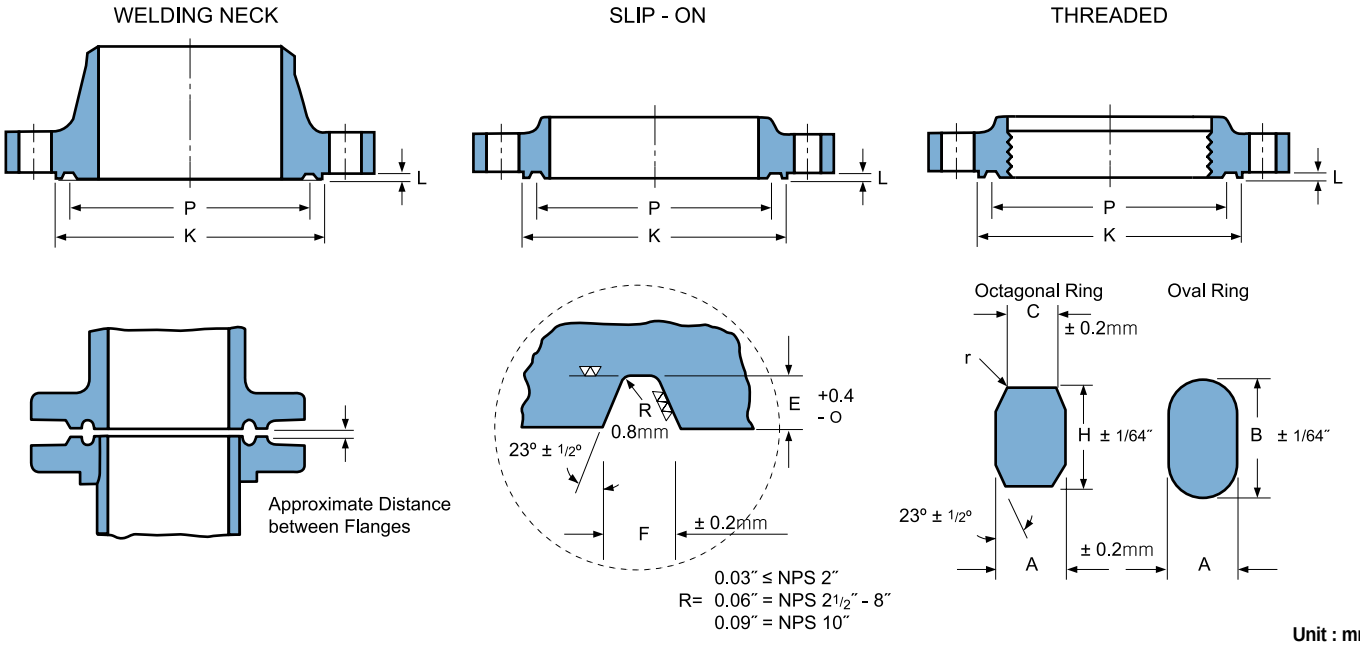
Unit : mm

Nominal Pipe Size	Pitch Diam. of Ring and Groove	Width of Ring	HEIGHT OF RING		Width of Flat on Octagonal Rings	Width of Groove	Depth of Groove	Diameter of Raised Face for Ring Joint or Lapped	Ring Number	Approximate Distande Between Flange of Ring Joints When Ring is Compressed
			OVal	Octagonal						
	P	A	B	H	C	F	E(L*)	K(Min)		
1/2	39.7	8.0	14.3	12.7	5.2	8.7	6.4	60.5	R12	4.1
3/4	44.5	8.0	14.3	12.7	5.2	8.7	6.4	66.8	R14	4.1
1	50.8	8.0	14.3	12.7	5.2	8.7	6.4	71.4	R16	4.1
1 1/4	60.3	8.0	14.3	12.7	5.2	8.7	6.4	81.0	R18	4.1
1 1/2	68.3	8.0	14.3	12.7	5.2	8.7	6.4	92.2	R20	4.1
2	95.3	11.1	17.5	15.9	7.7	11.9	7.9	124.0	R24	3.0
2 1/2	108.0	11.1	17.5	15.9	7.7	11.9	7.9	136.7	R27	3.0
3	136.5	11.1	17.5	15.9	7.7	11.9	7.9	168.4	R35	3.0
4	161.9	11.1	17.5	15.9	7.7	11.9	7.9	193.8	R39	3.0
5	193.7	11.1	17.5	15.9	7.7	11.9	7.9	228.6	R44	3.0
6	211.2	12.7	19.1	17.5	8.7	13.5	9.5	247.7	R46	3.0
8	269.9	15.9	22.2	20.7	10.5	16.7	11.1	317.5	R50	4.1
10	323.9	15.9	22.2	20.7	10.5	16.7	11.1	371.6	R54	4.1
12	381.0	22.2	28.6	27.0	14.8	23.0	14.3	438.2	R58	4.8
14	419.1	25.4	33.4	31.8	17.3	27.0	15.9	489.0	R64	5.6
16	469.9	28.6	36.5	34.9	19.8	30.2	17.5	546.1	R67	7.9
18	533.4	28.6	36.5	34.9	19.8	30.2	17.5	612.9	R71	7.9
20	584.2	31.8	39.7	38.1	22.3	33.4	17.5	673.1	R75	9.7
24	692.2	34.9	44.5	41.3	24.8	36.5	20.6	793.8	R79	11.2

NOTE :
1. Unless other wise specified by the customer, Ring Type Joint Flanges will be furnished in accordance with these details.
2. The depth of groove is added to the minimum flange thickness.
   * Raised face " L" is equal to groove dimension " E " but is not subjedt to tolerances for " E "
   * A plus tolerance of 3/64 in, for heights B and H is permitted providing the variation in the height of any given ring does not exceed 1/64 in, throughout its entire cirkcumference.
3. Dimension " R " is max.
4. Radius " r " is 1/16″ for ring widths 7/8″ and less and 3/32″ for ring widths 1″(25.4mm) and over.

CLASS 2500 FLANGES

Ring Joint Flanges Facing Dimensions



Unit : mm

Nominal Pipe Size	Pitch Diam. of Ring and Groove	Width of Ring	HEIGHT OF RING		Width of Flat on Octagonal Rings	Width of Groove	Depth of Groove	Diameter of Raised Face for Ring Joint or Lapped	Ring Number	Approximate Distande Between Flange of Ring Joints When Ring is Compressed
			OVal	Octagonal						
	P	A	B	H	C	F	E(L*)	K(Min)		
1/2	42.9	8.0	14.3	12.7	5.2	8.7	6.4	65.0	R13	4.1
3/4	50.8	8.0	14.3	12.7	5.2	8.7	6.4	73.2	R16	4.1
1	60.3	8.0	14.3	12.7	5.2	8.7	6.4	82.6	R18	4.1
1 1/4	72.2	11.1	17.5	15.9	7.7	11.9	7.9	101.6	R21	3.0
1 1/2	82.6	11.1	17.5	15.9	7.7	11.9	7.9	114.3	R23	3.0
2	101.6	11.1	17.5	15.9	7.7	11.9	7.9	133.4	R26	3.0
2 1/2	111.1	12.7	19.1	17.5	8.7	13.5	9.5	149.4	R28	3.0
3	127.0	12.7	19.1	17.5	8.7	13.5	9.5	168.4	R32	3.0
4	157.2	15.9	22.2	20.7	10.5	16.7	11.1	203.2	R38	4.1
5	190.5	19.1	25.4	23.8	12.3	19.8	12.7	241.3	R42	4.1
6	228.6	19.1	25.4	23.8	12.3	19.8	12.7	279.4	R47	4.1
8	279.4	22.2	28.6	27.0	14.8	23.0	14.3	339.9	R51	4.8
10	342.9	28.6	36.5	34.9	19.8	30.2	17.5	425.5	R55	6.4
12	406.4	31.8	39.7	38.1	22.3	33.4	17.5	495.3	R60	7.9

NOTE :

1. Unless other wise specified by the customer, Ring Type Joint Flanges will be furnished in accordance with these details.
2. The depth of groove is added to the minimum flange thickness.
   * Raised face " L" is equal to groove dimension " E " but is not subjedt to tolerances for " E "
   * A plus tolerance of 3/64 in, for heights B and H is permitted providing the variation in the height of any given ring does not exceed 1/64 in, throughout its entire cirkcumference.
3. Dimension " R " is max.
4. Radius " r " is 1/16″ for ring widths 7/8″ and less and 3/32″ for ring widths 1″(25.4mm) and over.

SUPERLOK®

ORIFICE FLANGES

- ANSI Orifice Flanges
- Class 300 Flanges
- Class 400 Flanges
- Class 600 Flanges
- Class 900 Flanges
- Class 1500 Flanges
- Class 2500 Flanges

ANSI ORIFICE FLANGES

(ANSI B16.36) Forged Flanges

ORIFICE FLANGES are widely used in conjunction with orifice meters for measuring the rate of flow of liquids and gases.
They are basically the same as standard welding neck , slip-on and screwed flanges except for the provision of radial,
tapped holes in the flange ring for meter connections and additional bolts to act as jack screws to facilitate separating the flanges for inspection or replacement of the orifice plate.

NOTES :

■ JACK SCREW PROVISION

(1) Each Flange shall have a machine bolt mounted in a hole drilled on the flange centerline at 90 deg. from the pressure taps, for use as a jackscrew, Machine bolt shall be regular, with one heavy hex, net.
(2) A slot shall be provided in the flange 0.06 in. (1.6mm) wider than the width across flats of the nut. The depth of the shot shall admit the nut so that there is no interference with the joining of the flanges when bolted together without orifice plate.

■ PRESSURE TAPS

(1) Each orifice falnge is provided with two pressure tap holes extending radially from the outside diameter of the flange to the inside diameter of the flange. Corner taps may be used on NPS 1 1/2 and smaller if space permits.
Each pressure tap hole shall be equipped with a pipe plug.
(2) The 0.94 in. (23.8) locating dimension for raised face and 0.75 in. (19.1mm) for ring joint shall be measured at the bore.
(3) Each pressure tap hole shall be equipped with a pipe plug.

■ FACING

The finish of Contact Faces Shall Conform to the Requirements of ASME / ANSI B 16.5

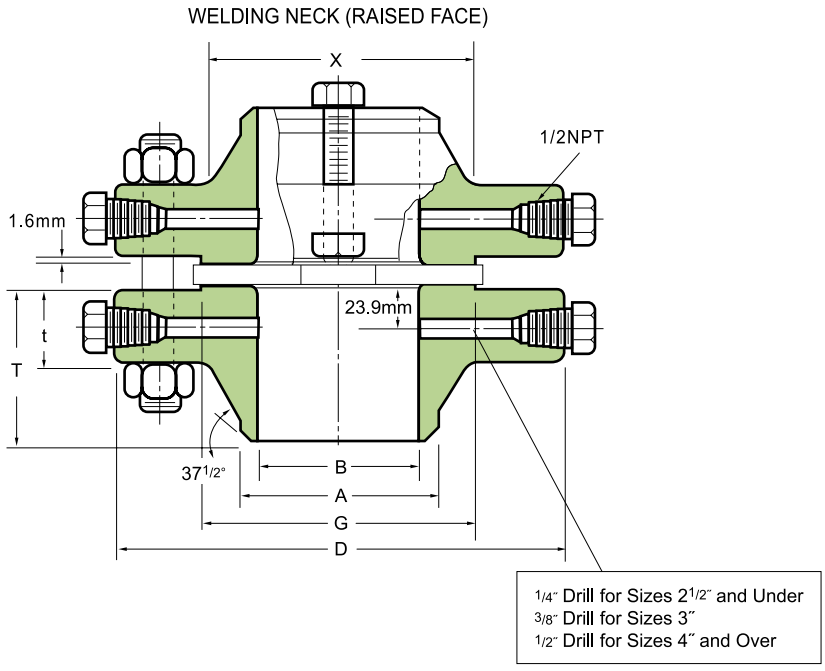
■ FLANGE THREADS

(1) Theaded flanges shall have an American Notional Standard taper pipe thread conforming to ANSI B 2.1
(2) The thread shall be concentric with the axis of the flange and variations in alignment shall not exceed 0.06 in (1.6mm) per foot.
(3) The flanges are made with counterbored at the back of the flange and the threads shall be chamfered to the diameter of the counterbore at an angle of approximately 45 degrees with the axis of the thread to afford easy entrance in making a joint.
The chamfer shall be concentric with the thread.
(4) In order to permit the pipe to be inserted to the flange, the threads should have full root diameters through to the face of the flange, or shall have a counterbore at the face of the flange.
(5) The gaging notch of the working gage shall come flush with the bottom of the chamger in all threaded flanges and shall be considered as being the intersection of the chamger cone and the pitch cone of the thread.
This depth of chamfer is approximately equal to 1/2 of the pitch of the thread.
(6) The maximum allowable threa variation is one turn large or small from the gaging notch.

■ TOLERANCES

Tolerances on all dimensions shall be as shown ANSI B16.5 except for those shown below.
(1) Tolerance on location of center of pressure tap hole from flange face shall be :
a. Flanges smaller than nominal size 4 ± 0.02 in (0.5mm)
b. Flanges nominal size 4 and larger ± 0.03 in (0.8mm)
(2) Bore diameter tolerance (welding neck flanges only) is ± 0.5% of nominal value.

CLASS 300 ORIFICE FLANGES

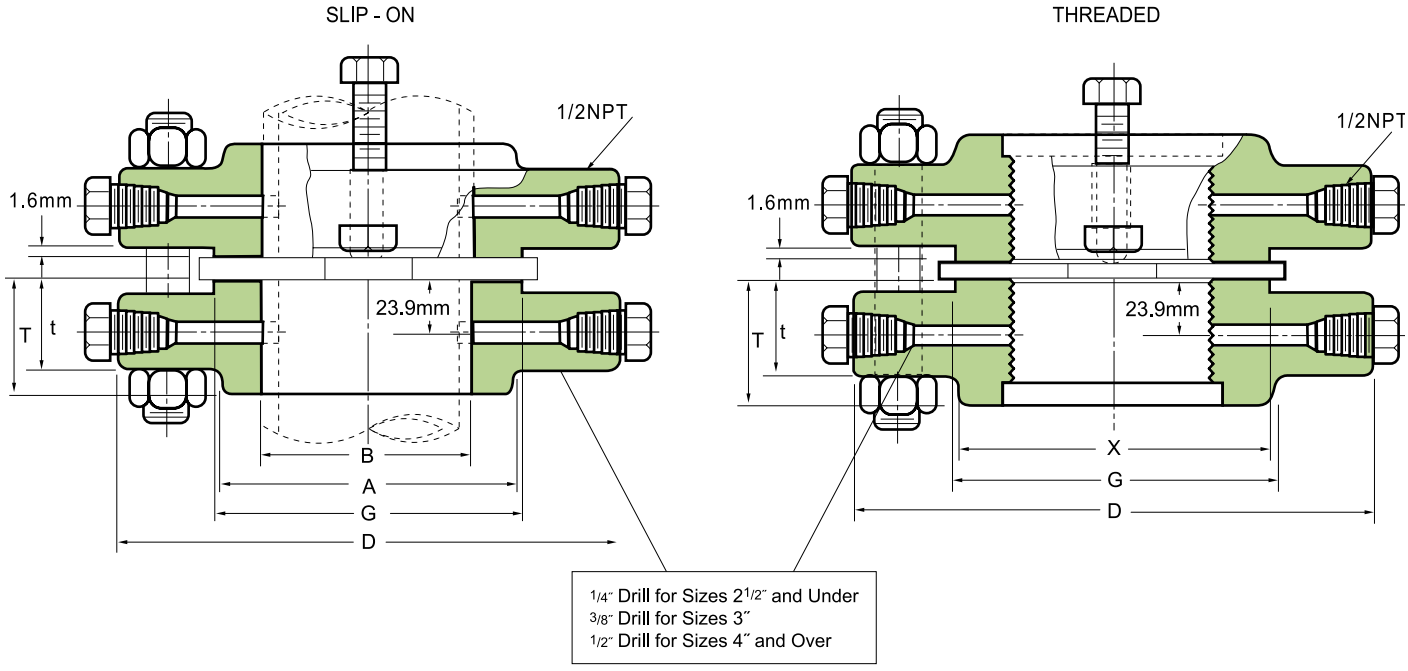


ANSI B 16.36 Forged Flanges

Unit : mm

Nominal Pipe Size	Outside Diam. of Flange	THICKNESS OF FLANGE (t)	Diam. of Hub at Base	Diam. of Raised Base	Diam. of Hub of Bevel	LENGTH THRU HUB (T)		BORE (B)	
		Raised Face				Welding Neck	Slip-on & Threaded	Welding Neck	Slip-on
	D		X	G	A	Raised Face	Raised Face		
1	124	38.1	53.8	50.8	33.5	82.6	47.8	26.7	34.5
1 1/4	133	38.1	63.5	63.5	42.2	84.1	46.0	35.1	43.2
1 1/2	155	38.1	69.9	73.2	48.3	85.9	47.8	40.9	49.5
2	165	38.1	84.1	91.9	60.5	85.9	49.3	52.6	62.0
2 1/2	191	38.1	100.1	104.6	73.2	88.9	50.8	62.7	74.7
3	210	38.1	117.3	127.0	88.9	88.9	52.3	78.0	90.7
4	254	38.1	146.1	157.2	114.3	91.9	53.8	102.4	116.1
5	279	38.1	177.8	185.7	141.2	101.6	53.8	128.3	143.8
6	318	38.1	206.2	215.9	168.4	100.1	53.8	154.2	170.7
8	381	41.1	260.4	269.7	219.2	111.3	62.0	202.7	221.5
10	445	47.8	320.5	323.9	273.1	117.3	66.5	254.5	276.4
12	521	50.8	374.7	381.0	323.9	130.0	73.2	304.8	327.2
14	584	53.8	425.5	412.8	355.6	142.7	76.2	336.6	359.2
16	648	57.2	482.6	469.9	406.4	146.1	82.6	387.4	410.5
18	711	60.5	533.4	533.4	457.2	158.8	88.9	438.2	461.8
20	775	63.5	587.2	584.2	508.0	162.1	95.3	489.0	513.1
24	914	69.9	701.5	692.2	609.6	168.1	106.4	590.6	616.0

NOTE :
1. For the 'Bore' (B) of Welding Neck Flanges other than Standard Wall Thickness, refer to 46,47
2. Class 300 Welding Neck Flanges of sizes 24″ (609.6mm) and smaller will be bored to match Standard Wall Pipe unless otherwise specified.
3. Class 300 Orifice Flanges will be furnished with 0.06″ (1.6mm) raised face, which is included in 'Thickness' (t) and 'Length through Hub' (T)
4. Bolt lengths for raised face flanges include allwoance for orifice and gasket thickness of 0.25″ (6.4mm) for NPS 1-12 and 0.38″ (9.7mm) for sizes 14-24



