

## ANSI / ASME B16.5 (2003) Pipe Flanges

All units are in mm, except the Nominal Pipe Size in inches.

Nominal Pipe Size	Pitch Diam. of Ring and Groove	Width of Ring	HEIGHT OF RING		Width of Flat on Octagonal Rings	Width of Groove	Depth of Groove	Diameter of Raised Face for Ring Joint or Lapped	Ring Number	Approximate Distance Between Flanges of Ring Joints When Ring in Compressed
			Oval	Octagonal						
			P	A						
1/2	39.7	8.0	14.3	12.7	5.2	8.7	6.4	60.5	R12	4.1
3/4	44.5	8.0	14.3	12.7	5.2	8.7	6.4	60.5	R14	4.1
1	50.8	8.0	14.3	12.7	5.2	8.7	6.4	60.5	R16	4.1
1 1/4	60.3	8.0	14.3	12.7	5.2	8.7	6.4	81.0	R18	4.1
1 1/2	68.3	8.0	14.3	12.7	5.2	8.7	6.4	92.2	R20	4.1
2	95.3	11.1	17.5	15.9	7.7	11.9	7.9	124.0	R24	3.0
2 1/2	108.0	11.1	17.5	15.9	7.7	11.9	7.9	136.7	R27	3.0
2	136.5	11.1	17.5	15.9	7.7	11.9	7.9	168.4	R35	3.0
3 1/2	161.9	11.1	17.5	15.9	7.7	11.9	7.9	193.8	R39	3.0
10	193.7	11.1	17.5	15.9	7.7	11.9	7.9	228.6	R44	3.0
12	211.2	12.7	19.1	17.5	8.7	13.5	9.5	247.7	R46	3.0
14	269.9	15.9	22.2	20.7	10.5	16.7	11.1	317.5	R50	4.1
10	323.9	15.9	22.2	20.7	10.5	16.7	11.1	371.6	R54	4.1
12	381.0	22.2	28.6	27.0	14.8	23.0	14.3	438.2	R58	4.8
14	419.1	25.4	33.4	31.8	17.3	27.0	15.9	489.0	R63	5.6
16	469.9	28.6	36.5	34.9	19.8	30.2	17.5	546.1	R67	7.9
18	533.4	28.6	36.5	34.9	19.8	30.2	17.5	612.9	R71	7.9
20	584.2	31.8	39.7	38.1	22.3	33.4	17.5	673.1	R75	9.7
24	692.2	34.9	44.5	41.3	24.8	36.5	20.6	793.8	R79	11.2

### Notes:

Unless otherwise specified by the customer, Ring Type Joint Flanges will be furnished in accordance with these details.

The depth of groove is added to the minimum flange thickness

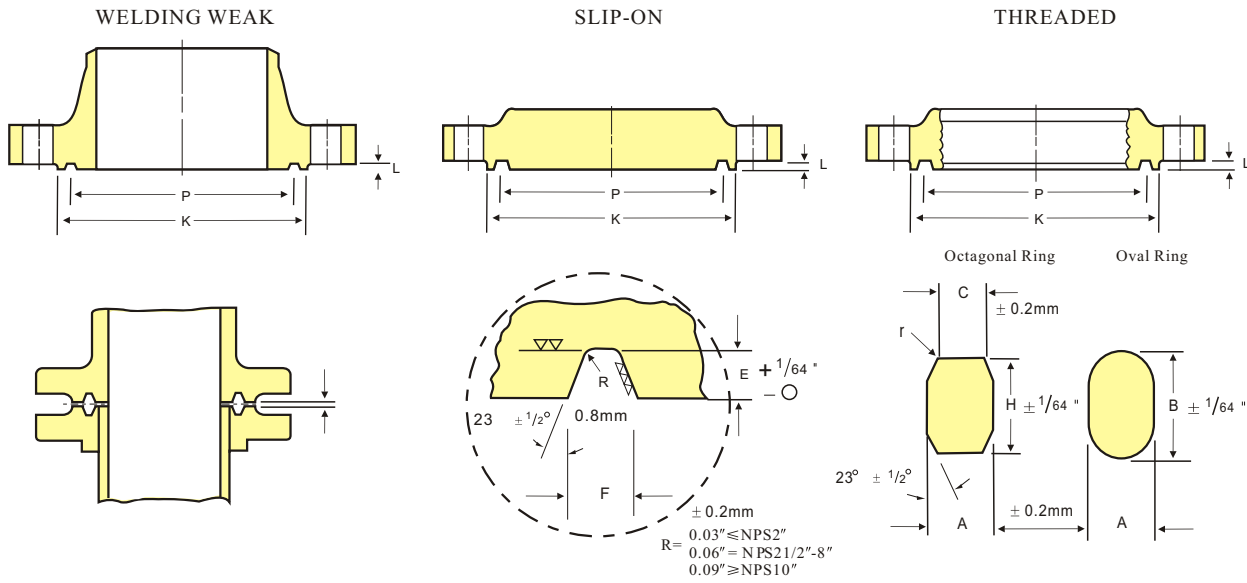
\*Raised face L is equal to groove dimension E but is not subject to tolerances for E

\*A plus tolerance of 3/64 in. For heights B and H is permitted providing the variation in the height of any given ring does not exceed 1/64 in.

Throughout its entire circumference.

Dimension R is max

Radius r is 1/16 for ring widths 7/8 and less and 3/32 for ring WIDTHS 1 (25.4mm) and over.



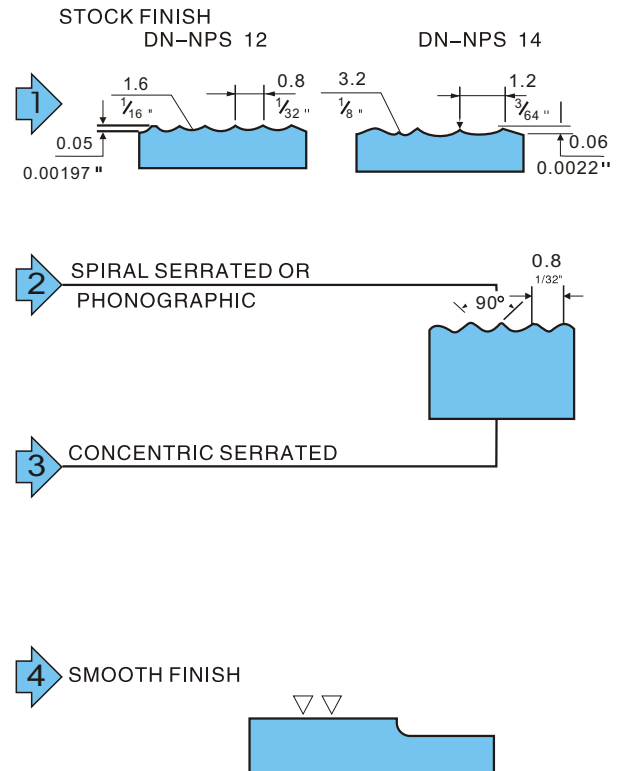
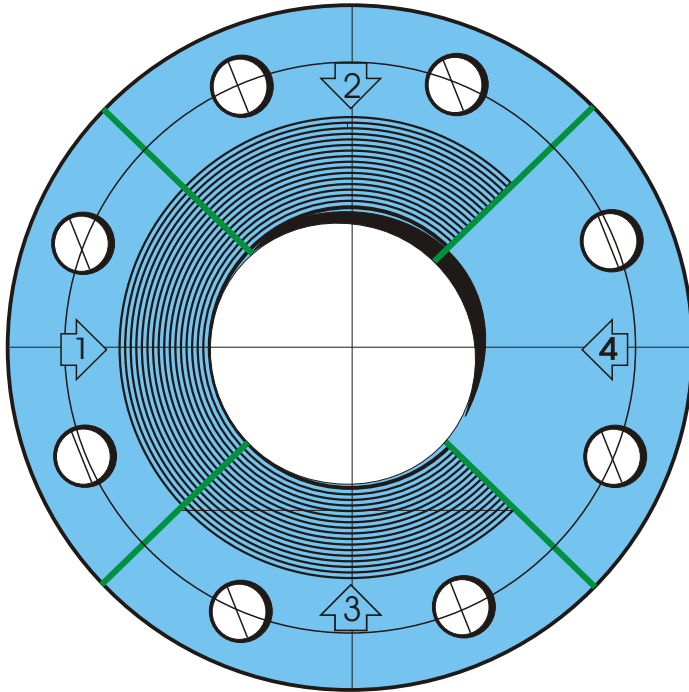
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Nominal Pipe Size	Pitch Diam. of Ring and Groove	Width of Ring	HEIGHT OF RING		Width of Flat on Octagonal Rings	Width of Groove	Depth of Groove	Diameter of Raised Face for Ring Joint or Lapped	Ring Number	Approximate Distance Between Flanges of Ring Joints When Ring is Compressed
			Oval	Octagonal						
	P	A	B	H	C	F	E(L)	K(MIN)		
1/2 3/4 1	42.9	8.0	14.3	12.7	5.2	8.7	6.4	65.0	R13	4.1
	50.8	8.0	14.3	12.7	5.2	8.7	6.4	73.2	R16	4.1
	60.3	8.0	14.3	12.7	5.2	8.7	6.4	82.6	R18	4.1
1 1/4 1 1/2 2	72.2	11.1	17.5	15.9	7.7	11.9	7.9	101.6	R21	3.0
	82.6	11.1	17.5	15.9	7.7	11.9	7.9	114.3	R23	3.0
	101.6	11.1	17.5	15.9	7.7	11.9	7.9	133.4	R26	3.0
2 1/2 3 4	111.1	12.7	19.1	17.5	8.7	13.5	9.5	149.4	R28	3.0
	127.0	12.7	19.1	17.5	8.7	13.5	9.5	168.4	R32	3.0
	157.0	15.9	22.2	20.7	10.5	16.7	11.1	203.2	R38	4.1
5 6 8	190.5	19.1	25.4	23.8	12.3	19.8	12.7	241.3	R42	4.1
	228.6	19.1	25.4	23.8	12.3	19.8	12.7	279.4	R47	4.1
	279.4	22.2	28.6	27.0	14.8	23.0	14.3	339.9	R51	4.8
10 12	342.9	28.6	36.5	34.9	19.8	30.2	17.5	425.5	R55	6.4
	406.4	31.8	39.7	38.1	22.3	33.4	17.5	495.3	R60	7.9

