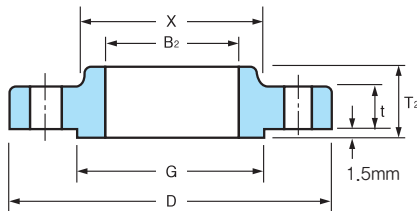
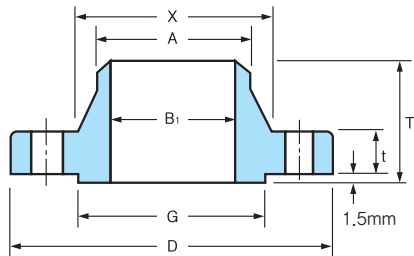


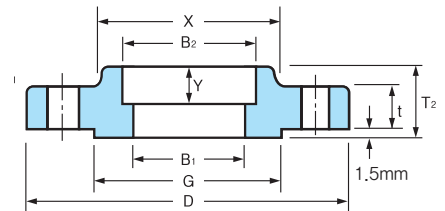
CLASS 150 FLANGES



SLIP-ON



WELDING NECK



SOCKET WELDING

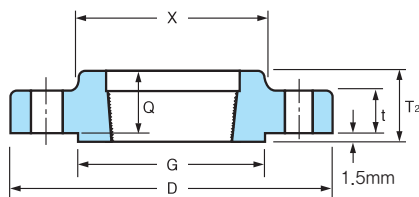
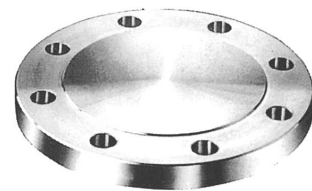
ASME B16.5 FORGED FLANGES

Unit : mm

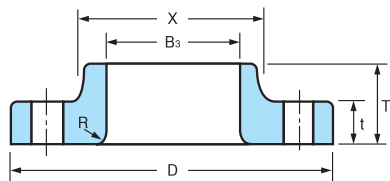
Nominal Pipe Size	Outside Diam.	Diam. at Base of Hub	O. D. of Raised Face	Thick- ness	Thick- ness Lap Joint	BORE			LENGTH THRU HUB			Diam. of Hub at Bevel	Radius of Fillet	Thread Length
						Welding Neck Socket Welding	Slip-on Socket Welding	Lap Joint	Welding Neck	Slip-on Threaded Socket Welding	Lap Joint			
						B ₁	B ₂	B ₃	T ₁	T ₂	T ₃	A	R	Q
1/2	89	30	35.1	9.7	11.2	15.8	22.4	22.9	47.5	15.5	16	21.3	3	16
3/4	99	38	42.9	11.2	12.7	21.0	27.7	28.2	52.5	15.5	16	26.7	3	16
1	108	49	50.8	12.7	14.2	26.6	34.5	35.1	55.5	17.5	18	33.5	3	18
1 1/4	117	59	63.5	14.2	15.7	35.1	43.2	43.7	57.5	20.5	21	42.2	5	21
1 1/2	127	65	73.0	15.9	17.5	40.9	49.5	50.0	61.5	22.5	22	48.3	6	22
2	152	78	91.9	17.5	19.0	52.5	61.9	62.5	63.5	25.5	25	60.5	8	25
2 1/2	178	90	104.6	20.6	22.4	62.7	74.7	75.4	69.5	28.5	28	73.2	8	28
3	190	108	127.0	22.4	23.9	77.9	90.7	91.4	69.5	29.5	30	88.9	10	30
3 1/2	216	122	139.7	22.4	23.9	90.1	103.4	104.1	71.5	31.5	32	101.6	10	32
4	229	135	157.2	22.4	23.9	102.3	116.1	116.8	76.5	33.5	33	114.3	11	33
5	254	164	185.7	22.4	23.9	128.2	143.8	144.5	88.5	36.5	37	141.2	11	37
6	279	192	215.9	23.9	25.4	154.1	170.7	171.4	88.5	39.5	40	168.4	13	40
8	343	246	269.7	26.9	28.4	202.7	221.5	222.2	101.5	44.5	44	219.2	13	44
10	406	305	323.8	28.4	30.2	254.5	276.4	277.4	101.5	49.5	49	273.0	13	49
12	483	365	381.0	30.2	31.8	304.7	327.2	328.2	114.5	55.5	56	323.8	13	56
14	533	400	412.8	33.3	35.1	336.5	359.2	360.2	126.5	57.5	79	355.6	13	57
16	597	457	469.9	35.1	36.6	387.3	410.5	411.2	126.5	63.5	87	406.4	13	64
18	635	505	533.4	38.1	39.6	437.9	461.8	462.3	139.5	68.5	97	457.2	13	68
20	698	559	584.2	41.1	42.9	488.9	513.1	514.4	144.5	72.5	103	508.0	13	73
22	749	610	641.4	44.4	46.0	539.9	564.4	565.2	149.5	79.5	108	558.8	13	—
24	813	663	692.2	46.0	47.8	590.9	616.0	616.0	152.5	82.5	111	609.6	13	83

Notes:

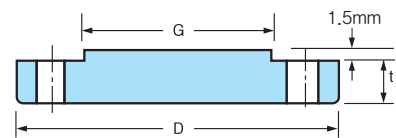
- (1) For the 'Bore'(B₁) other than Standard Wall Thickness, refer to page 62.
- (2) For Slip-on, Threaded, Socket welding and Lap Joint Flanges, the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.



THREADED



LAP JOINT



BLIND

Unit : mm

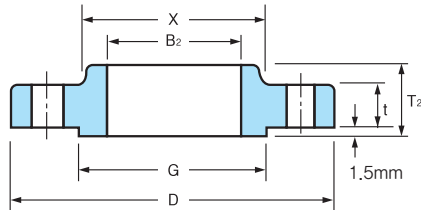
Nominal Pipe Size	Depth of Socket	DRILLING			BOLTING				APPROXIMATE WEIGHT				
		Bolt Circle Diam	Number of Holes	Diam of Holes	Diam of Bolts (inch)	Machine Bolt Length	Stud Bolt Length		Welding Neck	Slip-on and Threaded	Lap Joint	Blind	Socket Welding
	Y						Raised Face	Raised Face	Ring Joint	kg	kg	kg	kg
1/2	10	60.5	4	15.9	1/2	50	55	—	0.50	0.40	0.39	0.42	0.41
3/4	11	69.8	4	15.9	1/2	50	65	—	0.75	0.58	0.56	0.62	0.58
1	13	79.2	4	15.9	1/2	55	65	75	1.06	0.78	0.76	0.86	0.79
1 1/4	14	88.9	4	15.9	1/2	55	70	85	1.39	1.01	0.99	1.15	1.04
1 1/2	16	98.6	4	15.9	1/2	65	70	85	1.79	1.32	1.28	1.53	1.35
2	18	120.6	4	19.1	5/8	70	85	95	2.67	2.05	1.99	2.41	2.10
2 1/2	19	139.7	4	19.1	5/8	75	90	100	4.22	3.28	3.20	3.94	3.37
3	21	152.4	4	19.1	5/8	75	90	100	5.08	3.84	3.75	4.93	3.95
3 1/2	—	177.8	8	19.1	5/8	75	90	100	6.34	4.84	4.74	6.22	—
4	—	190.5	8	19.1	5/8	75	90	100	7.20	5.36	5.21	7.06	—
5	—	215.9	8	22.2	3/4	85	95	110	9.04	6.12	5.96	8.68	—
6	—	241.3	8	22.2	3/4	85	100	115	11.04	7.42	7.23	11.31	—
8	—	298.4	8	22.2	3/4	90	110	120	18.27	12.07	11.74	19.52	—
10	—	362.0	12	25.4	7/8	100	115	125	24.91	16.39	15.89	28.46	—
12	—	431.8	12	25.4	7/8	100	120	135	38.54	26.24	25.73	43.32	—
14	—	476.2	12	28.6	1	115	135	145	50.52	34.52	37.84	57.86	—
16	—	539.8	16	28.6	1	115	135	145	62.97	44.98	50.04	76.30	—
18	—	577.8	16	31.8	1 1/8	125	145	160	71.50	48.90	55.30	93.50	—
20	—	635.0	20	31.8	1 1/8	140	160	170	87.72	61.38	68.98	121.43	—
22	—	692.2	20	34.9	1 1/4	150	170	185	100.54	71.62	79.54	150.63	—
24	—	749.3	20	34.9	1 1/4	150	170	185	119.19	86.78	96.30	184.88	—

