

N.M. DHARIA & CO

23, BIBIJAN STREET 16 RATAN HOUSE 2ND FLOOR
MUMBAI - 400 003

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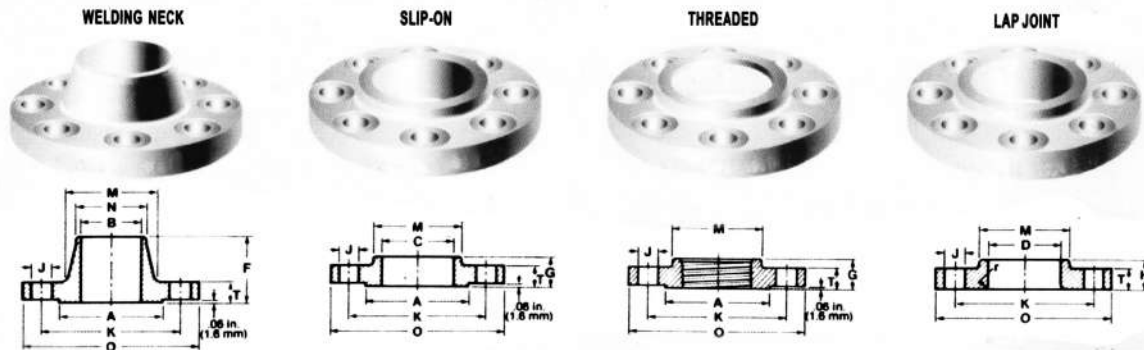
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SECTION III : FLANGES





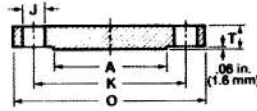
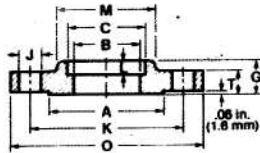
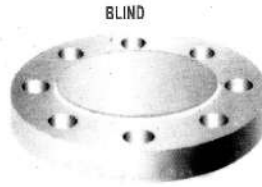
NPS	DN	FLANGE OUTSIDE DIAMETER O	FLANGE ² THICKNESS MIN. T	RAISED FACE DIA. A	BORE			LENGTH THRU HUB		
					WELDING NECK & SOCKET MIN. B3	SLIP-ON & SOCKET WELD SOCKET MIN. C	LAP JOINT MIN. D	WELDING NECK F	SLIP-ON, THREADED & SOCK. WELD G	LAP JOINT H
1/2	15	3.50	.44	1.38	.62	.88	.90	1.88	.62	.62
3/4	20	3.88	.50	1.69	.82	1.09	1.11	2.06	.62	.62
1	25	4.25	.56	2.00	1.05	1.36	1.38	2.19	.69	.69
1 1/4	32	4.62	.62	2.50	1.38	1.70	1.72	2.25	.81	.81
1 1/2	40	5.00	.69	2.88	1.61	1.95	1.97	2.44	.88	.88
2	50	6.00	.75	3.62	2.07	2.44	2.46	2.50	1.00	1.00
2 1/2	65	7.00	.88	4.12	2.47	2.94	2.97	2.75	1.12	1.12
3	80	7.50	.94	5.00	3.07	3.57	3.60	2.75	1.19	1.19
3 1/2	90	8.50	.94	5.50	3.55	4.07	4.10	2.81	1.25	1.25
4	100	9.00	.94	6.19	4.03	4.57	4.60	3.00	1.31	1.31
5	125	10.00	.94	7.31	5.05	5.66	5.69	3.50	1.44	1.44
6	150	11.00	1.00	8.50	6.07	6.72	6.75	3.50	1.56	1.56
8	200	13.50	1.12	10.62	7.98	8.72	8.75	4.00	1.75	1.75
10	250	16.00	1.19	12.75	10.02	10.88	10.92	4.00	1.94	1.94
12	300	19.00	1.25	15.00	12.00	12.88	12.92	4.50	2.19	2.19
14	350	21.00	1.38	16.25	TO BE	14.14	14.18	5.00	2.25	3.12
16	400	23.50	1.44	18.50	SPECIFIED	16.16	16.19	5.00	2.50	3.44
18	450	25.00	1.56	21.00	BY	18.18	18.20	5.50	2.69	3.81
20	500	27.50	1.69	23.00	PURCHASER	20.20	20.25	5.69	2.88	4.06
24	600	32.00	1.88	27.25		24.25	24.25	6.00	3.25	4.38
						615.9	615.9	152.4	83	111

¹Socket Welding Flanges, sizes NPS 3-1/2 (DN 90) and larger are not covered by ANSI B16.5

²Includes .06" (1.6 mm) raised face.

³These dimensions correspond to inside diameters of pipe as given in ANSI B36.10 for Standard Wall Pipe. Thickness of Standard Wall is the same as Schedule 40 in size NPS 10 (DN 250) and smaller.

INCHES
MILLIMETRES



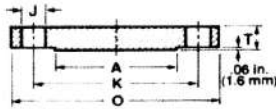
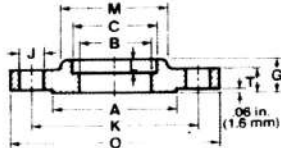
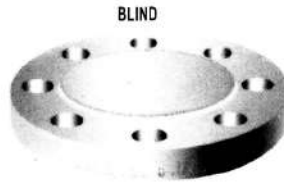
CLASS 150 (PN 20) FLANGES

FORGED STEEL

ASTM A-105 ANSI B16.5

NPS	DN	DRILLING			DEPTH ¹ OF SOCKET	DIAMETER OF HUB		LAP JOINT FILLET RADIUS	APPROXIMATE WEIGHT			
		NO. OF HOLES	DIA. OF HOLES	DIA. OF BOLT CIRCLE		AT BASE	AT CHAMFER		WELDING NECK	SLIP-ON, THREADED & SOCKET. WELDING ¹	BLIND	LAP JOINT
			J	K	L	M	N	r				
1/2		4	.62	2.38	.38	1.19	.84	.12	2	1	1	1
	15	4	16	60.3	10	30.2	21.4	3	0.9	.05	0.5	0.5
3/4		4	.62	2.75	.44	1.50	1.05	.12	2	2	2	2
	20	4	16	69.8	11	38.1	26.6	3	0.9	0.9	0.9	0.9
1		4	.62	3.12	.50	1.94	1.32	.12	3	2	2	2
	25	4	16	79.4	13	49.2	33.5	3	1.4	0.9	0.9	0.9
1 1/4		4	.62	3.50	.56	2.31	1.66	.19	3	3	3	3
	32	4	16	88.9	14	58.7	42.1	5	1.4	1.4	1.4	1.4
1 1/2		4	.62	3.88	.62	2.56	1.90	.25	4	3	4	3
	40	4	16	98.4	16	65.1	48.3	6	1.8	1.4	1.8	1.4
2		4	.75	4.75	.69	3.06	2.38	.31	6	5	5	5
	50	4	20	120.6	17	77.6	60.4	8	2.7	2.3	2.3	2.3
2 1/2		4	.75	5.50	.75	3.56	2.88	.31	8	7	7	7
	65	4	20	139.7	19	90.5	73.0	b	3.6	3.2	3.2	3.2
3		4	.75	6.00	.81	4.25	3.50	.38	10	8	9	8
	80	4	20	152.4	21	107.9	88.9	10	4.5	3.6	4.1	3.6
3 1/2		8	.75	7.00	-	4.81	4.00	.38	12	11	13	11
	90	8	20	177.8	-	122.2	101.6	10	5.4	5.0	5.9	5.0
4		8	.75	7.50	-	5.31	4.50	.44	15	13	17	13
	100	8	20	190.5	-	134.9	114.3	11	6.8	5.9	7.7	5.9
5		8	.88	8.50	-	6.44	5.56	.44	19	15	20	15
	125	8	23	215.9	-	163.5	141.3	11	8.6	6.8	9.1	6.8
6		8	.88	9.50	-	7.56	6.63	.50	24	19	26	19
	150	8	23	241.3	-	192.1	168.3	13	10.9	8.6	11.8	8.6
8		8	.88	11.75	-	9.69	8.63	.50	39	30	45	30
	200	8	23	298.4	-	246.1	219.1	13	17.7	13.6	20.4	13.6
10		12	1.00	14.25	-	12.00	10.75	.50	52	43	70	43
	250	12	26	361.9	-	304.8	273.0	13	23.6	19.5	31.8	19.5
12		12	1.00	17.00	-	14.38	12.75	.50	80	64	110	64
	300	12	26	431.8	-	365.1	323.8	13	36.3	29.0	49.9	29.0
14		12	1.12	18.75	-	15.75	14.00	.50	110	90	140	105
	350	12	29	476.2	-	400.0	355.6	13	50.0	41.0	63.5	47.6
16		16	1.12	21.25	-	18.00	16.00	.50	140	98	180	140
	400	16	29	539.7	-	457.2	406.4	13	64.0	44.5	81.6	63.5
18		16	1.25	22.75	-	19.88	18.00	.50	150	130	220	160
	450	16	32	577.8	-	504.8	457.2	13	68.0	59.0	99.8	72.6
20		20	1.25	25.00	-	22.00	20.00	.50	180	165	285	195
	500	20	32	635.0	-	558.8	508.0	13	81.6	75.0	129.0	88.5
24		20	1.38	29.50	-	26.12	24.00	.50	260	220	430	275
	600	20	35	749.3	-	663.6	609.6	13	118	99.8	195.0	125.0

POUNDS
KILOGRAMS



CLASS 300 (PN 50) FLANGES

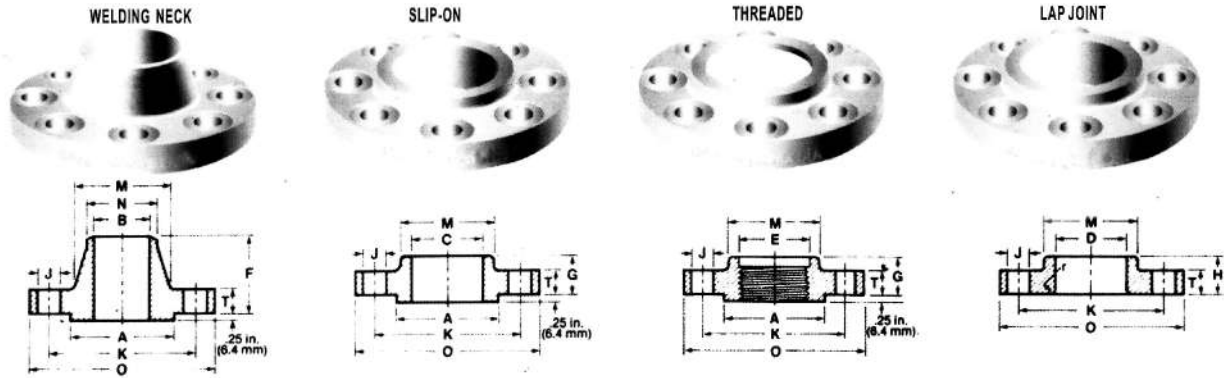
FORGED STEEL

ASTMA-105 ¹ANSI B16.5

NPS	DN	DRILLING			Depth ¹ of Socket	DIAMETER OF HUB		Lap Joint Fillet Radius	APPROXIMATE WEIGHT			
		NO. Of Holes	Dia. of Holes	Dia. of Bolt Circle		At Base	At Chamfer		Welding Neck	Slip-on, Threaded & Socket Welding ¹	Blind	Lap Joint
			J	K	L	M	N	r				
1/2		4	.62	2.62	.38	1.50	.84	.12	2	2	2	2
	15	4	16	66.7	10	38.1	21.4	3	0.9	0.9	0.9	0.9
3/4		4	.75	3.25	.44	1.88	1.05	.12	3	3	3	3
	20	4	20	82.5	11	47.6	26.6	3	1.4	1.4	1.4	1.4
1		4	.75	3.50	.50	2.12	1.32	.12	4	3	3	3
	25	4	20	88.9	13	53.8	33.5	3	1.8	1.4	1.4	1.4
1 1/4		4	.75	3.88	.56	2.50	1.66	.19	5	4	4	4
	32	4	20	98.4	14	63.5	42.1	5	2.3	1.8	1.8	1.8
1 1/2		4	.88	4.50	.62	2.75	1.90	.25	7	6	6	6
	40	4	23	114.3	16	69.9	48.3	6	3.2	2.7	2.7	2.7
2		8	.75	5.00	.69	3.31	2.38	.31	9	7	8	7
	50	8	20	127.0	17	84.1	60.3	8	4.1	3.2	3.6	3.2
2 1/2		8	.88	5.88	.75	3.94	2.88	.31	12	10	12	10
	65	8	23	149.2	19	100.0	73.0	8	5.4	4.5	5.4	4.5
3		8	.88	6.62	.81	4.62	3.50	.38	15	13	16	13
	80	8	23	168.3	21	117.5	88.9	10	6.8	5.9	7.3	5.9
3 1/2		8	.88	7.25	-	5.25	4.00	.38	18	17	21	17
	90	8	23	184.1	-	133.3	101.6	10	8.2	7.7	9.5	7.7
4		8	.88	7.88	-	5.75	4.50	.44	25	22	27	22
	100	8	23	200.0	-	146.0	114.3	11	11.3	10.0	12.2	10.0
5		8	.88	9.25	-	7.00	5.56	.44	32	28	35	28
	125	8	23	234.9	-	177.8	141.3	11	14.5	12.7	15.9	12.7
6		12	.88	10.62	-	8.12	6.63	.50	42	39	50	39
	150	12	23	269.9	-	206.4	168.3	13	19.0	17.7	22.7	17.7
8		12	1.00	13.0	-	10.25	8.63	.50	67	58	81	58
	200	12	26	330.2	-	260.3	219.1	13	30.4	26.3	36.7	26.3
10		16	1.12	15.25	-	12.62	10.75	.50	91	81	125	91
	250	16	29	387.3	-	320.7	273.0	13	41.3	36.7	56.7	41.3
12		16	1.25	17.75	-	14.75	12.75	.50	140	115	185	140
	300	16	32	450.8	-	374.6	323.8	13	63.5	52.2	83.9	63.5
14		20	1.25	20.25	-	16.75	14.00	.50	180	165	250	190
	350	20	32	514.3	-	425.5	355.6	13	81.6	74.8	113	86.2
16		20	1.38	22.50	-	19.00	16.00	.50	250	190	295	250
	400	20	35	571.5	-	482.6	406.4	13	113	86.2	134	113
18		24	1.38	24.75	-	21.00	18.00	.50	320	250	395	295
	450	24	35	628.6	-	533.4	457.2	13	145	113	179	134
20		24	1.38	27.00	-	23.12	20.00	.50	400	315	505	370
	500	24	35	685.80	-	587.4	508.0	13	181	143	229	168
24		24	1.62	32.00	-	27.62	24.00	.50	580	475	790	550
	600	24	42	812.80	-	701.7	609.6	13	283	215	358	249

POUNDS

KILOGRAMS

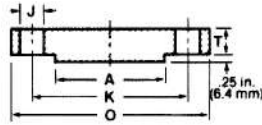
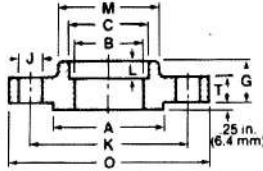
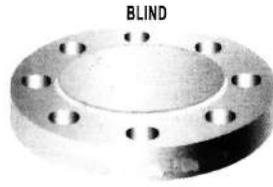