Unit : mm

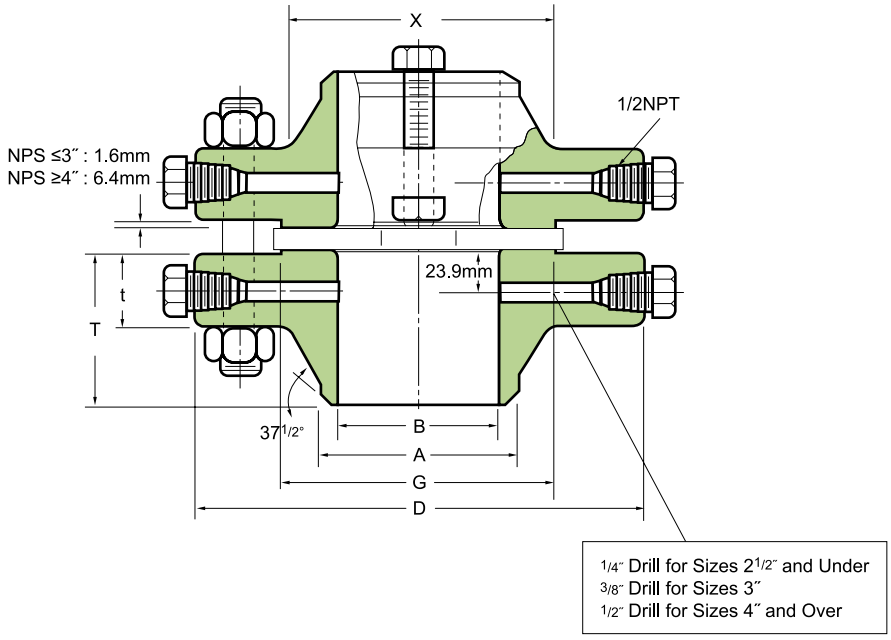
Nominal Pipe Size	Pich Diam. of Ring and Groove	Ring Number	DEPTH OF JACK SCREW SLOT	JACK SCREW SIZE	DRILLING TEMPLATE				
	P		Raised Face	Raised Face	Diam. of Bolt Circle	Number of Bolts	Diam. of Stud Bolts (inch)	Diam. of Bolts Holes	Length of Stud Bolts Raised Face
1	50.8	R16	9.7	Jack screw size for 1 thru 24 are those shown for length and diameter of bolts.	88.9	4	5/8	17.5	139.7
1 1/4	60.3	R18	9.7		98.6	4	5/8	17.5	152.4
1 1/2	68.3	R20	12.7		114.3	4	3/4	20.6	152.4
2	82.6	R23	9.7		127.0	8	5/8	17.5	152.4
2 1/2	101.6	R26	12.7		149.4	8	3/4	20.6	152.4
3	123.8	R31	12.7		168.1	8	3/4	20.6	152.4
4	149.2	R37	12.7		200.2	8	3/4	20.6	152.4
5	181.0	R41	12.7		235.0	8	3/4	22.4	152.4
6	211.1	R45	12.7		269.7	12	3/4	22.4	152.4
8	269.9	R49	15.7		330.2	12	7/8	25.4	158.8
10	323.9	R53	19.1		387.4	16	1	28.4	165.1
12	381.0	R57	22.4		450.9	16	1 1/8	31.8	177.8
14	419.1	R61	22.4		514.4	20	1 1/8	31.8	184.2
16	469.9	R65	25.4		571.5	20	1 1/4	35.1	196.9
18	533.4	R69	25.4		628.7	24	1 1/4	35.1	203.2
20	584.2	R73	25.4		685.8	24	1 1/4	35.1	215.9
24	692.2	R77	31.8		812.8	24	1 1/2	41.1	241.3

NOTE :

5. Unless otherwise specified, unions of 1 (25.4mm) thru 24 (609.6mm) furnished with carbon steel regular square headed bolts with semifinished American Standard heavy series hex nuts.

CLASS 400 ORIFICE FLANGES

WELDING NECK (RAISED FACE)



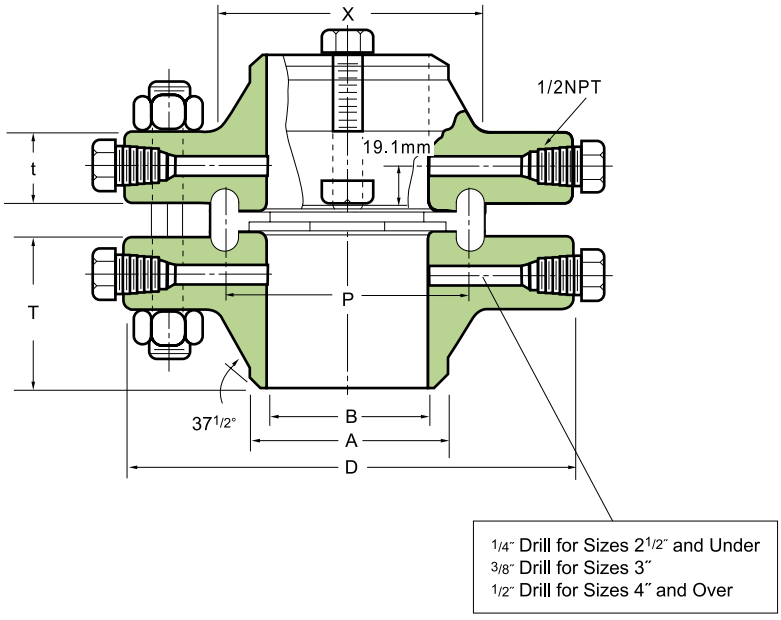
ANSI B 16.36 Forged Flanges

Unit : mm

Nominal Pipe Size	Outside Diam. of Flange	THICKNESS OF FLANGE (t)		Diam. of Hub at Base	Diam. of Raised Base	Diam. of Hub of Bevel	LENGTH THRU HUB (T)				BORE (B)	
							Welding Neck		Slip-on & Threaded			
		Raised Face	Ring Joint				Raised Face	Ring Joint	Raised Face	Ring Joint	Welding Neck	Slip-on
	D			X	G	A						
1	124	38.1	31.8	53.8	50.8	33.5	82.6	76.2	47.8	41.1	See Note 1. To bee specified by purchaser	34.5
1 1/4	133	38.1	31.8	63.5	63.5	42.2	84.1	77.7	46.0	39.6		43.2
1 1/2	155	38.1	31.8	69.9	73.2	48.3	85.9	79.2	47.8	41.1		49.5
2	165	38.1	31.8	84.1	91.9	60.5	85.9	79.2	49.3	42.9		62.0
2 1/2	191	38.1	31.8	100.1	104.6	73.2	88.9	82.6	50.8	44.5		74.7
3	210	38.1	31.8	117.3	127.0	88.9	88.9	82.6	52.3	46.0		90.7
4	254	35.1	35.1	146.1	157.2	114.3	88.9	88.9	50.8	50.8		116.1
5	279	38.1	38.1	177.8	185.7	141.2	101.6	101.6	53.8	53.8		143.8
6	318	41.1	41.1	206.2	215.9	168.4	103.1	103.1	57.2	57.2		170.7
8	381	47.8	47.8	260.4	269.7	219.2	117.3	117.3	68.3	68.3		221.5
10	445	53.8	53.8	320.5	323.9	273.1	124.0	124.0	73.2	73.2		276.4
12	521	57.2	57.2	374.7	381.0	323.9	136.7	136.7	79.2	79.2		327.2
14	584	60.7	60.7	425.5	412.8	355.6	149.4	149.4	-	-		359.2
16	648	63.5	63.5	482.6	469.9	406.4	152.4	152.4	-	-		410.5
18	711	66.5	66.5	533.4	533.4	457.2	165.1	165.1	-	-		461.8
20	775	69.9	69.9	587.2	584.2	508.0	168.1	168.1	-	-		513.1
24	914	76.2	76.2	701.5	692.2	609.6	174.8	174.8	-	-		564.4

NOTE :
1. For the inside diameter of pipes (corresponding to 'Bore' (B) of Welding Neck Flanges), refer to page 46,47
2. Class 400 Flanges of sizes 3″ and smaller will be furnished with 0.06″ (1.6mm) raised face, which is included in 'Thickness' (t) and 'Length through Hub' (T)
   The 0.25″ (6.35mm) raised face for sizes 4″ and larger is not included in (t) and (T)
3. Each union includes two carbon steel jack screw bolts with hex nuts.

WELDING NECK (RING-TYPE JOINT)



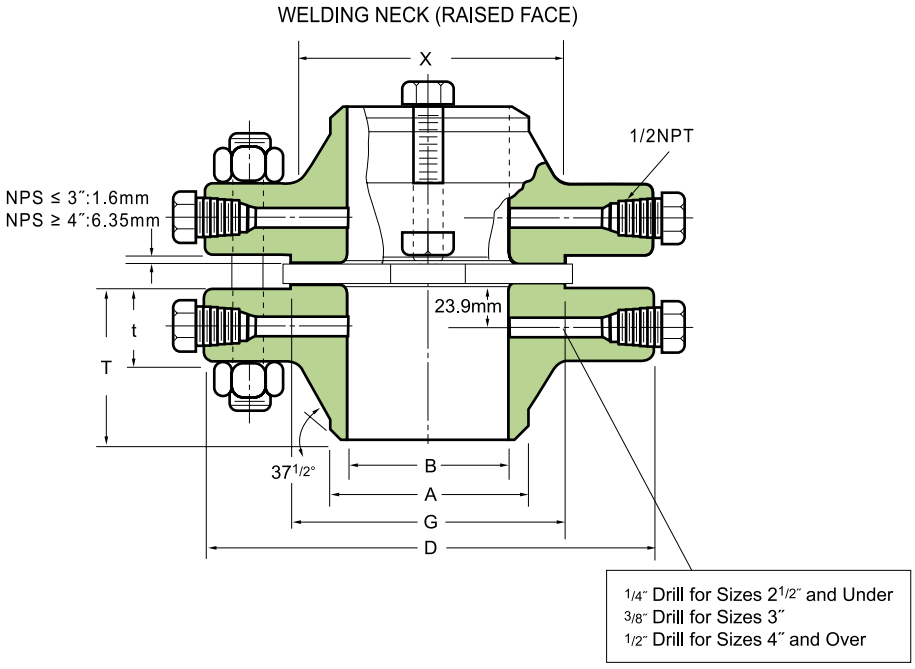
Unit : mm

Nominal Pipe Size	Pich Diam. of Ring and Groove P	Ring Number	DEPTH OF JACK SCREW SLOT		JACK SCREW SIZE		DRILLING TEMPLATE					
			Raised Face	Ring Joint	Raised Face (inch)	Ring Joint (inch)	Diam. of Bolt Circle	Number of Bolts	Diam. of Stud Bolts (inch)	Diam. of Bolts Holes	Length of Stud Bolts	
											Raised Face	Ring Joint
1	50.8	R16	9.7	6.4	5/8X4.00	5/8X4.75	88.9	4	5/8	17.5	127.0	146.1
1 1/4	60.3	R18	9.7	6.4	5/8X4.00	5/8X4.75	98.6	4	5/8	17.5	127.0	120.7
1 1/2	68.3	R20	12.7	6.4	3/4X4.25	3/4X5.00	114.3	4	3/4	21.0	133.4	152.4
2	82.6	R23	9.7	6.4	5/8X4.00	5/8X4.75	127.0	8	5/8	17.5	127.0	152.4
2 1/2	101.6	R26	12.7	6.4	3/4X4.25	3/4X5.00	149.4	8	3/4	20.6	133.4	158.8
3	123.8	R31	12.7	6.4	3/4X4.25	3/4X5.00	168.1	8	3/4	20.6	133.4	158.8
4	149.2	R37	6.4	15.7	3/4X3.00	3/4X4.00	200.2	8	7/8	25.4	139.7	152.4
5	181.0	R41	6.4	15.7	3/4X3.00	3/4X4.00	235.0	8	7/8	25.4	146.1	158.8
6	211.1	R45	12.7	22.4	1X3.50	1X4.00	269.7	12	7/8	25.4	158.8	165.1
8	269.9	R49	12.7	22.4	1X3.50	1X4.50	330.2	12	1	28.4	171.5	184.2
10	323.9	R53	12.7	22.4	1X4.00	1X4.50	387.4	16	1 1/8	31.8	190.5	203.2
12	381.0	R57	12.7	22.4	1X4.00	1X5.00	450.9	16	1 1/4	35.1	203.2	215.9
14	419.1	R61	12.7	22.4	1X4.25	1X5.00	514.4	20	1 1/4	35.1	209.6	228.6
16	469.9	R65	12.7	22.4	1X4.25	1X5.00	571.5	20	1 3/8	38.1	222.3	235.0
18	533.4	R69	12.7	22.4	1X4.50	1X5.00	628.7	24	1 3/8	38.1	235.0	241.3
20	584.2	R73	12.7	22.4	1X4.75	1X5.50	685.8	24	1 1/2	41.1	247.7	260.4
24	692.2	R77	12.7	22.4	1X5.00	1X6.00	812.8	24	1 3/4	47.8	279.4	285.8

NOTE :

4. Unless otherwise specified, raised face unions are furnished with alloy bolt studs per ASTM A193 Grade B7 with American Standard heavy series hex nuts ASTM A194 Class 2H.
5. On ring joint flanges having a groove depth 0.375″ (9.5mm) and less, the distance from the center line of the tap hole to the flange face is 0.750″ (19.1mm). When the depth of groofe is 0.438″ (11.1mm) or greater, changes in drill size or method of drilling are necessary.
6. Bolt lengths for raised face flanges include allwoance for orifice and gasket thickness of 0.25″ (6.4mm) for sizes 4-12 and 0.38″ (9.7mm) for sizes 14-24. Bolt lengths for ring type joint flanges include allowance of 0.62″ (15.7mm) for sizes 4-10, 0.75″ (19.1mm)for sizes 12-18 and 0.88″ (22.4mm) for size 20.

CLASS 600 ORIFICE FLANGES



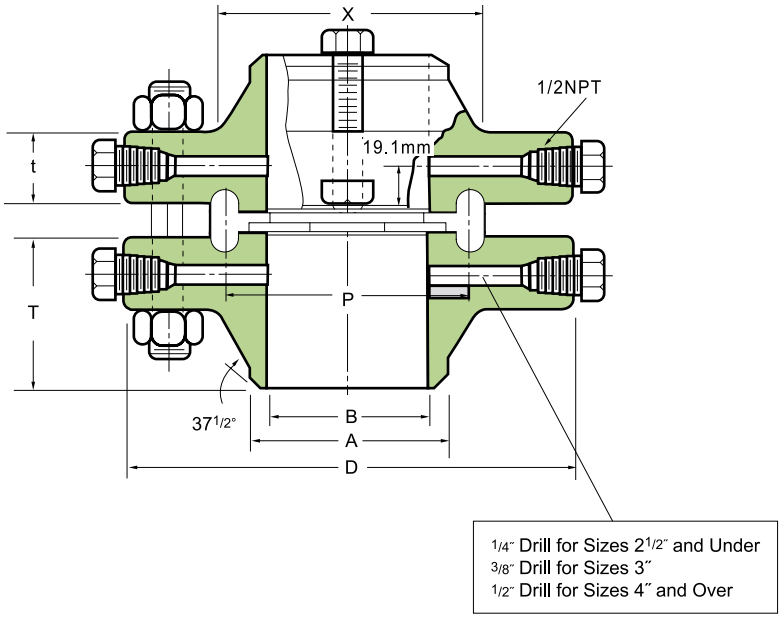
ANSI B 16.36 Forged Flanges

Unit : mm

Nominal Pipe Size	Outside Diam. of Flange	THICKNESS OF FLANGE (t)		Diam. of Hub at Base	Diam. of Raised Base	Diam. of Hub of Bevel	LENGTH THRU HUB (T)				BORE (B)	
		Raised Face	Ring Joint				Welding Neck		Slip-on & Threaded		Welding Neck	Slip-on
							Raised Face	Ring Joint	Raised Face	Ring Joint		
	D			X	G	A						
1	124	38.1	31.8	53.8	50.8	33.5	82.6	76.2	47.8	41.1	See Note 1. To bee specified by purchaser	34.5
1 1/4	133	38.1	31.8	63.5	63.5	42.2	84.1	77.7	46.0	39.6		43.2
1 1/2	155	38.1	31.8	69.9	73.2	48.3	85.9	79.2	47.8	41.1		49.5
2	165	38.1	31.8	84.1	91.9	60.5	85.9	79.2	49.3	42.9		62.0
2 1/2	191	38.1	31.8	100.1	104.6	73.2	88.9	82.6	50.8	44.5		74.7
3	210	38.1	31.8	117.3	127.0	88.9	88.9	82.6	52.3	46.0		90.7
4	273	38.1	38.1	152.4	157.2	114.3	101.6	101.6	53.8	53.8		116.1
5	330	44.5	44.5	189.0	185.7	141.2	114.3	114.3	60.5	60.5		143.8
6	356	47.8	47.8	222.3	215.9	168.4	117.3	117.3	66.5	66.5		170.7
8	419	55.6	55.6	273.1	269.7	219.2	133.4	133.4	76.5	76.2		221.5
10	508	63.5	63.5	342.9	323.9	273.1	152.4	152.4	85.9	85.9		276.4
12	559	66.5	66.5	400.1	381.0	323.9	155.4	155.4	91.9	91.9		327.2
14	603	69.9	69.9	431.8	412.8	355.6	165.4	165.1	-	-		-
16	686	76.2	76.2	495.3	469.9	406.4	177.8	177.8	-	-		-
18	743	82.6	82.6	546.1	533.4	457.2	184.2	184.2	-	-		-
20	813	88.9	88.9	609.6	584.2	508.0	190.5	190.5	-	-		-
24	940	101.6	101.6	717.6	692.2	609.6	203.2	203.2	-	-		-

NOTE :
1. For the inside diameter of pipes (corresponding to 'Bore' (B) of Welding Neck Flanges), refer to page 46,47
2. Class 600 Flanges of sizes 3″ and smaller will be furnished with 0.06″ (1.6mm) raised face, which is included in 'Thickness' (t) and 'Length through Hub' (T) The 0.25″ (6.35mm) raised face for sizes 4″ and larger is not included in (t) and (T)
3. Each union includes two carbon steel jack screw bolts with hex nuts.
4. Bolt lengths for raised face flanges include allwoance for orifice and gasket thickness of 0.25″ (6.4mm) for sizes 1-12 and 0.38″ (9.7mm) for sizes 14-24. Bolt lengths for ring type joint flanges include allowance of 0.62″ (15.7mm) for sizes 1-10, 0.75″ (19.1mm)for sizes 12-18 and 0.88″ (22.4mm) for size 20.