(3) Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.

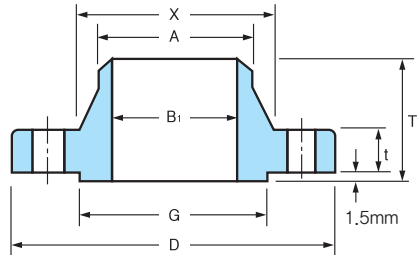
(4) The gasket surface and backside(bearing surface for bolting)are made parallel within 1 degree. To accomplish parallelism, spot facing is carried out according to MSS SP-9, without reducing thickness (t).

(5) Depth of Socket(Y) is covered by ANSI B16.5 only in sizes through 3 inch, over 3inch is at the manufacturer's option.

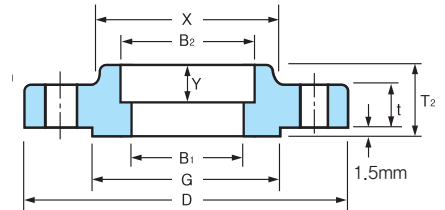
CLASS 300 FLANGES



SLIP-ON



WELDING NECK



SOCKET WELDING

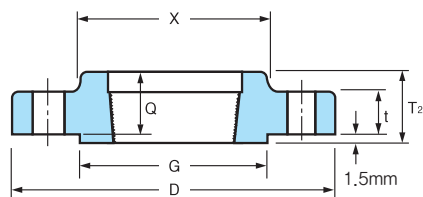
ASME B16.5 FORGED FLANGES

Unit : mm

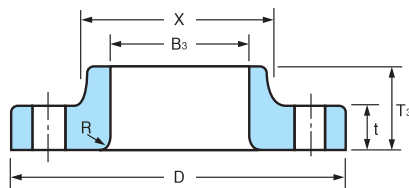
Nominal Pipe Size	Outside Diam.	Diam. at Base of Hub	O. D. of Raised Face	Thick-ness	Thick-ness Lap Joint	BORE				LENGTH THRU HUB			Diam. of Hub at Bevel	Radius of Fillet	Thread Length
						Welding Neck Socket Welding	Slip-on Socket Welding	Lap Joint	Min. Thread Counter Bore	Welding Neck	Slip-on Threaded Socket Welding	Lap Joint			
	D	X	G	t	t	B ₁	B ₂	B ₃	B	T ₁	T ₂	T ₃	A	R	Q
1/2	95	38	35.1	12.7	14.2	15.8	22.4	22.9	23.6	52.5	22.5	22	21.3	3	16
3/4	117	48	42.9	14.2	15.7	21.0	27.7	28.2	29.0	57.5	25.5	25	26.7	3	16
1	124	54	50.8	15.7	17.5	26.6	34.5	35.1	35.8	61.5	26.5	27	33.5	3	18
1 1/4	133	64	63.5	17.5	19.0	35.1	43.2	43.7	44.4	65.5	26.5	27	42.2	5	21
1 1/2	155	70	73.0	19.0	20.6	40.9	49.5	50.0	50.3	68.5	30.5	30	48.3	6	22
2	165	84	91.9	20.6	22.4	52.5	62.0	62.5	63.5	69.5	33.5	33	60.5	8	28
2 1/2	190	100	104.6	23.9	25.4	62.7	74.7	75.4	76.2	76.5	38.5	38	73.2	8	32
3	210	117	127.0	26.9	28.4	77.9	90.7	91.4	92.2	79.5	42.5	43	88.9	10	32
3 1/2	229	133	139.7	28.4	30.2	90.1	103.4	104.1	104.9	81.5	44.5	44	101.6	10	37
4	254	146	157.2	30.2	31.8	102.3	116.1	116.8	117.6	85.5	47.5	48	114.3	11	37
5	279	178	185.7	33.3	35.1	128.2	143.8	144.5	144.5	98.5	50.5	51	141.2	11	43
6	318	206	215.9	35.1	36.6	154.1	170.7	171.4	171.4	98.5	52.5	52	168.4	13	46
8	381	260	269.7	39.6	41.1	202.7	221.5	222.2	222.2	111.5	61.5	62	219.2	13	51
10	444	321	323.8	46.0	47.8	254.5	276.4	277.4	276.4	117.5	66.5	95	273.0	13	56
12	521	375	381.0	49.3	50.8	304.7	327.2	328.2	328.7	130.5	73.5	102	323.8	13	60
14	584	425	412.8	52.3	53.8	336.5	359.2	360.2	360.4	142.5	76.5	111	355.6	13	64
16	648	483	469.9	55.6	57.2	387.3	410.5	411.2	411.2	146.5	82.5	121	406.4	13	68
18	711	533	533.4	58.7	60.5	437.9	461.8	462.3	462.0	158.5	88.5	130	457.2	13	70
20	775	587	584.2	62.0	63.5	488.9	513.1	514.4	512.8	162.5	95.5	140	508.0	13	73
22	838	641	641.4	65.0	66.5	539.9	564.4	565.2	—	165.5	101.5	145	558.8	13	—
24	914	702	692.2	68.3	69.9	590.9	616.0	616.0	614.4	168.5	106.5	152	609.6	13	83

Notes:

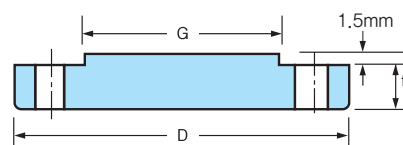
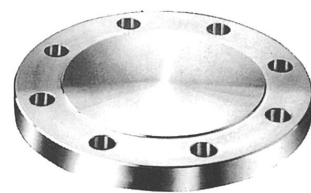
- (1) For the 'Bore'(B₁) other than Standard Wall Thickness, refer to page 62.
- (2) For Slip-on, Threaded, Socket welding and Lap Joint Flanges, the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.