NPS	DN	Flange Outside Diameter O	Flange ² Thickness Min. T	Raised Face Dia. A	BORE				LENGTH THRU HU ²		
					Welding Neck & Socket Welding B	Slip-on & Socket Weld. Socket Min. C	Lap Joint Min. D	Threaded Counterbore Min. E	Welding Neck F	Slip-on, Threaded, Socket Welding G	Lap Joint H
1/2	15	3.75	.56	1.38		.88	.90	.93	2.06	.88	.88
3/4	20	4.62	.62	1.69		1.09	1.11	1.14	2.25	1.00	1.0
	25	117	16.0	42.9		27.8	28.2	29.0	57.1	25	25
1	25	4.88	.69	2.0		1.36	1.38	1.41	2.44	1.06	1.06
	32	124	17.5	50.8		34.5	34.9	36.0	61.9	27	27
1 1/4	40	5.25	.81	2.5	To be specified by purchaser	1.70	1.72	1.75	2.62	1.12	1.12
	50	133	21.0	63.5		43.3	43.7	44.5	66.7	29	29
1 1/2	40	6.12	.88	2.88		1.95	1.97	1.99	2.75	1.25	1.25
	50	156	22.5	73.0		49.6	50.0	50.5	69.8	32	32
2	50	6.5	1.0	3.62		2.44	2.46	2.50	2.88	1.44	1.44
	65	165	25.5	92.1		61.9	62.5	63.5	73.0	37	37
2 1/2	65	7.5	1.12	4.12		2.94	2.97	3.00	3.12	1.62	1.62
	80	191	29.0	104.8		74.6	75.4	76.0	79.4	41	41
3	80	8.25	1.25	5.0		3.57	3.60	3.63	3.25	1.81	1.81
	100	210	32.0	127.0		90.7	91.4	92.0	82.5	46	46
3 1/2	90	9.0	1.38	5.5		4.07	4.10	4.13	3.38	1.94	1.94
	125	229	35.0	139.7		103.4	104.1	105	85.7	49	49
4	100	10.75	1.5	6.19		4.57	4.60	4.63	4.0	2.12	2.12
	150	273	38.5	157.2		116.1	116.8	118	101.6	54	54
5	125	13.0	1.75	7.31		5.66	5.69	5.69	4.5	2.38	2.38
	175	330	44.5	185.7		143.7	144.5	145	114.3	60	60
6	150	14.0	1.88	8.5		6.72	6.75	6.75	4.62	2.62	2.62
	200	356	48.0	215.9		170.7	171.4	171	117.3	67	67
8	200	16.5	2.19	10.62		8.72	8.75	8.75	5.25	3.0	3.0
	250	419	55.5	269.9		221.5	222.2	222	133.3	76	76
10	250	20.0	2.5	12.75		10.88	10.92	10.88	6.0	3.38	4.38
	300	510	63.5	323.8		276.2	277.4	276	152.4	86	111
12	300	22.0	2.62	15.0		12.88	12.92	12.94	6.12	3.62	4.62
	350	560	66.5	381.0		327.0	328.2	329	155.6	92	117
14	350	23.75	2.75	16.25		14.14	14.18	14.19	6.5	3.69	5.0
	400	605	70.0	412.8		359.2	360.2	360	165.1	94	127
16	400	27.0	3.0	18.5		16.16	16.19	16.19	7.0	4.19	5.5
	450	685	76.5	469.9		410.4	411.2	411	177.5	106	140
18	450	29.25	3.25	21.0		18.18	18.20	18.19	7.25	4.62	6.0
	500	745	83.0	533.4		461.8	462.3	462	184.1	117	152
20	500	32.0	3.5	23.0		20.20	20.25	20.19	7.5	5.0	6.5
	550	815	89.0	584.2		513.1	514.3	513	190.5	127	165
24	550	37.0	4.00	27.25		24.25	24.25	24.19	8.0	5.5	7.25
	600	940	102.0	692.2		615.9	615.9	614	203.2	140	184

¹ Socket Welding Flanges, size NPS 31/2 (DN 90) and larger are not covered by ANSI B16.5

² Does not include .25" (6.4 mm) raised face.

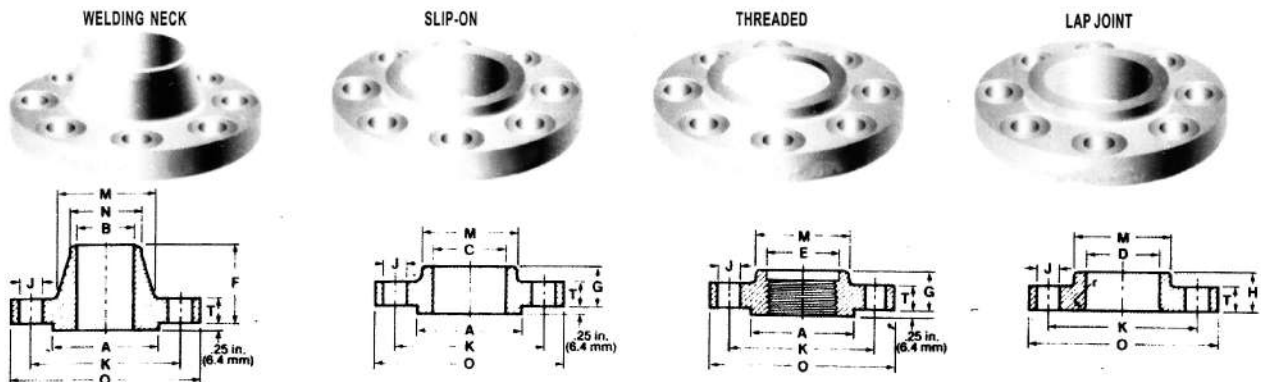
INCHES
MILLIMETRES



CLASS 600 (PN 100) FLANGES FORGED STEEL ASTMA-105 ANSI B16.5

NPS	DN	DRILLING			Depth ¹ of Socket L	DIAMETER OF HUB		Lap Joint Fillet Radius r	APPROXIMATE WEIGHT			
		NO. Of Holes	Dia. of Holes J	Dia. of Bolt Circle K		At Base M	At Chamfer N		Welding Neck	Slip-on, Threaded & Socket Welding ¹	Blind	Lap Joint
1/2	15	4	.62	2.62	.38	1.5	.84	.12	2	2	2	2
3/4	20	4	.75	3.25	.44	1.88	1.05	.12	4	3	3	3
1	25	4	.75	3.5	.50	2.12	1.32	.12	4	4	4	4
1 1/4	32	4	.75	3.88	.56	2.5	1.66	.19	6	5	5	5
1 1/2	40	4	.88	4.5	.62	2.75	1.90	.25	8	7	8	7
2	50	8	.75	5.0	.69	3.31	2.38	.31	12	9	10	9
2 1/2	65	8	.88	5.88	.75	3.94	2.88	.31	18	13	15	12
3	80	8	.88	6.62	.81	4.62	3.50	.38	23	16	20	15
3 1/2	90	8	1.0	7.25	-	5.25	4.00	.38	26	21	29	20
4	100	8	1.0	8.5	-	6.0	4.50	.44	42	37	41	36
5	125	8	1.12	10.5	-	7.44	5.56	.44	68	63	68	61
6	150	12	1.12	11.5	-	8.75	6.63	.50	81	80	86	78
8	200	12	1.25	13.75	-	10.75	8.63	.50	120	115	140	110
10	250	16	1.38	17.0	-	13.5	10.75	.50	190	170	230	170
12	300	20	1.38	19.25	-	15.75	12.75	.50	225	200	295	200
14	350	20	1.50	20.75	-	17.0	14.0	.50	280	230	355	250
16	400	20	1.62	23.75	-	19.5	16.0	.50	390	330	495	365
18	450	20	1.75	25.75	-	21.5	18.0	.50	475	400	630	435
20	500	24	1.75	28.5	-	24.0	20.0	.50	590	510	810	570
24	600	24	2.0	33.0	-	28.25	24.0	.50	830	730	1250	810

POUNDS
KILOGRAMS



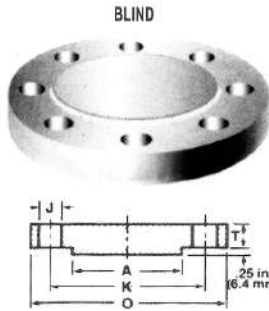
For sizes NPS 1/2 (DN 15) through NPS 2 1/2 (DN 65) use Class 1500 (PN 250) flanges.*

NPS	DN	Flange Outside Diameter	Flange ² Thickness Min.	Raised Face Dia.	BORE				LENGTH THRU HUB		
					Welding Neck	Slip-on Min.	Lap Joint Min.	Threaded Counterbore Min.	Welding Neck	Slip-on, Threaded	Lap Joint
		O	T	A	B	C	D	E	F	G	H
3		9.50	1.50	5.00		3.57	3.60	3.63	4.00	2.12	2.12
	80	241	38.5	127.0		90.7	91.4	92	101.6	54	54
4		11.50	1.75	6.19		4.57	4.60	4.63	4.50	2.75	2.75
	100	292	44.5	157.2		116.1	116.8	118	114.3	70	70
5		13.75	2.0	7.31		5.66	5.69	5.69	5.00	3.12	3.12
	125	349	51.0	185.7		143.7	144.5	145	127.0	79	79
6		15.00	2.19	8.50	To be	6.72	6.75	6.75	5.50	3.38	3.38
	150	381	56.0	215.9		170.7	171.4	171	139.7	86	86
8		18.50	2.5	10.62	specified	8.72	8.75	8.75	6.38	4.00	4.50
	200	470	63.5	269.9		221.5	222.2	222	161.9	102	114
10		21.50	2.75	12.75	by	10.88	10.92	10.88	7.25	4.25	5.00
	250	545	70.0	323.8		276.2	277.4	276	184.2	108	127
12		24.00	3.12	15.00	purchaser	12.88	12.92	12.94	7.88	4.62	5.62
	300	610	79.5	381.0		327.0	328.2	329	200.0	117	143
14		25.25	3.38	16.25		14.14	14.18	14.19	8.38	5.12	6.12
	350	640	86.0	412.8		359.2	360.2	360	212.7	130	156
16		27.75	3.5	18.50		16.16	16.19	16.19	8.50	5.25	6.50
	400	705	89.0	469.9		410.4	411.2	411	215.9	133	165
18		31.00	4.0	21.00		18.18	18.20	18.19	9.00	6.00	7.50
	450	785	102.0	533.4		461.8	462.3	462	228.8	152	191
20		33.75	4.25	23.00		20.20	20.25	20.19	9.75	6.25	8.25
	500	855	108.0	584.2		513.1	514.3	513	247.6	159	210
24		41.00	5.5	27.25		24.25	24.25	24.19	11.50	8.00	10.50
	600	1040	140.0	692.2		615.9	615.9	614	292.1	203	267

*Including SOCKET WELDING FLANGES.

**Does not include .25" (6.4 mm) raised face.

INCHES
MILLIMETRES

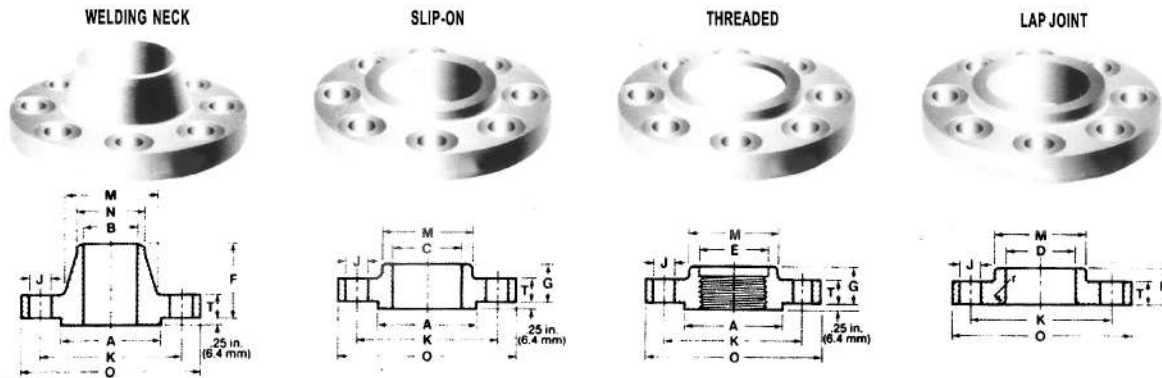


CLASS 900 (PN 160) FLANGES FORGED STEEL ASTMA-105 ANSI B16.5

For sizes NPS 1/2 (DN 15) through NPS 2 1/2 (DN 65) use Class 1500 (PN 250) flanges.¹

NPS	DN	DRILLING			DIAMETER OF HUB		Lap Joint Fillet Radius	APPROXIMATE WEIGHT			
		No. Of Holes	Dia. of Holes	Dia. of Bolt Circle	At Base	At Chamfer		Welding Neck	Slip-on, Threaded	Blind	Lap Joint
			J	K	M	N	r				
3		8	1.00	7.50	5.00	3.50	.38	31	31	31	47
	80	8	26	190.5	127.0	88.9	10	14.1	14.1	14.1	21.3
4		8	1.25	9.25	6.25	4.50	.44	51	53	54	51
	100	8	32	234.9	158.7	114.3	11	23.1	24.0	24.5	23.1
5		8	1.38	11.00	7.50	5.56	.44	86	83	87	81
	125	8	35	279.4	190.5	141.3	11	39.0	37.6	39.5	36.7
6		12	1.25	12.50	9.25	6.63	.50	110	110	115	105
	150	12	32	317.5	234.9	168.3	13	49.9	49.9*	52.2	47.6
8		12	1.50	15.50	11.75	8.63	.50	175	170	200	190
	200	12	39	393.7	298.4	219.1	13	79.4	77.1	90.7	86.2
10		16	1.50	18.50	14.50	10.75	.50	260	245	290	275
	250	16	39	469.9	368.3	273.0	13	118	111	132	125
12		20	1.50	21.00	16.50	12.75	.50	325	325	415	370
	300	20	39	533.4	419.1	323.8	13	147	147	188	168
14		20	1.62	22.00	17.75	14.00	.50	400	400	520	415
	350	20	42	558.8	450.8	355.6	13	181	181	236	188
16		20	1.75	24.25	20.00	16.00	.50	495	425	600	465
	400	20	45	615.9	508.0	406.4	13	225	193	272	211
18		20	2.00	27.00	22.25	18.00	.50	680	600	850	650
	450	20	51	685.8	565.1	457.2	13	308	272	386	295
20		20	2.12	29.50	24.50	20.00	.50	830	730	1075	810
	500	20	54	749.3	622.3	508.0	13	376	331	488	367
24		20	2.62	35.50	29.5	24.00	.50	1500	1400	2025	1550
	600	20	67	901.7	749.3	609.6	13	680	635	918	703

POUNDS
KILOGRAMS

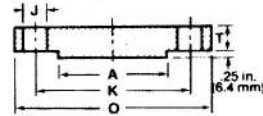
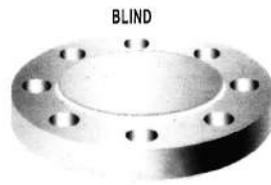
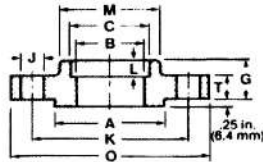


NPS	DN	Flange Outside Diameter	Flange ² Thickness Min.	Raised Face Dia.	BORE				LENGTH THRU HUB ²		
					Welding Neck & ¹ Socket Welding	¹ Slip-on & ¹ Sock. Weld. Socket Min.	Lap Joint Min.	Threaded Counterbore Min.	Welding Neck	¹ Slip-on, Threaded, ¹ Socket Welding	Lap Joint
		O	T	A	B	C	D	E	F	G	H
1/2	15	4.75	.88	1.38		0.88	.90	93	2.38	1.25	1.25
3/4	20	5.12	1.00	1.69		1.09	1.11	1.14	2.75	1.38	1.38
1	25	5.88	1.12	2.00		1.36	1.38	1.41	2.88	1.62	1.62
1 1/4	32	6.25	1.12	2.50		1.70	1.72	1.75	2.88	1.62	1.62
1 1/2	40	7.00	1.25	2.88		1.95	1.97	1.99	3.25	1.75	1.75
2	50	8.50	1.50	3.62	To be	2.44	2.46	2.50	4.00	2.25	2.25
2 1/2	65	9.62	1.62	4.12	specified	2.94	2.97	3.00	4.12	2.50	2.50
3	80	10.50	1.88	5.00	by	-	3.60	3.63	4.62	2.88	2.88
4	100	12.25	2.12	6.19	purchaser	-	4.60	4.63	4.88	3.56	3.56
5	125	14.75	2.88	7.31		-	5.69	5.69	6.12	4.12	4.12
6	150	15.50	3.25	8.50		-	6.75	6.75	6.75	4.69	4.69
8	200	19.00	3.62	10.62		-	8.75	8.75	8.38	5.62	5.62
10	250	23.00	4.25	12.75		-	10.92	10.88	10.00	6.25	7.00
12	300	26.50	4.88	15.00		-	12.92	12.94	11.12	7.12	8.62
14	350	29.50	5.25	16-25		-	14.18	-	11.75	-	9.50
16	400	32.50	5.75	18.50		-	16.19	-	12.25	-	10.25
18	450	36.00	6.38	21.00		-	18.20	-	12.88	-	10.88
20	500	38.75	7.00	23.00		-	20.25	-	14.00	-	11.50
24	600	46.00	8.00	27.25		-	24.25	-	16.00	-	13.00
		600	1170	203.5		692.2			615.9		330

¹ Socket Welding and Slip-on Flanges size NPS 3 (DN 80) and larger are not covered by ANSI B16.5

² Does not include .25" (6.4 mm) raised face.