WELDING NECK (RING-TYPE JOINT)



Unit : mm

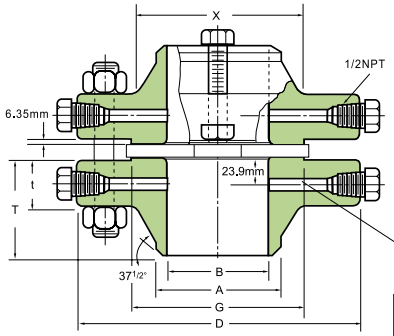
Nominal Pipe Size	Pich Diam. of Ring and Groove	Ring Number	DEPTH OF JACK SCREW SLOT		JACK SCREW SIZE		DRILLING TEMPLATE						
			Raised Face	Ring Joint	Raised Face (inch)	Ring Joint (inch)	Diam. of Bolt Circle	Number of Bolts	Diam. of Stud Bolts (inch)	Diam. of Stud Bolts Holes		Length of Stud Bolts	
	P									RF	RTJ	Raised Face	Ring Joint
1	50.8	R16	9.7	6.4	5/8X4.00	5/8X4.75	88.9	4	5/8	17.5	19.1	127.0	146.1
1 1/4	60.3	R18	9.7	6.4	5/8X4.00	5/8X4.75	98.6	4	5/8	17.5	-	127.0	120.7
1 1/2	68.3	R20	12.7	6.4	3/4X4.25	3/4X5.00	114.3	4	3/4	20.6	22.4	133.4	152.4
2	82.6	R23	9.7	6.4	5/8X4.00	5/8X4.75	127.0	8	5/8	17.5	19.7	127.0	152.4
2 1/2	101.6	R26	12.7	6.4	3/4X4.25	3/4X5.00	149.4	8	3/4	20.6	22.4	133.4	158.8
3	123.8	R31	12.7	6.4	3/4X4.25	3/4X5.00	168.1	8	3/4	20.6	22.4	133.4	158.8
4	149.2	R37	6.4	15.7	3/4X3.00	3/4X4.00	215.9	8	7/8	25.4	25.4	152.4	165.1
5	181.0	R41	6.4	15.7	3/4X3.50	3/4X4.50	266.7	8	1	28.4	28.4	139.7	177.8
6	211.1	R45	12.7	22.4	1X4.00	1X4.50	292.1	12	1	28.4	28.4	177.8	190.5
8	269.9	R49	12.7	22.4	1X4.00	1X4.75	349.3	12	1 1/8	31.8	31.8	196.9	209.6
10	323.9	R53	12.7	22.4	1X4.00	1X5.00	431.8	16	1 1/4	35.1	35.1	222.3	235.0
12	381.0	R57	12.7	22.4	1X4.50	1X5.00	489.0	20	1 1/4	35.1	35.1	228.6	241.3
14	419.1	R61	12.7	22.4	1X5.00	1X5.50	527.1	20	1 3/8	38.1	38.1	241.3	254.0
16	469.9	R65	12.7	22.4	1X5.00	1X5.50	603.3	20	1 1/2	41.1	41.1	260.4	273.1
18	533.4	R69	12.7	22.4	1X5.00	1X5.75	654.1	20	1 5/8	44.5	44.5	297.4	292.1
20	584.2	R73	12.7	22.4	1X6.00	1X6.25	723.9	24	1 5/8	44.5	44.5	298.5	317.5
24	692.2	R77	12.7	22.4	1X6.00	1X7.00	838.2	24	1 7/8	50.8	50.8	336.6	342.9

NOTE :

4. Unless otherwise specified, raised face unions are furnished with alloy bolt studs per ASTM A193 Grade B7 with American Standard heavy series hex nuts ASTM A194 Class 2H.
5. On ring joint flanges having a groove depth 0.375″ (9.5mm) and less, the distance from the center line of the tap hole to the flange face is 0.750″ (19.1mm). When the depth of groofe is 0.438″ (11.1mm) or greater, changes in drill size or method of drilling are necessary.

CLASS 900 / 1500 ORIFICE FLANGES

WELDING NECK
(RAISED FACE)



1/4″ Drill for Sizes 2 1/2″ and Under
3/8″ Drill for Sizes 3″
1/2″ Drill for Sizes 4″ and Over

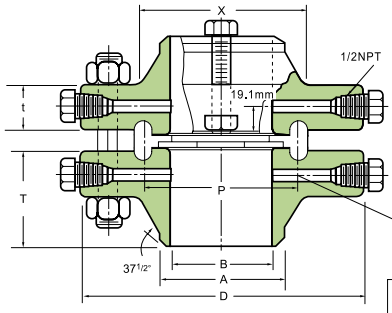
ANSI B 16.36 Forged Flanges

Unit : mm

Nominal Pipe Size	Outside Diam. of Flange	THICKNESS OF FLANGE (t)		Diam. of Hub at Base	Diam. of Raised Base	Diam. of Hub of Bevel	LENGTH THRU HUB (T)				BORE (B)	
							Welding Neck		Slip-on & Threaded			
		Raised Face	Ring Joint				Raised Face	Ring Joint	Raised Face	Ring Joint	Welding Neck	Slip-on
	D			X	G	A						
CLASS 900												
3	241	38.1	38.1	127.0	127.0	88.9	101.6	101.6	53.8	53.8	To bee specified by purchaser	90.7
4	292	44.5	44.5	158.8	157.2	114.3	114.3	114.3	69.9	69.9		116.1
5	349	50.8	50.8	190.5	185.7	141.2	127.0	127.0	79.2	79.2		143.8
6	381	55.6	55.6	235.0	215.9	168.4	139.7	139.7	85.9	85.9		170.7
8	470	63.5	63.5	298.5	269.7	219.2	162.1	162.1	101.6	101.6		221.5
10	546	69.9	69.9	368.3	323.9	273.1	184.2	184.2	108.0	108.0		276.4
12	610	79.2	79.2	419.1	381.0	323.9	200.2	200.2	117.3	117.3		327.2
14	641	85.9	-	450.9	412.8	355.6	212.9	-	-	-		-
16	705	88.9	-	508.0	469.9	406.4	215.9	-	-	-		-
18	787	101.6	-	565.2	533.4	457.2	228.6	-	-	-		-
20	857	108.0	-	622.3	584.2	508.0	247.7	-	-	-		-
24	1041	139.7	-	749.3	692.2	609.6	292.1	-	-	-		-
CLASS 1500												
1	149	38.1	38.1	52.3	50.8	33.5	82.6	82.6	47.8	44.5	To bee specified by purchaser	34.5
1 1/4	158	35.1	35.1	63.5	63.5	42.2	73.2	73.2	47.8	44.5		43.2
1 1/2	178	38.1	38.1	69.9	73.2	48.3	88.9	88.9	47.8	44.5		49.5
2	216	38.1	38.1	104.6	91.9	60.5	101.6	101.6	57.2	57.2		62.0
2 1/2	244	41.1	41.1	124.0	104.6	73.2	104.6	104.6	63.5	63.5		74.7
3	267	47.8	47.8	133.4	127.0	88.9	117.3	117.3	73.2	73.2		90.7
4	311	53.8	53.8	162.1	157.2	114.3	124.0	124.0	90.4	90.4		116.1
5	375	73.2	73.2	196.9	185.7	141.2	155.4	104.6	104.6	104.6		143.8
6	394	82.6	82.6	228.6	215.9	168.4	171.5	171.5	119.1	119.1		170.7
8	483	91.9	91.9	292.1	269.7	219.2	212.9	212.9	142.7	142.7		221.5
10	584	108.0	108.0	368.3	323.9	273.1	254.0	254.0	158.8	158.5		276.4
12	673	124.0	124.0	450.9	381.0	323.9	282.4	282.4	180.8	180.8		327.2
14	749	133.4	-	495.3	412.8	355.6	298.5	-	-	-		-
16	826	146.1	-	552.5	469.9	406.4	311.2	-	-	-		-
18	914	162.1	-	596.9	533.4	457.2	327.2	-	-	-		-
20	984	177.8	-	641.4	584.2	508.0	355.6	-	-	-		-
24	1168	203.2	-	762.0	692.2	609.6	406.4	-	-	-		-

NOTE :
1. For the inside diameter of pipes (corresponding to 'Bore' (B) of Welding Neck Flanges), refer to page 46,47
2. Class 900 Flanges of sizes 1″ (25.4mm) through 2 1/2″ are the same as for Class 1500.
3. Class 900 and 1500 is not included in "thickness' (t) and 'Length through Hub' (t).
4. Each union includes two carbon steel jack screw bolts with hex nuts.

WELDING NECK
(RING-TYPE JOINT)



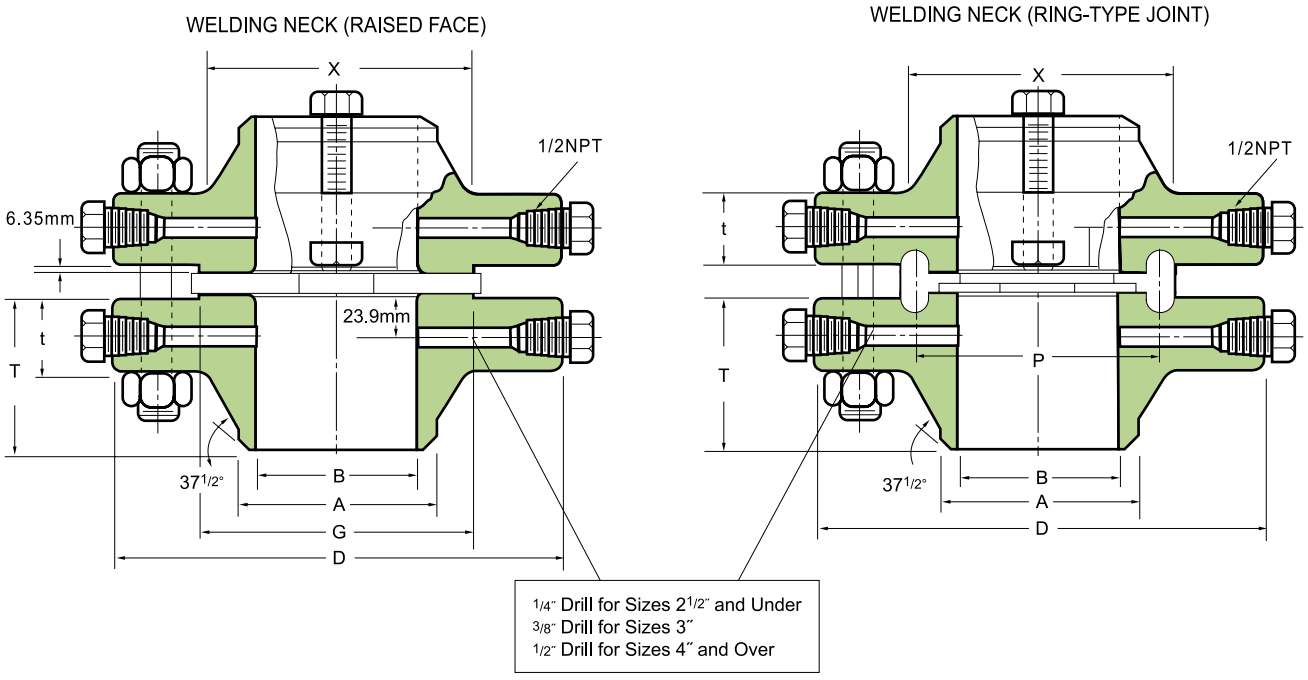
1/4″ Drill for Sizes 2 1/2″ and Under
3/8″ Drill for Sizes 3″
1/2″ Drill for Sizes 4″ and Over

Unit : mm

Nominal Pipe Size	Pich Diam. of Ring and Groove	Ring Number	DEPTH OF JACK SCREW SLOT		JACK SCREW SIZE		DRILLING TEMPLATE					
			Raised Face	Ring Joint	Raised Face (inch)	Ring Joint (inch)	Diam. of Bolt Circle	Number of Bolts	Diam. of Stud Bolts (inch)	Diam. of Bolts Holes	Length of Stud Bolts	
	P										Raised Face	Ring Joint
CLASS 900												
3	123.8	R31	9.7	15.7	3/4X3.50	3/4X4.00	190.5	8	7/8	25.4	152.4	165.1
4	149.2	R37	9.7	15.7	3/4X3.50	3/4X4.50	235.0	8	1 1/8	31.8	177.8	190.5
5	181.0	R41	9.7	15.7	3/4X3.50	3/4X4.50	279.4	8	1 1/4	35.1	190.5	203.2
6	211.1	R45	15.7	22.4	1X4.50	1X4.75	317.5	12	1 1/8	31.8	196.9	209.6
8	269.9	R49	15.7	22.4	1X4.50	1X5.00	393.7	12	1 3/8	38.1	228.6	241.3
10	323.9	R53	15.7	22.4	1X4.50	1X5.25	469.9	16	1 3/8	38.1	241.3	254.0
12	381.0	R57	15.7	22.4	1X4.50	1X5.50	533.4	20	1 3/8	38.1	260.4	273.1
14	-	-	-	-	-	-	558.8	20	1 1/2	41.1	279.4	-
16	-	-	-	-	-	-	616.0	20	1 5/8	44.5	292.1	-
18	-	-	-	-	-	-	685.8	20	1 7/8	50.8	330.2	-
20	-	-	-	-	-	-	749.3	20	2	53.8	355.6	-
24	-	-	-	-	-	-	901.7	20	2 1/2	66.5	444.5	-
CLASS 1500												
1	50.8	R16	6.4	12.7	5/8X3.00	5/8X3.50	101.6	4	7/8	25.4	152.4	158.8
1 1/4	60.3	R18	6.4	12.7	5/8X3.00	5/8X3.50	111.3	4	7/8	25.4	139.7	146.1
1 1/2	68.3	R20	6.4	12.7	5/8X3.00	5/8X3.50	124.0	4	1	28.4	158.8	165.1
2	95.3	R24	6.4	12.7	5/8X3.00	5/8X4.00	165.1	8	7/8	25.4	152.4	165.1
2 1/2	108.0	R27	6.4	12.7	5/8X3.00	5/8X4.00	190.5	8	1	28.4	165.1	177.8
3	136.5	R35	9.7	15.7	5/8X3.50	3/4X4.50	203.2	8	1 1/8	31.8	184.2	196.9
4	161.9	R39	9.7	15.7	5/8X3.50	3/4X4.50	241.3	8	1 1/4	35.1	203.2	215.9
5	193.7	R44	9.7	15.7	5/8X3.50	3/4X4.50	292.1	8	1 1/2	41.1	247.7	260.4
6	211.1	R46	15.8	22.4	1X6.00	1X6.50	317.5	12	1 3/8	38.1	266.7	279.4
8	269.9	R50	15.7	22.4	1X6.50	1X6.50	393.7	12	1 5/8	44.5	298.5	317.5
10	323.9	R54	15.7	22.4	1X6.50	1X7.00	482.6	12	1 7/8	50.8	342.9	362.0
12	381.0	R58	15.7	22.4	1X6.50	1X8.00	571.5	16	2	53.8	381.0	406.4
14	-	-	-	-	-	-	635.0	16	2 1/4	60.5	412.8	-
16	-	-	-	-	-	-	704.9	16	2 1/2	66.5	450.9	-
18	-	-	-	-	-	-	774.7	16	2 3/4	73.2	501.7	-
20	-	-	-	-	-	-	831.9	16	3	79.2	546.1	-
24	-	-	-	-	-	-	990.6	16	3 1/2	91.9	622.3	-

NOTE :
4. Unless otherwise specified, raised face unions are furnished with alloy bolt studs per ASTM A193 Grade B7 with American Standard heavy series hex nuts ASTM A194 Class 2H.
5. On ring joint flanges having a groove depth 0.375″ (9.5mm) and less, the distance from the center line of the tap hole to the flange face is 0.750″ (19.1mm). When the depth of groofe is 0.438″ (11.1mm) or greater, changes in drill size or method of drilling are necessary.
6. Bolt lengths for raised face flanges include allwoance for orifice and gasket thickness of 0.25″ (6.4mm) for sizes 3-12 and 0.38″ (9.7mm) for sizes 14-24. Bolt lengths for ring type joint flanges include allowance of 0.62″ (15.7mm) for sizes 3-10, 0.75″ (19.1mm)for sizes 12-18 and 0.88″ (22.4mm) for size 20.

CLASS 2500 ORIFICE FLANGES



ANSI B 16.36 Forged Flanges

Unit : mm

Nominal Pipe Size	O.D. of Flange Face	O.D. of Raised Flange	THK'S of Hub Min	Length Thru	Diam. of Hub	Diam. of Hub at Bevel	Bore	Ring Type Joing	Ring Number	DRILLING TEMPLATE				LENGTH OF STUD BOLTS	
								Pitch Diam.		Diam. Bolt Circle	Number of Holes	Diam. of Holes	Diam. of Bolts (inch)	Raised Face	Ring Joint
	D	G	t	T	X	A	B	P							
1	159	50.8	38.1	91.9	57.2	33.5	See Note 1. To bee specified by purchaser	60.3	R18	108.0	4	25.4	7/8	152.4	158.8
1 1/2	203	73.2	44.5	111.3	79.2	48.3		82.6	R23	146.1	4	31.8	1 1/8	177.8	190.5
2	235	91.9	50.8	127.0	95.3	60.5		101.6	R26	171.5	8	28.4	1	184.2	196.9
2 1/2	267	104.6	57.2	142.7	114.3	73.2		111.1	R28	196.9	8	31.8	1 1/8	203.2	215.9
3	305	127.0	66.5	168.1	133.4	88.9		127.0	R32	228.6	8	35.1	1 1/4	228.6	241.3
4	356	157.2	76.2	190.5	165.1	114.3		-	-	273.1	8	41.1	1 1/2	260.4	-
6	483	215.9	108.0	273.1	235.0	168.4		-	-	368.3	8	53.8	2	349.3	-
8	552	269.7	127.0	317.5	304.8	219.2		-	-	438.2	12	53.8	2	387.4	-
10	673	323.9	165.1	419.1	374.7	273.1		-	-	539.8	12	66.5	2 1/2	489.0	-
12	762	381.0	184.2	463.6	441.5	323.9		-	-	619.3	12	73.2	2 3/4	539.8	-

NOTE :
1. For the inside diameter of pipes (corresponding to 'Bore' (B) of Welding Neck Flanges), refer to page 46,47
2. Class 2500 Flanges will be furnished with 0.25″ (6.4mm) raised face, which is included in 'Thickness' (t) and 'Length through Hub' (T)
3. Each union includes two carbon steel jack screw bolts with hex nuts.
4. Unless otherwise specified, raised face unions are furnished with alloy bolt studs per ASTM A193 Grade B7 with American Standard heavy series hex nuts ASTM A194 Class 2H.
5. On ring joint flanges having a groove depth 0.375″ (9.5mm) and less, the distance from the center line of the tap hole to the flange face is 0.750″ (19.1mm). When the depth of groove is 0.438″ (11.1mm) or greater, changes in drill size or method of drilling are necessary.
6. Class 2500 Slip-on flanges are not covered by ANSI B16.5.
7. Bolt lengths for raised face flanges include allowance for orifice and gasket thickness of 0.25″ (6.4mm) for sizes 1-12 and 0.38″ (9.7mm) for sizes 14-24. Bolt lengths for ring type joint flanges include allowance of 0.62″ (15.7mm) for sizes 1-6.