THREADED



LAP JOINT



BLIND

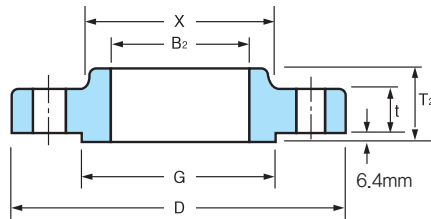
Nominal Pipe Size	Depth of Socket Y	DRILLING			BOLTING				APPROXIMATE WEIGHT				
		Bolt Circle Diam	Number of Holes	Diam of Holes	Diam of Bolts (inch)	Machine Bolt Length			Welding Neck	Slip-on and Threaded	Lap Joint	Blind	Socket Welding
						Raised Face	Raised Face	Ring Joint					
									kg	kg	kg	kg	kg
1/2	10	66.5	4	15.9	1/2	55	65	75	0.78	0.64	0.63	0.64	0.66
3/4	11	82.6	4	19.1	5/8	65	75	90	1.32	1.11	1.09	1.09	1.13
1	13	88.9	4	19.1	5/8	65	75	90	1.65	1.34	1.33	1.37	1.38
1 1/4	14	98.6	4	19.1	5/8	70	85	95	2.13	1.67	1.65	1.79	1.72
1 1/2	16	114.3	4	22.2	3/4	75	90	100	2.99	2.47	2.43	2.63	2.54
2	17	127.0	8	19.1	5/8	75	90	100	3.55	2.87	2.80	3.16	2.98
2 1/2	19	149.4	8	22.2	3/4	85	100	115	5.40	4.32	4.23	4.84	4.52
3	21	168.1	8	22.2	3/4	90	110	120	7.23	5.84	5.75	6.81	6.13
3 1/2	—	184.2	8	22.2	3/4	95	110	125	9.04	7.33	7.17	8.67	—
4	—	200.2	8	22.2	3/4	95	115	125	11.69	9.63	9.50	11.50	—
5	—	235.0	8	22.2	3/4	110	120	135	15.64	12.11	11.94	15.48	—
6	—	269.7	12	22.2	3/4	110	120	140	20.11	15.76	15.48	21.02	—
8	—	330.2	12	25.4	7/8	120	140	150	31.06	24.11	23.83	34.21	—
10	—	387.4	16	28.6	1	140	160	170	44.54	33.90	37.95	53.14	—
12	—	450.8	16	31.8	1 1/8	145	170	185	64.51	50.07	55.21	78.89	—
14	—	514.4	20	31.8	1 1/8	160	180	190	89.47	69.42	79.52	104.97	—
16	—	571.5	20	34.9	1 1/4	165	190	205	111.90	88.41	102.83	137.56	—
18	—	628.6	24	34.9	1 1/4	170	195	210	136.98	108.15	125.11	174.91	—
20	—	685.8	24	34.9	1 1/4	185	205	220	165.93	134.47	154.91	221.46	—
22	—	743.0	24	41.3	1 1/2	205	230	255	191.99	158.06	181.16	268.69	—
24	—	812.8	24	41.3	1 1/2	205	230	255	239.13	201.22	232.01	338.80	—

(3) Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.

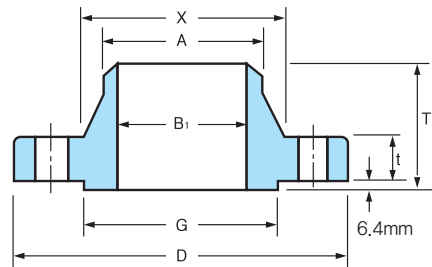
(4) The gasket surface and backside(bearing surface for bolting)are made parallel within 1 degree. To accomplish parallelism, spot facing is carried out according to MSS SP-9, without reducing thickness (t).

(5) Depth of Socket(Y) is covered by ANSI B16.5 only in sizes through 3 inch, over 3inch is at the manufacturer's option.

CLASS 400 FLANGES



SLIP-ON



WELDING NECK

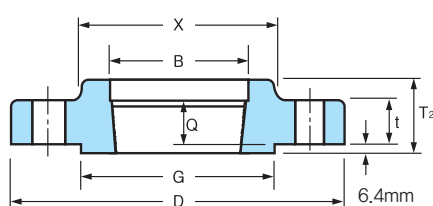
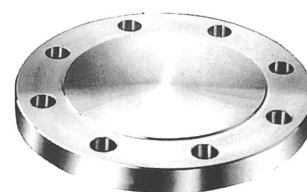
ASME B16.5 FORGED FLANGES

Unit : mm

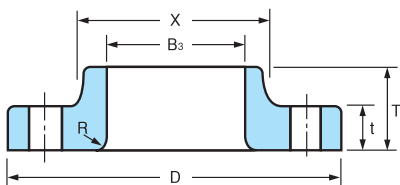
Nominal Pipe Size	Outside Diam.	Diam. at Base of Hub	O. D. of Raised Face	Thick-ness	BORE				LENGTH THRU HUB			Diam. of Hub at Bevel
					Welding Neck Socket Welding	Slip-on	Lap Joint	Counter Bore Min. Thread Min.	Welding Neck	Slip-on Threaded Socket Welding	Lap Joint	
	D	X	G	t	B ₁	B ₂	B ₃	B	T ₁	T ₂	T ₃	A
1/2	95	38	35.1	14.2	15.8	22.4	22.9	23.6	58.4	28.4	22	21.3
3/4	117	48	42.9	15.7	21.0	27.7	28.2	29.0	63.4	31.4	25	26.7
1	124	54	50.8	17.5	26.6	34.5	35.1	35.8	68.4	33.4	27	33.5
1 1/4	133	64	63.5	20.6	35.1	43.2	43.7	44.4	73.4	34.4	28	42.2
1 1/2	155	70	73.0	22.4	40.9	49.5	50.0	50.5	76.4	38.4	32	48.3
2	165	84	91.9	25.4	52.5	62.0	62.5	63.5	79.4	43.4	37	60.5
2 1/2	190	100	104.6	28.4	62.7	74.7	75.4	76.2	85.4	47.4	41	73.2
3	210	117	127.0	31.8	77.9	90.7	91.4	92.2	89.4	52.4	46	88.9
3 1/2	229	133	139.7	35.1	90.1	103.4	104.1	104.9	92.4	55.4	49	101.6
4	254	146	157.2	35.1	102.3	116.1	116.8	117.6	95.4	57.4	51	114.3
5	279	178	185.7	38.1	128.2	143.8	144.5	144.5	108.4	60.4	54	141.2
6	318	206	215.9	41.1	154.1	170.7	171.4	171.4	109.4	63.4	57	168.4
8	381	260	269.7	47.8	202.7	221.5	222.2	222.2	123.4	74.4	68	219.2
10	444	321	323.8	53.8	254.5	276.4	277.4	276.4	130.4	79.4	102	273.0
12	521	375	381.0	57.2	304.7	327.2	328.2	328.7	143.4	85.4	108	323.8
14	584	425	412.8	60.5	336.5	359.2	360.2	360.4	155.4	90.4	117	355.6
16	648	483	469.9	63.5	387.3	410.5	411.2	411.2	158.4	100.4	127	406.4
18	711	533	533.4	66.5	437.9	461.8	462.3	462.0	171.4	105.4	137	457.2
20	775	587	584.2	69.8	488.9	513.1	514.4	512.8	174.4	108.4	146	508.0
22	838	641	641.4	73.2	539.9	564.4	565.2	—	177.4	114.4	152	558.8
24	914	702	692.2	76.2	590.9	616.0	616.0	614.4	181.4	120.4	159	609.6