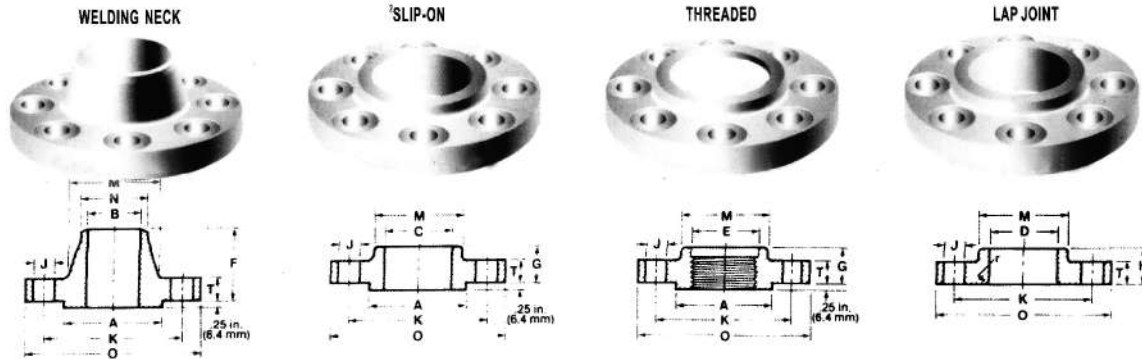
INCHES
MILLIMETRES



CLASS 1500 (PN 250) FLANGES FORGED STEEL ASTM A-105 ANSI B16.5

NPS	DN	DRILLING			Depth Of Socket	DIAMETER OF HUB		Lap Joint Fillet Radius	APPROXIMATE WEIGHT			
		No. Of Holes	Dia. of Holes	Dia. of Bolt Circle		At Base	At Chamfer		Welding Neck	Slip-on, Threaded & Socket Welding	Blind	Lap Joint
1/2	15	4	.88	3.25	.38	1.50	.84	.12	5	4	4	4
3/4	20	4	.88	3.50	.44	1.75	1.05	.12	6	5	6	5
1	25	4	1.00	4.00	.50	2.06	1.32	.12	9	8	8	8
1 1/4	32	4	1.00	4.38	.56	2.50	1.66	.19	10	9	9	9
1 1/2	40	4	1.12	4.88	.62	2.75	1.90	.25	13	12	13	12
2	50	8	1.00	6.50	.69	4.12	2.38	.31	25	25	25	25
2 1/2	65	8	1.12	7.50	.75	4.88	2.88	.31	36	36	35	35
3	80	8	1.25	8.00	-	5.25	3.50	.38	48	48	48	47
4	100	8	1.38	9.50	-	6.38	4.50	.44	73	73	73	75
5	125	8	1.62	11.50	-	7.75	5.56	.44	130	130	140	140
6	150	12	1.50	12.50	-	9.00	6.63	.50	165	165	160	170
8	200	12	1.75	15.50	-	11.50	8.63	.50	275	260	300	285
10	250	12	2.00	19.00	-	14.50	10.75	.50	455	435	510	485
12	300	16	2.12	22.50	-	17.75	12.75	.50	690	580	690	630
14	350	16	2.38	25.00	-	19.50	14.00	.50	940	-	975	890
16	400	16	2.62	27.75	-	21.75	16.00	.50	1250	-	1300	1150
18	450	16	2.88	30.50	-	23.50	18.00	.50	1625	-	1750	1475
20	500	16	3.12	32.75	-	25.25	20.00	.50	2050	-	2225	1775
24	600	16	3.62	39.00	-	30.00	24.00	.50	3325	-	3625	2825
	600	16	92	990.6	-	762.0	609.6	13	1510	-	1644	1326

POUNDS
KILOGRAMS



NPS	DN	Flange Outside Diameter O	Flange ¹ Thickness T	Raised Face Dia. A	BORE				LENGTH THRU HUB ¹		
					Welding Neck & Socket ² Welding R	Slip-on ² & Sock. Weld. ² Socket Min. C	Lap Joint Min. D	Threaded Counterbore Min. E	Welding Neck F	Slip-on ² Threaded, Socket ² Welding G	Lap Joint H
1/2	15	5.25	1.19	1.38		0.88	.90	0.93	2.88	1.56	1.56
3/4	20	5.50	1.25	1.69		1.09	1.11	1.14	3.12	1.69	1.69
1	25	6.25	1.38	2.00		1.36	1.38	1.41	3.50	1.88	1.88
1 1/4	32	7.25	1.50	2.50	To be specified	1.70	1.72	1.75	3.75	2.06	2.06
1 1/2	40	8.00	1.75	2.88		1.95	1.97	1.99	4.38	2.38	2.38
2	50	9.25	2.00	3.62	by purchaser	2.44	2.46	2.50	5.00	2.75	2.75
2 1/2	65	10.50	2.25	4.12		2.94	2.97	3.00	5.62	3.12	3.12
3	80	12.00	2.62	5.00		3.57	3.60	3.63	6.62	3.62	3.62
4	100	14.00	3.00	6.19		4.57	4.60	4.63	7.50	4.25	4.25
5	125	16.50	3.62	7.31		5.66	5.69	5.69	9.00	5.12	5.12
6	150	19.00	4.25	8.50		6.72	6.75	6.75	10.75	6.0	6.0
8	200	21.75	5.00	10.62		8.72	8.75	8.75	12.50	7.0	7.0
10	250	26.50	6.50	12.75		10.88	10.92	10.88	16.50	9.0	9.0
12	300	30.00	7.25	15.00		12.88	12.92	12.94	18.25	10.0	10.0
	300	760	184.5	381.0		327.0	328.2	329	463.6	254	254

¹ Dimensions do not include .25" (6.4 mm) raised face.

² Class 2500 (PN 400) Socket Welding and Slip-on Flanges not covered by ANSI B16.5

REDUCING FLANGES ANSI B16.5

Hub dimensions shall be at least as large as those of the standard flanges of the size to which the reduction is being made, except that flanges reduced to a size smaller than those shown in the accompanying table may be used without hubs.

For threaded flanges, tapped smaller than the reduced size in the table, Blind Flanges may be used.

Flange thickness, outside diameter, drilling template and facing dimensions, shall be the same as those of a standard flange of the nominal pipe size from which the reduction is being made.

Reducing flanges are specified by giving firstly the size from which the reduction is made, followed by the reduced size.

Example:

NPS 6 x 4 Class 300 reducing threaded flange. (DN 150 x 100, PN 50 reducing threaded flange).

INCHES

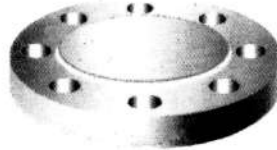
MILLIMETRES



SOCKET WELDING



BLIND

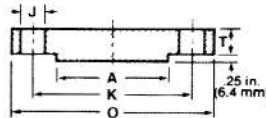
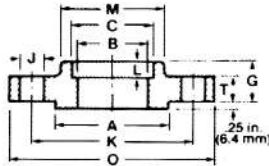


CLASS 2500 (PN 400) FLANGES*

FORGED STEEL

ASTMA-105

¹ANSI B16.5



NPS	DN	DRILLING			¹ Depth of ² Socket	DIAMETER OF HUB		Lap Joint Fillet Radius	APPROXIMATE WEIGHT			
		No. of Holes	Dia. of Holes	Dia. of Bolt Circle		At Base	At Chamfer		Welding Neck	¹ Slip on, Threaded & ¹ Socket. Welding	Blind	Lap Joint
1/2	15	4	.88	3.50	.38	1.69	.84	.12	7	7	7	7
3/4	20	4	.88	3.75	.44	2.00	1.05	.12	8	8	8	8
1	25	4	1.00	4.25	.50	2.25	1.32	.12	12	11	11	11
1 1/4	32	4	1.12	5.12	.56	2.88	1.66	.19	17	16	17	16
1 1/2	40	4	1.25	5.75	.62	3.12	1.90	.25	25	22	23	22
2	50	8	1.12	6.75	.69	3.75	2.38	.31	42	38	39	37
2 1/2	65	8	1.25	7.75	.75	4.50	2.88	.31	52	55	56	53
3	80	8	1.38	9.00	-	5.25	3.50	.38	94	83	86	80
4	100	8	1.62	10.75	-	6.50	4.50	.44	145	125	135	120
5	125	8	1.88	12.75	-	8.00	5.56	.44	245	210	225	205
6	150	8	2.12	14.50	-	9.25	6.63	.50	380	325	345	315
8	200	12	2.12	17.25	-	12.00	8.63	.50	580	485	530	470
10	250	12	2.62	21.25	-	14.75	10.75	.50	1075	930	1025	900
12	300	12	2.88	24.38	-	17.38	12.75	.50	1525	1100	1300	1100
		12	74	619.1	-	441.3	323.8	13	692	499	590	499

*Class 2500 (PN 400) Socket Welding and Slip-on Flanges are not covered by ANSI B 16.5

Bevel of Welding Neck, see page 41.

CLASS 150 - 2500 (PN 20- 400)

Nominal Pipe Size	DN	Smallest Size of Reducing Outlet Requiring Hub Flanges
1	25	1/2
1 1/4	32	1/2
1 1/2	40	1/2
2	50	1
2 1/2	65	1 1/4
3	80	1 1/2

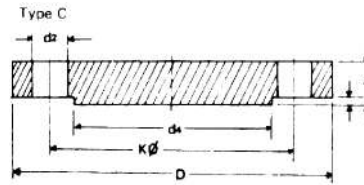
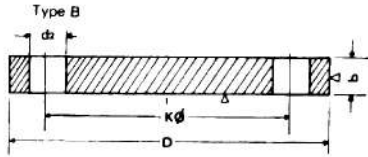
Nominal Pipe Size	DN	Smallest Size of Reducing Outlet Requiring Hub Flanges
3 1/2	90	1 1/2
4	100	1 1/2
5	125	1 1/2
6	150	2 1/2
8	200	3 1/2
10	250	3 1/2

Nominal Pipe Size	DN	Smallest Size of Reducing Outlet Requiring Hub Flanges
12	300	3 1/2
14	350	3 1/2
16	400	4
18	450	4
20	500	4
24	600	4

POUNDS

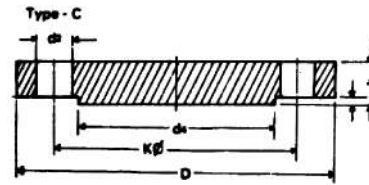
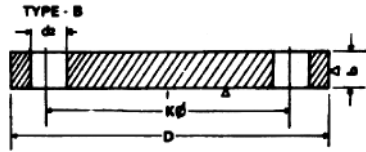
KILOGRAMS

Reducing Flanges are generally supplied as Slip-on or Threaded, however Reducing Welding Neck flanges are available by special order.



DIN 2527

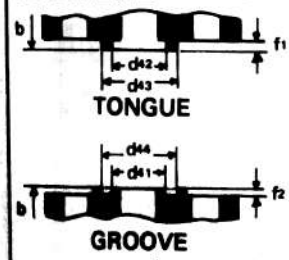
	NW	D	Flange		Raised Face Bolt Hole		Number	Bolts	Dia. of Bolt Hole	Weight of one Flange (7.85 kg/dm ³)		
			b	k	d ₁	f				Type-B	Type-C	
ND-6	10	75	12	50	35	2	4	M 10	--	11.5	0.38	0.33
	15	80	12	55	40	2	4	M 10	--	11.5	0.44	0.38
	20	90	14	65	50	2	4	M 10	--	11.5	0.65	0.59
	25	100	14	75	60	2	4	M 10	--	11.5	0.82	0.74
	32	120	14	90	70	2	4	M 12	(1/2")	14	1.17	1.07
	40	130	14	100	80	3	4	M 12	(1/2")	14	1.39	1.21
	50	140	14	110	90	3	4	M 12	(1/2")	14	1.62	1.43
	65	160	14	130	110	3	4	M 12	(1/2")	14	2.44	2.21
	80	190	16	150	128	3	4	M 16	(3/8")	18	3.43	3.09
	100	210	16	170	148	3	4	M 16	(3/8")	18	4.76	4.37
	125	240	18	200	178	3	8	M 16	(3/8")	18	6.11	5.68
	150	265	18	225	202	3	8	M 16	(3/8")	18	7.51	7.02
	(175)	295	20	255	232	3	8	M 16	(3/8")	18	10.4	9.85
	200	320	20	280	258	3	8	M 16	(3/8")	18	12.3	11.7
	250	375	22	335	312	3	12	M 16	(3/8")	18	18.3	17.6
ND-10 Note from 10 mm to 175 mm see ND-16	300	440	22	395	366	4	12	M 20	(3/4")	23	25.3	24.0
	350	490	22	445	415	4	12	M 20	(3/4")	23	31.6	30.1
	400	540	22	495	465	4	16	M 20	(3/4")	23	38.4	36.4
	500	645	24	600	570	4	20	M 20	(3/4")	23	38.4	58.1
	200	340	24	295	268	3	8	M 20	(3/4")	23	16.5	15.6
	250	395	26	350	320	3	12	M 20	(3/4")	23	24.0	23.1
	300	445	26	400	370	4	12	M 20	(3/4")	23	30.9	29.4
	350	505	26	460	430	4	16	M 20	(3/4")	23	40.6	38.0
	400	565	26	515	482	4	16	M 24	(7/8")	27	49.4	47.5
500	670	28	620	585	4	20	M 24	(7/8")	27	75.0	72.7	
ND-16 Note: For DIN 2527 ND-10-4 Holes	10	90	14	60	40	2	4	M 12	(1/2")	14	0.63	0.56
	15	95	14	65	45	2	4	M 12	(1/2")	14	0.72	0.64
	20	105	16	75	58	2	4	M 12	(1/2")	14	1.01	0.93
	25	115	16	85	68	2	4	M 12	(1/2")	14	1.23	1.13
	32	140	16	100	78	2	4	M 16	(5/8")	18	1.80	1.66
	40	150	16	110	88	3	4	M 16	(5/8")	18	2.09	1.85
	50	165	18	125	102	3	4	M 16	(5/8")	18	2.88	2.59
	65	185	18	145	122	3	4	M 16	(5/8")	18	3.66	3.33
	80	200	20	160	138	3	4*/8	M 16	(5/8")	18	4.77	4.34
	100	220	20	180	158	3	8	M 16	(5/8")	18	5.65	5.26
	125	250	22	210	188	3	8	M 16	(5/8")	18	8.42	7.67
	150	285	22	240	212	3	8	M 20	(3/4")	23	10.4	9.85
	(175)	315	24	270	242	3	8	M 20	(3/4")	23	14.0	13.5
	200	340	24	295	268	3	12	M 20	(3/4")	23	16.1	15.6
	250	405	26	355	320	3	12	M 24	(7/8")	27	24.9	23.9
300	460	28	410	378	4	12	M 24	(7/8")	27	35.1	33.6	
350	520	30	470	438	4	16	M 24	(7/8")	27	47.8	46.2	
400	580	32	525	490	4	16	M 27	1"	30	63.5	61.5	
500	715	34	650	610	4	20	M 30	(1 1/8")	33	102	99.5	