Notes:  
 Unless otherwise specified by the customer, Ring Type Joint Flanges will be finished in accordance with these details.  
 The depth of groove is added to the minimum flange thickness  
 \*Raised face "L" is equal to groove dimension "E" but is not subject to tolerances for "E"  
 \*A plus tolerance of 3/64 in. Throughout its entire circumference.  
 Exceed 1/64 in. Throughout its entire circumference.  
 Dimension "R" is max.  
 Radius "r" 1/16 "for ring widths 7/8" and less and 3/32" for ring widths 1 (25.4mm) and over

## ANSI B16.5 (ASME B16.5: 2003) Pipe Flanges



**STOCK FINISH:** The most widely used of any gasket finish, because practically IS SUITABLE FOR ALL ORDINARY SERVICE CONDITIONS

This is a continuous spiral. Flanges sizes 12 (304.8mm) and smaller, are produced with a 1/16 round-nosed tool at a feed of 1/32 per revolution. For sizes 14 (355.6mm) and larger, the finish is made with 1/8 round-nosed tool at a feed of 3/64 per revolution.

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

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

**SMOOTH FINISH:** The cutting tool employed shall have an approximate 0.06 radius.

The resultant surface finish shall have a 125 inch to 250 inch (ANSI B16.5 para 6.4; 4.1)

### 1. RAISED FACE, AND LARGE MALE AND FEMALE

Either a serrated - concentric or serrated-spiral finish having from 34 to 64 grooves per inch is used. The cutting tool employed has an approximate 0.06 in radius. The resultant surface finish shall have a 125 inch (3.2 m) to 500 inch (12.5 m) approximate roughness.

### 2. TONGUE AND GROOVE, AND SMALL MALE AND FEMALE

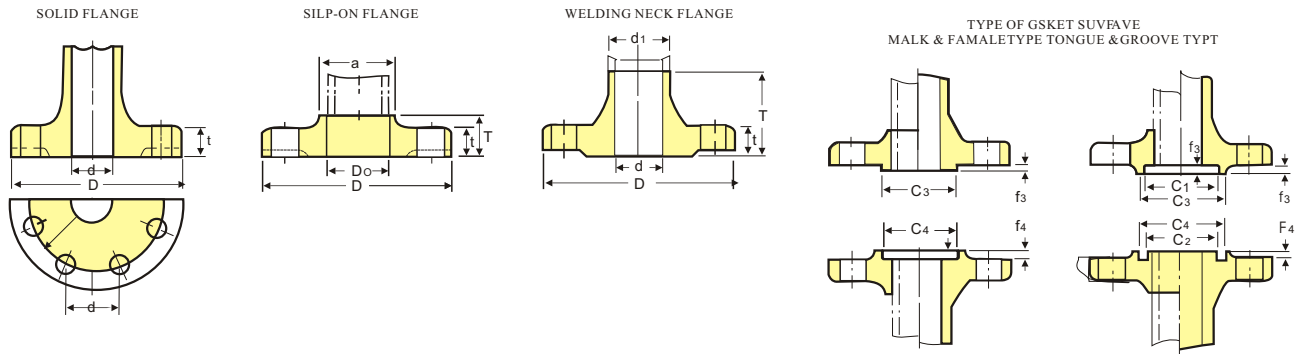
The gasket contact surface does not exceed 125 in. (3.2 m) roughness.

### 3. RING JOINT

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

### 4. BLIND

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



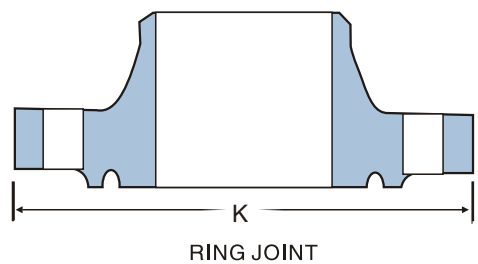
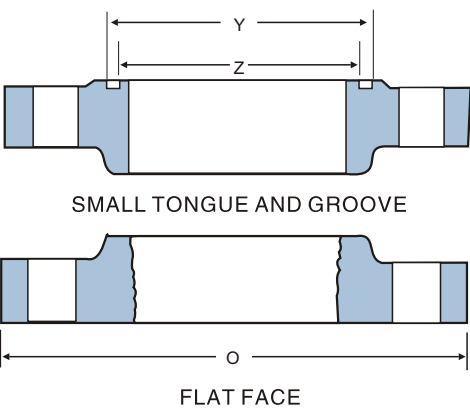
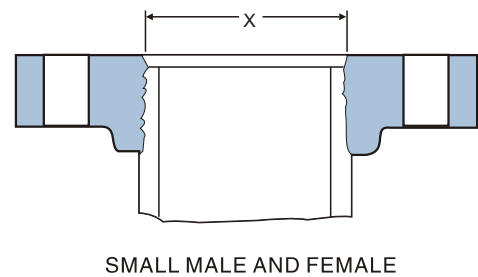
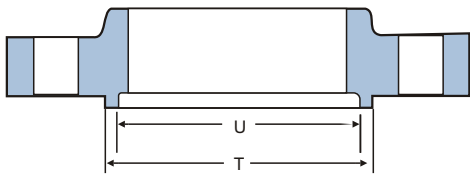
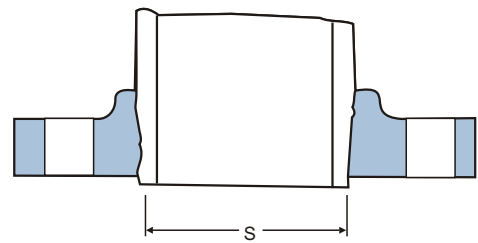
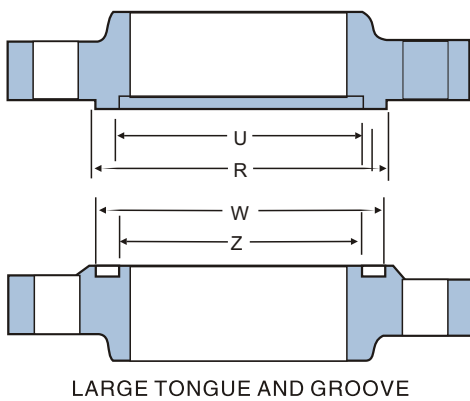
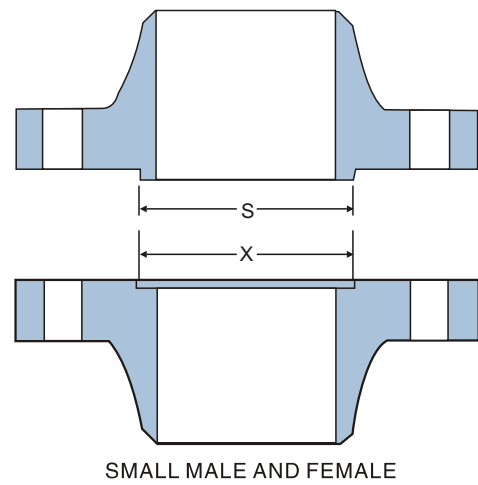
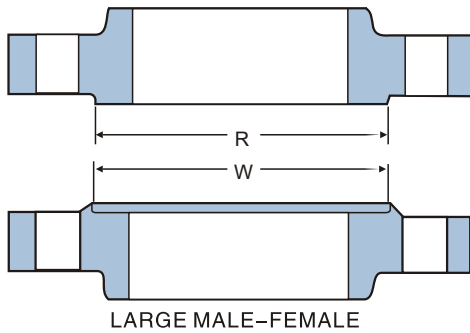
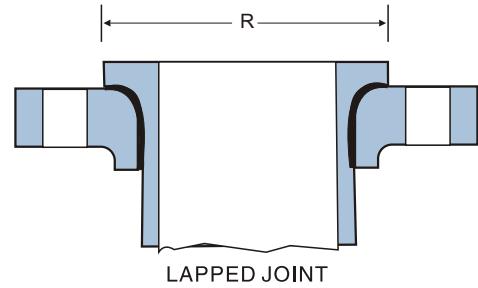
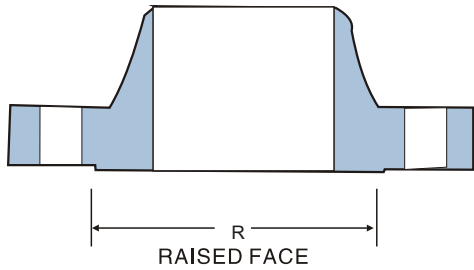
All units are in mm, except the Nominal Pipe Size in inches.