Notes:

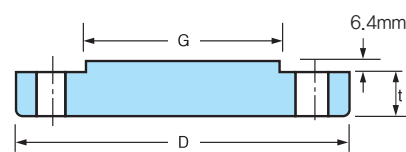
- (1) For the inside diameter of pipes (corresponding to 'Bore' (B1) of Welding Neck Flanges), refer to page 62.
- (2) For Slip-on, Threaded and Lap Joint Flanges the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.



THREADED



LAP JOINT



BLIND

Unit : mm

Nominal Pipe Size	Radius of Fillet	Thread Length	DRILLING			BOLTING				APPROXIMATE WEIGHT			
						Stud Bolt Length							
			Bolt Circle Diam	Number of Holes	Diam of Holes	Diam of Bolts (inch)	0.25" Raised Face	Male– Female Tongue– Groove	Ring Joint	Welding Neck	Slip-on and Threaded	Lap Joint	Blind
	kg	kg								kg	kg		
1/2	3	16	66.5	4	15.9	1/2	75	70	75	0.88	0.73	0.70	0.75
3/4	3	16	82.6	4	19.1	5/8	90	85	90	1.47	1.24	1.19	1.26
1	3	18	88.9	4	19.1	5/8	90	85	90	1.86	1.53	1.47	1.60
1 1/4	5	21	98.6	4	19.1	5/8	95	90	95	2.50	2.01	1.92	2.22
1 1/2	6	22	114.3	4	22.2	3/4	110	100	110	3.53	2.96	2.84	3.25
2	8	28	127.0	8	19.1	5/8	110	100	110	4.36	3.61	3.42	4.14
2 1/2	8	32	149.4	8	22.2	3/4	120	115	120	6.38	5.21	4.97	6.06
3	10	35	168.1	8	22.2	3/4	125	120	125	8.57	7.05	6.70	8.51
3 1/2	10	40	184.2	8	25.4	7/8	140	135	140	10.77	8.86	8.47	11.00
4	11	37	200.2	8	25.4	7/8	140	135	140	13.37	11.13	10.64	13.81
5	11	43	235.0	8	25.4	7/8	145	135	145	17.61	13.83	13.22	18.42
6	13	46	269.7	12	25.4	7/8	150	145	150	22.98	18.26	17.49	25.49
8	13	51	330.2	12	28.6	1	170	165	170	36.15	28.66	27.59	42.74
10	13	56	387.4	16	31.8	1 1/8	190	185	190	50.49	38.94	42.23	64.13
12	13	60	450.8	16	34.9	1 1/4	205	195	205	72.85	57.08	61.14	94.53
14	13	64	514.4	20	34.9	1 1/4	210	205	210	100.09	79.07	87.41	124.79
16	13	68	571.5	20	38.1	1 3/8	220	215	220	123.89	101.25	111.91	161.66
18	13	70	628.6	24	38.1	1 3/8	230	220	230	151.22	122.48	135.87	204.10
20	13	73	685.8	24	41.3	1 1/2	240	235	250	179.66	146.70	164.47	254.20
22	13	—	743.0	24	44.5	1 5/8	255	250	260	210.80	175.10	195.63	311.55
24	13	83	812.8	24	47.6	1 3/4	265	260	280	258.47	218.89	246.39	385.63

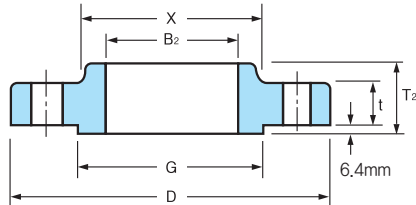
(3) Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.

(4) The gasket surface and backside (bearing surface for bolting) are made parallel within 1 degree.

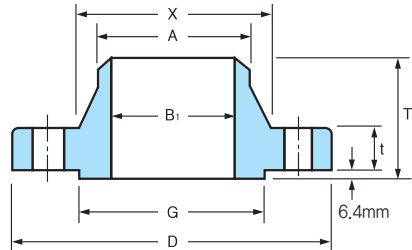
To accomplish parallelism, spot facing is carried out according to MSS SP-9, without reducing thickness (t).

(5) Dimensions of sizes 1/2" through 3 1/2" are the same as for Class 600 Flanges

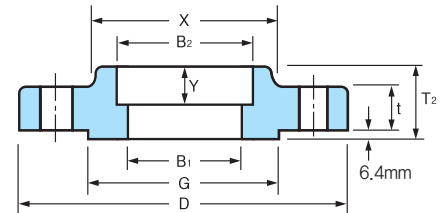
CLASS 600 FLANGES



SLIP-ON



WELDING NECK



SOCKET WELDING

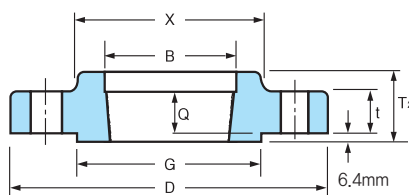
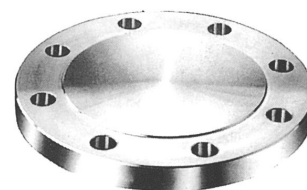
ASME B16.5 FORGED FLANGES