DIN 2527

	NW	D	Flange		Raised Face Bolt Hole		Number	Bolts	Dia. of Bolt Hole d ₂	Weight of one Flange (7.85 kg/dm ³)	
			b	k	d ₁	1				Type-B	Type-C
ND-25 Note : from 10 mm to 150 mm see ND-40	(175)	330	28	280	248	3	12	M 24 (7/8")	27	17.3	16.5
	200	360	30	310	278	3	12	M 24 (7/8")	27	22.3	21.5
	250	425	32	370	335	3	12	M 27 (1")	30	33.5	32.5
	300	485	34	430	395	4	16	M 27 (1")	30	46.3	44.7
	350	555	38	490	450	4	16	M 30 (1 1/8")	33	68.0	65.9
	400	620	40	550	505	4	16	M 33 (1 1/4")	36	89.7	87.0
ND-40	500	730	44	660	615	4	20	M 33 (1 1/4")	36	138	134
	10	90	16	60	40	2	4	M 12 (1/2")	14	0.72	0.62
	15	95	16	65	45	2	4	M 12 (1/2")	14	0.81	0.74
	20	105	18	75	58	2	4	M 12 (1/2")	14	1.24	1.05
	25	115	18	85	68	2	4	M 12 (1/2")	14	1.38	1.31
	32	140	18	100	78	2	4	M 16 (5/8")	18	2.03	1.82
	40	150	18	110	88	3	4	M 16 (5/8")	18	2.35	2.11
	50	165	20	125	102	3	4	M 16 (5/8")	18	3.20	2.91
	65	185	22	145	122	3	8	M 16 (5/8")	18	4.29	4.13
	80	200	24	160	138	3	8	M 16 (5/8")	18	5.88	5.21
	100	235	24	190	162	3	8	M 20 (3/4")	23	7.54	7.08
	125	270	26	220	188	3	8	M 24 (1")	27	10.8	10.4
	150	300	28	250	218	3	8	M 24 (1")	27	14.5	13.9
	175	350	32	295	260	3	12	M 27 (1")	30	22.1	21.3
	200	375	34	320	285	3	12	M 27 (1")	30	27.2	26.2
	250	450	38	385	345	3	12	M 30 (1 1/8")	33	43.8	43.1
	300	515	42	450	410	4	16	M 30 (1 1/8")	33	63.3	62.2
	350	580	46	510	465	4	16	M 33 (1 1/4")	36	89.5	87.2
	400	660	50	585	535	4	16	M 36 (1 3/8")	39	127	124
	500	775	52	670	615	4	20	M 39 (1 1/2")	42	172	168

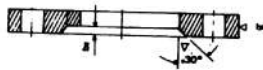
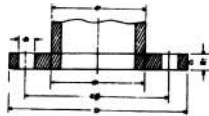
FLANGE FACINGS TONGUE AND GROOVE, NOMINAL PRESSURE 10 TO 100 ACCORDING TO DIN 2512



Nominal Pipe Size	Tongue			Groove			Nominal Pipe Size	Tongue			Groove		
	d ₄₂	d ₄₃	f ₁	d ₄₁	d ₄₄	f ₂		d ₄₂	d ₄₃	f ₁	d ₄₁	d ₄₄	f ₂
10	24	34	4	23	35	3	175	213	233	4.5	212	234	2.5
15	29	39	4	28	40	3	200	239	259	4.5	238	260	3.5
20	36	50	4	35	51	3	250	292	312	4.5	291	313	3.5
25	43	57	4	42	58	3	300	343	363	4.5	342	364	3.5
32	51	65	4	50	66	3	350	395	421	5	394	422	4
40	61	75	4	60	76	3	400	447	473	5	446	474	4
50	73	87	4	72	88	3	500	549	575	5	548	576	4
65	95	109	4	94	110	3	600	649	675	5	648	676	4
80	106	120	4	105	121	3	700	751	777	5	750	778	4
100	129	149	4.5	128	150	3.5	800	856	882	5	855	883	4
125	155	175	4.5	154	176	3.5	900	961	987	5	960	988	4
150	183	203	4.5	182	204	3.5	1000	1061	1091	6	1060	1092	5

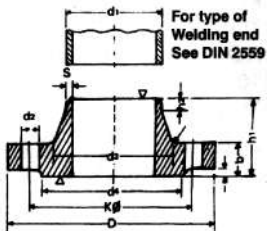


DIN 2576
Flanges, Slip-on type for British or Welding nominal pressure 10



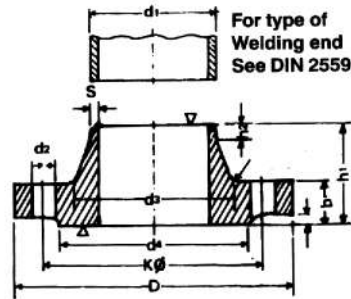
Pipe		Flange				Flange			Weight of one Flange 7.85 kg/dm ³ kg
NW	d1	ds	D	b1	k	Number	Thread	d2	
10	14 17.2*	14.5 17.7	90	14	60	4	M 12 (1/2")	14	0.613 0.605
15	20 21.3*	20.5 21.8	95	14	65	4	M 12 (1/2")	14	0.675 0.669
20	25 26.9*	25.5 27.4	105	16	75	4	M 12 (1/2")	14	0.947 0.936
25	30 33.7*	30.5 34.2	115	16	85	4	M 12 (1/2")	14	1.14 1.11
32	38 42.4*	38.5 42.9	140	16	100	4	M 16 (5/8")	18	1.66 1.62
40	44.5 48.3*	45 48.8	150	16	110	4	M 16 (5/8")	18	1.89 1.86
50	57 60.3*	57.5 60.8	165	18	125	4	M 16 (5/8")	18	2.51 2.47
65	76.1*	76.6	185	18	145	4	M 16 (5/8")	18	3.00
80	88.9*	89.4	200	20	160	4	M 16 (5/8")	18	3.79
100	108 114.3*	108.5 114.8	220	20	180	8	M 16 (5/8")	18	4.20 4.03
125	133 139.7*	133.5 140.2	250	22	210	8	M 16 (5/8")	18	5.71 5.46
150	159 168.3*	159.5 168.8	285	22	240	8	M 20 (3/4")	23	6.72 6.57
175	191 193.7*	192 194.7	315	24	270	8	M 20 (3/4")	23	8.60 8.45
200	216 219.1*	217 220.1	340	24	295	8	M 20 (3/4")	23	9.50 9.31
250	267 273*	268 274	395	26	350	12	M 20 (3/4")	23	12.5 11.9
400	406.4* 419	407.4 420	565	32	515	16	M 24 (1")	27	27.9 25.9
500	508* 521	509 522	670	38	620	20	M 24 (1")	27	37.9 41.1

DIN 2632
Welding Neck Flanges for Nominal pressure 10



Pipe		Flange				Neck				Raised Face		Bolts		Weight of one Flange 7.85 kg/dm ³ kg	
NW	d1	D	b	k	h1	d3	s	f	h2	d4	f	Number	Thread		d2
200	216 219.1	340	24	295	62	232 235	5.9	10	16	268	3	8			11.3
250	267 273	395	26	350	68	285 295	6.3	12	16	320	3				14.7
300	318 323.9	445	26	400	68	335 344	7.1	12	16	370	4	12	M 20 (3/4")	23	17.6
350	355.6 368	505	26	460	68	385	7.1	12	16	430	4				21.4
400	406.4 419	565	26	515	72	440	7.1	12	16	482	4	16			26.1
500	508 521	670	28	620	75	542	7.1	12	16	585	4		M 24 (3/4")	27	34.7
600	609.6 622	780	28	725	80	642	7.1	12	18	685	5	20	M 27 (1")	30	42.2

Note: For nominal sizes 10 up to 175 see DIN 2633.



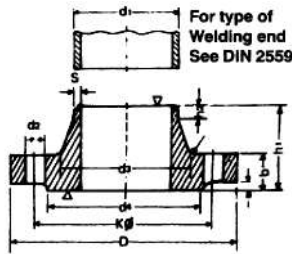
DIN 2633
Welding Neck Flanges for Nominal pressure 16

Pipe		Flange				Neck				Raised Face		Bolts		Weight of one Flange 7.85 kg/dm ³ kg		
NW	d ₁	D	b	k	h ₁	d ₃	s	f	h ₂	d ₄	f	Number	Thread		d ₂	
10	14	90	14	60	35	25	1.8	4	6	40	2	4	M 12	(1/2")	14	0.580
	17.2					28										0.648
15	20	95	14	65	35	30	2	4	6	45	2	4	M 12	(1/2")	14	0.952
	21.3					32										1.14
20	25	105	16	75	38	38	2.3	4	6	58	2	4	M 12	(1/2")	14	1.69
	26.9					40										1.86
25	30	115	16	85	38	42	2.6	4	6	68	2	4	M 12	(1/2")	14	2.53
	33.7					45										3.06
32	38	140	16	100	40	52	2.6	6	6	78	2	4	M 12	(1/2")	14	3.70
	42.4					56										4.62
40	44.5	150	16	110	42	60	2.6	6	7	88	3	4	M 12	(1/2")	14	6.30
	48.3					64										7.75
50	57	165	18	125	45	72	2.9	6	8	102	3	4	M 12	(1/2")	14	10.0
	60.3					75										11.0
65	76.1	185	18	145	45	90	2.9	6	10	122	3	4	M 12	(1/2")	14	15.6
	88.9					105										22.0
80	88.9	200	20	160	50	105	3.2	8	10	138	3	4	M 16	(5/8")	18	22.0
	108					125										28.7
100	108	220	20	180	52	125	3.6	8	12	158	3	8	M 16	(5/8")	18	36.3
	114.3					131										36.3
125	133	250	22	210	55	150	4	8	12	188	3	8	M 16	(5/8")	18	46.2
	139.7					156										63.0
150	159	285	22	240	55	175	4.5	10	12	212	3	8	M 20	(3/4")	23	7.75
	168.3					184										10.0
175	191	315	24	270	60	208	5.4	10	12	242	3	8	M 20	(3/4")	23	11.0
	193.7					210										15.6
200	216	340	24	295	62	232	5.9	10	16	268	3	12	M 20	(3/4")	23	22.0
	219.1					235										28.7
250	267	405	26	355	70	285	6.3	12	16	320	3	12	M 24	(7/8")	27	28.7
	273					292										36.3
300	318	460	28	410	78	338	7.1	12	16	378	4	16	M 24	(7/8")	27	36.3
	323.9					344										46.2
350	355.6	520	30	470	82	390	8	12	16	438	4	16	M 27	(1")	30	59.3
	368					445										73.4
400	406.4	580	32	525	85	445	8	12	16	490	4	20	M 30	(1 1/8")	33	75.0
	419					548										99.0
500	508	715	34	650	90	548	8	12	16	610	4	20	M 30	(1 1/8")	33	119
	521					548										159
600	609	840	36	770	95	652	8.8	12	18	725	5	24	M 33	(1 1/4")	36	193.7
	622					652										219.1
700	711.2	910	36	840	100	755	8.8	12	18	795	5	24	M 36	(1 3/8")	39	267
	720					755										219.1
800	812.8	1025	38	950	105	855	10	12	20	900	5	28	M 39	(1 1/2")	42	273
	820					855										219.1
900	914.4	1125	40	1050	110	955	10	12	20	1000	5	28	M 39	(1 1/2")	42	273
	920					955										219.1
1000	1016	1255	42	1170	120	1058	10	16	22	1115	5	28	M 39	(1 1/2")	42	273
	1020					1058										219.1

4 bolts for ND 10 (nominal presst@re) (the order then reads:
Welding neck flange 80/88.9 ND 10 DIN 2633)



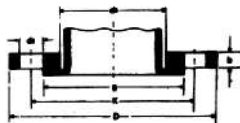
DIN 2634 Welding Neck Flanges for Nominal pressure 25



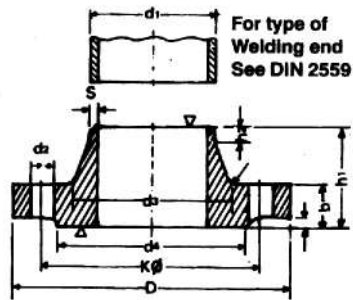
Pipe		Flange				Neck				Raised Face		Bolts		Weight of one Flange 7.85 kg/dm ³ /kg																						
NW	d ₁	D	b	k	h ₁	d ₃	s	f	h ₂	d ₄	f	Number	Thread		d ₂																					
175	(191)	330	28	280	75	215	5.6	10	15	248	3	12	M 24	(7/8")	27	13.4																				
	193.7					218										17.0																				
200	216	360	30	310	80	240	6.3	10	16	278	3					16	M 27	(1")	30	24.4																
	219.1					244														31.2																
250	267	425	32	370	88	292	7.1	12	18	335	3									20	M 30	(1 1/8")	33	31.2												
	273					298																		45.0												
300	318	485	34	430	92	345	8	12	18	395	4													16	M 33	(1 1/4")	36	45.0								
	323.9					352																						58.7								
350	355.6	555	38	490	100	398	8	12	20	450	4																	20	M 36	(1 3/8")	39	86.1				
	368					419																										101				
400	406.4	620	40	550	110	452	8.8	12	20	505	4																					20	M 36	(1 3/8")	39	101
	419					508																														
500	508	730	44	660	125	558	10	12	20	615	4	20	M 36	(1 3/8")	39																					101
	521					609.6																														
600	609.6	845	46	770	125	660	11	12	20	720	5					20	M 36	(1 3/8")	39																	101
	622																																			

Note: For nominal sizes 10 up to 175 see DIN 2635.

Loose Flange for Flange Collar PN 10 (DIN 2642, DIN Connections)



Nominal Pipe Size	Flange D mm	d5 mm	b mm	r mm	k mm	Drilling Number	d2 mm	Weight kg	Collar g mm
10	90	16	16	5	60	4	15	0.23	45
15	95	23	16	5	65	4	15	0.26	50
20	105	28	16	5	75	4	15	0.30	60
25	115	33	16	5	85	4	15	0.37	70
32	140	42	16	5	100	4	18	0.54	82
40	150	50	16	5	110	4	18	0.59	92
50	165	62	18	5	125	4	18	0.80	107
65	185	81	18	5	145	4	18	0.90	127
80	200	94	20	5	160	4	18	1.28	142
100	220	113	20	5	180	8	18	1.37	162
125	250	138	22	6	210	8	18	1.78	192
150	285	164	22	6	240	8	22	2.27	2.18
175	315	195	24	6	270	8	22	2.90	248
200	340	222	24	7	295	8	22	3.16	2.73
250	395	273	26	7	350	12	22	4.22	328
300	445	324	26	7	400	12	22	4.80	378
350	505	374	26	8	460	16	22	5.85	438
400	565	426	32	8	515	16	25	8.45	490
450	615	475	32	8	565	20	25	9.45	540
500	670	530	34	8	620	20	25	11.35	595
600	780	630	36	10	725	20	30	15.30	695
700	895	730	40	10	840	24	30	21.40	810
800	1015	832	44	10	950	24	34	30.50	916



DIN 2635 Welding Neck Flanges for Nominal pressure 40

Pipe		Flange				Neck				Raised Face		Bolts		Weight of one Flange 7.85 kg/dm ³ kg														
NW	d ₁	D	b	k	h ₁	d ₃	s	f	h ₂	d ₄	f	Number	Thread		d ₂													
10	14	90	14	60	38	25	1.8	4	6	40	2	4	M 12 (1/2")	14	0.661													
	17.2					28									0.746													
15	20	95	16	65	38	30	2	4	6	45	2				8	M 16 (5/8")	18	1.06										
	21.3					32												1.29										
20	25	105	18	75	40	38	2.3	4	6	58	2							8	M 20 (3/4")	23	1.88							
	26.9					40															2.33							
25	30	115	18	85	40	42	2.6	4	6	68	2										8	M 24 (7/8")	27	2.82				
	33.7					46																		3.74				
32	38	140	18	100	42	52	2.6	6	6	78	2													12	M 27 (1")	30	4.75	
	42.4					56																					6.52	
40	44.5	150	18	110	45	60	2.6	6	7	88	3		16	M 30 (1 1/8")													33	9.07
	48.3					64																						11.8
50	57	165	20	125	48	72	2.9	6	8	102	3				16	M 33 (1 1/4")	36											18.2
	60.3					75																						21.5
65	76.1	185	22	145	52	90	2.9	6	10	122	3							20	M 36 (1 3/8")	39								34.9
	88.9					105																						49.7
80	108	200	24	160	58	128	3.2	8	12	138	3										20	M 39 (1 1/2")	42					68.1
	114.3					134																						96.5
100	133	235	24	190	65	155	3.6	8	12	162	3													20	M 39 (1 1/2")	42		117
	139.7					162																						
125	159	270	26	220	68	182	4	8	12	188	3	20	M 39 (1 1/2")	42														
	168.3					192																						
150	191	300	28	250	75	215	4.5	10	12	218	3				20	M 39 (1 1/2")	42											
	193.7					218																						
175	216	350	32	295	82	240	5.6	10	15	260	3							20	M 39 (1 1/2")	42								
	219.1					244																						
200	267	450	38	320	105	298	7.1	12	18	345	3										20	M 39 (1 1/2")	42					
	273					306																						
250	318	515	42	385	115	352	8	12	18	410	4													20	M 39 (1 1/2")	42		
	323.9					362																						
300	355.6	580	46	450	125	408	8.8	12	20	460	4	20	M 39 (1 1/2")	42														
	368																											
350	406.4	660	50	585	135	462	11	12	20	535	4				20	M 39 (1 1/2")	42											
	419																											
400	508	755	52	670	140	562	14.2	12	20	615	4							20	M 39 (1 1/2")	42								
	521																											



British Standard Pipe Flanges DIMENSION OF PIPE FLANGES AS PER TABLE BS-10

Table D for Working Steam Pressure upto 50 lbs per Sq. Inch.