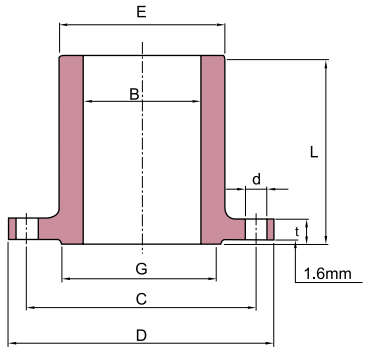
SUPERLOK®

LONG WELDING NECK FLANGES

- Class 150 Flanges
- Class 300 Flanges
- Class 400 Flanges
- Class 600 Flanges
- Class 900 Flanges
- Class 1500 Flanges
- Class 2500 Flanges

LONG WELDING NECK FLANGES

CLASS 150 FLANGES



Unit : mm

Nominal Pipe Size	Outside Diam.	O.D of Raised Face	Hub Diameter of Bevel	Diameter of Bore	Thickness of Flange Min	Length Throuth Hub	DRILLING		
							Diameter of Bolt Circle	Number of Holes	Diameter of Holes
	D	G	E	B	t	L	C		d
1/2	89	34.9	30.2	12.7	11.2	228.6	60.5	4	15.7
3/4	99	42.9	38.1	19.1	12.7	228.6	69.9	4	15.7
1	108	50.8	50.8	25.4	14.2	228.6	79.2	4	15.7
1 1/4	117	63.5	60.5	31.8	15.7	228.6	88.9	4	15.7
1 1/2	127	73.0	66.5	38.1	17.5	228.6	98.6	4	15.7
2	152	91.9	82.6	50.8	19.1	228.6	120.7	4	19.1
2 1/2	178	104.6	95.3	63.5	22.4	228.6	139.7	4	19.1
3	191	127.0	108.0	76.2	23.9	228.6	152.4	4	19.1
3 1/2	216	139.7	124.0	88.9	23.9	228.6	177.8	8	19.1
4	229	157.2	139.7	101.6	23.9	304.8	190.5	8	19.1
5	254	185.7	165.1	127.0	23.9	304.8	215.9	8	22.4
6	279	215.9	196.9	152.4	25.4	304.8	241.3	8	22.4
8	343	269.7	247.7	203.2	28.4	304.8	298.5	8	22.4
10	406	323.9	304.8	254.0	30.2	304.8	362.0	12	25.4
12	483	381.0	365.3	304.8	31.8	304.8	431.8	12	25.4
14	533	412.8	406.4	355.6	35.1	304.8	476.3	12	28.4
16	597	469.9	457.2	406.4	36.6	304.8	539.8	16	28.4
18	635	533.4	508.0	457.2	39.6	304.8	577.9	16	31.8
20	699	584.2	558.8	508.0	42.9	304.8	635.0	20	31.8
24	813	692.2	666.8	609.6	47.8	304.8	749.3	20	35.1

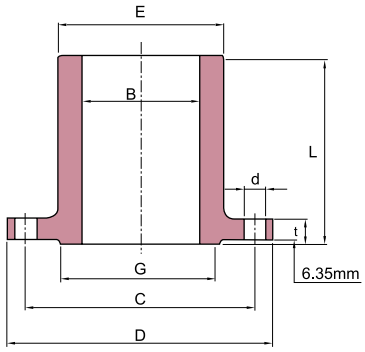
CLASS 300 FLANGES

Unit : mm

Nominal Pipe Size	Outside Diam.	O.D of Raised Face	Hub Diameter of Bevel	Diameter of Bore	Thickness of Flange Min	Length Throuth Hub	DRILLING		
							Diameter of Bolt Circle	Number of Holes	Diameter of Holes
	D	G	E	B	t	L	C		d
1/2	95	35.1	38.1	12.7	14.2	228.6	66.5	4	15.7
3/4	117	42.9	47.8	19.1	15.7	228.6	82.6	4	19.1
1	124	50.8	53.8	25.4	17.5	228.6	88.9	4	19.1
1 1/4	133	63.5	63.5	31.8	19.1	228.6	98.6	4	19.1
1 1/2	155	73.2	69.9	38.1	20.6	228.6	114.3	4	22.4
2	165	91.9	84.1	50.8	22.4	228.6	127.0	8	19.1
2 1/2	191	104.6	100.1	63.5	25.4	228.6	149.4	8	22.4
3	210	127.0	117.3	76.2	28.4	228.6	168.1	8	22.4
3 1/2	229	139.7	133.4	88.9	30.2	228.6	184.2	8	22.4
4	254	157.2	146.1	101.6	31.8	304.8	200.2	8	22.4
5	279	185.7	177.8	127.0	35.1	304.8	235.0	8	22.4
6	318	215.9	206.2	152.4	36.6	304.8	269.7	12	22.4
8	381	269.7	260.4	203.2	41.1	304.8	330.2	12	25.4
10	445	323.9	320.5	254.0	47.8	304.8	387.4	16	28.4
12	521	381.0	374.7	304.8	50.8	304.8	450.9	16	31.8
14	584	412.8	425.5	355.6	53.8	304.8	514.4	20	31.8
16	648	469.9	482.6	406.4	57.2	304.8	571.5	20	35.1
18	711	533.4	533.4	457.2	60.5	304.8	628.7	24	35.1
20	775	584.2	587.2	508.0	63.5	304.8	685.8	24	35.1
24	914	692.2	701.5	609.6	69.9	304.8	812.8	24	41.1

NOTE : 1. Bore (B) is the same as nominal pipe size.
2. Welding necks longer than listed are available in all sizes on special order.

CLASS 400 FLANGES



Unit : mm

Nominal Pipe Size	Outside Diam.	O.D of Raised Face	Hub Diameter of Bevel	Diameter of Bore	Thickness of Flange Min	Length Throuth Hub	DRILLING		
							Diameter of Bolt Circle	Number of Holes	Diameter of Holes
	D	G	E	B	t	L	C		d
1/2	Use Class 600 dimensions in these sizes.								
3/4									
1									
1 1/4									
1 1/2									
2									
2 1/2									
3									
3 1/2									
4	254	157.2	146.1	101.6	35.1	304.8	200.2	8	25.4
5	279	185.7	177.8	127.0	38.1	304.8	235.0	8	25.4
6	318	215.9	206.2	152.4	41.1	304.8	269.7	12	25.4
8	381	269.7	260.4	203.2	47.8	304.8	330.2	12	28.4
10	445	323.9	320.5	254.0	53.8	304.8	387.4	16	31.8
12	521	381.0	374.7	304.8	57.2	304.8	450.9	16	35.1
14	584	412.8	425.5	355.6	60.5	304.8	514.4	20	35.1
16	648	469.9	482.6	406.4	63.5	304.8	571.5	20	38.1
18	711	533.4	533.4	457.2	66.5	304.8	628.7	24	38.1
20	775	584.2	587.2	508.0	69.9	304.8	685.8	24	41.1
24	914	692.2	701.5	609.6	76.2	304.8	812.8	24	47.8

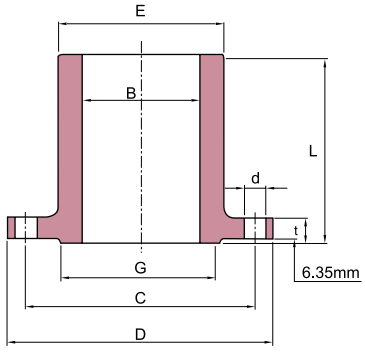
CLASS 600 FLANGES

Unit : mm

Nominal Pipe Size	Outside Diam.	O.D of Raised Face	Hub Diameter of Bevel	Diameter of Bore	Thickness of Flange Min	Length Throuth Hub	DRILLING		
							Diameter of Bolt Circle	Number of Holes	Diameter of Holes
	D	G	E	B	t	L	C		d
1	124	50.8	53.8	25.4	17.5	228.6	88.9	4	19.1
1 1/4	133	63.5	63.5	31.8	20.6	228.6	98.6	4	19.1
1 1/2	155	73.2	69.9	38.1	22.4	228.6	114.3	4	22.4
2	165	91.9	84.1	50.8	25.4	228.6	127.0	8	19.1
2 1/2	191	104.6	100.1	63.5	28.4	228.6	149.4	8	22.4
3	210	127.0	117.3	76.2	31.8	228.6	168.1	8	22.4
3 1/2	229	139.7	133.4	88.9	35.1	228.6	184.2	8	25.4
4	273	157.2	152.4	101.6	38.1	304.8	215.9	8	25.4
5	330	185.7	190.5	127.0	44.5	304.8	266.7	8	28.4
6	356	215.9	222.3	152.4	47.8	304.8	292.1	12	28.4
8	419	269.7	273.1	203.2	55.6	304.8	349.3	12	31.8
10	508	323.9	342.9	254.0	63.5	304.8	431.8	16	35.1
12	559	381.0	400.1	304.8	66.5	304.8	489.0	16	35.1
14	603	412.8	431.8	355.6	69.9	304.8	527.1	20	38.1
16	686	469.9	495.3	406.4	76.2	304.8	603.3	20	41.1
18	743	533.4	546.1	457.2	82.6	304.8	654.1	20	44.5
20	813	584.2	609.6	508.0	88.9	304.8	723.9	24	44.5
24	940	692.2	717.6	609.6	101.6	304.8	838.2	24	50.8

NOTE : 1. Bore (B) is the same as nominal pipe size.
2. Welding necks longer than listed are available in all sizes on special order.

CLASS 900 FLANGES



Unit : mm

Nominal Pipe Size	Outside Diam.	O.D of Raised Face	Hub Diameter of Bevel	Diameter of Bore	Thickness of Flange Min	Length Throuth Hub	DRILLING		
							Diameter of Bolt Circle	Number of Holes	Diameter of Holes
	D	G	E	B	t	L	C		d
1	Use Class 1500 dimensions in these sizes.								
1 1/4									
1 1/2									
2									
2 1/2									
3	241	127.0	127.0	76.2	38.1	304.8	190.5	8	22.4
4	292	157.2	158.8	101.6	44.5	304.8	235.0	8	31.8
5	349	185.7	190.5	127.0	50.8	304.8	279.4	8	35.1
6	381	215.9	235.0	152.4	55.6	304.8	317.5	12	31.8
8	470	269.7	298.5	203.2	63.5	304.8	393.7	12	38.1
10	546	323.9	368.3	254.0	69.9	406.4	469.9	16	38.1
12	610	381.0	419.1	304.8	79.2	406.4	533.4	20	38.1
14	641	412.8	450.9	355.6	85.9	To be specified by Purchaser.	558.8	20	41.1
16	705	469.9	508.0	406.4	88.9		616.0	20	44.5
18	787	533.4	565.2	457.2	101.6		685.8	20	50.8
20	857	584.2	622.3	508.0	108.0		749.3	20	53.8
24	1041	692.2	749.3	609.6	139.7		901.7	20	66.5

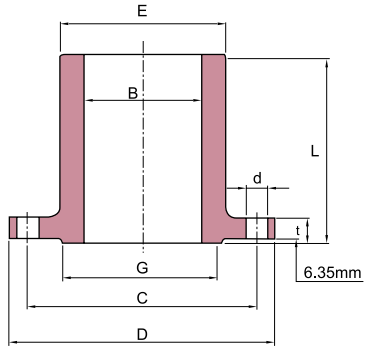
CLASS 1500 FLANGES

Unit : mm

Nominal Pipe Size	Outside Diam.	O.D of Raised Face	Hub Diameter of Bevel	Diameter of Bore	Thickness of Flange Min	Length Throuth Hub	DRILLING		
							Diameter of Bolt Circle	Number of Holes	Diameter of Holes
	D	G	E	B	t	L	C		d
1	149	50.8	52.4	25.4	28.4	228.6	101.6	4	25.4
1 1/4	159	63.5	63.5	31.8	28.4	228.6	111.3	4	25.4
1 1/2	178	73.2	69.9	38.1	31.8	228.6	124.0	4	28.4
2	216	91.9	104.6	50.8	38.1	228.6	165.1	8	25.4
2 1/2	244	104.6	124.0	63.5	41.1	304.8	190.5	8	28.4
3	267	127.0	133.4	76.2	47.8	304.8	203.2	8	31.8
4	311	157.2	162.1	101.6	53.8	304.8	241.3	8	35.1
5	375	185.7	196.9	127.0	73.2	304.8	292.1	8	41.1
6	394	215.9	228.6	152.4	82.6	304.8	317.5	12	38.1
8	483	269.7	292.1	203.2	91.9	304.8	393.7	12	44.5
10	584	323.9	368.3	254.0	108.0	406.4	482.6	12	50.8
12	673	381.0	450.9	304.8	124.0	406.4	571.5	16	53.8
14	749	412.8	495.3	355.6	133.4	To be specified by Purchaser.	635.0	16	60.5
16	826	469.9	552.5	406.4	146.1		704.9	16	66.5
18	914	533.4	596.9	457.2	162.1		774.7	16	73.2
20	984	584.2	641.4	508.0	177.8		831.9	16	79.2
24	1168	692.2	762.0	609.6	203.2		990.6	16	91.9

NOTE : 1. Bore (B) is the same as nominal pipe size.
2. Welding necks longer than listed are available in all sizes on special order.

CLASS 2500 FLANGES



Unit : mm

Nominal Pipe Size	Outside Diam.	O.D of Raised Face	Hub Diameter of Bevel	Diameter of Bore	Thickness of Flange Min	Length Throuth Hub	DRILLING		
							Diameter of Bolt Circle	Number of Holes	Diameter of Holes
	D	G	E	B	t	L	C		d
1	159	50.8	57.2	25.4	35.1	228.6	108.0	4	25.4
1 1/4	184	63.5	73.2	31.8	38.1	228.6	130.0	4	28.4
1 1/2	203	73.2	79.2	38.1	44.5	228.6	146.1	4	31.8
2	235	91.9	95.3	50.8	50.8	228.6	171.5	8	28.4
2 1/2	267	104.6	114.3	63.5	57.2	304.8	196.9	8	31.8
3	305	127.0	133.4	76.2	66.5	304.8	228.6	8	35.1
4	356	157.2	165.1	101.6	76.2	304.8	273.1	8	41.1
5	419	185.7	203.2	127.0	91.9	304.8	323.9	8	47.8
6	483	215.9	235.0	152.4	108.0	304.8	368.3	8	53.8
8	552	269.7	304.8	203.2	127.0	304.8	438.2	12	53.8
10	673	323.9	374.7	254.0	165.1	406.4	539.8	12	66.5
12	762	381.0	441.5	304.8	184.2	406.4	619.3	16	73.2

GUIDE TO MATERIAL LAYOUT & SPECIFICATIONS

Pipe	Weld Fittings	Screwed & Scoket Fittings	Flanges	Valves
A-53	A-234 WPB	A-105, A-181 Gr. 60 or 70	A-105, A-181 Gr. 60 or 70	A-105 A-216 WCB
A-106B	A-234 WPB	A-105, Gr. 60 or 70	A-105, Gr. 60 or 70	A-105 A-216 WCB
A-312 T304	A-403 WP-304	A-182 F-304	A-182 F-304	A-182 F-304 CMO
A-312 T316	A-403 WP-316	A-182 F-316	A-182 F-316	A-182 F-316 CM 8MO
A-333 Gr. 1or6	A-420 WPL 1&6	A-350 LF-1	A-350 LF-1	A-350 LF-1 A-352 LCB
A-333 Gr. 3	A-420 WPL-3	A-350 LF-3	A-350 LF-3	A-350 LF-3 A-352 LC3
A-335 P-1	A-234 WP-1	A-182 F-1	A-182 F-1	A-217 WC-6
A-335 P-11	A-234 WP-11	A-182 F-11	A-182 F-11	A-182 F-11 A-217 WC-6
A-335 P-12	A-234 WP-12	A-182 F-12	A-182 F-12	A-217 WC-6
A-335 P-22	A-234 WP-22	A-182 F-22	A-182 F-22	A-182 F-22 A-217 WC-9
A-335 P-5	A-234 WP-5	A-182 F-5	A-182 F-5	A-182 F-5 A-216 WC-5
A-335 P-7	A-234 WP-7	A-182 F-7	A-182 F-7	A-182 F-7 A-217 WC-12
A-335 P-9	A-234 WP-9	A-182 F-9	A-182 F-9	A-182 F-9 A-217 WC-12

NOTE : 1. Bore (B) is the same as nominal pipe size.
2. Welding necks longer than listed are available in all sizes on special order.

REDUCING FLANGES

Threaded and Slip-on Types

■ HUB

For hub diameter (X) and height of hub above the back of the flange (N) refer to the list of standard flange specification of the same type and pressure and use the dimensions of a flange one nominal pipe size smaller than the nominal pipe size from which the reduction is being made.

■ FLANGE O.D., DRILLING TEMPLATE AND THICKNESS

Outside diameter, drilling template and flange thickness Q(See note on FACINGS) agree with the dimensions of a standard flange of the nominal pipe size from which the reduction is being made.

■ FACING

Facing dimensions also agree with the dimensions of a standard flange of the nominal pipe size from which the reduction is being made.
150 lb. and 300 lb. forged steel Threaded, Slip-On, Welding Neck and Blind flanges are furnished with American Standard 1/16" raised face which is included in flange thickness. Q. 400 lb., 600 lb., 900 lb., 1500 lb., 1500 lb. and 2500 lb. flange are supplied with American Standard 1/4" raised face which is not included in flange thickness (Q)

■ BORE OR TAPPING

The bore or tapping is machined to accept a pipe of the nominal pipe size to which the reduction is being made. For reduction to size smaller than shown, BLIND FLANGE are tapped or bored to specified nominal pipe size.

EXAMPLE :

A 300 lb. threaded flange used in reducing from a 6″ (152.4mm) to 3″(76.2mm) nominal pipe size should be specified as a 3″ (76.2mm) x 12 1/2″ - 300 lb. Threaded Reducing Flange. It would have the following dimensional characteristics :

Diameter of Hub (X) - 7″(177.8mm).
Height of Hub (N) - 5/8″.