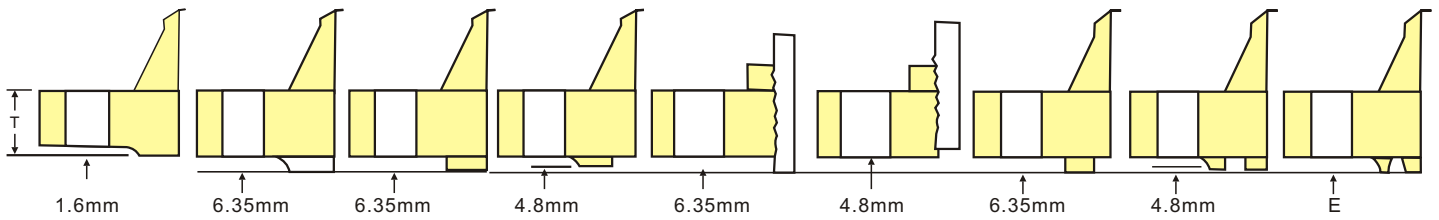
Outsied Diameter	When O.D Is 24" or Less	$\pm 1/16''(1.6\text{mm})$
	When O.D Is Over 24 "	$\pm 1/8''(3.2\text{mm})$
Inside Diameter	Threaded	Within Limits on boring gauge
	Socket-Welding, Silp-on and Lap joint	10" & Smaller $+1/32''(0.8\text{mm}), -0''$ 12" & Larger $+11/16''(1.6\text{mm}), -0$
Outside Diameter of Hub	5" and Smaller	$+3/32''(2.4\text{mm})$ $-1/32''(0.8\text{mm})$
	6" and Larger	$+5/32''(4.0\text{mm})$ $-1/32''(0.8\text{mm})$
Diameter of Contact Face	$1/16''$ Raised Face	$\pm 1/32''(0.8\text{mm})$
	$1/4''$ Raised Face Tongue & Groove Male, Female	$\pm 1/64''(0.4\text{mm})$
Diameter of Counterbore	Same as for Insied Diameter	
Driling	Bolt Circle	$\pm 1/16''(1.6\text{mm})$
	Bolt Hole Spacing	$\pm 1/32''(0.8\text{mm})$
	Eccentricity of Bolt Circle with Respect to Facing	$2\frac{1}{2}''$ Smaller $1 / 32''(0.8\text{mm})$ Max. 3" & Larger $1 / 16''(1.6\text{mm})$ Max.
	Eccentricity of Bolt Circle with Respect to Facing	$1/32''(0.8\text{mm})$ Max.
	Eccentricity of Facing with Respect to Bore	$1/32''(0.8\text{mm})$ Max.
Thickness	18" and Smaller	$\pm 1/8''(3.2\text{mm}), -0''$
	20" and Larger	$\pm 3/16''(4.8\text{mm}), -0''$
Length Thru Hub	10" and Smaller	$\pm 1/16''(1.6\text{mm})$
	12" and Larger	$\pm 1/8''(3.2\text{mm})$

Outsied Diameter	When O.D Is 24" or Less	$\pm 1/16''(1.6\text{mm})$
	When O.D Is Over 24 "	$\pm 1/8''(3.2\text{mm})$
Inside Diameter	10" and Smaller	$\pm 1/32''(0.8\text{mm})$
	12" thru 18"	$\pm 1/16''(1.6\text{mm})$
	20" and Larger	$+1/8''(3.2\text{mm})$ $-1/16''(1.6\text{mm})$
Diameter of Contact Face	When Hub Base is 24" or Smaller	$\pm 1/16''(1.6\text{mm})$
	When Hub Base is Over 24"	$\pm 1/8''(3.2\text{mm})$
Diameter of Hub at Point of Welding	5" and Larger	$+3/32''(2.4\text{mm})$ $-1/32''(0.8\text{mm})$
	6" and Larger	$+5/32''(2.4\text{mm})$ $-1/32''(0.8\text{mm})$
Driling	Bolt Circle	$\pm 1/16''(1.6\text{mm})$
	Bolt Hole Spacing	$\pm 1/32''(0.8\text{mm})$
	Eccentricity of Bolt Circle with Respect to Facing	$2\frac{1}{2}''$ Smaller $1 / 32''(0.8\text{mm})$ Max. 3" & Larger $1 / 16''(1.6\text{mm})$ Max.
	Eccentricity of Bolt Circle with Respect to Bore	$1/32''(0.8\text{mm})$ Max.
	Eccentricity of Facing with Respect to Bore	$1/32''(0.8\text{mm})$ Max.
Thickness	18" and Smaller	$\pm 1/8''(3.2\text{mm}), -0''$
	20" and Larger	$\pm 3/16''(4.8\text{mm}), -0''$
Length Thru Hub	10" and Smaller	$\pm 1/16''(1.6\text{mm})$
	12" and Larger	$\pm 1/8''(3.2\text{mm})$

Notes This tolerance is covered in ANSI B 16.5, but make option

All units are in mm, except the Nominal Pipe Size in inches.





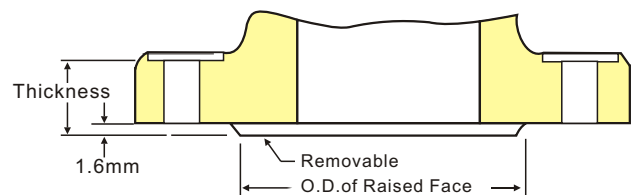
### ANSI / ASME B16.5 (2003) Pipe Flanges

All units are in mm, except the Nominal Pipe Size in inches.

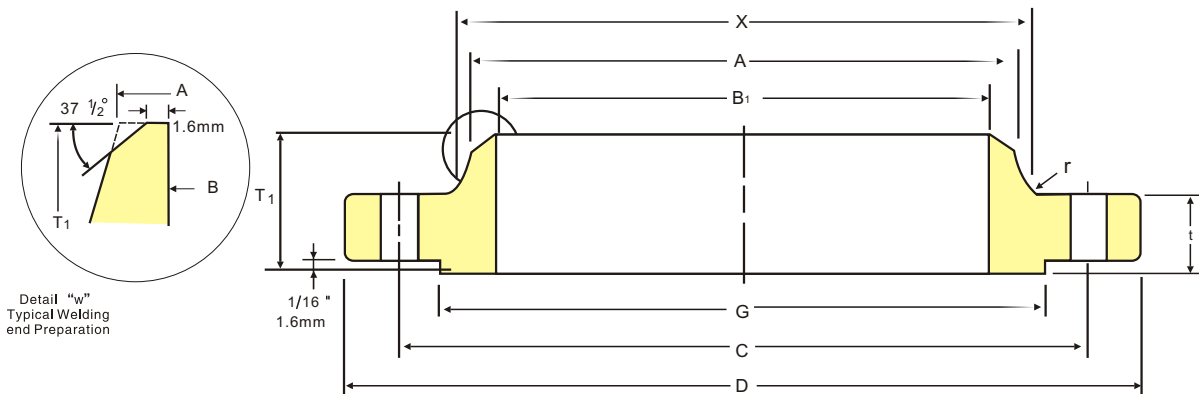
Nominal Pipe Size	OUTSID DIAMETER			I.D. of Large and Small Tongue	OUTSIDE DIAMETER				I.D. of Large and Groove	HELGHT		Depth of Groove or Female
	Raised Face, Lapped, Large Male and Large Tongue	Small Male	Small Tongue		Large Female and Large Groove		Small Female	Small Groove		Raised Face and 300 ST' DS	Raised Face Large and Small Male and Tongue Classes 400 2500 ST' DS	
					R	S						
1/2	35.1	18.3	35.1	25.4	36.6	46.0	19.8	36.6	23.9	1.5	6.4	4.8
3/4	42.9	23.9	42.9	33.3	44.5	53.8	25.4	44.5	31.8	1.5	6.4	4.8
1	50.8	30.2	47.8	38.1	52.3	62.0	31.8	49.3	36.6	1.5	6.4	4.8
1 1/4	63.5	38.1	57.2	47.8	65.0	74.7	39.6	58.7	46.0	1.5	6.4	4.8
1 1/2	73.2	44.5	63.5	53.8	74.7	84.1	46.0	65.0	52.3	1.5	6.4	4.8
2	91.9	57.2	82.6	73.2	93.7	103.1	58.7	84.1	71.4	1.5	6.4	4.8
2 1/2	104.6	68.3	95.3	85.9	106.4	115.8	69.9	96.8	84.1	1.5	6.4	4.8
3	127.0	84.1	117.3	108.0	128.5	138.2	85.9	119.1	106.4	1.5	6.4	4.8
3 1/2	139.7	96.8	130.0	120.7	141.2	150.9	98.6	131.8	119.1	1.5	6.4	4.8
4	157.2	109.5	144.5	131.8	158.8	168.1	111.3	146.1	130.0	1.5	6.4	4.8
5	185.7	136.7	173.0	160.3	187.5	196.9	138.2	174.8	158.0	1.5	6.4	4.8
6	215.9	162.1	203.2	190.5	217.4	227.1	163.6	204.7	189.0	1.5	6.4	4.8
8	269.7	212.9	254.0	238.3	271.5	280.9	214.4	255.5	236.5	1.5	6.4	4.8
10	323.9	266.7	304.8	285.8	325.4	335.0	268.2	306.3	284.2	1.5	6.4	4.8
12	381.0	317.5	362.0	342.9	382.5	392.2	319.0	363.5	341.4	1.5	6.4	4.8
14	412.8	349.3	393.7	374.7	414.3	423.9	350.8	395.2	373.1	1.5	6.4	4.8
16	469.9	400.1	447.5	425.5	471.4	481.1	401.6	449.3	423.9	1.5	6.4	4.8
18	533.4	450.9	511.0	489.0	534.9	544.1	452.4	512.8	487.4	1.5	6.4	4.8
20	584.2	501.7	558.8	533.4	585.7	595.4	503.2	560.3	531.9	1.5	6.4	4.8
24	692.2	603.3	666.8	641.4	693.7	703.3	604.8	668.3	639.8	1.5	6.4	4.8