Table E for Working Steam Pressure 50 lb and upto 100 lb per Sq. Inch.

Nominal Pipe Size	O. D. of Pipe	Dia. of Flange	Dia. of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness	Nominal Pipe Size	Dia. of Flange	Dia. of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness
1/2"	27/32"	3.3/4"	2.5/8"	4	1/2"	3/16"	1/2"	3.3/4"	2.5/8"	4	1/2"	1/4"
3/4"	1.1/16"	4"	2.7/8"	4	1/2"	3/16"	3/4"	4"	2.7/8"	4	1/2"	1/4"
1"	1.11/32"	4.1/2"	3.1/4"	4	1/2"	3/16"	1"	4.1/2"	3.1/4"	4	1/2"	9/32"
1.1/4"	1.11/16"	4.3/4"	3.7/16"	4	1/2"	1/4"	1.1/4"	4.3/4"	3.7/16"	4	1/2"	5/16"
1.1/2"	1.29/32"	5.1/4"	3.7/8"	4	1/2"	1/4"	1.1/2"	5.1/4"	3.7/8"	4	1/2"	11/32"
2"	2.3/8"	6"	4.1/2"	4	5/8"	5/16"	2"	6"	4.1/2"	4	5/8"	3/8"
2.1/2"	3"	6.1/2"	5"	4	5/8"	5/16"	2.1/2"	6.1/2"	5"	4	5/8"	13/32"
3"	3.1/2"	7.1/4"	5.3/4"	4	5/8"	3/8"	3"	7.1/4"	5.3/4"	4	5/8"	7/16"
3.1/2"	4"	8"	6.1/2"	4	5/8"	3/8"	3.1/2"	8"	6.1/2"	8	5/8"	15/32"
4"	4.1/2"	8.1/2"	7"	4	5/8"	3/8"	4"	8.1/2"	7"	8	5/8"	1/2"
5"	5.1/2"	10"	8.1/4"	8	5/8"	1/2"	5"	10"	8.1/4"	8	5/8"	9/16"
6"	6.1/2"	11"	9.1/4"	8	5/8"	1/2"	6"	11"	9.1/4"	8	3/4"	11/16"
7"	7.1/2"	12"	10.1/4"	8	5/8"	1/2"	7"	12"	10.1/4"	8	3/4"	3/4"
8"	8.5/8"	13.1/4"	11.1/2"	8	5/8"	1/2"	8"	13.1/4"	11.1/2"	8	3/4"	3/4"
9"	9.5/8"	14.1/2"	12.3/4"	8	5/8"	5/8"	9"	14.1/2"	12.3/4"	12	3/4"	13/16"
10"	10.3/4"	16"	14"	8	3/4"	5/8"	10"	16"	14"	12	3/4"	7/8"
12"	12.3/4"	18"	16"	12	3/4"	5/8"	12"	18"	16"	12	7/8"	1"
14"	14"	20.3/4"	18.1/2"	12	7/8"	3/4"	14"	20.3/4"	18.1/2"	12	7/8"	1"
16"	16"	22.3/4"	20.1/2"	12	7/8"	3/4"	16"	22.3/4"	20.1/2"	12	7/8"	1"
18"	18"	25.1/4"	23"	12	7/8"	7/8"	18"	25.1/4"	23"	16	7/8"	1.1/8"
20"	20"	27.3/4"	25.1/4"	16	7/8"	1"	20"	27.3/4"	25.1/4"	16	7/8"	1.1/4"
24"	24"	32.1/2"	29.3/4"	16	1"	1.1/8"	24"	32.1/2"	29.3/4"	16	1"	1.1/2"

Table F for Working Pressure above 100 lb and upto 150 lb per Sq. Inch.

Table H for Working Pressure above 150 lb and upto 250 lb per Sq. Inch.

Nominal Pipe Size	Dia. of Flange	Dia. of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness
1/2"	3.3/4"	2.5/8"	4	1/2"	3/8"
3/4"	4"	2.7/8"	4	1/2"	3/8"
1"	4.3/4"	3.7/16"	4	5/8"	3/8"
1.1/4"	5.1/4"	3.7/8"	4	5/8"	1/2"
1.1/2"	5.1/2"	4.1/8"	4	5/8"	1/2"
2"	6.1/2"	5"	4	5/8"	5/8"
2.1/2"	7.1/4"	5.3/4"	8	5/8"	5/8"
3"	8"	6.1/2"	8	5/8"	5/8"
3.1/2"	8.1/2"	7"	8	5/8"	3/4"
4"	9"	7.1/2"	8	5/8"	3/4"
5"	11"	9.1/4"	8	3/4"	7/8"
6"	12"	10.1/4"	12	3/4"	7/8"
7"	13.1/4"	11.1/2"	12	3/4"	7/8"
8"	14.1/2"	12.3/4"	12	3/4"	1"
9"	16"	14"	12	7/8"	1"
10"	17"	15"	12	7/8"	1"
12"	19.1/4"	17.1/4"	16	7/8"	1.1/8"
14"	21.3/4"	19.1/2"	16	1"	1.1/4"
16"	24"	21.3/4"	20	1"	1.1/4"
18"	26.1/2"	24"	20	1.1/8"	1.3/8"
20"	29"	26.1/2"	24	1.1/8"	1.1/2"
24"	33.1/2"	30.3/4"	24	1.1/4"	1.5/8"

Nominal Pipe Size	Dia. of Flange	Dia. of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness
1/2"	4.1/2"	3.1/4"	4	5/8"	1/2"
3/4"	4.1/2"	3.1/4"	4	5/8"	1/2"
1"	4.3/4"	3.7/16"	4	5/8"	9/16"
1.1/4"	5.1/4"	3.7/8"	4	5/8"	11/16"
1.1/2"	5.1/2"	4.1/8"	4	5/8"	11/16"
2"	6.1/2"	5"	4	5/8"	3/4"
2.1/2"	7.1/4"	5.3/4"	8	5/8"	3/4"
3"	8"	6.1/2"	8	5/8"	7/8"
3.1/2"	8.1/2"	7"	8	5/8"	7/8"
4"	9"	7.1/2"	8	5/8"	1"
5"	11"	9.1/4"	8	3/4"	1.1/8"
6"	12"	10.1/4"	12	3/4"	1.1/8"
7"	13.1/4"	11.1/2"	12	3/4"	1.1/4"
8"	14.1/2"	12.3/4"	12	3/4"	1.1/4"
9"	16"	14"	12	7/8"	1.3/8"
10"	17"	15"	12	7/8"	1.3/8"
12"	19.1/4"	17.1/4"	16	7/8"	1.1/2"
14"	21.3/4"	19.1/2"	16	1"	1.5/8"
16"	24"	21.3/4"	20	1"	1.3/4"
18"	26.1/2"	24"	20	1.1/8"	1.7/8"
20"	29"	26.1/2"	24	1.1/8"	2"
24"	33.1/2"	30.3/4"	24	1.1/4"	2.1/4"



British Standard Pipe Flanges

Table J: For working pressure above 250 lb and upto 350 lb per Sq. Inch. **Table K:** For working pressure above 350 lb and upto 450 lb per Sq. Inch

Nominal Pipe Size	Dia. of Flange	Dia. of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness	Nominal Pipe Size	Dia. of Flange	Dia. of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness
1/2"	4.1/2"	3.1/4"	4	5/8"	5/8"	1/2"	4.1/2"	3.1/4"	4	5/8"	3/4"
3/4"	4.1/2"	3.1/4"	4	5/8"	5/8"	3/4"	4.1/2"	3.1/4"	4	5/8"	3/4"
1"	4.3/4"	3.7/16"	4	5/8"	3/4"	1"	5"	3.3/4"	4	5/8"	7/8"
1.1/4"	5.1/4"	3.7/8"	4	5/8"	3/4"	1.1/4"	5.1/4"	3.7/8"	4	5/8"	7/8"
1.1/2"	5.1/2"	4.1/8"	4	5/8"	7/8"	1.1/2"	6"	4.1/2"	4	3/4"	1"
2"	6.1/2"	5"	4	3/4"	1"	2"	6.1/2"	5"	8	5/8"	1"
2.1/2"	7.1/4"	5.3/4"	8	3/4"	1"	2.1/2"	7.1/4"	5.3/4"	8	3/4"	1.1/8"
3"	8"	6.1/2"	8	3/4"	1.1/4"	3"	8"	6.1/2"	8	3/4"	1.1/4"
3.1/2"	8.1/2"	7"	8	3/4"	1.1/4"	3.1/2"	9"	7.1/4"	8	7/8"	1.1/4"
4"	9"	7.1/2"	8	3/4"	1.3/8"	4"	9.1/2"	7.3/4"	8	7/8"	1.3/8"
5"	11"	9.1/4"	8	7/8"	1.1/2"	5"	11"	9.1/4"	12	7/8"	1.5/8"
6"	12"	10.1/4"	12	7/8"	1.1/2"	6"	12"	10.1/4"	12	7/8"	1.5/8"
7"	13.1/4"	11.1/2"	12	7/8"	1.5/8"	7"	13.1/2"	11.1/2"	12	1"	1.3/4"
8"	14.1/2"	12.3/4"	12	7/8"	1.5/8"	8"	14.1/2"	12.1/2"	12	1"	1.7/8"
9"	16"	14"	12	1"	1.3/4"	9"	16"	14"	16	1"	2"
10"	17"	15"	12	1"	1.7/8"	10"	17"	15"	16	1"	2"
12"	19.1/4"	17.1/4"	16	1"	2"	12"	19.1/4"	17"	16	1.1/8"	2.1/4"
14"	21.3/4"	19.1/2"	16	1.1/8"	2.1/8"	14"	22.1/2"	20"	16	1.1/4"	2.3/8"
16"	24"	21.3/4"	20	1.1/8"	2.1/4"	16"	24.3/4"	22.1/4"	20	1.1/4"	2.5/8"
18"	26.1/2"	24"	20	1.1/4"	2.3/8"	18"	28.1/4"	25.3/4"	20	1.3/8"	3"
20"	29"	26.1/2"	24	1.1/4"	2.1/2"	20"	31"	28	20	1.1/21"	3.1/4"
24"	33.1/2"	30.3/4"	24	1.3/8"	2.3/4"						

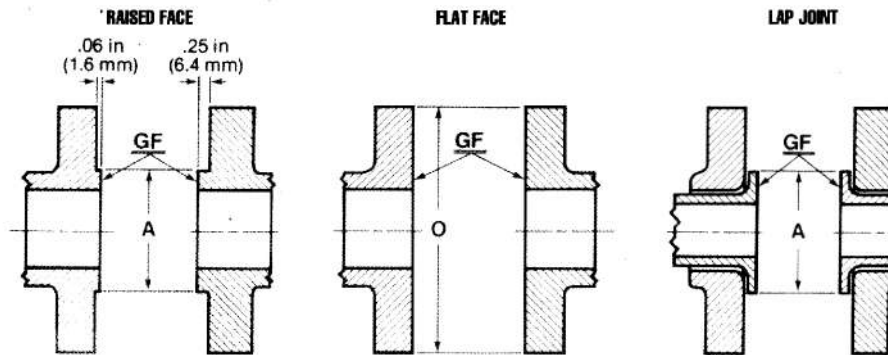
For 1/2" and 5/8" Bolts the diameters of the holes 1/16" in Larger than the bolts
For 3/4" bolts and sizes above, the diameter shall be 1/8" in Larger than the Bolts.

BRITISH STANDARD PIPE FLANGES PRESSURE-TEMPERATURE RATINGS FOR CARBON STEEL FLANGES TEMPERATURE

Table	°F 0-450	500	550	600	650	700	750	800	825	850	875	900	Max. Hydr- raulic Test Pressure
	-17.8 °C to 232.2	260.0	287.8	315.6	343.3	371.1	399	427	441	454	468	482	
D	100	95	85	80	70	65	55	50				-	150
E	200	185	170	155	140	130	115	100				-	300
F	300	280	255	235	215	195	170	150	-	-	-	-	450
H	500	465	430	395	355	320	285	250	215	180	150	115	750
J	700	650	600	550	500	450	400	350	300	255	210	160	1050
K	900	835	770	705	645	580	515	450	390	325	265	205	1350
R	1200	1115	1030	945	855	770	685	600	520	435	355	275	1800
S	1800	1670	1545	1415	1285	1155	1030	900	780	655	535	415	2700
T	2800	2600	2400	2200	2000	1800	1600	1400	1210	1025	835	645	4200



Flange Facing and Gasket Dimensions



RAISED FACE, FLAT FACE, LAP JOINT.

NPS	* FLANGE FACING		GASKET DIMENSIONS								
	RAISED FACE, LAP JOINT O. DIA.	FLAT FACE O. DIA.	FLAT RING TYPE GASKET (EXTENDING TO INSIDES OF BOLTS) OUTSIDE DIAMETER							FULL FACE TYPE	FLAT RING OR FULL FACE TYPES
DN	A	O	CL. 150	CL. 300	CL. 400	CL. 600	CL. 900	CL. 1500	CL. 2500	OUTSIDE DIAMETER	INSIDE DIAMETER
1/2	1.38		1.88	2.12	2.12	2.12	2.50	2.50	2.75		0.84
15	35		48	54	54	54	64	64	70		21
3/4	1.69		2.25	2.62	2.62	2.62	2.75	2.75	3.00		1.06
20	43		57	67	67	67	70	70	76		27
1	2		2.62	2.88	2.88	2.88	3.12	3.12	3.38		1.31
25	51		67	73	73	73	79	79	86		33
1 1/4	2.5		3.00	3.25	3.25	3.25	3.50	3.50	4.12		1.66
32	64		76	83	83	83	89	89	105		42
1 1/2	2.88		3.38	3.75	3.75	3.75	3.88	3.88	4.62		1.91
40	73		86	95	95	95	98	98	117		49
2	3.62		4.12	4.38	4.38	4.38	5.62	5.62	5.75		2.38
50	92		105	111	111	111	143	143	146		60
2 1/2	4.12		4.88	5.12	5.12	5.12	6.50	6.50	6.62		2.88
65	105		124	130	130	130	165	165	168		73
3	5		5.38	5.88	5.88	5.88	6.62	6.88	7.75		3.5
80	127		137	149	149	149	168	175	197		89
3 1/2	5.5		6.38	6.50	6.38	6.38	-	-	-		4
90	140		162	165	162	162	-	-	-		102
4	6.19		6.88	7.12	7.00	7.62	8.12	8.25	9.25		4.5
100	157		175	181	178	194	206	210	235		114
5	7.31		7.75	8.50	8.38	9.50	9.75	10.00	11.00		5.56
125	185		197	216	213	241	248	254	279		141
6	8.5		8.75	9.88	9.75	10.50	11.38	11.12	12.50		6.62
150	216		222	251	248	267	289	283	318		168
8	10.62		11.00	12.12	12.00	12.62	14.12	13.88	15.25		8.62
200	270		279	308	305	321	359	352	387		219
10	12.75		13.38	14.25	14.12	15.75	17.12	17.12	18.75		10.75
250	324		340	362	359	400	435	435	476		273
12	15		16.12	16.62	16.50	18.00	19.62	20.50	21.62		12.75
300	381		410	422	419	457	498	520	550		324
14	16.25		17.75	19.12	19.00	19.38	20.50	22.75	-		14
350	413		451	486	483	492	520	580	-		356
16	18.5		20.25	21.25	21.12	22.25	22.62	25.25	-		16
400	470		515	540	537	565	575	640	-		407
18	21		21.62	23.50	23.38	24.12	25.12	27.75	-		18
450	533		550	595	595	615	640	705	-		457
20	23		23.88	25.75	25.50	26.88	27.50	29.75	-		20
500	584		605	655	648	685	700	755	-		508
24	27.25		28.25	30.5	30.25	31.12	33.00	35.50	-		24
600	692		718	775	770	790	839	902	-		610

Same as flange outside diameter, see page 3 - 15 (Section III)

Gasket Facing is indicated on the facing drawings by "GF".