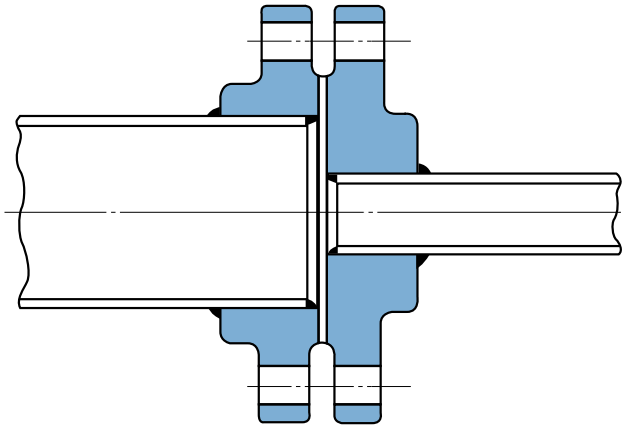
Hub dimensions are those of a 5″(127.0mm), 300lb, Standard flange.
Outside Diameter - 12 1/2″
Thickness (Q) - 1 7/16″
Raised face - 1/16″.
O.D., Flange Thickness Q., Raised Face and Drilling Template are those of a 6″(152.4mm), 300lb. Standard Flange.
Tapping - 3″(76.2mm) I.P.S.
Flange is tapped to the nominal pipe size to which reduction is being made.

WELDING NECK TYPES

On Reducing Welding Neck Flanges. which are made only on special order, the hub dimensions agree with the hub dimensions of standard flanges of the size to which reduction is being made. Other flange dimensions, including the drilling template, agree with the standard dimensions of the size from which the reduction is being made.

REDUCING FLANGES

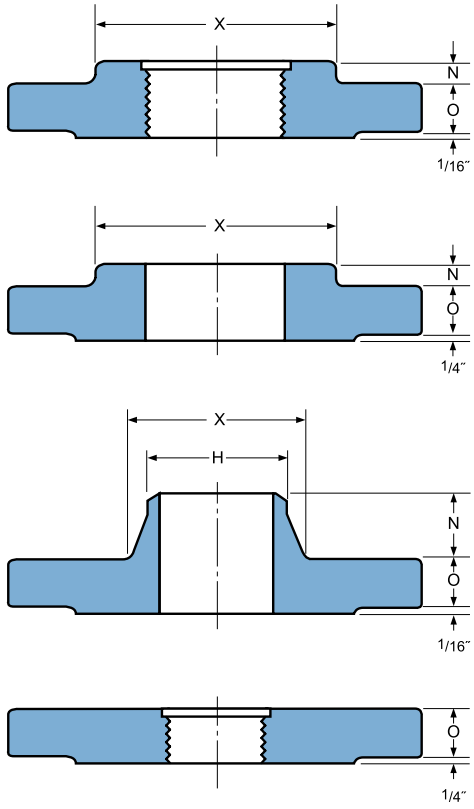
Threaded-Slip-on-Welding neck



In ordering Reducing Flanges : specify (1) nominal pipe size of the tapping or bore to which the reduction is being made.
(2) the outside diameter of the flange from which the reduction is being made and (3) pressure rating.

EXAMPLE :

A 300 lb. Reducing flange for reducing from a 6″ (152.4mm) to a 3″(76.2mm) nominal pipe size should be designated as a 3″ (76.2mm) x 12 1/2″ - 300 lb. Reducing Flange. Whether Threaded, Slip-On, or Welding Neck type is desired must also be specified.



ANSI B 16.5 Forged Flanges

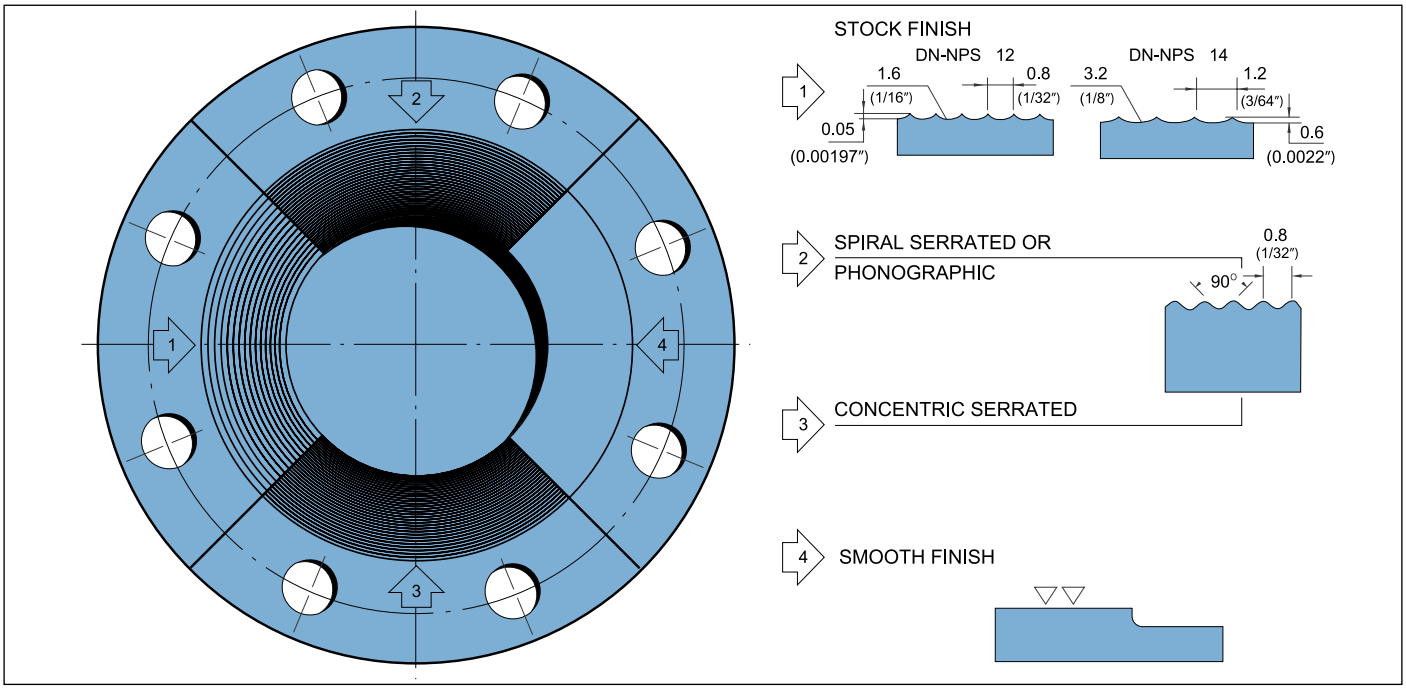
Dimensions inches.

Nominal Pipe size to Which Reduction is to be Maed to be Specified by Purchaser	Nominal Flange	OUTSIDE DIAMETER OF FLANGE FROM WHICH REDUCTION IS BEING MADE							Samallest Size Bore or Tapping Requiring Hub Flange
		150 lb. Standard	300 lb. Standard	400 lb. Standard	600 lb. Standard	900 lb. Standard	1500 lb. Standard	2500 lb. Standard	
	3/4	3 7/8	4 5/8	4 5/8	4 5/8	5 1/8	5 1/8	5 1/2	1/2
	1	4 1/4	4 7/8	4 7/8	4 7/8	5 7/8	5 7/8	6 1/4	1/2
	1 1/4	4 5/8	5 1/4	5 1/4	5 1/4	6 1/4	6 1/4	7 1/4	1/2
	1 1/2	5	6 1/8	6 1/8	6 1/8	7	7	8	1/2
	2	6	6 1/2	6 1/2	6 1/2	8 1/2	8 1/2	9 1/4	1
	2 1/2	7	7 1/2	7 1/2	7 1/2	9 5/8	9 5/8	10 1/2	1 1/4
	3	7 1/2	8 1/4	8 1/4	8 1/4	9 1/2	10 1/2	12	1 1/4
	3 1/2	8 1/2	9	9	9	-	-	-	1 1/2
	4	9	10	10	10 3/4	11 1/2	12 1/4	14	1 1/2
	5	10	11	11	13	13 3/4	14 3/4	16 1/2	1 1/2
	6	11	12 1/2	12 1/2	14	15	15 1/2	19	2 1/2
	8	13 1/2	15	15	16 1/2	18 1/2	19	21 3/4	3
	10	16	17 1/2	17 1/2	20	21 1/2	23	26 1/2	3 1/2
	12	19	20 1/2	20 1/2	22	24	26 1/2	30	3 1/2
	14	21	23	23	23 3/4	25 1/4	-	-	3 1/2
	16	23 1/2	25 1/2	25 1/2	27	27 3/4	-	-	4
	18	25	28	28	29 1/4	31	-	-	4
	20	27 1/2	30 1/2	30 1/2	32	33 3/4	-	-	4
	24	32	36	36	37	41	-	-	4

NOTE :
For reductions to size smaller than shown, blind flange are tapped or bored for specified nominal pipe size.

STANDARD FINISH

Standard Finishes for Face of Flange(ANSI B16.5)



STOCK FINISH : The most widely used of any gasket finish, because, practically, is suitable for all ordinary service conditions. This is a continuous spiral groove. Flanges sizes 12″ (304.8mm) and smaller, are produced with a 1/16″ round nosed tool at a feed of 1/32″ per revolution. For sizes 14″ (355.6mm) and larger, the finish is made with 1/8″ round-nosed tool at a feed of 3/64″ per revolution.

SPIRAL SERRATED OR PHONOGRAPHIC : This finish is produced by using a 90° round nosed tool.

CONCENTRIC SERRATED : This finish is produced by using a 90° round nosed tool.

SMOOTH FINISH : The cutting tool employed shall have an approximate 0.06″ radius. The resultant surface finish shall have a 125 μ inch to 250 μ inch (ANSI B 16.5 para 6, 4, 4)

■ RAISED FACE, AND LARGE MALE AND FEMALE

Either a serrated-concentric or serrated-spiral finish having from 45 to 55 grooves per inch is used. The cutting tool empolyed has an approximate 0.06 in, radius. The resultant surface finish shall have a 125 μ inch (3.2㎛), to 250 μ inch (6.4㎛) approximate roughness.

■ TONGUE AND GROOVE, AND SMALL MALE AND FEMALE

The gasket contact surface does not exceed 125 μ in (3.2㎛) roughness.

■ RING JOINT

The inside wall surface of gasket groove does not exceed 63 μ in (1.6㎛) roughness.

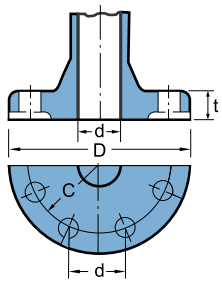
■ BLIND

Blind flanges need not be faced in the center if, when this center part is raised, its diameter is at least 1 in smaller than the inside diameter of fittings of the corresponding pressure class. When the center part is depressed, its diameter is not greater than the inside diameter of the corresponding pressure class fittings. Maching of the depressed center is not required.

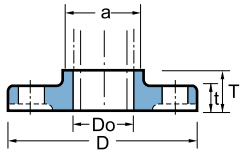
TOLERANCE

ANSI B16.5 Forged Flanges

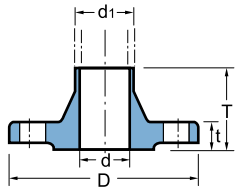
SOLID FANAGE



SLIP-ON FLANGE

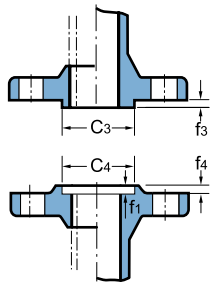


WELDING NECK FLANGE

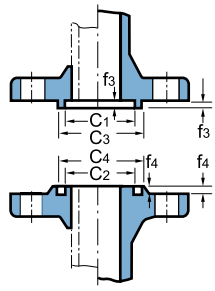


TYPE OF GASKET SURFACE

MALE & FEMEALE TYPE



TONGUE & GROOVE TYPE



THREADED, SOCKET-WELDING, SLIP-ON, LAP JOINT AND BLIND

Outside Diameter	When O.D. is 24″ or less	±1 1/16″ (1.6mm)*
	When O.D. is Over 24″	±1/8″ (3.2mm)*
Inside Diameter	Threaded	Within limits on boring gauge
	Socket-Welding, Slip-on and Lap joint	10″ & Smaller +1/32″ (0.8mm), -0″ 12″ & Larger +1/16″ (1.6mm), -0″
Outside Diameter of Hub	5″ and Smaller	+3/32″ (2.4mm)* -1/32″ (0.8mm)
	6″ and Larger	+5/32″ (4.0mm) -1/32″ (0.8mm)
Diameter of Contact Face	1/16″ Raised Face	+1/32″ (0.8mm)
	1/4″ Raised Face Tongue & Groove Male, Female	+1/64″ (0.4mm)
Daimeter of Counterbore	Same as for Inside Daimeter	
Drilling	Bolt Circle	±1/16″ (1.6mm)
	Bolt Hole Spacing	±1/32″ (0.8mm)
	Eccentricity of Bolt Circle with Respect to Facing	2 1/2″ & Smaller 1/32″ (0.8mm) Max. 3″ & Larger 1/16″ (1.6mm) Max.
	Eccentricity of Bolt Circle with Respect to Bore	1/32″ (0.8mm) Max.*
	Eccentricity of Facing with Respect to Bore	1/32″ (0.8mm) Max.*
Thickness	18 ″and Smaller	+1/8″ (3.2mm), -0″
	20″ and Larger	+3/16″ (4.8mm), -0″
Length Thru Hub	10″ and Smaller	±1/16″ (1.6mm)
	12″ and Larger	±1/8″ (3.2mm)

NOTE : * This tolerance is not covered in ANSI B16.5, but maker's option

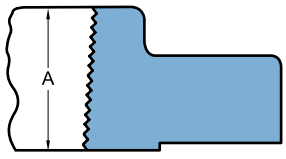
WELDING NECK

Outside Diameter	When O.D. is 24″ or less	±1 1/16″ (1.6mm)*
	When O.D. is Over 24″	±1/8″ (3.2mm)*
Inside Diameter	10″ and Smaller	±1/32″ (0.8mm)
	12″ thru 18″	±1/16″ (1.6mm)
	20″ and Larger	+1/8″ (3.2mm) -1/16″ (1.6mm)
Diameter of Contact Face	1/16″ Raised Face	±1/32″ (0.8mm)
	1/4″ Raised Face Tongue &Groove Male, Female	+1/64″ (0.4mm)
Diameter of Hub at Base	When Hub Base is 24″ or Smaller	±1/16″ (1.6mm)
	When Hub Base is Over 24″	±1/8″ (3.2mm)
Daimeter of Hub at Point of Welding	5″ and Smaller	+3/32″ (2.4mm) -1/32″ (0.8mm)
	6″ and Larger	+5/32″ (4.0mm) -1/32″ (0.8mm)
Drilling	Bolt Circle	±1/16″ (1.6mm)
	Bolt Hole Spacing	±1/32″ (0.8mm)
	Eccentricity of Bolt Circle with Respect to Facing	2 1/2″ & Smaller 1/32″ (0.8mm) Max. 3″ & Larger 1/16″ (1.6mm) Max.
	Eccentricity of Bolt Circle with Respect to Bore	1/32″ (0.8mm) Max.*
	Eccentricity of Facing with Respect to Bore	1/32″ (0.8mm) Max.*
Thickness	18″ and Smaller	+1/8″ (3.2mm), -0″
	20″ and Larger	+3/16″ (4.8mm), -0″
Length Thru Hub	4″ and Smaller	±1/16″ (1.6mm)
	5″ ~ 10″	+1.6 ~ 3.0mm
	12″ and Larger	+3.0 ~ 5.0mm

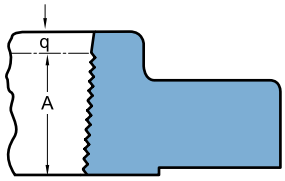
NOTE : * This tolerance is not covered in ANSI B16.5, but maker's option

THREAD

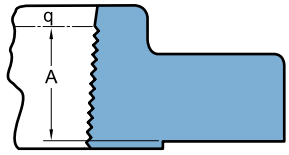
Thread and Standards for ANSI Flanges (ANSI B2.1)



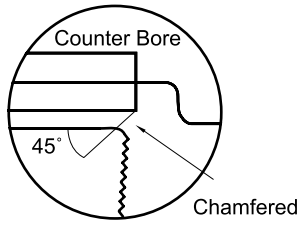
CLASS 150 Standard
with 1.6mm Raised Face

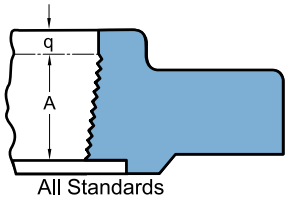


CLASS 300 Standard
with 1.6mm Raised Face

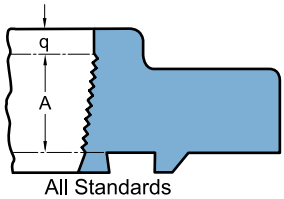


CLASS 400 Standard
and Heavier
with 6.35mm Raised or Male Face

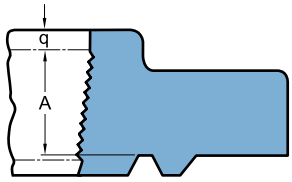




All Standards
with Female Face



All Standards
with Groove Face



All Standards
with Ring Joint Face

ANSI B 16.5 Forged Flanges

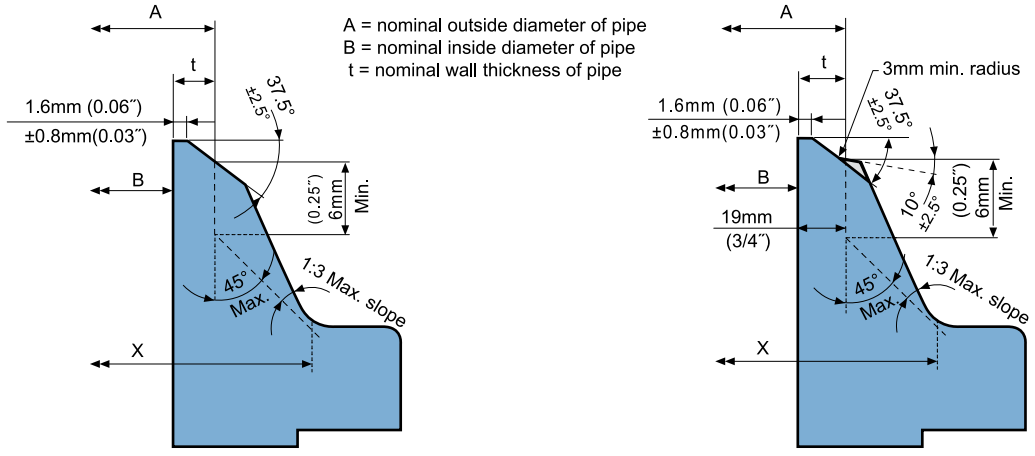
Unit : mm

Nominal Pipe Size	A-THREAD LENGTHS						
	Class 150	Class 300	Class 400	Class 600	Class 900	Class 1500	Class 2500
1/2	15.9	15.9	15.9	15.9	22.2	22.2	28.6
3/4	15.9	15.9	15.9	15.9	25.4	25.4	31.8
1	17.5	17.5	17.5	17.5	28.6	28.6	34.9
1 1/4	20.7	20.7	20.7	20.7	30.2	30.2	38.1
1 1/2	22.2	22.2	22.2	22.2	31.8	31.8	44.5
2	25.4	28.6	28.6	28.6	38.1	38.1	50.8
2 1/2	28.6	31.8	31.8	31.8	47.6	47.6	57.2
3	30.1	31.8	34.9	34.9	41.3	50.8	63.5
3 1/2	31.8	36.5	39.7	39.7	-	-	-
4	33.4	36.5	36.5	41.3	47.6	57.2	69.9
5	36.5	42.9	42.9	47.6	54.0	63.5	76.2
6	39.7	46.1	46.1	50.8	57.2	69.9	82.6
8	44.5	50.8	50.8	60.3	63.5	76.2	95.3
10	49.2	55.6	55.6	65.1	71.5	84.2	108.0
12	55.6	60.3	60.3	69.9	76.2	92.1	120.7
14	57.2	63.5	63.5	73.0	82.6	-	-
16	63.5	68.3	68.3	77.8	85.7	-	-
18	68.3	69.9	69.9	79.4	88.9	-	-
20	69.9	73.0	73.0	82.6	92.1	-	-
24	82.6	82.6	82.6	92.1	101.6	-	-