Unit : mm

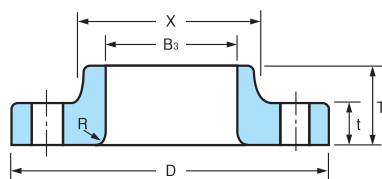
Nominal Pipe Size	Outside Diam. D	Diam. at Base of Hub X	O. D. of Raised Face G	Thick-ness t	BORE				LENGTH THRU HUB			Diam. of Hub at Bevel A	Radius of Fillet R	Thread Length Q
					Welding Neck Socket Welding	Slip-on Socket Welding	Lap Joint	Counter Bore Min. Thread Min.	Welding Neck	Slip-on Threaded Socket Welding	Lap Joint			
					B ₁	B ₂	B ₃	B	T ₁	T ₂	T ₃			
1/2	95	38	35.1	14.2	15.8	22.4	22.9	23.6	58.4	28.4	22	21.3	3	16
3/4	117	48	42.9	15.7	21.0	27.7	28.2	29.0	63.4	31.4	25	26.7	3	16
1	124	54	50.8	17.5	26.6	34.5	35.1	35.8	68.4	33.4	27	33.5	3	18
1 1/4	133	64	63.5	20.6	35.1	43.2	43.7	44.4	73.4	34.4	28	42.2	5	21
1 1/2	155	70	73.0	22.4	40.9	49.5	50.0	50.5	76.4	38.4	32	48.3	6	22
2	165	84	91.9	25.4	52.5	62.0	62.5	63.5	79.4	43.4	37	60.5	8	28
2 1/2	190	100	104.6	28.4	62.7	74.7	75.4	76.2	85.4	47.4	41	73.2	8	32
3	210	117	127.0	31.8	77.9	90.7	91.4	92.2	89.4	52.4	46	88.9	10	35
3 1/2	229	133	139.7	35.1	90.1	103.4	104.1	104.9	92.4	55.4	49	101.6	10	40
4	273	152	157.2	38.1	102.3	116.1	116.8	117.6	108.4	60.4	54	114.3	11	41
5	330	189	185.7	44.4	128.2	143.8	144.5	144.5	120.4	66.4	60	141.2	11	48
6	356	222	215.9	47.8	154.1	170.7	171.4	171.4	123.4	73.4	67	168.4	13	51
8	419	273	269.7	55.6	202.7	221.5	222.2	222.2	139.4	82.4	76	219.2	13	57
10	508	343	323.8	63.5	254.5	276.2	277.4	276.4	158.4	92.4	111	273.0	13	65
12	559	400	381.0	66.5	304.7	327.0	328.2	328.7	161.4	98.4	117	323.8	13	70
14	603	432	412.8	69.8	336.5	359.2	360.2	360.4	171.4	100.4	127	355.6	13	73
16	686	495	469.9	76.2	387.3	410.5	411.2	411.2	184.4	112.4	140	406.4	13	78
18	743	546	533.4	82.6	437.9	461.8	462.3	462.0	190.4	123.4	152	457.2	13	79
20	813	610	584.2	88.9	488.9	513.1	514.4	512.8	196.4	133.4	165	508.0	13	83
22	870	663	641.4	95.2	539.8	564.4	565.2	—	203.4	139.4	175	558.8	13	—
24	940	718	692.2	101.6	590.9	616.0	616.0	614.4	209.4	146.4	184	609.6	13	92

Notes:

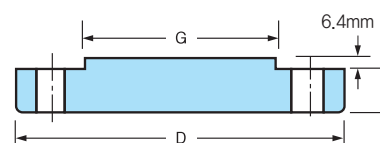
- (1) For the inside diameter of pipes (corresponding to 'Bore' (B₁) of Welding Neck Flanges), refer to page 62.
- (2) For Slip-on, Threaded, and Lap Joint and Socket Welding Flanges, the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.
- (3) Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.



THREADED



LAP JOINT



BLIND

Unit : mm

Nominal Pipe Size	Depth of Socket Y	DRILLING			BOLTING				APPROXIMATE WEIGHT				
		Bolt Circle Diam	Number of Holes	Diam of Holes	Diam of Bolts (inch)	Stud Bolt Length			Welding Neck kg	Slip-on and Threaded kg	Lap Joint kg	Blind kg	Socket Welding kg
						0.25" Raised Face	Male- Female Tongue- Groove	Ring Joint					
1/2	10	66.5	4	15.9	1/2	75	70	75	0.88	0.73	0.70	0.75	0.76
3/4	11	82.6	4	19.1	5/8	90	85	90	1.47	1.24	1.19	1.26	1.28
1	13	88.9	4	19.1	5/8	90	85	90	1.86	1.53	1.47	1.60	1.59
1 1/4	14	98.6	4	19.1	5/8	95	90	95	2.50	2.01	1.92	2.22	2.09
1 1/2	16	114.3	4	22.2	3/4	110	100	110	3.53	2.96	2.84	3.25	3.07
2	18	127.0	8	19.1	5/8	110	100	110	4.36	3.61	3.42	4.14	3.78
2 1/2	19	149.4	8	22.2	3/4	120	115	120	6.38	5.21	4.97	6.06	5.49
3	21	168.1	8	22.2	3/4	125	120	125	8.57	7.05	6.70	8.51	7.46
3 1/2	—	184.2	8	25.4	7/8	140	135	140	10.77	8.86	8.47	11.00	—
4	—	215.9	8	25.4	7/8	145	140	145	17.39	14.51	14.01	17.26	—
5	—	266.7	8	28.6	1	165	160	165	29.11	24.34	23.72	29.37	—
6	—	292.1	12	28.6	1	170	165	170	34.77	28.93	28.14	36.28	—
8	—	349.2	12	31.8	1 1/8	190	185	195	52.80	43.32	42.24	58.86	—
10	—	431.8	16	34.9	1 1/4	215	210	215	86.67	70.37	75.16	97.49	—
12	—	489.0	20	34.9	1 1/4	220	215	220	103.67	84.10	90.20	123.79	—
14	—	527.0	20	38.1	1 3/8	235	230	235	122.87	98.63	108.15	150.63	—
16	—	603.2	20	41.3	1 1/2	255	250	255	171.87	141.94	155.42	213.66	—
18	—	654.0	20	44.5	1 5/8	275	265	275	205.52	173.08	188.14	272.06	—
20	—	723.9	24	44.5	1 5/8	285	280	290	256.53	220.46	241.51	349.52	—
22	—	777.7	24	47.6	1 3/4	305	—	310	298.95	257.11	283.79	428.36	—
24	—	838.2	24	50.8	1 7/8	330	325	335	359.94	312.99	345.95	533.33	—

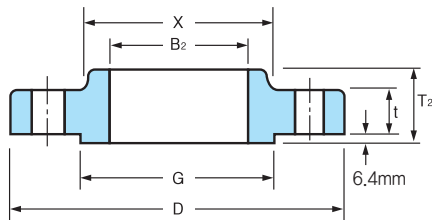
(4) The gasket surface and backside (bearing surface for bolting) are made parallel within 1 degree.

To accomplish parallelism, spot facing is carried out according to MSS SP-9, without reducing thickness (t).

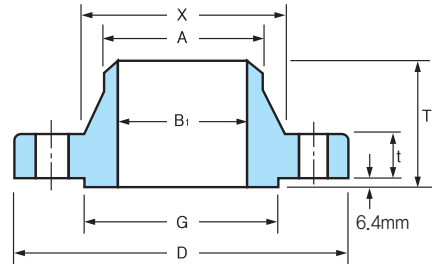
(5) Dimensions of sizes 1/2" through 31/2" are the same as for Class 400 Flanges

(6) Depth of Socket (Y) is covered by ANSI B16.5 only in sizes through 3 inch, over 3 inch is at the manufacturer's option.