**Notes:**

- 1) Small male and female faces are not applicable to Slip-on Flange.
- 2) Large male and female faces are not applicable to Class 150 Flanges.
- 3) For flanges of Class 150 and 300 where they are to be bolted to ANSI Class 125 and 250 Cast-Iron Flanges or required with flat face, flat face can be made by removing raised face.



\* Tolerances are ±0.03 (+0.8mm) for 0.06 " (1.6mm) RF and ±0.02 " (+0.5mm) for 0.25 " (6.35mm) RF Large Male and Large Tongue



### CLASS 75 FLANGES

All units are in mm, except the Nominal Pipe Size in inches.

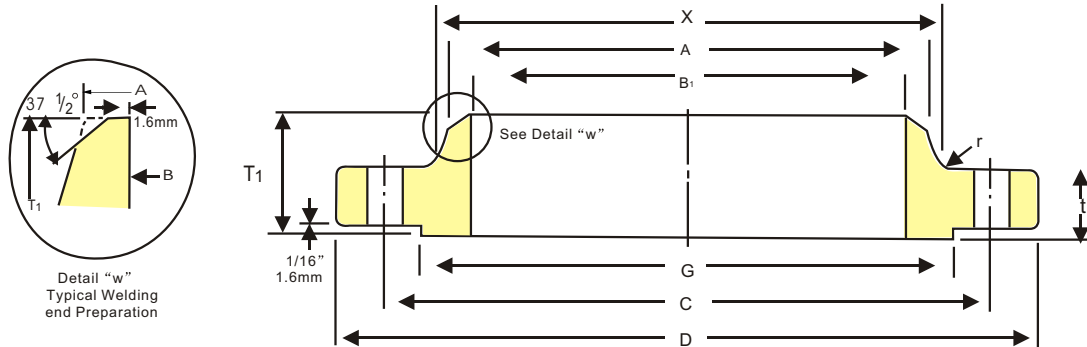
Nominal Pipe Size	Outside Diam.	O.D. of Raised Face	Diam. At Base - Hub	Thick-ness	BORE			Length Thru Hub	Diam. Of Hub of Bevel	Radius of Base of Hub	DRILLING			Approximate Weight (Kg) 9.5mm Within			
					Wall Thickness						T1	A	R		Bolt Circle Diam.	Number of Holes	Diam. Of Holes
					6.35mm	9.5mm	12.7mm										
	D	G	X	A	B1			T1	A	R	C						
26	762	704.9	676.1	33.3	647.7	641.4	635.0	58.7	661.9	7.9	723.9	36	19.1	29.01			
28	813	755.7	726.9	33.3	698.5	692.2	685.8	62.0	712.7	7.9	774.7	40	19.1	31.01			
30	864	806.5	777.7	33.3	749.3	743.0	736.6	65.0	763.5	7.9	825.5	44	19.1	35.05			
32	914	857.3	828.5	35.1	800.1	793.8	787.4	69.9	814.3	7.9	876.3	48	19.1	48.03			
34	965	908.1	879.3	35.1	850.9	844.6	838.2	73.2	865.1	7.9	927.1	52	19.1	50.03			
36	1034	965.2	935.0	36.6	850.9	895.4	889.0	85.9	918.9	9.7	992.1	40	22.4	62.06			
38	1084	1016.0	985.8	38.1	952.5	964.2	939.8	88.9	966.7	9.7	1042.9	40	22.4	70.05			
40	1135	1066.8	1036.6	38.1	1003.3	997.0	990.6	91.9	1017.5	9.7	1093.7	44	22.4	74.05			
42	1186	1117.6	1087.4	39.6	1054.1	1047.8	1041.4	95.3	1068.3	9.7	1144.5	48	22.4	77.09			
44	1251	1174.8	1140.0	42.9	1104.9	1049.4	1143.0	104.6	1119.1	9.7	1203.5	36	22.5	82.08			
46	1302	1225.6	1190.8	44.5	1155.7	1149.4	1143.0	108.0	1169.9	9.7	1254.3	40	22.5	105.01			
48	1353	1276.4	1241.6	46.0	1206.5	1200.2	1193.8	111.3	1220.7	9.7	1305.1	44	22.5	120.03			
50	1403	1327.2	1293.9	47.8	1257.3	1251.0	1244.6	115.8	1271.5	9.7	1355.9	44	22.5	134.28			
52	1457	1378.0	1344.7	47.8	1308.1	1301.8	1295.4	120.7	1322.3	9.7	1409.7	48	22.5	142.18			
54	1508	1428.8	1397.0	49.3	1358.9	1352.6	1346.2	125.5	1373.1	9.7	1460.5	48	22.5	180.15			
56	1575	1485.9	1450.8	50.8	1409.7	1403.4	1397.0	134.9	1423.9	11.2	1521.0	40	22.4	184.58			
58	1626	1536.7	1501.6	52.3	1460.5	1454.2	1447.8	138.2	1474.7	11.2	1571.8	44	22.5	195.56			
60	1676	1587.5	1552.4	55.6	1511.3	1505.0	1498.6	144.5	1525.5	11.2	1622.6	44	28.4	210.20			

### CLASS 150 FLANGES

Nominal Pipe Size	Outside Diam.	O.D. of Raised Face	Diam. At Base of Hub	Thick-ness		BORE			Length Thru Hub	Diam. Of Hub of Bevel	Radius of Base of Hub	DRILLING			Approximate Weight (Kg) 9.5mm Within				
				T	(BL)	Wall Thickness						T1	A	R	Bolt Circle Diam.	Number of Holes	Diam. Of Holes	WN	BL
				6.35mm	9.5mm	12.7mm	B1												
26	786	711.2	684.3	41.1	44.5	647.7	641.4	635.0	88.9	661.9	9.7	744.5	36	22.4	59	165			
28	837	762.0	735.1	44.5	47.8	698.5	692.2	685.8	95.3	712.7	9.7	795.3	40	22.4	68	201			
30	887	812.8	787.4	44.5	50.8	749.3	743.0	736.6	100.1	763.5	9.7	846.1	44	22.4	74	241			
32	941	863.6	839.7	46.0	53.8	800.1	793.8	787.4	108.0	814.3	9.7	900.1	48	22.4	85	288			
34	1005	920.8	892.0	49.5	57.2	850.9	844.6	838.2	110.2	865.1	9.7	957.3	40	25.4	103	349			
36	1057	971.6	944.6	52.3	58.7	901.7	895.4	889.0	117.3	915.9	9.7	1009.7	44	25.4	117	397			
38	1124	1022.4	997.0	53.8	63.5	952.5	964.2	939.8	124.0	968.2	9.7	1069.8	40	28.4	140	485			
40	1175	1079.5	1049.3	55.6	66.5	1003.3	997.0	990.6	128.5	1019.0	9.7	1120.6	44	28.4	153	556			
42	1226	1130.3	1101.9	58.7	68.3	1054.1	1047.8	1041.4	133.4	1069.8	11.2	1171.4	48	28.4	168	621			
44	1276	1181.1	1152.7	60.5	71.4	1104.9	1098.6	1092.2	136.7	1120.6	11.2	1222.2	52	31.8	200	704			
46	1341	1234.9	1205.0	62.0	74.7	1155.7	1149.4	1143.0	144.5	1171.4	11.2	1284.2	40	31.8	210	816			
48	1392	1289.1	1257.3	65.0	77.7	1206.5	1200.2	1193.8	149.4	1222.2	11.2	1335.0	44	31.8	240	915			
50	1443	1339.9	1308.1	68.3	80.8	1257.3	1251.0	1244.6	153.9	1273.0	11.2	1385.8	48	31.8	250	1021			
52	1494	1390.7	1360.4	69.9	84.1	1308.1	1301.8	1295.4	157.2	1323.8	11.2	1436.6	52	31.8	266	1139			
54	1549	1441.5	1412.7	71.4	87.4	1358.9	1352.6	1346.2	162.1	1374.6	11.2	1492.3	56	31.8	310	1274			
56	1600	1492.3	1465.3	73.2	90.4	1409.7	1403.4	1397.0	166.6	1425.4	14.2	1543.1	60	31.8	306	1406			
58	1675	1543.1	1516.1	74.7	93.5	1460.5	1454.2	1447.8	174.8	1476.2	14.2	1611.4	48	35.1	367	1596			
60	1726	1600.2	1570.0	76.2	96.8	1511.3	1505.0	1498.6	179.3	1527.0	14.2	1662.2	52	35.1	410	1754			

Notes:

- 1) Bore (B) of flanges is shall be specified by the purchaser.
- 2) Class 75 flanges 0.06 " (1.6mm) raised face, which is included in Thickness (t) and Length through Hub T1



## ANSI / ASME B16.5 (2003) Pipe Flanges

All units are in mm, except the Nominal Pipe Size in inches.