NOTE :
1. Except flanges with Small Male / Female face (on pipe end), threaded flanges, have an American National Standard taper pipe thread conforming to ANSI B2.1
2. The thread is concentric with the axis of the flange and variations in alignment do not exceed 0.06˝(1.6mm)in, per foot (05. percent).
3. Class 150 flanges are made without counterbore. The threads are chamfered approximately to the major diameter of the thread at the back of the flange at an angle of approximately 45 degrees with the axis of the thread. The chamfer is concentrid with the thread and included in the measurement of the thread length.
4. Class 300 and higher pressure flanges are made with a counterbore at the back of the flange. The threads are chamfered to the diameter of the counterbore at an angle of approximately 45 degrees with the axis of the thread. The counterbore and chamfer are concentric with the thread.
5. The minimum length of effective thread in reducing flanges is at least equal to dimension Q of the corresponding class of threaded flange as shwon in the above table. Threads do not necessarily extend to the face to the flange.

WELDING ENDS

ANSI B16.5 Forged Flanges

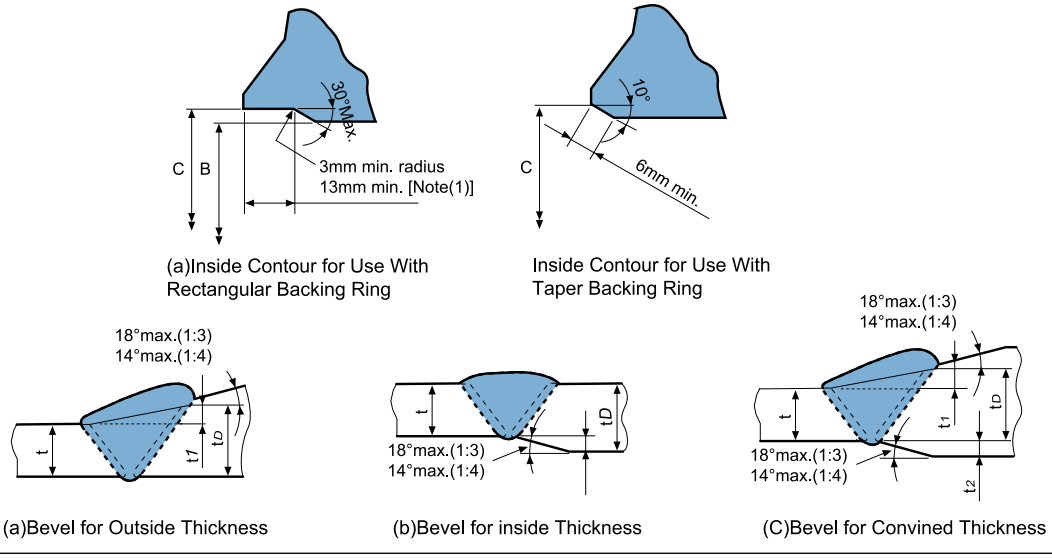


Notes :

When the thickness of the hub at the bevel is greater than that of the pipe to which the flange is joined and the additional thickness is proveded on the outside diameter, a taper weld having a slop not exceeding 1 to 3 may be employed or, alternatively, the greater outside diameter may be tapered, at the same maximum slope or less, from a point on the welding bevel equal th the O.D. at the mating pipe. Similarly, when the greater thickness is provided on the inside of the flange, it shall be taper-bored from the welding end at a slope not exceeding 1 to 3

When flanges covered by this standard are intended for services with light wall, higher strength pipe, the thickness of the hub at the bevel may be greater than that of the pipe to which the flange is joined. Under these conditions a single taper hub may be provided and the outside diameter of the hub at the base (Dimension X) may also be modified.

The additional thickness may be provided on either inside or outside or partially on each side, but the total additional thickness shall not exceed on-half times the nominal wall thickness of intended mating pipe



Notes :

(1) When the materials joined have equal minimum specified yield strength, there shall be no restriction on the minimum slope.
(2) Neither t1, t2, t3 nor their sum (t1 + t2) shall exceed 0.5t
(3) When the minimum specified yield strengths of the sections to be joined are unequal, the value of to shall at least equal t time the ratio of minimum specified yield strength of the pipe to minimum specified yield strength of the flange.

PIPE&FITTINGS WALL THICKNESS SCHEDULES DIMENSION

Nominal Pipe Size		Outside Diam.	Wall I.D.	Nominal Wall Thickness (Stainless steel)					Nominal Wall Thickness (Carbon & Low Alloy Steel)			
A	B			S5S*	S10S*	S20S	S40S	S80S	S5	S10	S20	S30
6	1/8	10.3	W.T	-	1.24	-	1.73	2.41	-	1.24	-	1.45
			I.D	-	7.82	-	6.84	5.48	-	7.82	-	7.40
8	1/4	13.7	W.T	-	1.65	-	2.24	3.02	-	1.65	-	1.85
			I.D	-	10.40	-	9.22	7.66	-	10.40	-	10.00
10	3/8	17.1	W.T	-	1.65	-	2.31	3.20	-	1.65	-	1.85
			I.D	-	13.80	-	12.48	10.70	-	13.80	-	13.40
15	1/2	21.3	W.T	1.65	2.11	-	2.77	3.73	1.65	2.11	-	2.41
			I.D	18.00	17.08	-	15.76	13.84	18.00	17.08	-	16.48
20	3/4	26.7	W.T	1.65	2.11	-	2.87	3.91	1.65	2.11	-	2.41
			I.D	23.40	22.48	-	20.96	18.88	23.40	22.48	-	21.88
25	1	33.4	W.T	1.65	2.77	-	3.38	4.55	1.65	2.77	-	2.90
			I.D	30.10	27.86	-	26.64	24.30	30.10	27.86	-	27.60
32	1 1/4	42.2	W.T	1.65	2.77	-	3.56	4.85	1.65	2.77	-	2.97
			I.D	38.90	36.66	-	35.08	32.50	38.90	36.66	-	36.26
40	1 1/2	48.3	W.T	1.65	2.77	-	3.68	5.08	1.65	2.77	-	3.18
			I.D	45.00	42.76	-	40.94	38.14	45.00	42.76	-	41.94
50	2	60.3	W.T	1.65	2.77	-	3.91	5.54	1.65	2.77	-	3.18
			I.D	57.00	54.76	-	52.48	49.22	57.00	54.76	-	53.94
65	2 1/2	73.0	W.T	2.11	3.05	-	5.16	7.01	2.11	3.05	-	4.78
			I.D	68.78	66.90	-	62.68	58.98	68.78	66.90	-	63.44
80	3	88.9	W.T	2.11	3.05	-	5.49	7.62	2.11	3.05	-	4.78
			I.D	84.68	82.80	-	77.92	73.66	84.68	82.80	-	79.34
90	3 1/2	101.6	W.T	2.11	3.05	-	5.74	8.08	2.11	3.05	-	4.78
			I.D	97.38	95.50	-	90.12	85.44	97.38	95.50	-	92.04
100	4	114.3	W.T	2.11	3.05	-	6.02	8.56	2.11	3.05	-	4.78
			I.D	110.08	108.20	-	102.26	97.18	110.08	108.20	-	104.74
125	5	141.3	W.T	2.77	3.40	-	6.55	9.53	2.77	3.40	-	-
			I.D	135.76	134.50	-	128.20	122.24	135.76	134.50	-	-
150	6	168.3	W.T	2.77	3.40	-	7.11	10.97	2.77	3.40	-	-
			I.D	162.76	161.50	-	154.08	146.36	162.76	161.50	-	-
200	8	219.1	W.T	2.77	3.76	-	8.18	12.70	2.77	3.76	6.35	7.04
			I.D	213.56	211.58	-	202.74	193.70	213.56	211.58	20.640	205.02
250	10	273.1	W.T	3.40	4.19	-	9.27	12.70	3.40	4.19	6.35	7.80
			I.D	266.30	264.72	-	254.56	247.70	266.30	264.72	260.40	257.50
300	12	323.9	W.T	3.96	4.57	-	9.53	12.70	3.96	4.57	6.35	8.38
			I.D	315.98	314.76	-	304.84	298.50	315.98	314.76	311.20	307.14
350	14	355.6	W.T	3.96	4.78	-	9.53	12.70	3.96	6.35	7.92	9.53
			I.D	347.68	346.04	-	336.54	330.20	347.68	342.90	339.76	336.54
400	16	406.4	W.T	4.19	4.78	-	9.53	12.70	4.19	6.35	7.92	9.53
			I.D	398.02	396.84	-	387.34	381.00	398.02	393.70	390.56	387.34
450	18	457.0	W.T	4.19	4.78	-	9.53	12.70	4.19	6.35	7.92	11.13
			I.D	448.62	447.44	-	437.94	431.60	448.62	444.30	441.16	434.74
500	20	508.0	W.T	4.78	5.54	7.90	9.53	12.70	4.78	6.35	9.53	12.70
			I.D	498.44	496.62	492.20	488.94	482.60	498.44	495.30	488.94	482.60
550	22	559.0	W.T	4.78	5.54	-	-	-	4.78	6.35	9.53	12.70
			I.D	549.44	547.92	-	-	-	549.44	546.30	539.34	533.60
600	24	610.0	W.T	5.54	6.35	-	9.53	12.70	5.54	6.35	9.53	14.27
			I.D	598.92	597.30	-	590.94	584.60	598.92	597.30	590.94	581.46

● Carbon & Low Alloy Steel (B36.10M)

The wall thickness shown represent nominal or average wall dimensions which are subject to a-12 1/2% mill tolerance.
Note that schedule 40 in. size 12″ (304.8mm) and larger and that schedule 80 in. seze 10″ (254mm) and larger do not agree with schedules 40S and 80S of ANSI B36.19 nor with standard weight and extra strong respectively.

ASME B36.10M & ASME B36.19M - 2004

-Nominal Wall Thickness (Carbon & Low Alloy Steel)-										Outside Diam.	Nominal Pipe Size	
STD	S40	S60	XS	S80	S100	S120	S140	S160	XXS		A	B
1.73	1.73	-	2.41	2.41	-	-	-	-	-	10.3	6	1/8
6.84	6.84	-	5.48	5.48	-	-	-	-	-			
2.24	2.24	-	3.02	3.02	-	-	-	-	-	13.7	8	1/4
9.22	9.22	-	7.66	7.66	-	-	-	-	-			
2.31	2.31	-	3.20	3.20	-	-	-	-	-	17.1	10	3/8
12.48	12.48	-	10.70	10.70	-	-	-	-	-			
2.77	2.77	-	3.73	3.73	-	-	-	4.78	7.47	21.3	15	1/2
15.76	15.76	-	13.84	13.84	-	-	-	11.74	6.36			
2.87	2.87	-	3.91	3.91	-	-	-	5.56	7.82	26.7	20	3/4
20.96	20.96	-	18.88	18.88	-	-	-	15.58	11.06			
3.38	3.38	-	4.55	4.55	-	-	-	6.35	9.09	33.4	25	1
26.64	26.64	-	24.30	24.30	-	-	-	20.70	15.22			
3.56	3.56	-	4.85	4.85	-	-	-	6.35	9.70	42.2	32	1 1/4
35.08	35.08	-	32.50	32.50	-	-	-	29.50	22.80			
3.68	3.68	-	5.08	5.08	-	-	-	7.14	10.15	48.3	40	1 1/2
40.94	40.94	-	38.14	38.14	-	-	-	34.02	28.00			
3.91	3.91	-	5.54	5.54	-	-	-	8.74	11.07	60.3	50	2
52.46	52.48	-	49.22	49.22	-	-	-	42.82	38.16			
5.16	5.16	-	7.01	7.01	-	-	-	9.53	14.02	73.0	65	2 1/2
62.68	62.68	-	58.98	58.98	-	-	-	53.94	44.96			
5.49	5.49	-	7.62	7.62	-	-	-	11.13	15.24	88.9	80	3
77.92	77.92	-	73.66	73.66	-	-	-	66.64	58.24			
5.74	5.74	-	8.08	8.08	-	-	-	12.70	-	101.6	90	3 1/2
90.12	90.12	-	85.44	85.44	-	-	-	76.20	-			
6.02	6.02	-	8.56	8.56	-	11.13	-	13.49	17.12	114.3	100	4
102.26	102.26	-	97.18	97.18	-	92.04	-	87.32	80.06			
6.55	6.55	-	9.53	9.53	-	12.70	-	15.88	19.05	141.3	125	5
128.20	128.20	-	122.24	122.24	-	115.90	-	109.54	103.20			
7.11	7.11	-	10.97	10.97	-	14.27	-	18.26	21.95	168.3	150	6
154.08	154.08	-	146.36	146.36	-	139.76	-	131.78	124.40			
8.18	8.18	10.31	12.70	12.70	15.09	18.26	20.62	23.01	22.23	219.1	200	8
202.74	202.74	198.48	193.70	193.70	188.92	182.58	177.86	173.08	174.63			
9.27	9.27	12.70	12.70	15.09	18.26	21.44	25.40	28.58	25.40	273.1	250	10
254.56	254.56	247.70	247.70	242.92	236.58	230.22	222.30	215.94	222.30			
9.53	10.31	14.27	12.70	17.48	21.44	25.40	28.58	33.32	25.40	323.9	300	12
304.84	303.28	295.36	298.50	288.94	281.02	273.10	266.74	257.26	273.10			
9.53	11.13	15.09	12.70	19.05	23.83	27.79	31.75	35.71	-	355.6	350	14
336.54	333.34	325.42	330.20	317.50	307.94	300.02	292.10	284.18	-			
9.53	12.70	16.66	12.70	21.44	26.19	30.96	36.53	40.49	-	406.4	400	16
387.34	381.00	373.08	381.00	363.52	354.02	344.48	333.34	325.42	-			
9.53	14.27	19.05	12.70	23.83	29.36	34.93	39.67	45.24	-	457.0	450	18
437.94	428.46	418.90	431.60	409.34	398.28	387.14	377.66	366.52	-			
9.53	15.09	20.62	12.70	26.19	32.54	38.10	44.45	50.01	-	508.0	500	20
488.94	477.82	466.76	482.60	455.62	442.92	431.80	419.10	407.98	-			
9.53	-	22.23	12.70	28.58	34.93	41.28	47.63	53.98	-	559.0	550	22
539.94	-	514.54	533.60	501.84	489.14	476.44	463.74	451.04	-			
9.53	17.48	24.61	12.70	30.96	38.89	46.02	52.37	59.54	-	610.0	600	24
590.94	575.04	560.78	584.60	548.08	532.22	517.96	505.26	490.92	-			

● Stainless steel (B36.19M)

The wall thickness shown represent nominal or average wall dimensions which are subject to a-12 1/2% mill tolerance.

+Size 14″(355.6mm) through 30″(762.0mm) are not at publication data covered in B36.19, and dimansions listed are those commonly used in the industry.

*Schedules 5S and 10S wall thicknesses do not permit threading in accordance with ASME B2 1.

**Note that schedule 40S and schedule 80S in these sizes do not agree with schedule 40 and schedule 80 of ASME B36.10.and tjat they are identical to standard weight and extra strong respectively of ASME B36.10.