CLASS 900 FLANGES



SLIP-ON



WELDING NECK

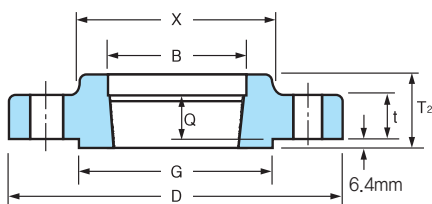
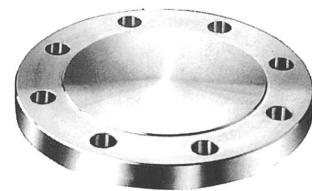
ASME B16.5 FORGED FLANGES

Unit : mm

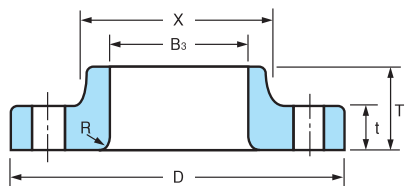
Nominal Pipe Size	Outside Diam.	Diam. at Base of Hub	O. D. of Raised Face	Thick-ness	BORE				LENGTH THRU HUB			Diam. of Hub at Bevel
					Welding Neck Socket Welding	Slip-on	Lap Joint	Counter Bore Min. Thread Min.	Welding Neck	Slip-on Threaded	Lap Joint	
	D	X	G	t	B ₁	B ₂	B ₃	B	T ₁	T ₂	T ₃	A
1/2	121	38	35.1	22.4	15.8	22.4	22.9	23.6	66.4	38.4	32	21.3
3/4	130	44	42.9	25.4	21.0	27.7	28.2	29.0	76.4	41.4	35	26.7
1	149	52	50.8	28.4	26.6	34.5	35.4	35.8	79.4	47.4	41	33.5
1 1/4	159	64	63.5	28.4	35.1	43.2	43.7	44.4	79.4	47.4	41	42.2
1 1/2	178	70	73.0	31.8	40.9	49.5	50.0	50.5	89.4	50.4	44	48.3
2	216	105	91.9	38.1	52.5	62.0	62.5	63.5	108.4	63.4	57	60.5
2 1/2	244	124	104.6	41.1	62.7	74.7	75.4	76.2	111.4	70.4	64	73.2
3	241	127	127.0	38.1	77.9	90.7	91.4	92.2	108.4	60.4	54	88.9
4	292	159	157.2	44.5	102.3	116.1	116.8	117.6	120.4	76.4	70	114.3
5	349	190	185.7	50.8	128.2	143.8	144.5	144.5	133.4	85.4	79	141.2
6	381	235	215.9	55.6	154.1	170.7	171.4	171.4	146.4	92.4	86	168.4
8	470	298	269.7	63.5	202.7	221.5	222.2	222.2	168.4	108.4	114	219.2
10	546	368	323.8	69.8	254.5	276.4	277.4	276.4	190.4	114.4	127	273.0
12	610	419	381.0	79.2	304.7	327.2	328.2	328.7	206.4	123.4	143	323.8
14	641	451	412.8	85.9	336.5	359.2	360.2	360.4	219.4	136.4	155	355.6
16	705	508	469.9	88.9	387.3	410.5	411.2	411.2	222.4	139.4	165	406.4
18	787	565	533.4	101.6	437.9	461.8	462.3	462.0	235.4	158.4	190	457.2
20	857	622	584.2	108.0	488.8	513.1	514.4	512.8	254.4	165.4	210	508.0
24	1041	749	692.2	139.7	590.9	616.0	616.0	614.4	298.4	209.4	267	609.6

Notes:

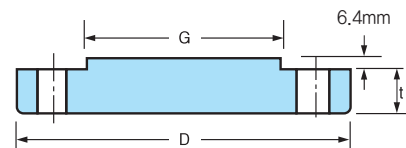
- (1) For the inside diameter of pipes (corresponding to 'Bore' (B1) of Welding Neck Flanges), refer to page 62.
- (2) For Slip-on, Threaded, Lap Joint Flanges the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.



THREADED



LAP JOINT



BLIND

Unit : mm

Nominal Pipe Size	Radius of Fillet	Thread Length	DRILLING			BOLTING				APPROXIMATE WEIGHT			
						Diam of Bolts (inch)	Stud Bolt Length						
			Bolt Circle Diam	Number of Holes	Diam of Holes		0,25" Raised Face	Male- Female Tongue- Groove	Ring Joint	Welding Neck	Slip-on and Threaded	Lap Joint	Blind
	R	Q	kg	kg	kg	kg							
1/2	3	22	82.6	4	22.2	3/4	110	100	110	1.92	1.76	1.73	1.80
3/4	3	25	88.9	4	22.2	3/4	115	110	115	2.57	2.33	2.28	2.41
1	3	28	101.6	4	25.4	7/8	125	120	125	3.72	3.40	3.33	3.54
1 1/4	5	30	111.1	4	25.4	7/8	125	120	125	4.34	3.90	3.81	4.13
1 1/2	6	32	124.0	4	28.6	1	140	135	140	6.00	5.39	5.26	5.78
2	8	38	165.1	8	25.4	7/8	145	140	145	11.13	9.86	9.65	10.08
2 1/2	8	48	190.5	8	28.6	1	160	150	160	15.24	13.60	13.39	13.85
3	10	41	190.5	8	25.4	7/8	145	140	145	13.74	11.58	11.23	13.06
4	11	48	235.0	8	31.8	1 1/8	170	165	170	22.58	19.76	19.25	22.14
5	11	54	279.4	8	34.9	1 1/4	190	185	190	36.08	31.83	31.19	36.44
6	13	57	317.5	12	31.8	1 1/8	190	185	195	47.73	41.17	40.35	47.42
8	13	64	393.7	12	38.1	1 3/8	220	215	220	81.39	70.79	72.57	82.49
10	13	71	469.9	16	38.1	1 3/8	235	230	235	120.25	100.39	105.75	122.37
12	13	76	533.4	20	38.1	1 3/8	255	250	255	159.44	132.64	141.54	173.16
14	13	83	558.8	20	41.3	1 1/2	275	265	280	182.24	152.98	162.12	206.16
16	13	86	616.0	20	44.5	1 5/8	285	280	290	219.46	184.67	199.68	259.29
18	13	89	685.8	20	50.8	1 7/8	325	320	335	295.88	257.67	279.13	366.68
20	13	92	749.3	20	54.0	2	350	345	360	367.08	316.69	350.73	463.44
24	13	102	901.7	20	66.7	2 1/2	440	430	455	670.79	604.39	672.06	875.20