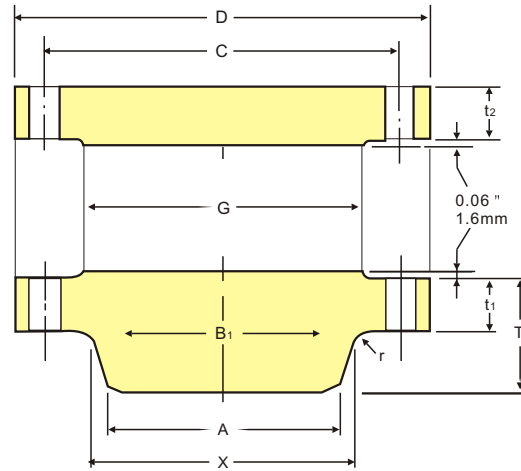
Nominal Pipe Size	Outside Diam.	O.D. of Raised Face	Diam. At Base of Hub	Thick-ness	BORE			Length Thru Hub	Thickness		Radius of Base of Hub	DRILLING			Approximate Weight (Kg) 9.5mm Within			
					Wall Thickness				T <sub>1</sub>	T		(BL)	R	C	Number of Holes	Diam. Of Holes	WN	BL
					6.35mm	9.5mm	12.7mm											
D	G	X	T	B1			T <sub>1</sub>	T	(BL)	R	C	Number of Holes	Diam. Of Holes	WN	BL			
26	867	736.6	701.5	665.2	647.7	641.4	635.0	144.5	88.9	88.9	14.2	803.1	32	35.1	200	393		
28	921	787.4	755.7	716.0	698.5	692.2	685.8	149.4	88.9	88.9	14.2	857.3	36	35.1	210	443		
30	991	844.6	812.8	768.4	749.3	743.0	736.6	158.0	93.7	93.7	14.2	920.8	36	38.1	270	540		
32	1054	901.7	863.6	819.2	800.1	793.8	787.4	168.1	103.1	103.1	15.7	977.9	32	41.1	330	677		
34	1108	925.5	917.4	870.0	850.9	844.6	838.2	173.0	103.1	103.1	15.7	1031.7	36	41.1	360	747		
36	1171	1009.7	965.2	920.8	901.7	895.4	889.0	180.8	103.1	103.1	15.7	1089.2	32	44.5	410	838		
38	1222	1060.5	1016.0	971.6	952.5	946.2	939.8	192.0	111.3	111.3	15.7	1140.0	36	44.5	571	983		
40	1273	1114.6	1066.8	1022.4	1003.3	997.0	990.6	198.4	115.8	115.8	15.7	1190.8	40	44.5	661	1110		
42	1334	1168.4	1117.6	1074.7	1054.1	1047.8	1041.4	204.7	119.1	119.1	15.7	1244.6	36	47.8	721	1256		
44	1384	1219.2	1173.2	1125.5	1104.9	1098.6	1092.2	214.4	127.0	127.0	15.7	1295.4	40	47.8	801	1441		
46	1461	1270.0	1228.85	1176.3	1155.7	1149.4	1143.0	222.3	128.5	130.0	15.7	1365.3	36	50.8	971	1649		
48	1511	1327.2	1277.9	1277.1	1206.5	1200.2	1193.8	223.8	128.5	134.9	15.7	1416.1	40	50.8	991	1829		
50	1562	1378.0	1330.5	1277.9	1254.3	1251.0	1244.6	235.0	138.2	139.7	15.7	1466.9	44	50.8	1048	2021		
52	1613	1428.8	1382.8	1328.7	1308.1	1301.8	1295.4	242.8	142.7	144.3	15.7	1517.7	48	50.8	1114	2223		
54	1673	1479.6	1435.1	1379.5	1358.9	1352.6	1346.2	239.8	136.7	149.4	15.7	1577.8	48	50.8	1161	2486		
56	1765	1536.7	1493.8	1422.4	1409.7	1403.4	1397.0	268.2	153.9	157.0	17.5	1651.0	36	60.5	1336	2913		
58	1827	1593.9	1547.9	1481.1	1460.5	1454.2	1447.8	274.6	153.9	162.1	17.5	1712.0	40	60.5	1428	3218		
60	1878	1651.0	1598.7	1531.9	1511.3	1505.0	1498.6	271.5	150.9	166.6	17.5	1763.8	40	60.5	1451	3504		

Notes:

(1) Bors (B) of flanges is shall be specified by the purchaser

(2) Class 300 flanges will be furnished will be furnished 0.06 (1.6mm) raised face, which is included in Thickness (t) and Length through Hub T<sub>1</sub>

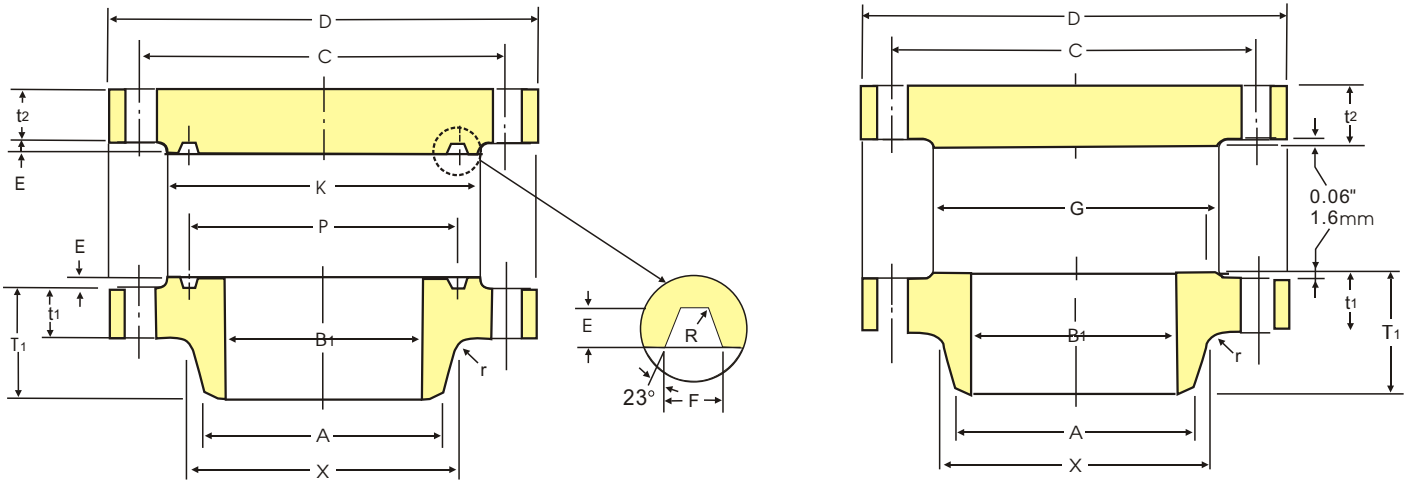




### MSS SP44 FORGED FLANGES

All units are in mm, except the Nominal Pipe Size in inches.