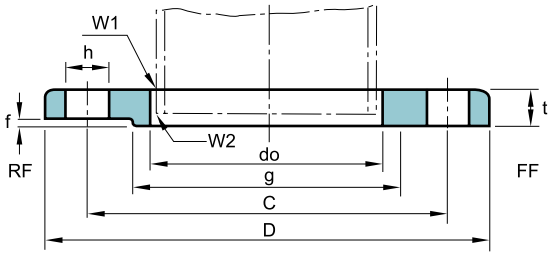
SUPERLOK®

JIS / KS FLANGES

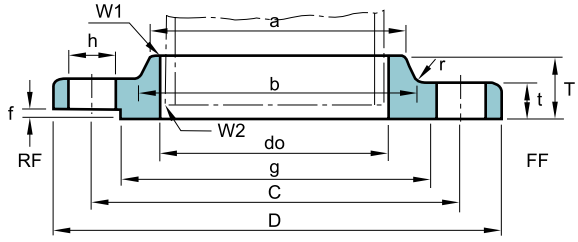
- Class 5K Flanges
- Class 10K Flanges
- Class 16K Flanges
- Class 20K Flanges
- Class 30K Flanges
- Class 40K Flanges
- Class 210Kgf/㎠ Flanges for Oil Pressure
- Class 280Kgf/㎠ Flanges for Oil Pressure
- Class 350Kgf/㎠ Flanges for Oil Pressure
- Tolerance for pipe Flanges

5K KS B1503 / JIS B2220

NOMINAL SIZE 10 - 400mm



NOMINAL SIZE 450 - 1000mm



Unit : mm

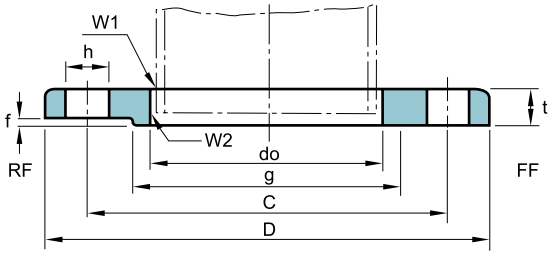
Nominal Bore of Flange	Outside Dia. of Appli-Cable pipe	Inside Dia. of Flange	Outside Dia. of Flange	SECTIONAL DIMENSIONS OF FLANGE							DIA. OF BOLT			Nominal Bolt Size	Welding		Weight (kg)
						Dia. of Hub		Radius	Raised Face	Dia. of Raised Face	Dia. of Bolt Circle	Number of Bolt Holes	Hole Dia.				
		do	D	t	T	a	b	r	f	g	C		h		W1	W2	
(10)	17.3	17.8	75	9	-	-	-	-	1	39	55	4	12	M10	5.0	2.5	0.27
15	21.7	22.2	80	9	-	-	-	-	1	44	60	4	12	M10	5.0	3.0	0.30
(20)	27.2	27.7	85	10	-	-	-	-	1	49	65	4	12	M10	5.0	3.0	0.37
25	34.0	34.5	95	10	-	-	-	-	1	59	75	4	12	M10	5.0	3.0	0.45
(32)	42.7	43.2	115	12	-	-	-	-	2	70	90	4	15	M12	6.0	3.0	0.78
40	48.6	49.1	120	12	-	-	-	-	2	75	95	4	15	M12	6.0	3.0	0.83
50	60.5	61.1	130	14	-	-	-	-	2	85	105	4	15	M12	6.0	3.0	1.07
65	76.3	77.1	155	14	-	-	-	-	2	110	130	4	15	M12	6.0	4.0	1.49
80	89.1	90.0	180	14	-	-	-	-	2	121	145	4	19	M16	6.0	4.0	1.99
(90)	101.6	102.6	190	14	-	-	-	-	2	131	155	4	19	M16	6.0	4.0	2.09
100	114.3	115.4	200	16	-	-	-	-	2	141	165	8	19	M16	7.0	4.0	2.39
125	139.8	141.2	235	16	-	-	-	-	2	176	200	8	19	M16	7.0	4.0	3.23
150	165.2	166.6	265	18	-	-	-	-	2	206	230	8	19	M16	7.0	5.0	4.41
(175)	190.7	192.1	300	18	-	-	-	-	2	232	260	8	23	M20	7.5	5.0	5.51
200	216.3	218.0	320	20	-	-	-	-	2	252	280	8	23	M20	8.5	6.0	6.33
(225)	241.8	243.7	345	20	-	-	-	-	2	277	305	12	23	M20	9.0	6.0	6.64
250	267.4	269.5	385	22	-	-	-	-	2	317	345	12	23	M20	10.0	6.0	9.45
300	318.5	321.0	430	22	-	-	-	-	3	360	390	12	23	M20	10.0	6.0	10.30
350	355.6	358.1	480	24	-	-	-	-	3	403	435	12	25	M22	12.0	7.0	14.00
400	406.4	409.0	540	24	-	-	-	-	3	463	495	16	25	M22	12.0	7.0	16.90
450	457.2	460.0	605	24	40	495	500	5	3	523	555	16	25	M22	12.0	7.0	24.80
500	508.0	511.0	655	24	40	546	552	5	3	573	605	20	25	M22	12.0	7.0	26.90
550	558.8	562.0	720	26	42	597	603	5	3	630	665	20	27	M24	12.0	7.0	34.10
600	609.6	613.0	770	26	44	648	654	5	3	680	715	20	27	M24	12.0	7.0	37.50
650	660.4	664.0	825	26	48	702	708	5	3	735	770	24	27	M24	12.0	7.0	42.80
700	711.2	715.0	875	26	48	751	758	5	3	785	820	24	27	M24	12.0	7.0	45.40
750	762.0	766.0	945	28	52	802	810	5	3	840	880	24	33	M30	12.0	7.0	57.40
800	812.8	817.0	995	28	52	854	862	5	3	890	930	24	33	M30	13.0	8.0	60.80
850	863.6	868.0	1045	28	54	904	912	5	3	940	980	24	33	M30	13.0	8.0	63.50
900	914.4	919.0	1095	30	56	956	964	5	3	990	1030	24	33	M30	13.0	8.0	75.30
1000	1016.0	1021.0	1195	32	60	1058	1066	5	3	1090	1130	28	33	M30	14.0	9.0	88.50
*(1100)	1117.6	1123.0	1305	32	-	-	-	-	3	1200	1240	28	33	M30	-	-	-
*1200	1219.2	1225.0	1420	34	-	-	-	-	3	1305	1350	32	33	M30	-	-	-
*1350	1371.6	-	1575	34	-	-	-	-	3	1460	1505	32	33	M30	-	-	-
*1500	1524.0	-	1730	36	-	-	-	-	3	1615	1660	36	33	M30	-	-	-

Notes

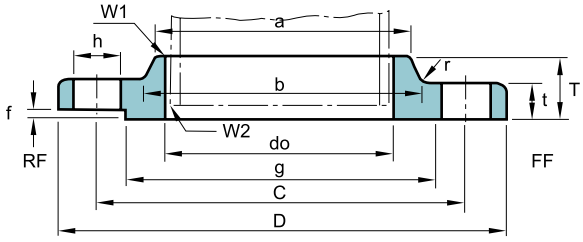
1. Flanges of parenthesized nominal diameter had letter not be used.
2. The facing of flanges shall conform to KS B1519 (JIS B2202) 1987.
3. Nominal diameter over 1000 is manufacturer's standard (*)

10K KS B1503 / JIS B2220

NOMINAL SIZE 10 - 225mm



NOMINAL SIZE 250 - 1000mm



Unit : mm

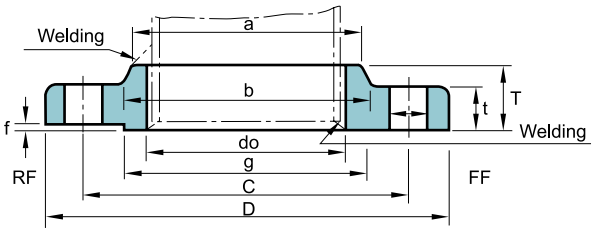
Nominal Bore of Flange	Outside Dia. of Appli-Cable pipe	Inside Dia. of Flange	Outside Dia. of Flange	SECTIONAL DIMENSIONS OF FLANGE							DIA. OF BOLT			Nominal Bolt Size	Welding		Weight (kg)
						Dia. of Hub		Radius	Raised Face	Dia. of Raised Face	Dia. of Bolt Circle	Number of Bolt Holes	Hole Dia.				
		do	D	t	T	a	b	r	f	g	C		h		W1	W2	
10	17.3	17.8	90	12	-	-	-	-	1	46	65	4	15	M12	5.0	2.5	0.52
15	21.7	22.2	95	12	-	-	-	-	1	51	70	4	15	M12	5.0	3.0	0.57
20	27.2	27.7	100	14	-	-	-	-	1	56	75	4	15	M12	5.0	3.0	0.73
25	34.0	34.5	125	14	-	-	-	-	1	67	90	4	19	M16	5.0	3.0	1.13
32	42.7	43.2	135	16	-	-	-	-	2	76	100	4	19	M16	6.0	3.0	1.48
40	48.6	49.1	140	16	-	-	-	-	2	81	105	4	19	M16	6.0	3.0	1.56
50	60.5	61.1	155	16	-	-	-	-	2	96	120	4	19	M16	6.0	3.0	1.88
65	76.3	77.1	175	18	-	-	-	-	2	116	140	4	19	M16	6.5	4.0	2.60
80	89.1	90.0	185	18	-	-	-	-	2	126	150	8	19	M16	6.5	4.0	2.61
(90)	101.6	102.6	195	18	-	-	-	-	2	136	160	8	19	M16	6.5	4.0	2.76
100	114.3	115.4	210	18	-	-	-	-	2	151	175	8	19	M16	7.0	4.0	3.14
125	139.8	141.2	250	20	-	-	-	-	2	182	210	8	23	M20	7.5	4.0	4.77
150	165.2	166.6	280	22	-	-	-	-	2	212	240	8	23	M20	8.0	5.0	6.34
(175)	190.7	192.1	305	22	-	-	-	-	2	237	265	12	23	M20	9.0	5.0	6.82
200	216.3	218.0	330	22	-	-	-	-	2	262	290	12	23	M20	9.0	6.0	7.53
(225)	241.8	243.7	350	22	-	-	-	-	2	282	310	12	23	M20	9.0	6.0	7.74
250	267.4	269.5	400	24	36	288	292	6	2	324	355	12	25	M22	10.0	6.0	12.70
300	318.5	321.0	445	24	38	340	346	6	3	368	400	16	25	M22	10.0	6.0	13.80
350	355.6	358.1	490	26	42	380	386	6	3	413	445	16	25	M22	12.0	7.0	18.20
400	406.4	409.0	560	28	44	436	442	6	3	475	510	16	27	M24	12.0	7.0	25.20
450	457.2	460.0	620	30	48	496	502	6	3	530	565	20	27	M24	14.0	8.0	33.00
500	508.0	511.0	675	30	48	548	554	6	3	585	620	20	27	M24	14.0	8.0	37.60
550	558.8	562.0	745	32	52	604	610	6	3	640	680	20	33	M30	15.0	9.0	49.70
600	609.6	613.0	795	32	52	656	662	6	3	690	730	24	33	M30	16.0	10.0	52.60
650	660.4	664.0	845	34	56	706	712	6	3	740	780	24	33	M30	16.0	10.0	60.60
700	711.2	715.0	905	34	58	762	770	6	3	800	840	24	33	M30	17.0	10.0	70.60
750	762.0	766.0	970	36	62	816	824	6	3	855	900	24	33	M30	18.0	11.0	85.80
800	812.8	817.0	1020	36	64	868	876	6	3	905	950	28	33	M30	19.0	12.0	91.20
(850)	863.6	868.0	1070	36	66	920	928	6	3	955	1000	28	33	M30	19.0	12.0	98.60
900	914.4	919.0	1120	38	70	971	979	6	3	1005	1050	28	33	M30	22.0	14.0	109.00
1000	1016.0	1021.0	1235	40	74	1073	1081	6	3	1110	1160	28	39	M36	22.0	14.0	133.00
*(1100)	1117.6	1123.0	1345	42	76	-	-	-	3	1220	1270	28	39	M36	-	-	-
*1200	1219.2	1225.0	1465	44	78	-	-	-	3	1325	1380	32	39	M36	-	-	-
*1350	1371.6	-	1630	48	82	-	-	-	3	1480	1540	36	45	M42	-	-	-
*1500	1524.0	-	1795	50	90	-	-	-	3	1635	1700	40	45	M42	-	-	-

Notes

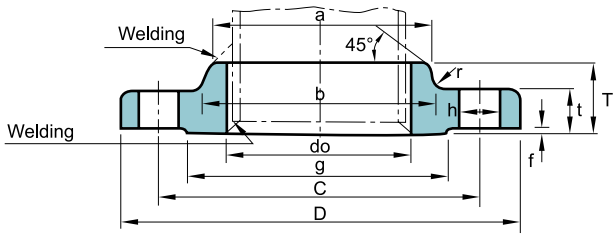
1. Flanges of parenthesized nominal diameter had letter not be used.
2. The facing of flanges shall conform to KS B1519 (JIS B2202) 1987.
3. Nominal diameter over 1000 is manufacturer's standard (*)

16K KS B1503 / JIS B2220

NOMINAL SIZE 10 - 600mm



NOMINAL SIZE 650 - 1200mm



Unit : mm

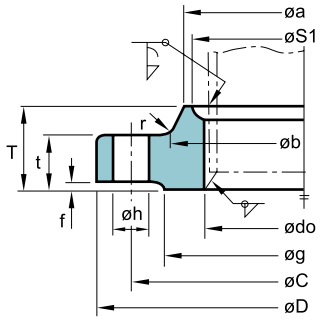
Nominal Bore of Flange	Outside Dia. of Steel pipe	Inside Dia. of Flange	Outside Dia. of Flange	SECTIONAL DIMENSIONS OF FLANGE							DIA. OF BOLT			Nominal Bolt Size	Weight (kg)
						Dia. of Hub		Radius			Bolt Circle Dia.	Number of Bolt Holes	Hole Dia.		
		do	D	t	T	a	b	r	f	g	C		h		
10	17.3	17.8	90	12	16	26	28	4	1	46	65	4	15	M12	0.52
15	21.7	22.2	95	12	16	30	32	4	1	51	70	4	15	M12	0.58
20	27.2	27.7	100	14	20	38	42	4	1	56	75	4	15	M12	0.75
25	34.0	34.5	125	14	20	46	50	4	1	67	90	4	19	M16	1.16
32	42.7	43.2	135	16	22	56	60	5	2	76	100	4	19	M16	1.53
40	48.6	49.1	140	16	24	62	66	5	2	81	105	4	19	M16	1.64
50	60.5	61.1	155	16	24	76	80	5	2	96	120	8	19	M16	1.83
65	76.3	77.1	175	18	26	94	98	5	2	116	140	8	19	M16	2.58
80	89.1	90.0	200	20	28	108	112	6	2	132	160	8	23	M20	3.66
(90)	101.6	102.6	210	20	30	120	124	6	2	145	170	8	23	M20	3.95
100	114.3	115.4	225	22	34	134	138	6	2	160	185	8	23	M20	4.94
125	139.8	141.2	270	22	34	164	170	6	2	195	225	8	25	M22	7.00
150	165.2	166.6	305	24	38	196	202	6	2	230	260	12	25	M22	9.62
200	216.3	218.0	350	26	40	244	252	6	2	275	305	12	25	M22	12.10
250	267.4	269.5	430	28	44	304	312	6	2	345	380	12	27	M24	20.00
300	318.5	321.0	480	30	48	354	364	8	3	395	430	16	27	M24	24.40
350	355.6	358.1	540	34	52	398	408	8	3	440	480	16	33	M30X3	35.00
400	406.4	409.0	605	38	60	446	456	10	3	495	540	16	33	M30X3	46.20
450	457.2	460.0	675	40	64	504	514	10	3	560	605	20	33	M30X3	61.90
500	508.0	511.0	730	42	68	558	568	10	3	615	660	20	33	M30X3	73.25
(550)	558.8	562.0	795	44	70	612	622	10	3	670	720	20	39	M36X3	88.10
600	609.6	613.0	845	46	74	666	676	10	3	720	770	24	39	M36X3	98.80
(650)	660.4	664.0	895	48	77	704	726	10	5	770	820	24	39	M36X3	101.00
700	711.2	715.0	960	50	80	754	776	10	5	820	875	24	42	M39X3	120.00
(750)	762.0	766.0	1020	52	83	806	832	10	5	880	935	24	42	M39X3	141.00
800	812.8	817.0	1085	54	86	865	885	10	5	930	990	24	48	M45X3	161.00
(850)	863.6	868.0	1135	56	89	916	936	10	5	980	1040	24	48	M45X3	177.00
900	914.4	919.0	1185	58	93	968	986	10	5	1030	1090	28	48	M45X3	191.00
1000	1016.0	1021.0	1320	62	99	1070	1098	12	5	1140	1210	28	56	M52X3	230.00
(1100)	1117.6	1123.0	1420	66	105	1180	1200	12	5	1240	1310	32	56	M52X3	289.00
1200	1219.2	1225.0	1530	70	112	1282	1302	12	5	1350	1420	32	56	M52X3	348.00

Notes

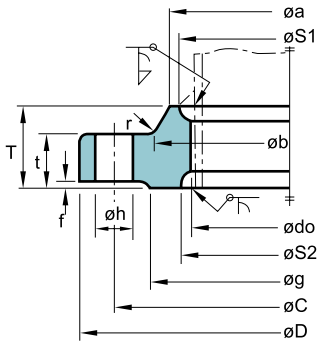
1. Flanges of parenthesized nominal diameter had letter not be used.
2. The facing of flanges shall conform to KS B1519 (JIS B2202) 1987.
3. The dimension of flange of 650A and larger in nominal sizes excluding 850A, are in accordance with the nominal pressure 25 BAR specified in ISO2084-1974