Dimensions conform to ANSI B16.5 and ANSI B16.21, where applicable.

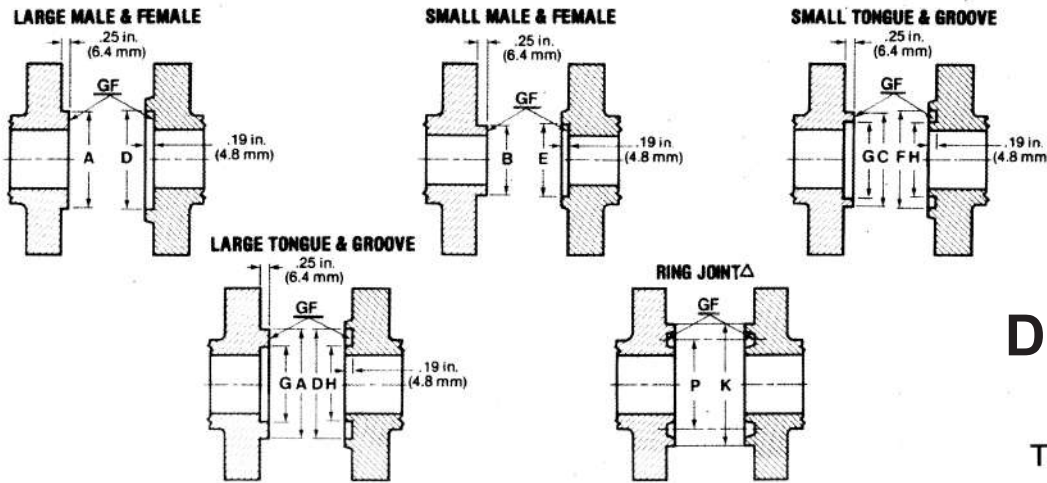
*A tolerance of ± 0.016 " (0.4 mm) is allowed on the inside and outside diameters of all facings.

INCHES
MILLIMETERS



Flange Facing and Gasket Dimensions

MALE & FEMALE,
TONGUE & GROOVE



NPS	* FLANGE FACINGS DIMENSIONS								GASKET DIMENSIONS				
	OUTSIDE DIAMETER						INSIDE DIAMETER		OUTSIDE DIAMETER			INSIDE DIAMETER	
	LARGE MALE; LARGE TONGUE	SMALL MALE	SMALL TONGUE	LARGE FEMALE; LARGE GROOVE	SMALL FEMALE	SMALL GROOVE	LARGE TONGUE SMALL TONGUE	LARGE GROOVE; SMALL GROOVE	LARGE MALE & FEMALE; LARGE TONGUE & GROOVE	SMALL MALE & FEMALE	SMALL TONGUE & GROOVE	LARGE MALE & FEMALE	LARGE OR SMALL TONGUE & GROOVE
DN	A	B	C	D	E	F	G	H					
1/2	1.38	0.72	1.38	1.44	0.78	1.44	1.00	0.94	1.38	0.72	1.38	0.84	1.00
15	35	18.3	35.0	36.5	19.9	36.5	25.4	23.8	35	18.3	35.0	21	25
3/4	1.69	.94	1.69	1.75	1.00	1.75	1.31	1.25	1.69	.94	1.69	1.06	1.31
20	43	23.8	42.9	44.5	25.4	44.4	33.3	31.8	43	23.8	42.9	27	33
1	2.00	1.19	1.88	2.06	1.25	1.94	1.5	1.44	2.00	1.19	1.88	1.31	1.50
25	51	30.2	47.6	52.4	31.8	49.2	38.1	36.5	51	30.2	47.6	33	38
1 1/4	2.50	1.5	2.25	2.56	1.56	2.31	1.88	1.81	2.50	1.50	2.25	1.66	1.88
32	64	38.1	57.2	65.1	39.7	58.7	47.6	46.0	64	38.1	57.2	42	48
1 1/2	2.88	1.75	2.50	2.94	1.81	2.56	2.12	2.06	2.88	1.75	2.50	1.91	2.12
40	73	44.4	63.5	74.6	46.0	65.1	54.0	52.4	73	44.4	63.5	49	54
2	3.62	2.25	3.25	3.69	2.31	3.31	2.88	2.81	3.62	2.25	3.25	2.38	2.88
50	92	57.2	82.6	93.7	58.7	84.1	73.0	71.4	92	57.2	82.6	60	73
2 1/2	4.12	2.69	3.75	4.19	2.75	3.81	3.38	3.31	4.12	2.69	3.75	2.88	3.38
65	105	68.3	95.2	106.4	69.9	96.8	85.7	84.1	105	68.3	95.2	73	86
3	5.00	3.31	4.62	5.06	3.38	4.69	4.25	4.19	5.00	3.31	4.62	3.5	4.25
80	127	84.1	117.5	128.6	85.7	119.1	108.0	106.4	127	84.1	117.5	89	108
3 1/2	5.50	3.81	5.12	5.56	3.88	5.19	4.75	4.69	5.50	3.81	5.12	4	4.75
90	140	96.8	130.2	141.3	98.4	131.8	120.6	119.1	140	96.8	130.2	102	121
4	6.19	4.31	5.69	6.25	4.38	5.75	5.19	5.12	6.19	4.31	5.69	4.5	5.19
100	157	109.5	144.5	158.8	111.1	146.0	131.8	130.2	157	109.5	144.5	114	132
5	7.31	5.38	6.81	7.38	5.44	6.88	6.31	6.25	7.31	5.38	6.81	5.56	6.31
125	185	136.5	173.0	187.3	138.1	174.6	160.3	158.8	185	136.5	173.0	141	161
6	8.50	6.38	8.00	8.56	6.44	8.06	7.5	7.44	8.50	6.38	8.00	6.62	7.50
150	216	161.9	203.2	217.5	163.5	204.8	190.5	188.9	216	161.9	203.2	168	191
8	10.62	8.38	10.00	10.69	8.44	10.06	9.38	9.31	10.62	8.38	10.00	8.62	9.38
200	270	212.7	254.0	271.5	214.3	255.6	238.1	236.5	270	212.7	254.0	219	238
10	12.75	10.5	12.00	12.81	10.56	12.06	11.25	11.19	12.75	10.50	12.00	10.75	11.25
250	324	266.7	304.8	325.4	268.3	306.4	285.8	284.2	324	266.7	304.8	273	286
12	15.0	12.5	14.25	15.06	12.56	14.31	13.5	13.44	15.00	12.50	14.25	12.75	13.50
300	381	317.5	362.0	382.6	319.1	363.5	342.9	341.3	381	317.5	362.0	324	343
14	16.25	13.75	15.50	16.31	13.81	15.56	14.75	14.69	16.25	13.75	15.50	14	14.75
350	413	349.2	393.7	414.3	350.8	395.3	374.6	373.1	413	349.2	393.7	356	375
16	18.5	15.75	17.62	18.56	15.81	17.69	16.75	16.69	18.50	15.75	17.62	16	16.75
400	470	400.0	447.7	471.5	401.6	449.3	425.4	423.9	470	400.0	447.7	407	426
18	21.0	17.75	20.12	21.06	17.81	20.19	19.25	19.19	21.00	17.75	20.12	18	19.25
450	533	450.9	511.2	535.0	452.4	512.8	489.0	487.4	533	450.9	511.2	457	489
20	23.0	19.75	22.0	23.06	19.81	22.06	21.0	20.94	23.00	19.75	22.0	20	21.00
500	584	501.7	558.8	585.8	503.2	560.4	533.4	531.8	584	501.7	558.8	510	535
24	27.25	23.75	26.25	27.31	23.81	26.31	25.25	25.19	27.25	23.75	26.25	24	25.25
600	692	603.3	666.8	693.7	604.8	668.3	641.4	639.8	692	603.3	666.8	610	640

Gasket Facing is indicated on the facing drawings by "GF".

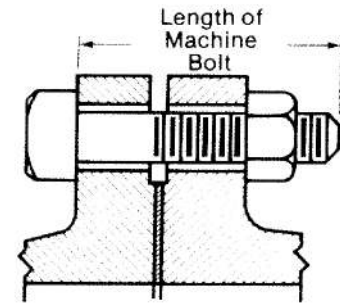
*A tolerance of ± 0.016 " (0.4 mm) is allowed on the inside and outside diameters of all facings.

Dimensions conform to ANSI B16.5 and ANSI B16.21, where applicable.

INCHES
MILLIMETERS



Bolt and Stud Dimensions*



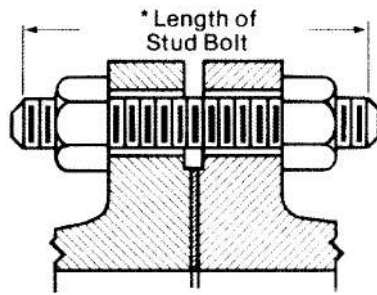
NPS DN	CLASS 150 (PN 20) FLANGES					CLASS 300 (PN 50) FLANGES					CLASS 300 (PN 64) FLANGES				
	NO. OF BOLTS	DIA. OF BOLTS (INCHES)	LENGTH			NO. OF BOLTS	DIA. OF BOLTS (INCHES)	LENGTH			NO. OF BOLTS	DIA. OF BOLTS (INCHES)	LENGTH		
			STUD BOLTS		MACHINE BOLTS			STUD BOLTS		MACHINE BOLTS			STUD BOLTS		MACHINE BOLTS
			.06 1.6 RAISED FACE	RING JOINT	.06 1.6 RAISED FACE			.06 1.6 RAISED FACE	RING JOINT	.06 1.6 RAISED FACE			.25 6.4 RAISED FACE	MALE & FEMALE TONGUE AND GROOVE	RING JOINT
1/2	4	1/2	2.50	-	2.00	4	1/2	2.75	3.00	2.25	4	1/2	3.25	3.00	3.00
15	4	1/2	65	-	50	4	1/2	70	75	65	4	1/2	85	75	75
3/4	4	1/2	2.50	-	2.25	4	5/8	3.00	3.50	2.50	4	5/8	3.50	3.25	3.50
20	4	1/2	65	-	55	4	5/8	5	90	6.5	4	5/8	90	85	90
1	4	1/2	2.75	3.25	2.25	4	5/8	3.25	3.75	2.75	4	5/8	3.75	3.50	3.75
25	4	1/2	70	85	55	4	5/8	85	95	70	4	5/8	95	90	95
1 1/4	4	1/2	2.75	3.25	2.50	4	5/8	3.25	3.75	2.75	4	5/8	4.00	3.75	4.00
40	4	1/2	70	85	65	4	5/8	85	95	70	4	5/8	100	95	100
1 1/2	4	1/2	3.00	3.50	2.50	4	3/4	3.75	4.25	3.00	4	3/4	4.25	4.00	4.25
40	4	1/2	75	90	65	4	3/4	95	110	75	4	3/4	110	100	110
2	4	5/8	3.25	3.75	2.75	8	5/8	3.50	4.25	3.00	8	5/8	4.25	4.00	4.50
50	4	5/8	85	95	70	8	5/8	90	110	75	8	5/8	110	100	115
2 1/2	4	5/8	3.50	4.00	3.00	8	3/4	4.00	4.75	3.50	8	3/4	4.75	4.50	5.00
65	4	5/8	90	100	75	8	3/4	100	120	90	8	3/4	120	115	130
3	4	5/8	3.75	4.25	3.25	8	3/4	4.25	5.00	3.75	8	3/4	5.00	4.75	5.25
80	4	5/8	95	110	85	8	3/4	110	125	95	8	3/4	130	120	135
3 1/2	8	5/8	3.75	4.25	3.25	8	3/4	4.50	5.25	3.75	8	7/8	5.50	5.25	5.75
90	8	5/8	95	110	85	8	3/4	115	135	95	8	7/8	140	135	145
4	8	5/8	3.75	4.25	3.25	6	3/4	4.50	5.25	4.00	8	7/8	5.50	5.25	5.75
100	8	5/8	95	110	85	8	3/4	115	135	100	8	7/8	140	135	145
5	8	3/4	4.00	4.50	3.25	8	3/4	4.75	5.50	4.25	8	7/8	5.75	5.50	6.00
125	8	3/4	100	115	85	8	3/4	120	140	110	8	7/8	145	140	155
6	8	3/4	4.00	4.50	3.50	12	3/4	5.00	5.75	4.25	12	7/8	6.00	5.75	6.25
150	8	3/4	100	115	90	12	3/4	130	145	110	12	7/8	155	145	160
8	8	3/4	4.25	4.75	3.75	12	7/8	5.50	6.25	4.75	12	1	6.75	6.50	7.00
200	8	3/4	110	120	95	12	7/8	140	160	120	12	1	175	165	180
10	12	7/8	4.75	5.25	4.00	16	1	6.25	7.00	5.50	16	1 1/8	7.50	7.25	7.75
250	12	7/8	120	135	100	16	1	160	180	140	16	1 1/8	190	185	195
12	12	7/8	4.75	5.25	4.25	16	1 1/8	6.75	7.50	6.00	16	1 1/4	8.00	7.75	8.25
300	12	7/8	120	135	110	16	1 1/8	175	190	155	16	1 1/4	205	195	210
14	12	1	5.25	5.75	4.50	20	1 1/8	7.00	7.75	6.25	20	1 1/4	8.25	8.00	8.50
350	12	1	135	145	115	20	1 1/8	180	195	160	20	1 1/4	210	205	215
16	16	1	5.50	6.00	4.75	20	1 1/4	7.50	8.25	6.50	20	1 3/8	8.75	8.50	9.00
400	16	1	140	155	120	20	1 1/4	190	210	165	20	1 3/8	225	215	230
18	16	1 1/8	6.00	6.50	5.00	24	1 1/4	7.75	8.50	6.75	24	1 3/8	9.00	8.75	9.25
450	16	1 1/8	150	165	125	24	1 1/4	195	215	175	24	1 3/8	230	225	235
20	20	1 1/8	6.25	6.75	5.50	24	1 1/4	8.25	9.00	7.25	24	1 1/2	9.75	9.50	10.00
500	20	1 1/8	160	175	140	24	1 1/4	210	230	185	24	1 1/2	250	240	255
20	20	1 1/4	7.00	7.50	6.00	24	1 1/2	9.25	10.25	8.00	24	1 3/4	10.75	10.50	11.25
600	20	1 1/4	180	190	155	24	1 1/2	235	260	205	24	1 3/4	275	265	285

*Length of Stud Bolt does not include the height of the points.

Bolt sizes are in inches.

Length of Male & Female and Tongue & Groove Stud Bolts are .25" (6.4 mm) less than those for the same size of .25" (6.4 mm) Raised Face Stud Bolts.