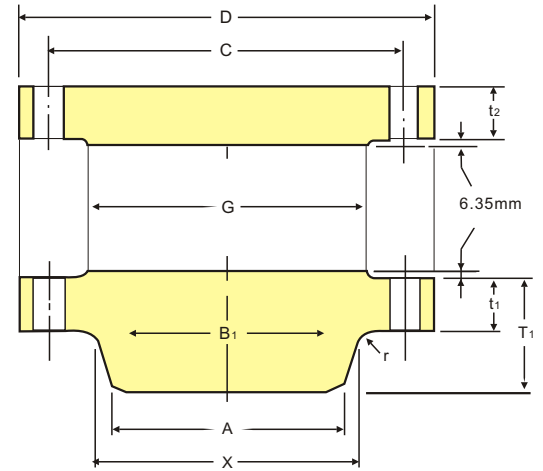
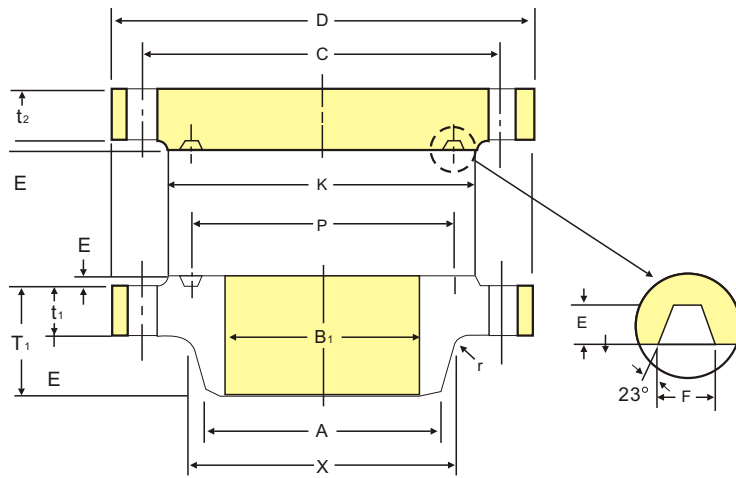
Nominal Pipe Size	Outside Diam. D	O.D. of Raised Face G	Diam At Base Of Hub X	Thickness t	Bore		Length Thru Hub T1	Diam. of Hub at Bevel A	Radius of Base of Hub r	Drilling			Approximate Weight (kg)	
					Wall Thickness					Bolt Circle Diam. C	Number of Holes	Diam. Of Holes	WN	BL
					9.5mm	12.7mm								
12	483	381.0	365.3	31.8	304.8	298.5	114.3	323.9	9.7	431.8	12	25.4	—	—
14	533	412.8	400.1	35.1	336.6	330.2	127.0	355.6	9.7	476.3	12	28.4	—	—
16	597	469.9	457.2	36.6	387.4	381.0	127.0	406.4	9.7	539.8	16	28.4	—	—
18	635	533.4	505.0	39.6	438.2	431.8	139.7	457.2	9.7	577.9	16	31.8	—	—
20	699	584.2	558.8	42.9	489.0	482.6	144.5	508.0	9.7	635.0	20	31.8	—	—
22	749	641.4	609.6	46.0	539.8	533.4	149.4	558.8	9.7	692.2	20	35.1	—	—
24	813	692.2	663.4	47.8	590.6	584.2	152.4	609.6	9.7	749.3	20	35.1	—	—
26	870	749.3	676.1	68.3	641.4	635.0	120.7	To be specified by purchaser	9.7	806.5	24	35.1	147	306
28	927	800.1	726.9	71.4	692.2	685.8	125.5		11.2	863.6	28	35.1	165	363
30	984	857.3	781.1	74.7	743.0	736.6	136.7		11.2	914.4	28	35.1	193	430
32	1060	914.4	831.9	80.8	793.8	787.4	144.5		11.2	977.9	28	41.1	243	537
34	1111	965.2	882.7	82.6	844.6	838.2	149.4		12.7	1028.7	32	41.1	258	600
36	1168	1022.4	933.5	90.4	895.4	889.0	157.0		11.7	1085.9	32	41.1	193	730
38	1238	1073.2	990.6	87.4	946.2	939.8	157.2		11.7	1149.4	32	41.1	243	794
40	1289	1124.0	1041.4	90.4	997.0	990.6	163.6		12.7	1200.2	36	41.1	258	893
42	1346	1193.8	1092.2	96.8	1047.8	1041.4	171.5		12.7	1257.3	36	41.1	306	1044
44	1403	1244.6	1143.0	101.6	1098.6	1092.2	177.8		12.7	1314.5	40	41.1	342	1190
46	1054	1295.4	1196.8	103.1	1149.4	1143.0	185.7		12.7	1365.3	40	41.1	368	1299
48	1511	1358.9	1247.6	108.0	1200.2	1193.8	192.0		12.7	1422.4	44	41.1	422	1470
50	1568	1409.7	1301.8	111.3	1251.0	1244.6	203.2		12.7	1479.6	44	47.8	470	1616
52	1628	1460.5	1352.6	115.8	1301.8	1295.4	209.6		12.7	1536.7	44	47.8	503	1817
54	1683	1511.3	1403.4	120.7	1352.6	1346.2	215.9		12.7	1593.9	44	47.8	556	2031
56	1746	1574.8	1457.5	124.0	1430.4	1397.0	228.6		12.7	1651.0	48	47.8	598	2244
58	1803	1625.6	1508.3	128.5	1454.2	1447.8	235.0	12.7	1708.2	48	47.8	661	2491	
60	1854	1676.4	1559.1	131.8	1505.0	1498.6	239.8	12.7	1759.0	52	47.8	936	2697	



## MSS SP44 Forged Flanges

All units are in mm, except the Nominal Pipe Size in inches.

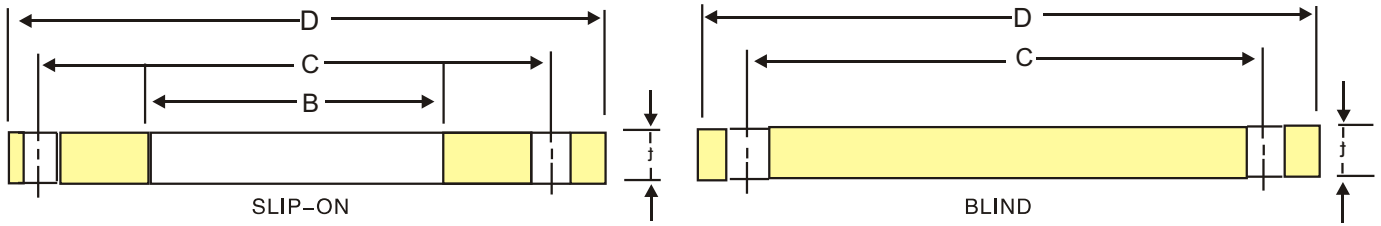
Nominal Pipe Size	Outside Diam. D	O.D. of Raised Face G	Diam At Base Of Hub X	Thickness		Bore		Length Thru Hub T1	Diam. of Hub of Bevel A	Radius of Fillet r	Drilling			Approximate Weight (kg)	
				Welding Neck t1	Blind t2	Wall Thickness					Bolt Circle Diam. C	Number of Holes	Diam. Of Holes	WN	BL
						9.5mm	12.7mm								
12	521	381.0	374.7	50.8	50.8	304.8	298.5	130.0	323.9	9.7	450.9	16	31.8	—	—
14	584	412.8	425.5	53.8	53.8	336.6	330.2	142.7	355.6	9.7	514.4	20	31.8	—	—
16	648	469.9	482.6	57.2	57.2	387.4	381.0	146.1	406.4	9.7	571.5	20	35.1	—	—
18	711	533.4	533.4	60.5	60.5	468.2	431.8	158.8	457.2	9.7	628.7	24	35.1	—	—
20	775	584.2	587.2	63.5	63.5	489.0	482.6	162.1	508.0	9.7	685.8	24	35.1	—	—
22	838	641.4	641.4	66.5	66.5	539.8	533.4	165.1	558.8	9.7	743.0	24	41.1	—	—
24	914	692.2	701.5	69.9	69.9	590.6	584.2	168.1	609.6	9.7	812.8	24	41.1	—	—
26	972	749.3	720.9	79.2	84.1	641.4	635.0	184.2	660.4	9.7	876.3	28	44.5	275	460
28	1035	800.1	774.7	85.9	90.4	692.2	685.8	196.9	711.2	11.2	939.8	28	44.5	340	566
30	1092	857.3	827.0	91.9	95.3	743.0	736.6	209.6	762.0	11.2	997.0	28	47.8	389	663
32	1149	914.4	881.1	98.6	100.1	793.8	787.4	222.3	812.8	11.2	1054.1	28	50.8	445	770
34	1207	965.2	936.8	101.6	104.6	844.6	838.2	231.6	863.6	12.7	1104.9	28	50.8	498	894
36	1270	1022.4	990.6	104.6	111.3	895.4	889.0	241.3	914.4	12.7	1168.4	32	53.8	563	1040
38	1168	1028.7	993.6	108.0	108.0	946.2	939.8	180.8		12.7	1092.2	32	41.1	307	872
40	1238	1085.9	1047.8	114.3	114.3	997.0	990.6	193.5		12.7	1155.7	32	44.5	392	1035
42	1289	1136.7	1098.6	119.1	119.1	1047.8	1041.4	200.2	To be specified by purchaser	12.7	1206.5	32	44.5	409	1173
44	1353	1193.8	1149.4	124.0	124.0	1198.6	1092.2	206.2		12.7	1263.7	32	47.8	464	1340
46	1416	1244.6	1203.5	128.5	128.5	1149.4	1143.0	215.9		12.7	1320.8	28	50.8	544	1600
48	1467	1301.8	1254.3	133.4	133.4	1200.2	1193.8	223.8		12.7	1371.6	32	50.8	569	1700
50	1530	1358.9	1305.1	139.7	139.7	1251.0	1244.6	231.6		12.7	1428.8	32	53.8	645	1936
52	1581	1409.7	1355.9	144.5	144.5	1301.8	1295.4	238.3		12.7	1479.6	32	53.8	694	2143
54	1657	1466.9	1409.7	152.4	152.4	1352.6	1346.2	252.5		12.7	1549.4	28	60.5	834	2486
56	1708	1517.7	1463.5	153.9	153.9	1403.4	1397.0	260.4		12.7	1600.2	28	60.5	882	2674
58	1759	1574.8	1514.3	158.8	158.8	1454.2	1447.8	266.7		12.7	1651.0	32	60.5	928	2913
60	1810	625.6	1565.1	163.6	163.6	1505.0	1498.6	273.1		12.7	1701.8	32	60.5	989	3184



## MSS SP44 Forged Flanges

All units are in mm, except the Nominal Pipe Size in inches.