20K KS B1503 / JIS B2220

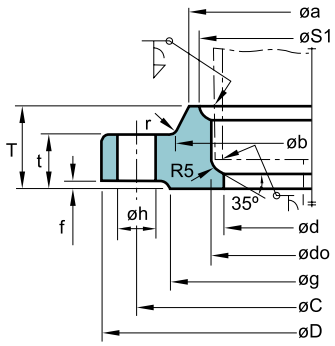
TYPE A
NOMINAL SIZE 10 - 50mm



TYPE B
NOMINAL SIZE 10 - 50mm



TYPE C
NOMINAL SIZE 65 - 600mm



Unit : mm

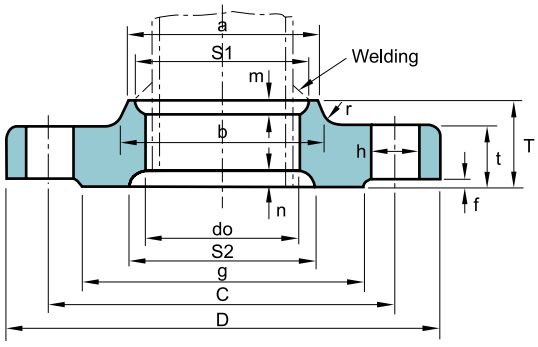
Nominal Bore of Flange	Outside Dia. of Steel pipe	Inside Dia. of Flange	Outside Dia. of Flange	SECTIONAL DIMENSIONS OF FLANGE								BOLT HOLE			Nominal Bolt Size	REFERENCE					Weight (kg)
						Dia. of Hub		Ra-dius				Bolt Circle Dia.	Number of Bolt Holes	Hole Dia.							
		do	D	t	T	a	b	r	f	g	d	C		h		S1	m	S2	n	l	
10	17.3	17.8	90	14	20	30	32	4	1	46	-	65	4	15	M12	27	4	27	4	-	0.59
15	21.7	22.2	95	14	20	34	36	4	1	51	-	70	4	15	M12	31	4	31	4	-	0.65
20	27.2	27.7	100	16	22	40	42	4	1	56	-	75	4	15	M12	37	4	37	4	-	0.81
25	34.0	34.5	125	16	24	48	50	4	1	67	-	90	4	19	M16	44	4	44	4.5	-	1.29
32	42.7	43.2	135	18	26	56	60	5	2	76	-	100	4	19	M16	52	4	53	5	-	1.60
40	48.6	49.1	140	18	26	62	66	5	2	81	-	105	4	19	M16	58	4	59	5.5	-	1.69
50	60.5	61.1	155	18	26	76	80	5	2	96	-	120	8	19	M16	70	4	72	5.5	-	1.89
65	76.3	77.7	175	20	30	100	104	5	2	116	65.9	140	8	19	M16	94	6	-	-	6	2.60
80	89.1	90.0	200	22	34	113	117	6	2	132	78.1	160	8	23	M20	107	6	-	-	6	3.93
(90)	101.6	102.6	210	24	36	126	130	6	2	145	90.2	170	8	23	M20	120	6	-	-	6	4.56
100	114.3	115.4	225	24	36	138	142	6	2	160	102.3	185	8	23	M20	132	6	-	-	6	5.13
125	139.8	141.2	270	26	40	166	172	6	2	195	126.6	225	8	25	M22	160	7	-	-	6	8.30
150	165.2	166.6	305	28	42	196	202	6	2	230	151.0	260	12	25	M22	186	8	-	-	6	10.60
200	216.3	218.0	350	30	46	244	252	6	2	275	199.9	305	12	25	M22	237	9	-	-	6	13.30
250	267.4	269.5	430	34	52	304	312	6	2	345	248.8	380	12	27	M24	290	10	-	-	6	23.40
300	318.5	321.0	480	36	56	354	364	8	3	395	297.9	430	16	27	M24	345	11	-	-	6	27.70
350	355.6	358.1	540	40	62	398	408	8	3	440	333.4	480	16	33	M30X3	384	12	-	-	6	39.20
400	406.4	409.0	605	46	70	446	456	10	3	495	381.0	540	16	33	M30X3	437	13	-	-	7	54.20
450	457.2	460.0	675	48	78	504	514	10	3	560	431.8	605	20	33	M30X3	490	15	-	-	7	71.70
500	508.0	511.0	730	50	84	558	568	10	3	615	482.6	660	20	33	M30X3	544	16	-	-	7	86.20
(550)	558.8	562.0	795	52	90	612	622	10	3	670	533.4	720	20	39	M36X3	595	16	-	-	7	105.00
600	609.6	613.0	845	54	96	666	676	10	3	720	584.2	770	24	39	M36X3	646	18	-	-	7	119.00
*650	660.4	664.0	945	60	-	-	-	-	5	790	-	850	24	48	M45X3	-	-	-	-	-	
*700	711.2	715.0	995	64	-	-	-	-	5	840	-	900	24	48	M45X3	-	-	-	-	-	
*750	762.0	766.0	1080	68	-	-	-	-	5	900	-	970	24	56	M52X3	-	-	-	-	-	
*800	812.8	817.0	1140	72	-	-	-	-	5	960	-	1030	24	56	M52X3	-	-	-	-	-	
*850	863.6	868.0	1200	74	-	-	-	-	5	1020	-	1090	24	56	M52X3	-	-	-	-	-	
*900	914.4	919.0	1250	76	-	-	-	-	5	1070	-	1140	28	56	M52X3	-	-	-	-	-	

Notes

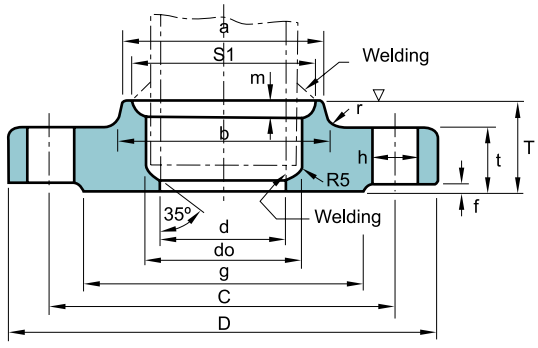
1. Flanges of parenthesized nominal diameter had letter not be used.
2. “d” is an example of pipe thickness for schedule 40 for nominal diameter 400 and under, and for schedule 12.7 mm for 450 through 600 of KS D3562 and KS D3507 (JIS G3454, JIS G3456)
3. The dimension of the notch (m, n, S1, S2) for welding can decided between conerned parties.
4. Nominal diameter over 600 is manufacturer's standard (*)

30K KS B1503 / JIS B2220

NOMINAL SIZE 10 - 50mm (TYPE B)



NOMINAL SIZE 65 - 400mm (TYPE C)



Unit : mm

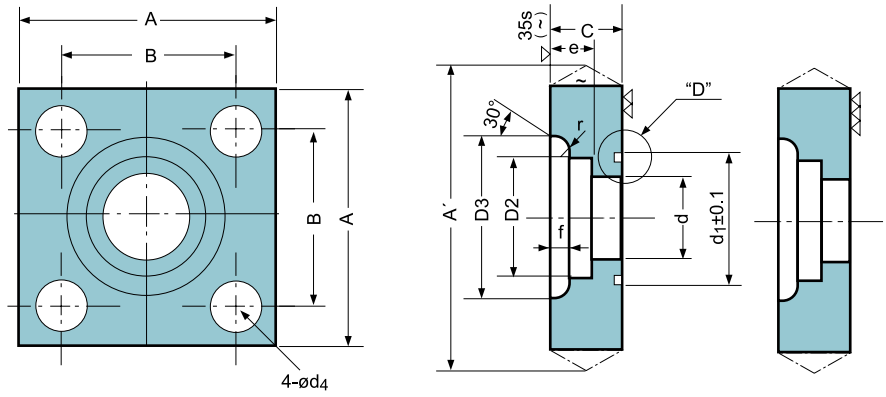
Nominal Bore of Flange	Outside Dia. of Steel pipe	Inside Dia. of Flange	Outside Dia. of Flange	SECTIONAL DIMENSIONS OF FLANGE								BOLT HOLE			Nominal Bolt Size	REFERENCE					Weight (kg)
						Dia. of Hub		Ra-dius				Bolt Circle Dia.	Number of Bolt Holes	Hole Dia.							
		do	D	t	T	a	b	r	f	g	d	C		h		S1	m	S2	n	l	
10	17.3	17.8	110	16	24	30	34	4	1	52	-	75	4	19	M16	-	-	-	-	-	0.99
15	21.7	22.2	115	18	26	36	40	5	1	55	-	80	4	19	M16	31	4.0	40	5	-	1.23
20	27.2	27.7	120	18	28	42	46	5	1	60	-	85	4	19	M16	37	5.0	44	5	-	1.34
25	34.0	34.5	130	20	30	50	54	5	1	70	-	95	4	19	M16	55	6.0	52	5	-	1.76
32	42.7	43.2	140	22	32	60	64	6	2	80	-	105	4	19	M16	52	6.0	60	5	-	2.15
40	48.6	49.1	160	22	34	66	70	6	2	90	-	120	4	23	M20	58	6.0	66	5	-	2.82
50	60.5	61.1	165	22	36	82	86	6	2	105	-	130	8	19	M16	70	6.5	78	5	-	2.89
65	76.3	77.1	200	26	40	102	106	8	2	130	65.9	160	8	23	M20	96	9.5	94	5	6	4.70
80	89.1	90.0	210	28	44	115	121	8	2	140	78.1	170	8	23	M20	109	9.5	-	-	6	5.36
(90)	101.6	102.6	230	30	46	128	134	8	2	150	90.2	185	8	25	M22	122	9.5	-	-	6	6.85
100	114.3	115.4	240	32	48	141	147	8	2	160	102.3	195	8	25	M22	135	9.5	-	-	6	7.89
125	139.8	141.2	275	36	54	166	172	8	2	195	126.6	230	8	25	M22	160	9.5	-	-	6	11.40
150	165.2	166.6	325	38	58	196	204	8	2	235	151.0	275	12	27	M24	186	9.5	-	-	6	16.70
200	216.3	218.0	370	42	64	248	256	8	2	280	199.9	320	12	27	M24	237	9.5	-	-	6	20.60
250	267.4	269.5	450	48	72	306	314	10	2	345	248.8	390	12	22	M30	290	10.0	-	-	6	36.10
300	318.5	321.0	515	52	78	360	370	10	3	405	297.9	450	16	33	M30	345	12.0	-	-	6	49.90
350	355.6	358.1	560	54	84	402	412	12	3	450	333.4	495	16	33	M30	383	13.0	-	-	6	61.20
400	406.4	409.0	630	60	92	456	468	15	3	510	381.0	560	16	39	M36	435	14.0	-	-	7	85.20

Notes

1. Flanges of parenthesized nominal diameter had letter not be used.
2. “d” is an example of pipe thickness for schedule 40 of KS D3562 and KS D3507 (JIS G3454, JIS G3456).
   if required, purchaser can specify for other pipe wall thickness.
3. This dimension of bolt holes (h) shall be in accordance with Class 3 of KS B1007 (Grade 3 of JiS B1001) where the nominal designation of screw thread of bolt is not more than M16, and in accordance with Class 2 of KS B1007 (Grade 2 of JIS B1001) where the nominal designation of screw thread of bolt is not less than M30 × 3.
4. The dimension of the notch (m, n, S1, S2) for welding can decided between conerned parties agreement between parties concerned.

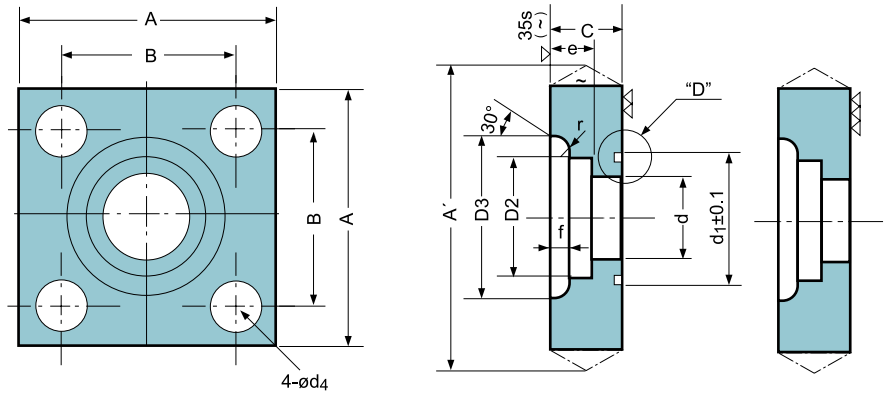
210Kgf/cm² (JIS B2291 SQUARE FLANGES)

Flange for Oil Pressure



Unit : mm

Nominal Bore	A		A' (Max)	B		C		d	d1		d2		e	d3	d4	f	r	Weight (kg)	G 계열 O 링
15	63	±1.0	67	40	±0.2	22	0 -1	16.0	30	±0.1	22.2	+0.2 0	11	32	11	3.5	5	0.6	G25
20	68		72	45		22		20.0	35		27.7		12	38	11	4.0	5	0.7	G30
25	80	±1.2	85	53		28	0 -1.5	25.0	40		34.5	+0.3 0	14	45	13	4.0	5	1.2	G35
32	90		95	63		28		31.5	45		43.2		16	56	13	6.0	5	1.5	G40
40	100	±1.5	106	70	±0.4	36	0 -2	37.5	55		49.1		18	63	18	7.0	5	2.4	G50
50	112		118	80		36		47.5	65		61.1		20	75	18	7.0	5	2.8	G60
65	140	±2.0	148	100		45		60.0	80		77.1	+0.4 0	22	95	22	9.5	6	5.3	G75
80	155		163	112		45		71.0	90		90.0		25	108	24	11.0	6	6.2	G85



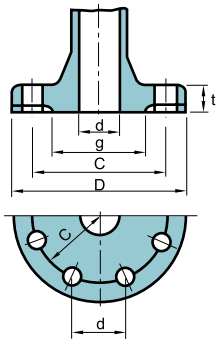
Unit : mm

Nominal Bore	A		A' (Max)	B		C		d	d1		d2		e	d3	d4	f	r	Weight (kg)
15	54	±1.0	58	36	±0.2	22	0 -1	16.0	30	±0.1	22.2	+0.2 0	11	32	11	3.5	5	0.5
20	58		62	40		22		20.0	35		27.7		12	38	11	4.0	5	0.6
25	68	±1.2	73	48		28	0 -1.5	25.0	40		34.5	+0.3 0	14	45	13	4.0	5	0.8
32	76		81	56		28		31.5	45		43.2		16	56	13	6.0	5	1.0
40	92	±1.5	98	65	±0.4	36	0 -2	37.5	55		49.1		18	63	18	7.0	5	1.9
50	100		106	73		36		47.5	65		61.1		20	75	18	7.0	5	2.0
65	128	±2.0	136	92		45		60.0	80		77.1	+0.4 0	22	95	22	9.5	6	4.1
80	140		148	103		45		71.0	90		90.0		25	108	24	11.0	6	4.7

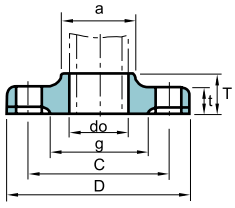
TOLERANCE FOR PIPE FLANGES

KS B1502 / JIS B2203

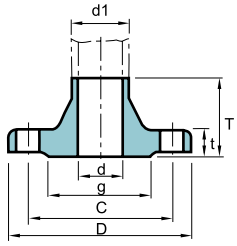
SOLID



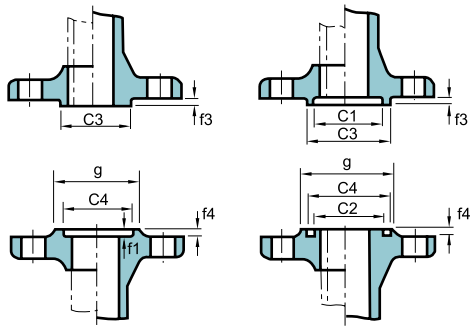
SLIP - ON



WELDING NECK



TYPE OF GASKET SURFACE



Flange Section		Surface Condition	Basic Size	Dimensional Tolerance
Outside Dia. D		As Forged (1)	300 & below	+not specified -2.0
			over 300 thru 600	
			over 600 thru 1000	
			over 1000 thru 1500	+not specified -3.0
			over 1500	
		Finish	300 & below	±1
			over 300 thru 600	±1.5
			over 600 thru 1000	±2
			over 1000 thru 1500	±2.5
			over 1500	±3
Inside Dia.	Solid Flange d(2)	As Forged (1)	16 & below	±1
			over 16 thru 63	±1.5
			over 63 thru 125	±2
			over 125 thru 150	±2.5
			over 250 thru 500	±3
			over 500 thru 1000	±4
			over 1000	±5, 0
	Slip-on Flange do	Finish	100 & below	+0.5, 0
			over 100 thru 400	+1, 0
			over 400 thru 600	+1.5, 0
			over 600 thru 800	+2.0, 0
			over 800 thru 1000	+2.5, 0
			over 1000	+3, 0
	Welding Neck Flange d		100 & below	0, -0.5
			over 100 thru 400	0, -1
			over 400 thru 600	0, -1.5
			over 600 thru 800	0, -2
			over 800 thru 1000	0, -2.5
			over 1000	0, -3
Bolt Hole	Bolt Circle Dia. c		250 & below	±0.5
			over 250 thru 550	±0.6
			over 550 thru 950	±0.8
			over 950 thru 1350	±1
			over 1350	±1.5

Flange Section		Surface Condition	Basic Size	Dimensional Tolerance
Bolt Hole	Pitch of Hole P	Drilling Hole		±0.5
Dia. of Hub	Slip-on Flange (a) and Welding Neck Flange (d1)	As Forged (1)	220 & below	+2, 0
			over 220 thru 450	+3, 0
			over 450 thru 650	+4, 0
			over 650 thru 850	+6, 0
			over 850 thru 1000	+7, 0
			over 1000	+8, 0
		Finish	220 & below	+1, 0
			over 220 thru 450	+1.5, 0
			over 450 thru 650	+2, 0
			over 650 thru 850	+2.5, 0
			over 850 thru 1000	+3, 0
			over 1000	+3.5, 0
Gasket Seat	C1, C2, C3, C4	Finish	500 & below	±0.3
			over 500 thru 1000	±0.35
			over 1000 thru 1500	±0.4
			over 1500	±0.5
	f3, f4	Finish	8 & below	±0.2
			over 8	±0.25
	g	Finish	200 & below	±0.8
			over 200 thru 650	±0.9
			over 650 thru 1000	±1
			over 1000	±1.2
Thickness		One-side Finish	20 & below	+1.5, 0
			over 20 thru 50	+2, 0
			over 50 thru 100	+3, 0
		Bolt-side Finish	20 & below	+1, 0
			over 20 thru 50	+1.5, 0
			over 50 thru 100	+2, 0
Hub Height T	Flange with pipe Inserted	Finish	50 & below	±1
			over 50 thru 100	±1.5
			over 100 thru 200	±2
	Flange with Butt-Welded Pipe	Finish	over 200 & below	+2, 0
			over 200 thru 300	+3, 0

Notes

1. This dimensional tolerance applies to the machined surface, as required.
2. This dimension d has been specified only for the flange, of which the bore part is cylindrical in shape.

Remarks

1. The dimensions d of bore part of the solid flanges with surface, as forged of valves, pumps, etc. are allowed up to plus 100% of the above dimensional tolerance. Provided that the required thickness shall be free from its influence.
2. The thickness of flange of valve and the like, of which the dimension between flange faces is limited to a fixed value, are allowed up to plus 100% of the above dimensional tolerance in the column of thickness.
3. In the case of spot facing of the single surface finishing, the thickness of spot facing is allowed up to 70% of th dimensional tolerance in the above column of thickness in negative side.
4. The chain double-lines in the figures of solid flange and socket welding type flange illustrate the casses of large raised facd flange.

Valve Series

- Key Operation Ball Valves
- Key Operation Needle Valves
- Ball Valves
- Integral Bonnet Needle Valves
- Union Bonnet Needle Valves
- Check Valves
- High Pressure Check Valves
- High Pressure Needle Valves
- Plug Valves
- Manifold Valves
- Vacuum Clamps
- Water Regulators
- Flexible Hoses
- Double Block & Bleed Valves
- Swing-Out Ball Valves
- Toggle Valves
- Bleed & Purge Valves
- Quick Connectors
- High Pressure Ball Valves
- Hydraulic Ball Valves
- Trunnion Ball Valves
- Rising Plug Valves
- Relief Valves
- Cryogenic Needle Valves
- Cryogenic Ball Valves
- Micron in-Line Filters
- Gauge Root Valves
- Hydraulic Flange and Components

Fitting Series

Tube Fittings (Compression Type)
Instrument Thread Fittings
Forged Fittings
Bite Type Tube Fittings (DIN2353)
Bite Type Tube Fittings (JIS B2351)
37 Flared Tube Fittings (SAE J514)
O-Ring Face Seal Fittings
Hose Connectors & Push-On Hose Fittings

Electric

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