INCHES
MILLIMETRES



Bolt and Stud Dimensions

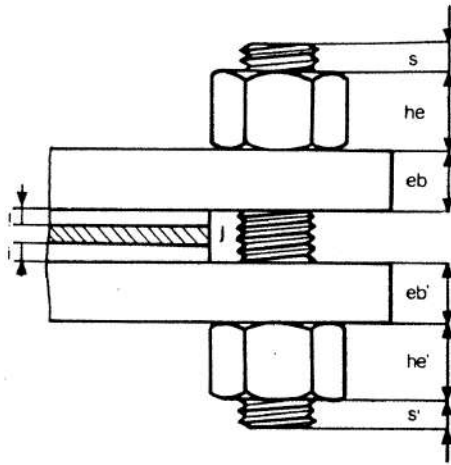
NPS DN	CLASS 600 (PN 100) FLANGES				CLASS 900 (PN 160) FLANGES				CLASS 1500 (PN 250) FLANGES				CLASS 2500 (PN 400) FLANGES			
	NO. OF BOLTS	DIA. OF BOLTS (INCHES)	LENGTH OF STUD BOLTS		NO. OF BOLTS	DIA. OF BOLTS (INCHES)	LENGTH OF STUD BOLTS		NO. OF BOLTS	DIA. OF BOLTS (INCHES)	LENGTH OF STUD BOLTS		NO. OF BOLTS	DIA. OF BOLTS (INCHES)	LENGTH OF STUD BOLTS	
			.25 6.4 RAISED FACE	RING JOINT			.25 6.4 RAISED FACE	RING JOINT			.25 6.4 RAISED FACE	RING JOINT			.25 6.4 RAISED FACE	RING JOINT
1/2	4	1/2	3.25	3.00	4	3/4	4.25	4.25	4	3/4	4.25	4.25	4	3/4	5.25	5.25
15	4	1/2	85	75	4	3/4	110	110	4	3/4	110	110	4	3/4	135	135
3/4	4	5/8	3.50	3.50	4	3/4	4.50	4.50	4	3/4	4.50	450	4	3/4	5.25	5.25
20	4	5/8	90	90	4	3/4	115	115	4	3/4	115	115	4	3/4	135	135
1	4	5/8	3.75	3.75	4	7/8	5.00	5.00	4	7/8	5.00	5.00	4	7/8	5.75	5.75
25	4	5/8	95	95	4	7/8	125	125	4	7/8	125	125	4	7/8	145	145
1 1/4	4	5/8	4.00	4.00	4	7/8	5.00	5.00	4	7/8	5.00	5.00	4	1	6.25	6.50
32	4	5/8	100	100	4	7/8	125	125	4	7/8	125	125	4	1	160	165
1 1/2	4	3/4	4.25	4.25	4	1	5.50	5.50	4	1	5.50	5.50	4	1 1/8	7.00	7.25
40	4	3/4	110	110	4	1	140	140	4	1	140	140	4	1 1/8	180	185
2	8	5/8	4.25	4.50	8	7/8	5.75	5.75	8	7/8	5.75	5.75	8	1	7.25	7.50
50	8	5/8	110	115	8	7/8	145	145	8	7/8	145	145	8	1	185	190
2 1/2	8	3/4	4.75	5.00	8	1	6.25	6.25	8	1	6.25	6.25	8	1 1/8	8.00	8.25
65	8	3/4	120	125	8	1	160	160	8	1	160	160	8	1 1/8	205	210
3	8	3/4	5.00	5.25	8	7/8	5.75	6.00	8	1 1/8	7.00	7.00	8	1 1/4	9.00	9.25
80	8	3/4	130	135	8	7/8	145	155	8	1 1/8	180	180	8	1 1/4	230	235
3 1/2	8	7/8	5.50	5.75	-	-	-	-	-	-	-	-	-	-	-	-
90	8	7/8	140	145	-	-	-	-	-	-	-	-	-	-	-	-
4	8	7/8	5.75	6.00	8	1 1/8	6.75	7.00	8	1 1/4	7.75	7.75	8	1 1/2	10.25	10.75
100	8	7/8	145	155	8	1 1/8	175	180	8	1 1/4	195	195	8	1 1/2	260	275
5	8	1	6.50	6.75	8	1 1/4	7.50	7.75	8	1 1/2	9.75	9.75	8	1 3/4	12.00	12.75
125	8	1	165	175	8	1 1/4	190	195	8	1 1/2	256	250	8	1 3/4	305	325
6	12	1	6.75	7.00	12	1 1/8	7.75	7.75	12	1 3/8	10.25	10.50	8	2	13.75	14.50
150	12	1	175	180	12	1 1/8	195	195	12	1 3/8	260	265	8	2	350	370
8	12	1 1/8	7.75	7.75	12	1 3/8	8.75	9.00	12	1 5/8	11.50	12.00	12	2	15.25	16.00
200	12	1 1/8	195	195	12	1 3/8	225	230	12	1 5/8	295	305	12	2	390	405
10	16	1 1/4	8.50	8.75	16	1 3/8	9.25	9.50	12	1 7/8	13.25	13.75	12	2 1/2	19.50	20.50
250	16	1 1/4	215	225	16	1 3/8	235	240	2	1 7/8	335	350	12	2 1/2	495	520
12	20	1 1/4	8.75	9.00	20	1 3/8	10.00	10.25	16	2	14.75	15.50	12	2 3/4	21.50	22.50
300	20	1 1/4	225	230	20	1 3/8	255	260	16	2	375	395	12	2 3/4	545	570
14	20	1 3/8	9.25	9.50	20	1 1/2	10.75	11.25	16	2 1/4	16.00	17.00				
350	20	1 3/8	235	240	20	1 1/2	275	285	16	2 1/4	405	430				
16	20	1 1/2	10.00	10.25	20	1 5/8	11.25	11.75	16	2 1/2	17.50	18.50				
400	20	1 1/2	255	260	20	1 5/8	285	300	16	2 1/2	445	470				
18	20	1 5/8	10.75	11.00	20	1 7/8	12.75	13.50	16	2 3/4	19.50	20.50				
450	20	1 5/8	275	280	20	1 7/8	325	345	16	2 3/4	495	520				
20	24	1 5/8	11.50	11.75	20	2	13.50	14.25	16	3	21.50	22.50				
500	24	1 5/8	295	300	20	2	345	360	16	3	545	570				
24	24	1 7/8	13.00	13.25	20	2 1/2	17.25	18.00	16	3 1/2	24.50	25.75				
600	24	1 7/8	330	335	20	2 1/2	440	455	16	3 1/2	620	655				

*Length of Stud Bolt does not include the height of the points.

Bolt sizes are in inches.

Length of Male & Female and Tongue & Groove Stud Bolts are .25" (6.4 mm) less than those for the same size of .25" (6.4 mm) Raised Face Stud Bolts.

INCHES
MILLIMETERS



METHOD FOR CALCULATING STUD BOLT LENGTHS

The stud-bolt theoretical length can be calculated by means of the formula:
 $L = 2(S + he + eb + l) + J$

where

free threads (equals 1/3 time bolt diameter)

nut thickness (equals nominal bolt diameter)

flange thickness

height of raised face.

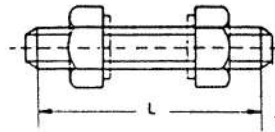
(for 150 and 300 rating height of raised face is included in eb height).

gasket thickness I.E. approximately 3 mm.

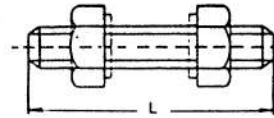
S = S'
 he = he' =
 eb = eb' =
 l = l' =
 J =

ATTENTION: difference of measuring lengths between ANSI B16.5 and BS 4882 - metric

Bolts : to ANSI B16.5
 BS 4882 inch sizes



Bolts: to BS 4882 metric



SIZES OF STUD-BOLTS FOR ANSI B16.5 FLANGES TYPE RF

Nominal diameter of flange	150 Lbs			300 Lbs			600 Lbs			900 Lbs			1500 Lbs		
	N°	Ø of bolts	length	N°	Ø of bolts	length	N°	Ø of bolts	length	N°	Ø of bolts	length	N°	Ø of bolts	length
1/2	4	1/2	2" 1/2	4	1/2	2" 3/4	4	1/2	3" 1/4	4	3/4	4" 1/4	4	3/4	4" 1/4
		14	60		14	70		14	90		20	110		20	110
3/4	4	1/2	2" 1/2	4	5/8	3"	4	5/8	3" 1/2	4	3/4	4" 1/2	4	3/4	4" 1/2
		14	70		16	80		16	100		20	120		20	120
1"	4	1/2	2" 3/4	4	5/8	3" 1/4	4	5/8	3" 3/4	4	7/8	5"	4	7/8	5"
		14	70		16	80		16	100		22	130		22	130
1" 1/4	4	1/2	2" 3/4	4	5/8	3" 1/4	4	5/8	4"	4	7/8	5"	4	7/8	5"
		14	80		16	90		16	100		22	130		22	130
1" 1/2	4	1/2	3"	4	3/4	3" 3/4	4	3/4	4" 1/4	4	1"	5" 1/2	4	1"	5" 1/2
		14	80		20	100		20	120		27	150		27	150
2"	4	5/8	3" 1/4	8	5/8	3" 1/2	8	5/8	4" 1/4	8	7/8	5" 3/4	8	7/8	5" 3/4
		16	90		16	100		16	120		22	150		22	150
2" 1/2	4	5/8	3" 1/2	8	3/4	4"	8	3/4	4" 3/4	8	1"	6" 1/4	8	1"	6" 1/4
		16	100		20	110		20	130		27	170		27	170
3"	4	5/8	3" 3/4	8	3/4	4" 1/4	8	3/4	5"	8	7/8	5" 3/4	8	1" 1/8	7"
		16	100		20	110		20	140		22	150		30	190
3" 1/2	8	5/8	3" 3/4	8	3/4	4" 1/2	8	7/8	5" 1/2	-	-	-	-	-	-
		16	100		20	120		22	150						
4"	8	5/8	3" 3/4	8	3/4	4" 1/2	8	7/8	5" 3/4	8	1" 1/8	6" 3/4	8	1" 1/4	7" 3/4
		16	100		20	120		22	160		30	180		33	210
5"	8	3/4	4"	8	3/4	4" 3/4	8	1"	6" 1/2	8	1" 1/4	7" 1/2	8	1" 1/2	9" 3/4
		20	100		20	130		27	180		33	210		39	260
6"	8	3/4	4"	12	3/4	5"	12	1"	6" 3/4	12	1" 1/8	7" 3/4	12	1" 3/8	10" 1/4
		20	110		20	130		27	190		30	210		36	270
8"	8	3/4	4" 1/4	12	7/8	5" 1/2	12	1" 1/8	7" 3/4	12	1" 3/8	8" 3/4	12	1" 5/8	11" 1/2
		20	120		22	150		30	200		36	230		42	300
10"	12	7/8	4" 3/4	16	1"	6" 1/4	16	1" 1/4	8" 1/2	16	1" 3/8	9" 1/4	16	1" 7/8	13" 1/4
		22	130		27	180		33	230		36	250		48	360
12"	12	7/8	4" 3/4	16	1" 1/8	6" 3/4	20	1" 1/4	8" 3/4	20	1" 3/8	10"	16	2"	14" 3/4
		22	130		30	190		33	240		36	270		52	390
14"	12	1" 1/8	5" 1/4	20	1" 1/8	7"	20	1" 3/8	9" 1/4	20	1" 1/2	10" 3/4	16	2" 1/4	16"
		27	150		30	200		36	250		39	280		56	430
16"	16	1"	5" 1/2	20	1" 1/4	7" 1/2	20	1" 1/2	10"	20	1" 1/8	11" 1/4	16	2" 1/2	17" 1/2
		27	150		33	200		39	270		42	320		64	470
18"	16	1" 1/8	6"	24	1" 1/4	7" 3/4	20	1" 5/8	10" 3/4	20	1" 7/8	12" 3/4	16	2" 3/4	19" 1/2
		30	160		33	210		42	290		48	340		68	520
20"	20	1" 1/8	6" 1/4	24	1" 1/4	8" 1/4	24	1" 5/8	11" 1/2	20	2"	13" 1/2	16	3"	21" 1/2
		30	170		33	220		42	300		52	370		76	570
22"	20	1" 1/4	7"	24	1" 1/2	9"	24	1" 3/4	12" 1/2	-	-	-	-	-	-
		33	180		39	250		45	330						
24"	20	1" 1/4	7"	24	1" 1/2	9" 1/4	24	1" 7/8	13"	20	2" 1/2	17" 1/4	16	3" 1/2	24" 1/2
		33	190		39	250		48	340		64	460		90	650

NOTE: Lengths in inches according to ANSI B16.5, measured from thread to thread, excluding points
 Lengths in mm are measured as "total overall lengths"
 In both cases; above mentioned sizes should be used when ordering



SIZES OF STUD-BOLTS FOR ANSI B16.5 FLANGES TYPE RTJ

Nominal diameter of flange	150 Lbs			300 Lbs			600 Lbs			900 Lbs			1500 Lbs		
	N°	Ø of bolts	length	N°	Ø of bolts	length	N°	Ø of bolts	length	N°	Ø of bolts	length	N°	Ø of bolts	length
1/2	-	-	-	4	1/2"	3"	4	1/2"	3"	4	3/4"	4" 1/4	4	3/4"	4" 1/4
3/4	-	-	-	4	5/8"	3" 1/2	4	5/8"	3" 1/2	4	3/4"	4" 1/2	4	3/4"	4" 1/2
1"	4	1/2"	3" 1/4	4	5/8"	3" 3/4	4	5/8"	3" 3/4	4	7/8"	5"	4	7/8"	5"
1" 1/4	4	1/2"	3" 1/4	4	5/8"	3" 3/4	4	5/8"	4"	4	7/8"	5"	4	7/8"	5"
1" 1/2	4	1/2"	3" 1/2	4	3/4"	4" 1/4	4	3/4"	4" 1/4	4	1"	5" 1/2	4	1"	5" 1/2
2"	4	5/8"	3" 3/4	8	5/8"	4" 1/4	8	5/8"	4" 1/2	8	7/8"	5" 3/4	8	7/8"	5" 3/4
2" 1/2	4	5/8"	4"	8	3/4"	4" 3/4	8	3/4"	5"	8	1"	6" 1/4	8	1"	6" 1/4
3"	4	5/8"	4" 1/4	8	3/4"	5"	8	3/4"	5" 1/4	8	7/8"	6"	8	1" 1/8	7"
3" 1/2	8	5/8"	4" 1/4	8	3/4"	5" 1/4	8	7/8"	5" 3/4	-	-	-	-	-	-
4"	8	5/8"	4" 1/4	8	3/4"	5" 1/4	8	7/8"	6"	8	1" 1/8	7"	8	1" 1/4	7" 3/4
5"	8	3/4"	4" 1/2	8	3/4"	5" 1/2	8	1"	6" 3/4	8	1" 1/4	7" 3/4	8	1" 1/2	9" 3/4
6"	8	3/4"	4" 1/2	12	3/4"	5" 3/4	12	1"	7"	12	1" 1/8	7" 3/4	12	1" 3/8	10" 1/2
8"	8	3/4"	4" 3/4	12	7/8"	6" 1/4	12	1" 1/8	7" 3/4	12	1" 3/8	9"	12	1" 5/8	12"
10"	12	7/8"	5" 1/4	16	1"	7"	16	1" 1/4	8" 3/4	16	1" 3/8	9" 1/2	12	1" 7/8	13" 3/4
12"	12	7/8"	5" 1/4	16	1" 1/8	7" 1/2	20	1" 1/4	9"	20	1" 3/8	10" 1/4	16	2"	15" 1/2
14"	12	1"	5" 3/4	20	1" 1/8	7" 3/4	20	1" 3/8	9" 1/2	20	1" 1/2	11" 1/4	16	2" 1/4	17"
16"	16	1"	6"	20	1" 1/4	8" 1/4	20	1" 1/2	10" 1/4	20	1" 5/8	11" 3/4	16	2" 1/2	18" 1/2
18"	16	1" 1/8	6" 1/2	24	1" 1/4	8" 1/2	20	1" 5/8	11"	20	1" 7/8	13" 1/2	16	2" 3/4	20" 1/2
20"	20	1" 1/8	6" 3/4	24	1" 1/4	9"	24	1" 5/8	11" 3/4	20	2"	14" 1/4	16	3"	22" 1/2
22"	20	1" 1/4	7" 1/2	24	1" 1/2	10"	24	1" 3/4	13"	-	-	-	-	-	-
24"	20	1" 1/4	7" 1/2	24	1" 1/2	10" 1/4	24	1" 7/8	13" 1/4	20	2" 1/2	7" 3/4	16	3" 1/2	25" 3/4

NOTE: Lengths in inches according to ANSI B16.5, measured from thread to thread, excluding points
 Lengths in mm are measured as "total overall lengths"
 In both cases, above mentioned sizes should be used when ordering
 For tolerances on total lengths see below