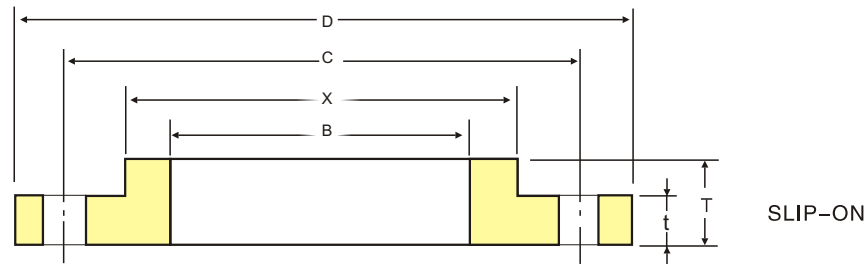
Nominal Pipe Size	Outside Diam. D	O.D. of Raised Face G	Diam At Base Of Hub X	Thickness		Bore		Length Thru Hub T1	Diam. Thru Hub A	Radius of Base of Hub r	Drilling			Approximate Weight (kg)	
				Welding Neck t1	Blind t2	Wall Thickness					Bolt Circle Diam. C	Number of Holes	Diam. Of Holes	WN	BL
						9.5mm	12.7mm								
						B1									
12	558.8	381.0	400.1	66.5	66.5	304.8	298.5	155.4	323.9	11.2	498.0	20	35.1	—	—
14	602.0	412.8	431.8	69.9	69.9	336.6	330.2	165.1	355.6	11.2	527.1	20	38.1	—	—
16	685.8	469.9	495.3	76.2	76.2	387.4	381.0	177.8	406.4	11.2	603.3	20	41.1	—	—
18	743.0	533.4	546.1	82.6	82.6	438.2	431.8	184.2	457.2	11.2	654.1	20	44.5	—	—
20	812.8	584.2	609.6	88.9	88.9	488.9	482.6	190.5	508.0	11.2	723.9	24	44.5	—	—
22	870.0	641.4	666.8	95.3	95.3	539.8	533.4	196.9	558.8	11.2	777.7	24	47.8	—	—
24	939.8	692.2	717.6	101.6	101.6	590.6	584.2	203.2	609.6	11.2	838.2	24	50.8	—	—
26	1016.0	749.3	747.8	108.0	125.5	641.4	635.0	222.25	660.4	12.7	914.4	28	50.8	431	765
28	1073.2	800.1	803.2	111.3	131.8	692.2	685.8	234.95	711.2	12.7	965.2	28	53.8	484	896
30	1130.3	857.3	826.1	114.3	139.7	743.0	736.6	247.65	762.0	12.7	1022.4	28	53.8	550	1060
32	1193.8	914.4	917.5	117.4	147.6	793.8	787.4	260.35	812.8	12.7	1079.5	28	60.5	614	1237
34	1244.6	965.2	973.1	120.7	153.6	844.6	838.2	269.75	863.6	14.2	1130.3	28	60.5	675	1410
36	1314.5	1022.4	1031.8	124.0	162.1	895.4	889.0	282.45	914.4	14.2	1193.8	28	66.5	764	1645
38	1270.0	1054.1	1022.4	152.4	155.5	946.2	939.8	254.00		14.2	1162.1	28	60.5	645	1492
40	1320.8	111.3	1073.2	158.8	162.1	997.0	990.6	263.65		14.2	1212.9	32	60.5	693	1676
42	1403.4	1168.4	1127.3	168.2	171.5	1047.8	1041.4	279.40	To specified by purchaser	14.2	1282.7	28	66.5	858	2006
44	1454.2	1225.6	1181.1	173.0	177.8	1098.6	1092.2	289.05		14.2	1333.5	32	66.5	911	2223
46	1511.3	1276.4	1235.0	179.3	185.7	1149.4	1143.0	299.97		14.2	1390.7	32	66.5	1019	2518
48	1593.9	1333.5	1289.1	189.0	195.3	1200.2	1193.8	315.98	To specified by purchaser	14.2	1460.5	32	73.2	1200	2925
50	1670.0	1384.3	1343.2	196.9	203.2	1251.1	1244.6	328.68		14.2	1524.1	28	79.2	1403	3351
52	120.9	1435.1	1394.0	203.2	209.6	1301.8	1295.4	336.55		14.2	1574.8	32	79.2	1473	3650
54	1778.0	1492.3	1447.8	209.6	217.4	1352.6	1346.2	349.25	To specified by purchaser	14.2	1632.0	32	79.2	1616	4059
56	1854.2	1543.1	1501.7	217.4	225.6	1403.4	1397.0	361.95		15.8	1695.5	32	85.9	1820	4550
58	1905.0	1600.2	1552.5	222.3	231.7	1454.2	1447.8	369.82		15.8	1746.3	32	85.9	1929	4950
60	1993.9	1657.4	1609.9	233.4	242.8	1505.0	1498.6	388.87	To specified by purchaser	17.5	1822.5	28	91.9	2325	5709



AWWA Standard Steel Ring Flanges, Class B(86 psi) and Class D (175-150psi)

All units are in mm, except the Nominal Pipe Size in inches.

Nominal Pipe Size	Outside Diam.	Bore	Thickness		DRILLING			
					Bolt Circle Diam.	Number of Holes	Diam. of Bolt Holes	
							Class B(t)	Class D(t)
D	B	Class B(t)	Class D(t)	C		Class B(t)	Class D(t)	
4	9	4.57	5/8	5/8	7 1/2	8	3/4	3/4
5	10	5.66	5/8	5/8	8 1/2	8	3/4	7/8
6	11	6.72	11/16	11/16	9 1/2	8	3/4	7/8
8	13 1/2	8.72	11/16	11/16	11 3/4	8	3/4	7/8
10	16	10.88	11/16	11/16	14 1/4	12	3/4	1
12	19	12.88	11/16	13/16	17	12	3/4	1
14	21	14.19	11/16	15/16	18 3/4	12	7/8	1 1/8
16	23 1/2	16.19	11/16	1	21 1/4	16	7/8	1 1/8
18	25	18.19	11/16	1 1/16	22 3/4	16	7/8	1 1/4
20	27 1/2	20.19	11/16	1 1/8	25	20	7/8	1 1/4
22	29 1/2	22.19	3/4	1 3/16	27 1/4	20	7/8	1 3/8
24	32	24.19	3/4	1 1/4	29 1/2	20	7/8	1 3/8
26	34 1/4	26.19	13/16	1 5/16	31 3/4	24	7/8	1 3/8
28	36 1/2	28.19	7/8	1 5/16	34	28	7/8	1 3/8
30	38 3/4	30.19	7/8	1 3/8	36	28	1	1 3/8
32	41 3/4	32.19	15/16	1 1/2	38 1/2	28	1	1 5/8
34	43 3/4	34.19	15/16	1 1/2	40 1/2	32	1	1 5/8
36	46	36.19	1	1 5/8	42 3/4	32	1	1 5/8
38	48 3/4	38.19	1	1 5/8	45 1/4	32	1	1 5/8
40	50 3/4	40.19	1	1 5/8	47 1/4	36	1	1 5/8
42	53	42.19	1 1/8	1 3/4	49 1/2	36	1 1/8	1 5/8
44	55 1/4	44.19	1 1/8	1 3/4	51 3/4	40	1 1/8	1 5/8
46	57 1/4	46.19	1 1/8	1 3/4	53 3/4	40	1 1/8	1 5/8
48	59 1/2	48.19	1 1/4	1 3/4	56	44	1 1/8	1 5/8
50	61 3/4	50.19	1 1/4	2	58 1/4	44	1 1/4	1 7/8
52	64	52.19	1 1/4	2	60 1/2	44	1 1/4	1 7/8
54	66 1/4	54.19	1 3/8	2 1/8	62 3/4	44	1 3/8	1 7/8
60	73	60.19	1 1/2	2 1/4	69 1/4	52	1 3/8	1 7/8
66	80	66.19	1 5/8	2 1/2	76	52	1 3/8	1 7/8
72	86 1/2	72.19	1 3/4	2 5/8	82 1/2	60	1 3/8	1 7/8
78	93	78.19	2	2 3/4	89	64	1 5/8	2 1/8
84	99 3/4	84.19	2	2 3/4	95 1/2	64	1 5/8	2 1/8
90	106 1/2	90.19	2 1/4	3	102	68	1 7/8	2 3/8
96	113 1/4	96.19	2 1/4	3	108 1/2	68	1 7/8	2 3/8
102	120	102.19	2 1/2	3 1/4	114 1/2	72	2 1/8	2 5/8
108	126 3/4	108.19	2 1/2	3 1/4	120 3/4	72	2 1/8	2 5/8
114	133 1/2	114.19	2 3/4	3 1/2	126 3/4	76	2 3/8	2 7/8
120	140 1/4	120.19	2 3/4	3 1/2	132 3/4	76	2 3/8	2 7/8



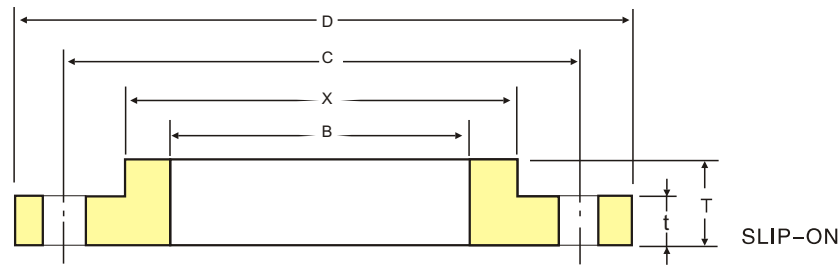
### AWWA Standard Steel Hub Flanges, Class B(86 psi) and Class D (175-150psi)

All units are in mm, except the Nominal Pipe Size in inches.