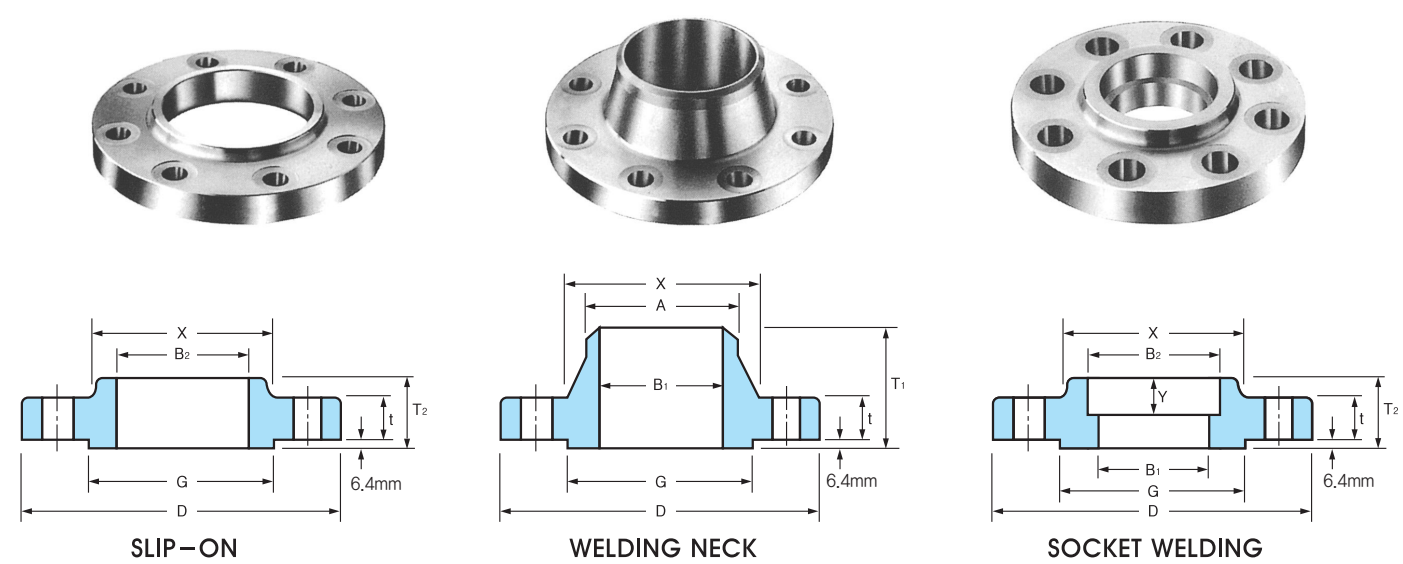
(3) Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.

(4) 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).

(5) Dimensions of sizes 1/2" through 21/2" are the same as for Class 1500 Flanges

CLASS 1500 FLANGES



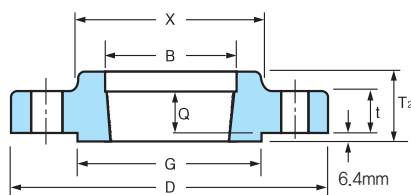
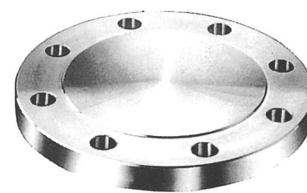
ASME B16.5 FORGED FLANGES

Unit : mm

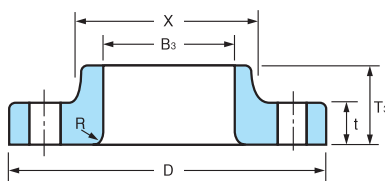
Nominal Pipe Size	Outside Diam.	Diam. at Base of Hub	O. D. of Raised Face	Thick- ness	BORE				LENGTH THRU HUB			Diam. of Hub at Bevel	Radius of Fillet	Thread Length
					Welding Neck Socket Welding	Slip-on Socket Welding	Lap Joint	Counter Bore Min. Thread Min.	Welding Neck	Slip-on Threaded Socket Welding	Lap Joint			
	D	X	G	t	B ₁	B ₂	B ₃	B	T ₁	T ₂	T ₃	A	R	Q
1/2	121	38	35.1	22.4	15.8	22.4	22.9	23.6	66.4	38.4	32	21.3	3	22
3/4	130	44	42.9	25.4	21.0	27.7	28.2	29.0	76.4	41.4	35	26.7	3	25
1	149	52	50.8	28.4	26.6	34.5	35.4	35.8	79.4	47.4	41	33.5	3	28
1 1/4	159	64	63.5	28.4	35.1	43.2	43.7	44.4	79.4	47.4	41	42.2	5	30
1 1/2	178	70	73.0	31.8	40.9	49.5	50.0	50.5	89.4	50.4	44	48.3	6	32
2	216	105	91.9	38.1	52.5	62.0	62.5	63.5	108.4	63.4	57	60.5	8	38
2 1/2	244	124	104.6	41.1	62.7	74.7	75.4	76.2	111.4	70.4	64	73.2	8	48
3	267	133	127.0	47.8	77.9	—	91.4	—	123.4	—	73	88.9	10	—
4	311	162	157.2	53.8	102.3	—	116.8	—	130.4	—	90	114.3	11	—
5	375	197	185.7	73.2	128.2	—	144.5	—	161.4	—	105	141.2	11	—
6	394	229	215.9	82.6	154.1	—	171.4	—	177.4	—	119	168.4	13	—
8	483	292	269.7	91.9	202.7	—	222.2	—	219.4	—	143	219.2	13	—
10	584	368	323.8	108.0	254.5	—	277.4	—	260.4	—	178	273.0	13	—
12	673	451	381.0	124.0	304.7	—	328.2	—	288.4	—	219	323.8	13	—
14	749	495	412.8	133.4	336.5	—	360.2	—	304.4	—	241	355.6	13	—
16	826	552	469.9	146.0	387.3	—	411.2	—	317.4	—	260	406.4	13	—
18	914	597	533.4	162.1	437.9	—	462.3	—	333.4	—	276	457.2	13	—
20	984	641	584.2	177.8	488.9	—	514.4	—	362.4	—	292	508.0	13	—
24	1168	762	692.2	203.2	590.9	—	616.0	—	412.4	—	330	609.6	13	—

Notes:

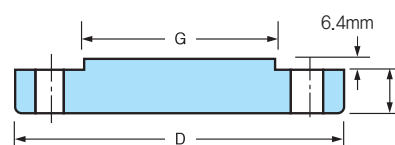
- (1) For the inside diameter of pipes (corresponding to 'Bore' (B1) of Welding Neck Flanges), refer to page 62.
- (2) For Slip-on, Threaded, and Lap Joint and Socket Welding Flanges, the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.
- (3) Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.



THREADED



LAP JOINT



BLIND

Nominal Pipe Size	Depth of Socket Y	DRILLING			BOLTING				APPROXIMATE WEIGHT				
		Bolt Circle Diam	Number of Holes	Diam of Holes	Diam of Bolts (inch)	Stud Bolt Length			Welding Neck kg	Slip-on and Threaded kg	Lap Joint kg	Blind kg	Socket Welding kg
						0.25 ~ Raised Face	Male- Female Tongue- Groove	Ring Joint					
1/2	10	82.6	4	22.2	3/4	110	100	110	1.92	1.76	1.73	1.80	1.81
3/4	11	88.9	4	22.2	3/4	115	110	115	2.57	2.33	2.28	2.41	2.39
1	13	101.6	4	25.4	7/8	125	120	125	3.72	3.40	3.33	3.54	3.50
1 1/4	14	111.1	4	25.4	7/8	125	120	125	4.34	3.90	3.81	4.13	4.04
1 1/2	16	124.0	4	28.6	1	140	135	140	6.00	5.39	5.26	5.78	5.55
2	18	165.1	8	25.4	7/8	145	140	145	11.13	9.86	9.65	10.08	10.16
2 1/2	19	190.5	8	28.6	1	160	150	160	15.24	13.60	13.35	13.85	14.12
3	—	203.2	8	31.8	1 1/8	180	170	180	20.09	—	17.60	19.25	—
4	—	241.3	8	34.9	1 1/4	195	190	195	29.90	—	27.12	29.81	—
5	—	292.1	8	41.3	1 1/2	250	240	250	57.10	—	51.37	58.64	—
6	—	317.5	12	38.1	1 3/8	260	255	265	68.04	—	60.37	71.99	—
8	—	393.7	12	44.5	1 5/8	290	285	300	115.72	—	102.00	121.53	—
10	—	482.6	12	50.8	1 7/8	335	330	345	201.02	—	180.38	210.51	—
12	—	571.5	16	54.0	2	375	370	385	301.23	—	284.15	316.17	—
14	—	635.0	16	60.3	2 1/4	405	400	425	396.06	—	383.13	420.06	—
16	—	704.8	16	66.7	2 1/2	445	440	470	503.99	—	492.94	558.50	—
18	—	774.7	16	73.0	2 3/4	495	490	525	653.85	—	635.97	760.53	—
20	—	831.8	16	79.4	3	540	535	565	797.31	—	763.37	963.81	—
24	—	990.6	16	92.1	3 1/2	615	610	650	1,264.88	—	1,220.36	1,557.19	—