TOLERANCES ON LENGTH OF STUDBOLTS

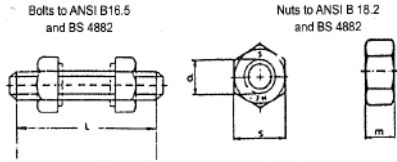
Diameter	1/2"		5/8"		3/4"		7/8"		1" to 2"	
	Thread	13-UNC	11-UNC	10-UNC	C9-UN	8-UNC/8-UN	8-UNC/8-UN	8-UNC/8-UN	8-UNC/8-UN	8-UNC/8-UN
Maximum tolerance	+ 3,9mm		+ 4,6mm		+ 5,1mm		+ 5,6mm		+ 6,4mm	
Column A	Column B									
Length excl. points	Total minimum length (in mm)									
INCH	mm									
2"	50.8	54.7	55.4	55.9	56.5	57.2	57.2	57.2	57.2	57.2
2 1/4"	57.1	61.0	61.7	62.2	62.8	62.3	62.3	62.3	62.3	62.3
2 1/2"	63.5	67.4	68.1	68.6	69.2	68.7	68.7	68.7	68.7	68.7
2 3/4"	69.8	73.7	74.4	74.9	75.5	75.0	75.0	75.0	75.0	75.0
3"	76.2	80.1	80.8	81.3	81.9	81.4	81.4	81.4	81.4	81.4
3 1/4"	82.5	86.4	87.1	87.6	88.2	87.7	87.7	87.7	87.7	87.7
3 1/2"	88.9	92.8	93.5	94.0	94.6	94.1	94.1	94.1	94.1	94.1
3 3/4"	95.2	99.1	99.8	100.3	100.9	100.4	100.4	100.4	100.4	100.4
4"	101.6	105.5	106.2	106.7	107.3	106.8	106.8	106.8	106.8	106.8
4 1/4"	108.0	111.9	112.6	113.1	113.7	113.2	113.2	113.2	113.2	113.2
4 1/2"	114.3	118.2	118.9	119.4	120.0	119.5	119.5	119.5	119.5	119.5
4 3/4"	120.7	124.6	125.3	125.8	126.4	125.9	125.9	125.9	125.9	125.9
5"	127.0	130.9	131.6	132.1	132.7	132.2	132.2	132.2	132.2	132.2
5 1/4"	133.4	137.3	138.0	138.5	139.1	138.6	138.6	138.6	138.6	138.6
5 1/2"	139.7	143.6	144.3	144.8	145.4	144.9	144.9	144.9	144.9	144.9
5 3/4"	146.1	150.0	150.7	151.2	151.8	151.3	151.3	151.3	151.3	151.3
6"	152.4	156.3	157.0	157.5	158.1	157.6	157.6	157.6	157.6	157.6
6 1/4"	158.8	162.7	163.4	163.9	164.5	164.0	164.0	164.0	164.0	164.0
6 1/2"	165.1	169.0	169.7	170.2	170.8	170.3	170.3	170.3	170.3	170.3
6 3/4"	171.5	175.4	176.1	176.6	177.2	176.7	176.7	176.7	176.7	176.7
7"	177.8	181.7	182.4	182.9	183.5	183.0	183.0	183.0	183.0	183.0
7 1/4"	184.2	188.1	188.8	189.3	189.9	189.4	189.4	189.4	189.4	189.4
7 1/2"	190.5	194.4	195.1	195.6	196.2	195.7	195.7	195.7	195.7	195.7
7 3/4"	196.9	200.8	201.5	202.0	202.6	202.1	202.1	202.1	202.1	202.1
8"	203.2	207.1	207.8	208.3	208.9	208.4	208.4	208.4	208.4	208.4
8 1/4"	209.6	213.5	214.2	214.7	215.3	214.8	214.8	214.8	214.8	214.8
8 1/2"	215.9	219.8	220.5	221.0	221.6	221.1	221.1	221.1	221.1	221.1
8 3/4"	222.3	226.2	226.9	227.4	228.0	227.5	227.5	227.5	227.5	227.5
9"	228.6	232.5	233.2	233.7	234.3	233.8	233.8	233.8	233.8	233.8
9 1/4"	235.0	238.9	239.6	240.1	240.7	240.2	240.2	240.2	240.2	240.2
9 1/2"	241.3	245.2	245.9	246.4	247.0	246.5	246.5	246.5	246.5	246.5
9 3/4"	247.7	251.6	252.3	252.8	253.4	252.9	252.9	252.9	252.9	252.9
10"	254.0	257.9	258.6	259.1	259.7	259.2	259.2	259.2	259.2	259.2
10 1/4"	260.4	264.3	265.0	265.5	266.1	265.6	265.6	265.6	265.6	265.6
10 1/2"	266.7	270.6	271.3	271.8	272.4	271.9	271.9	271.9	271.9	271.9
10 3/4"	273.1	277.0	277.7	278.2	278.8	278.3	278.3	278.3	278.3	278.3
11"	279.4	283.3	284.0	284.5	285.1	284.6	284.6	284.6	284.6	284.6
11 1/4"	285.7	289.6	290.3	290.8	291.4	290.9	290.9	290.9	290.9	290.9
11 1/2"	292.1	296.0	296.7	297.2	297.8	297.3	297.3	297.3	297.3	297.3
11 3/4"	298.4	302.3	303.0	303.5	304.1	303.6	303.6	303.6	303.6	303.6
12"	304.8	308.7	309.4	309.9	310.5	310.0	310.0	310.0	310.0	310.0
12 1/4"	311.1	315.0	315.7	316.2	316.8	316.3	316.3	316.3	316.3	316.3
12 1/2"	317.5	321.4	322.1	322.6	323.2	322.7	322.7	322.7	322.7	322.7
12 3/4"	323.8	327.7	328.4	328.9	329.5	329.0	329.0	329.0	329.0	329.0
13"	330.2	334.1	334.8	335.3	335.9	335.4	335.4	335.4	335.4	335.4

If stud-bolts are ordered in inch-sizes, length is ALWAYS measured from first thread to first thread, without points (see column A)
 The length of the point is minimum one thread, however maximum two threads (see column B)
 Everything fully in accordance with ASTM A 193 point 13.1



STUDBOLTS WITH 2 HEXAGONAL NUTS

UNC/8-UN



Bolts to ANSI B16.5 and BS 4882

Nuts to ANSI B 18.2 and BS 4882

d	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 3/8"
screw threads UNC up to 1" incl. 8-UN over 1"	13	11	10	9	8	8	8	8
S max	22.22	26.97	31.75	36.52	41.27	46.02	50.8	55.57
min	21.59	26.19	30.79	35.41	40.01	44.61	49.23	53.83
m max	12.80	16.02	19.25	22.47	25.7	28.93	31.77	35
min	11.79	14.91	18.04	21.16	24.29	27.41	30.15	33.28
L*	WEIGHT IN KG PER 1,000 PIECES (INCLUDING 2 NUTS)							
2	99.2	169.7	268.5					
2 1/4	104.2	178.1	280.5					
2 1/2	109.4	187.2	296.5					
2 3/4	114.5	195.2	305.6					
3	119.5	203.3	316.1					
3 1/4	124.7	211.2	327.8					
3 1/2	129.7	219.3	339.6					
3 3/4	134.8	227.4	351.5	509				
4	139.9	235.4	363.7	525.2				
4 1/4		243.5	376.1	541.4				
4 1/2		251.5	387.8	557.6	788.5			
4 3/4		259.6	398.6	573.8	799.0			
5		276.6	410.3	589.2	809.8			
5 1/4		280.1	423.3	606.0	831.2			
5 1/2		283.6	434.4	622.2	852.3	1132.6		
5 3/4		291.6	445.7	638.5	874.4	1159.7		
6		299.7	457.3	654.5	895.0	1167.4		
6 1/4		307.9	469.2	670.5	916.1	1215.0		
6 1/2		315.8	480.9	686.9	937.2	1242.0		
6 3/4		323.8	492.6	703.2	958.5	1269.8		
7		331.9	504.4	719.5	979.6	1296.8	1666.1	
7 1/4			512.6	735.7	1000.4	1324.6	1700.8	
7 1/2			528	761.9	1022.0	1351.8	1734.8	
7 3/4			539.3	773.4	1043.0	1379.8	1488.9	
8			551.5	784.0	1065.0	1406.4	1803.5	2267.9
8 1/4			563.3	800.3	1085.4	1433.4	1836.2	2301.4
8 1/2					1106.9	1461.4	1870.7	2343.6
8 3/4					1134.6		1906.9	2385.7
9					1149.4		1940.9	2427.4

*L (length of studbolt) is the length of first thread to first thread (without points). Method of ordering for Studbolt B7 1" x 7" : 03850 1" x 7" B7/2H.

d	1 1/2"	1 5/8"	1 3/4"	1 7/8"	2"
screw threads UNC up to 1" incl. 8-UN over 1"	8	8	8	8	8
S max	60.32	65.07	69.85	74.62	79.37
min	58.43	63.02	67.72	72.24	76.84
m max	38.22	41.45	44.67	47.9	51.13
min	36.4	39.53	42.65	45.78	48.9
L*	WEIGHT IN KG PER 1,000 PIECES (INCLUDING 2 NUTS)				
8 1/2	2804.5				
8 3/4	2853.9				
9	2903.4				
9 1/4	2952.8				
9 1/2	3002.2	3675.8			
9 3/4	3051.7	3791.8			
10	3101.1	1849.8	4589.9		
10 1/2	3200	3965.8	4724.5		
11	3298.8	4081.9	4859.1		
11 1/2	3397.7	4197.9	4993.6		
12	3496.6	4313.9	5128.2	6133.6	
13		4546	5397.3	6442.6	
14		4778	5666.4	6751.6	
15			5935.6	7060.5	8061.8
16			6204.7	7369.5	8413.3
17				7678.4	8764.8
18				7987.4	9116.4
19				8296.3	9367.9
20				8605.3	9619.4

*L (length of studbolt) is the length of first thread to first thread (without points). Method of ordering for Studbolt B7 1" x 7" : 03850 1" x 7" B7/2H.



IDENTIFICATION

APCO flanges, where the size and design permits, are marked with the following identification data in accordance with MSS SP-25 and ANSI B16.5,

Trade mark or name
B16 (ANSI designation)

Nominal size
Material designation

Primary service pressure
Heat code

FORGED FLANGE TOLERANCES

Millimetres in brackets

DIMENSION		WELDING NECK & SOCK. WELD	SLIP-ON & SOCK. WELD	THREADED	LAP JOIN	BLIND
1 Outside Diameter	Flange O.D. 24 or less (609.6)	±.06 (1.6)	±.06 (1.6)	±.06 (1.6)	±.06 (1.6)	±.06 (1.6)
	Flange O.D. over 24 (609.6)	±.12 (3.2)	±.12 (3.2)	±.12 (3.2)	±.12 (3.2)	±.12 (3.2)
Bore	NPS 10 (DN 250) & less	±.03 (0.8) ²	+0.03 (0.8) ³ -0	+0.03 (0.8) -0	+0.03 (0.8) -0	-
	NPS 12-18 (DN 300-450)	±.06 (1.6) ²	+0.06 (1.6) ⁴ -0	+0.06 (1.6) -0	+0.06 (1.6) -0	-
	NPS 20 (DN 500) & over	+0.12 (3.2) ² -0.06 (1.6)	+0.06 (1.6) ⁴ -0	+0.06 (1.6) -0	+0.06 (1.6) -0	-
Flange Thickness	NPS 18 (DN 450) & less	+0.12 (3.2) -0	+0.12 (3.2) -0	+0.12 (3.2) -0	+0.12 (3.2) -0	+0.12 (3.2) -0
	NPS 20 (DN 500) & over	+0.19 (4.8) -0	+0.19 (4.8) -0	+0.19 (4.8) -0	+0.19 (4.8) -0	+0.19 (4.8) -0
Raised Face Diameter	.06 (1.6) raised face	±.03 (0.8)	±.03 (0.8)	±.03 (0.8)	-	±.03 (0.8)
	.25 (6.4) raised face	±.02 (0.5)	±.02 (0.5)	±.02 (0.5)	-	±.02 (0.5)
Drilling	Bolt circle	±.06 (1.6)	±.06 (1.6)	±.06 (1.6)	±.06 (1.6)	±.06 (1.6)
	Bolt hole spacing	±.03 (0.8)	±.03 (0.8)	±.03 (0.8)	±.03 (0.8)	±.03 (0.8)
Eccentricity ³	NPS 2 1/2 (DN 65) & less	.03 (0.8) max.	.03 (0.8) max.	.03 (0.8) max.	.03 (0.8) max.	-
	NPS 3 (DN 80) & larger	.06 (1.6) max.	.06 (1.6) max.	.06 (1.6) max.	.06 (1.6) max.	-
Length Thru Hub	NPS 10 (DN 250) & less	±.06 (1.6)	±.06 (1.6) ¹	±.06 (1.6) ¹	±.06 (1.6) ¹	-
	NPS 12 (DN 300) & over	±.12 (3.2)	±.12 (3.2) ¹	±.12 (3.2) ¹	±.12 (3.2) ¹	-
1 Diameter of Hub at Base	NPS 12 (DN 300) & less	+0.09 (2.4) -0.06 (1.6)	+0.09 (2.4) -0.06 (1.6)	+0.09 (2.4) -0.06 (1.6)	+0.09 (2.4) -0.06 (1.6)	-
	NPS 14 (DN 350) & over	±.12 (3.2)	±.12 (3.2)	±.12 (3.2)	±.12 (3.2)	-
Diameter of Hub at Bevel	NPS 5 (DN 125) & less	+0.09 (2.4) -0.03 (0.8)	-	-	-	-
	NPS 6 (DN 150) & over	+0.16 (4.0) -0.03 (0.8)	-	-	-	-
Thickness of Hub at Bevel All sizes of welding neck		Minimum, -12 1/2% of matching nominal pipe wall thickness				

¹ These tolerances not covered by ANSI B16.5.

² Welding Neck and Socket Welding small bore.

³ Between bolt circle diameter and machined facing diameter.

⁴ Socket Welding Socket.

AWWA FLANGES (Page 34)

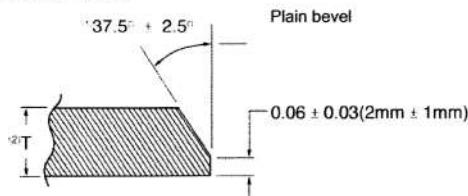
CLASS B FLANGES have a water service rating at atmospheric temperature of 86 psi. These flanges have the same outside diameter, bolt circle and number of bolts as ANSI B16.1 (25 psi cast-iron pipe flanges and flanged fittings).

In sizes NPS 48 (DN 1200) and under they have the same bolts, and in sizes over NPS 48 (DN 1200) they use larger bolts than specified by this 25 psi standard.

They also have the same outside diameter, bolt circle, and number of bolts as ANSI B16.1 (125 psi cast-iron pipe flanges and flanged fittings), but use smaller bolts.

CLASS D FLANGES have a water service rating at atmospheric temperature; sizes NPS 6 to NPS 12 (DN 150

WELDING BEVELS



ANSI B16.25, ANSI B16.47 Series B (API 605)

Nominal pipe wall thickness $T = 0.88$ (22.2 mm) max. For wall thicknesses less than 0.19 in. (4.8 mm) for carbon and ferritic alloy steel, and 0.125 in. (3.2 mm) austenitic alloy steel, ends may be cut square or slightly chamfered at manufacturer's option.

ANSI B16.47 Series A (MSS SP-44)

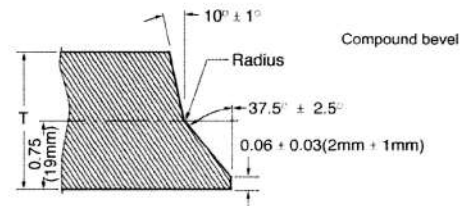
¹This angle is 30°, +5° -0° with flanges size 26 (DN 650) and larger.

² $T = 0.75$ " (20 mm) or less, or 1" (25.4 mm) at the manufacturer's option.

to DN 300) inclusive, 175 psi; sizes larger than NPS 12 (DN 300) 150 psi. These flanges have the same diameter and drilling as class 125 cast-iron flanges (ANSI B16.1).

CLASS E FLANGES have a water service rating at atmospheric temperature of 275 psi. These flanges have the same diameter and drilling as Class 125 cast-iron flanges (ANSI B16.1). In sizes NPS 24 (DN 600) and smaller they also match ANSI B16.5 150 psi standard for steel flanges.

ALL FLANGES: Carbon steel bolts should be used. Cloth-inserted rubber gaskets .06" (1.6 mm) thick should be used and should extend from the I.D. of flange to at least the inside edge of the bolt holes.



ANSI B16.25, ANSI B16.25, ANSI B16.47 Series B (API 605)

$T =$ more than 0.88 (22.4 mm)

ANSI B16.47 Series A (MSS SP-44)

$T =$ more than 0.75 (20 mm)