Nominal Pipe Size	Outside Diam.	Bore	Thickness	Length Through Hub	Diam of Hub at Base	DRILLING			
						Bolt Circle Diam	Number of Holes	Diam. of Bolt Holes	
								Class B	Class D
D	B	t	T	X	C				
4	9	4.57	1/2	7/8	5 <sup>15</sup> / <sub>16</sub>	7 1/2	8	3/4	3/4
5	10	5.66	9/16	1 1/4	6 5/16	8 1/2	8	3/4	7/8
6	11	6.72	9/16	1 1/4	7 9/16	9 1/2	8	3/4	7/8
8	13 1/2	8.72	9/16	1 1/4	9 11/16	11 3/4	8	3/4	7/8
10	16	10.88	11/16	1 1/4	12	14 1/4	12	3/4	1
12	19	12.88	11/16	1 1/4	14 3/8	17	12	3/4	1
14	21	14.19	3/4	1 1/4	15 3/4	18 3/4	12	7/8	1 1/8
16	23 1/2	16.19	3/4	1 1/4	18	21 1/4	16	7/8	1 1/8
18	25	18.19	3/4	1 1/4	19 7/8	22 3/4	16	7/8	1 1/4
20	27 1/2	20.19	3/4	1 1/4	22	25	20	7/8	1 1/4
22	29 1/2	22.19	1	1 3/4	24 1/4	27 1/4	20	7/8	1 3/8
24	32	24.19	1	1 3/4	26 1/8	29 1/2	20	7/8	1 3/8
26	34 1/4	26.19	1	1 3/4	28 1/2	31 3/4	24	7/8	1 3/8
28	36 1/2	28.19	1	1 3/4	30 1/2	34	28	7/8	1 3/8
30	38 3/4	30.19	1	1 3/4	32 1/2	36	28	1	1 3/8
32	41 3/4	32.19	1 1/8	1 3/4	34 3/4	38 1/2	28	1	1 5/8
34	43 3/4	34.19	1 1/8	1 3/4	36 3/4	40 1/2	32	1	1 5/8
36	46	36.19	1 1/8	1 3/4	38 3/4	42 3/4	32	1	1 5/8
38	48 3/4	38.19	1 1/8	1 3/4	40 3/4	45 1/4	32	1	1 5/8
40	50 3/4	40.19	1 1/8	1 3/4	43	47 1/4	36	1	1 5/8
42	53	42.19	1 1/4	1 3/4	45	49 1/2	36	1 1/8	1 5/8
44	55 1/4	44.19	1 1/4	2 1/4	47	51 3/4	40	1 1/8	1 5/8
46	57 1/4	46.19	1 1/4	2 1/4	49	53 3/4	40	1 1/8	1 5/8
48	59 1/2	48.19	1 3/8	2 1/2	51	56	44	1 1/8	1 5/8
50	61 3/4	50.19	1 3/8	2 1/2	53	58 1/4	44	1 1/4	1 7/8
52	64	52.19	1 3/8	2 1/2	55	60 1/2	44	1 1/4	1 7/8
54	66 1/4	54.19	1 3/8	2 1/2	57	62 3/4	44	1 3/8	1 7/8
60	73	60.19	1 1/2	2 3/4	63	69 1/4	52	1 3/8	1 7/8
66	80	66.19	1 1/2	2 3/4	69	76	52	1 3/8	1 7/8
72	83 1/2	72.19	1 1/2	2 3/4	75	82 1/2	60	1 3/8	1 7/8
78	93	78.19	1 3/4	3	81 1/4	89	64	1 5/8	2 1/8
84	99 3/4	84.19	1 3/4	3	87 1/2	95 1/2	64	1 5/8	2 1/8
90	106 1/2	90.19	2	3 1/4	93 3/4	102	68	1 7/8	2 3/8
96	113 1/4	96.19	2	3 1/4	100	108 1/2	68	1 7/8	2 3/8
102	120	102.19	2 1/4	3 1/2	105 3/4	114 1/2	72	2 1/8	2 5/8
108	126 3/4	108.19	2 1/4	3 1/2	111 1/2	120 3/4	72	2 1/8	2 5/8
114	133 1/2	114.19	2 1/2	3 3/4	117 3/4	126 3/4	76	2 3/8	2 7/8
120	140 1/4	120.19	2 1/2	3 3/4	124	132 3/4	76	2 3/8	2 7/8

Notes:

- (1) For Slip-on Flanges, (Hub Type Flanges), the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.
- (2) The Bore (B) shall be 3/6in. larger than the nominal outside diameter of the pipe, unless otherwise specified



### AWWA Standard Steel Hub Flanges, Class E

All units are in mm, except the Nominal Pipe Size in inches.

Nominal Pipe Size	Outside Diam.	Bore	Thickness	Length Through Hub	Diam. Of Hub at Base	DRILLING		
						Bolt Circle Diam.	Number of Holes	Diam of Bolt Holes
	D	B	T	T	X	C		
4	9	4.57	15/16	1 5/16	5 5/16	7 1/2	8	3/4
5	10	5.66	15/16	1 7/16	6 7/16	8 1/2	8	7/8
6	11	6.72	1	1 9/16	7 9/16	9 1/2	8	7/8
8	13 1/2	8.72	1 1/8	1 3/4	9 11/16	11 3/4	8	7/8
10	16	10.88	1 13/16	1 5/8	12	14 1/4	12	1
12	19	12.88	1 1/4	2 3/16	14 3/8	17	12	1
14	21	14.19	1 3/8	2 1/4	15 3/4	18 3/4	12	1 1/8
16	23 1/2	16.19	1 7/16	2 1/2	18	21 1/4	16	1 1/8
18	25	18.19	1 9/16	2 11/16	19 7/8	22 3/4	16	1 1/4
20	27 1/2	20.19	1 11/16	2 7/8	22	25	20	1 1/4
22	29 1/2	22.19	1 13/16	3 1/8	24	27 1/4	20	1 3/8
24	32	24.19	1 7/8	3 1/4	26 1/8	29 1/2	20	1 3/8
26	34 1/4	26.19	2	3 3/8	28 1/2	31 3/4	24	1 3/8
28	36 1/2	28.19	2 1/16	3 7/16	30 3/4	34	28	1 3/8
30	38 3/4	30.19	2 1/8	3 1/2	32 3/4	36	28	1 3/8
32	41 3/4	32.19	2 1/4	3 5/8	35 3/4	38 1/2	28	1 5/8
34	43 3/4	34.19	2 15/16	3 11/16	37	40 1/2	32	1 5/8
36	46	36.19	2 3/8	3 3/4	39 1/4	42 3/4	32	1 5/8
38	48 3/4	38.19	2 3/8	3 3/4	41 3/4	45 1/4	32	1 5/8
40	50 3/4	40.19	2 1/2	3 7/8	43 3/4	47 1/4	36	1 5/8
42	53	42.19	2 5/8	4	46	49 1/2	36	1 5/8
44	55 1/4	44.19	2 5/8	4	48	51 3/4	40	1 5/8
46	57 1/4	46.19	2 11/16	4 1/16	50	53 3/4	40	1 5/8
48	59 1/2	48.19	2 3/4	4 1/8	52 1/4	56	44	1 5/8
50	61 3/4	50.19	2 3/4	4 1/8	54 1/4	58 1/4	44	1 7/8
52	64	52.19	2 7/8	4 1/4	56 1/2	60 1/2	44	1 7/8
54	66 1/4	54.19	3	4 3/8	58 3/4	62 3/4	44	1 7/8
60	73	60.19	3 1/8	4 1/2	65 1/4	69 1/4	52	1 7/8
66	80	66.19	3 3/8	4 7/8	71 1/2	76	52	1 7/8
72	86 1/2	72.19	3 1/2	5	78 1/2	82 1/2	60	1 7/8
78	93	78.19	3 7/8	5 3/8	84 1/2	89	64	2 1/8
84	99 3/4	84.19	3 7/8	5 3/8	90 1/2	95 1/2	64	2 1/8
90	106 1/2	90.19	4 1/4	5 3/4	96 3/4	102	68	2 3/8
96	113 1/4	96.19	4 1/4	5 3/4	102 3/4	108 1/2	68	2 3/8
102	120	102.19	4 5/8	6 1/8	108 3/4	114 1/2	72	2 5/8
108	126 3/4	108.19	4 5/8	6 1/8	114 1/2	120 3/4	72	2 5/8
114	133 1/2	114.19	5	6 1/2	121 1/4	126 3/4	76	2 7/8
120	140 1/4	120.19	5	6 3/2	128	132 3/4	76	2 7/8

Notes:

- (1) For Slip-on Flanges, (Hub Type Flanges), the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.
- (2) The Bore (B) shall be 3/6in. larger than the nominal outside diameter of the pipe, unless otherwise specified

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