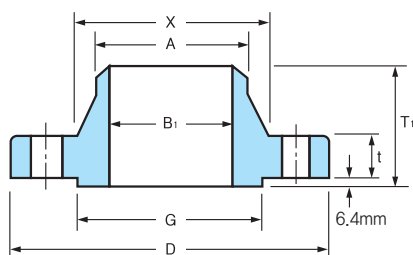
(4) The gasket surface and backside (bearing surface for bolting) are made parallel within 1 degree.

To accomplish parallelism, spot facing is carried out according to MSS SP-9, without reducing thickness (t).

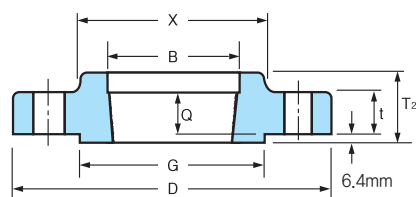
(5) Dimensions of sizes 1/2" through 2 1/2" are the same as for Class 900 Flanges

(6) Depth of Socket (Y) is covered by ANSI B16.5 only in sizes through 2 1/2" inch ,over 2 1/2" inch is at the manufacturer' s option.

CLASS 2500 FLANGES



WELDING NECK



THREADED

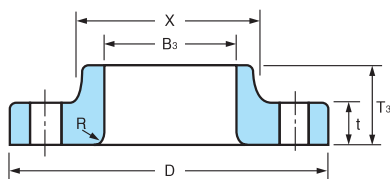
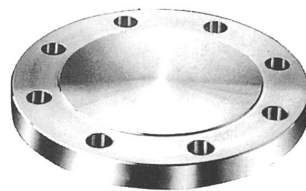
ASME B16.5 FORGED FLANGES

Unit : mm

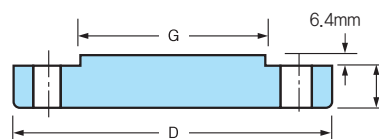
Nominal Pipe Size	Outside Diam.	Diam. at Base of Hub	O. D. of Raised Face	Thick- ness	BORE			LENGTH THRU HUB			Diam. of Hub at Bevel	Radius of Fillet	Thread Length
					Welding Neck Socket Welding	Lap Joint	Counter Bore Min. Thread Min.	Welding Neck	Threaded	Lap Joint			
	D	X	G	t	B ₁	B ₃	B	T ₁	T ₂	T ₃	A	R	Q
1/2	133	43	35.1	30.2	15.8	22.9	23.6	79.4	46.4	40	21.3	3	28
3/4	140	51	42.9	31.8	21.0	28.2	29.0	85.4	49.4	43	26.7	3	32
1	159	57	50.8	35.1	26.6	35.1	35.8	95.4	54.4	48	33.5	3	35
1 1/4	184	73	63.5	38.1	35.1	43.7	44.4	101.4	58.4	52	42.2	5	38
1 1/2	203	79	73.0	44.4	40.9	50.0	50.5	117.4	66.4	60	48.3	6	44
2	235	95	91.9	50.8	52.5	62.5	63.5	133.4	76.4	70	60.5	8	51
2 1/2	267	114	104.6	57.2	62.7	75.4	76.2	149.4	85.4	79	73.2	8	57
3	305	133	127.0	66.5	77.9	91.4	—	174.4	—	92	88.9	10	—
4	356	165	157.2	76.2	102.3	116.8	—	196.4	—	108	114.3	11	—
5	419	203	185.7	91.9	128.2	144.5	—	235.4	—	130	141.2	11	—
6	483	235	215.9	108.0	154.1	171.4	—	279.4	—	152	168.4	13	—
8	552	305	269.7	127.0	202.7	222.2	—	324.4	—	178	219.2	13	—
10	673	375	323.8	165.1	254.5	277.4	—	425.4	—	229	273.0	13	—
12	762	441	381.0	184.2	304.7	328.2	—	470.4	—	254	323.8	13	—

Notes:

- (1) For the inside diameter of pipes (corresponding to 'Bore' (B₁) of Welding Neck Flanges), refer to page 62.
- (2) For Slip-on, Threaded and Lap Joint Flanges, the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.



LAP JOINT



BLIND

Nominal Pipe Size	DRILLING			BOLTING				APPROXIMATE WEIGHT			
				Stud Bolt Length							
	Bolt Circle Diam	Number of Holes	Diam of Holes	Diam of Bolts (inch)	0.25 ~ Raised Face	Male– Female Tongue– Groove	Ring Joint	Welding Neck	Slip–on and Threaded	Lap Joint	Blind
kg								kg	kg	kg	
1/2	88.9	4	22.2	3/4	120	115	120	3.16	2.94	2.90	2.97
3/4	95.2	4	22.2	3/4	125	120	125	3.78	3.46	3.41	3.53
1	108.0	4	25.4	7/8	140	135	140	5.32	4.86	4.79	5.01
1 1/4	130.0	4	28.6	1	150	145	150	7.82	7.11	7.01	7.34
1 1/2	146.0	4	31.8	1 1/8	170	165	170	10.93	9.96	9.83	10.38
2	171.4	8	28.6	1	180	170	180	16.28	14.80	14.57	15.57
2 1/2	196.8	8	31.8	1 1/8	195	190	205	23.94	21.46	21.20	22.71
3	228.6	8	34.9	1 1/4	220	215	230	36.25	–	–	34.76
4	273.0	8	41.3	1 1/2	255	250	260	55.54	–	–	54.08
5	323.8	8	47.6	1 3/4	300	290	310	92.51	–	–	90.52
6	368.3	8	54.0	2	345	335	355	143.18	–	–	141.57
8	438.2	12	54.0	2	380	375	395	214.83	–	–	213.95
10	539.8	12	66.7	2 1/2	490	485	510	409.15	–	–	410.62
12	619.3	12	73.0	2 3/4	540	535	560	581.15	–	–	592.22

(3) Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.

(4) 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).

(5) Class 2500 Slip-on Flanges are not covered by ASME B16.5, slip-on flanges are at the manufacturer's option.