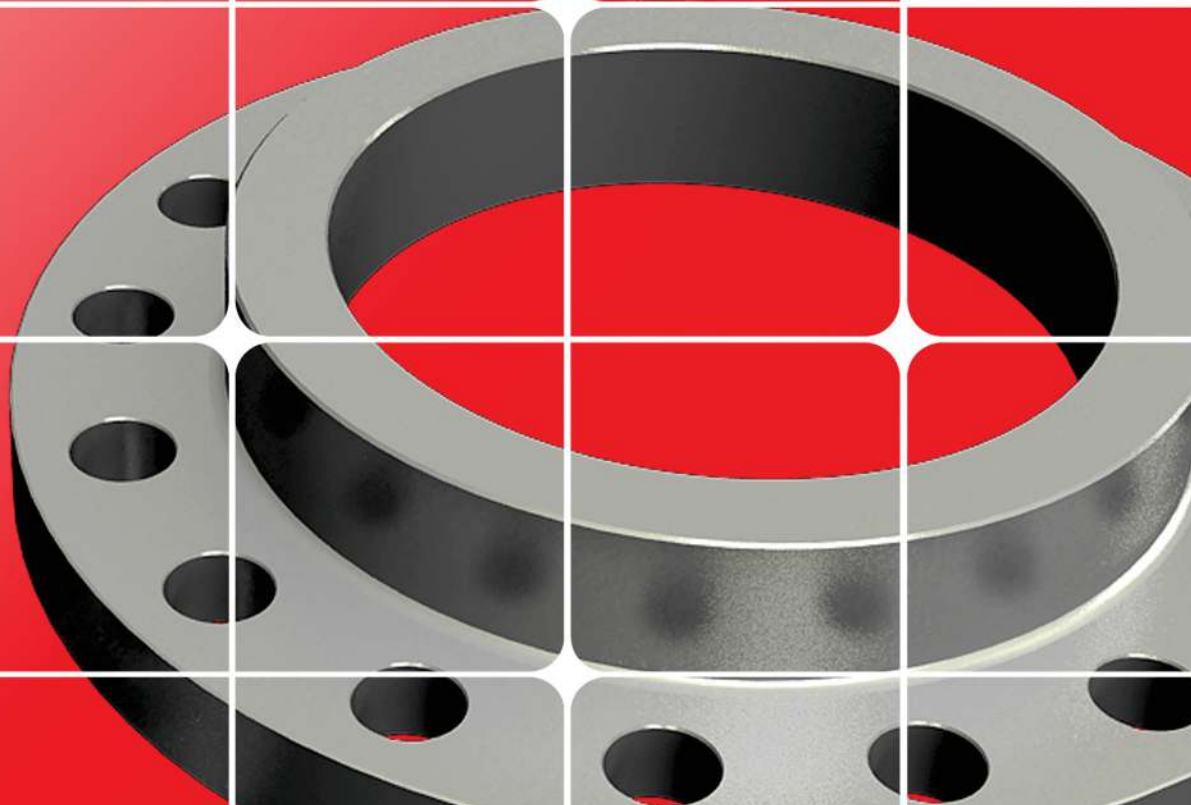
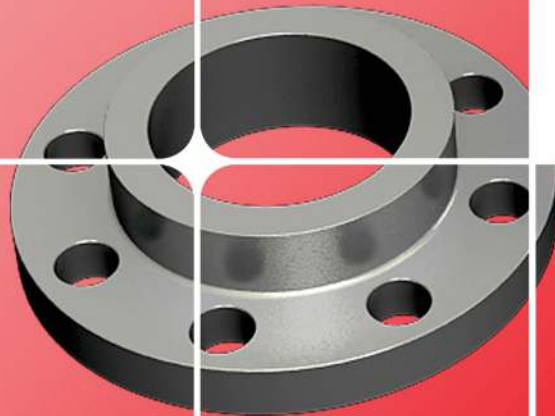
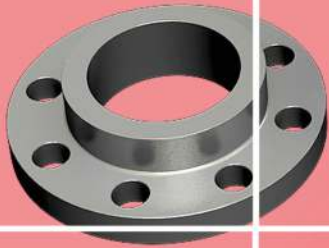


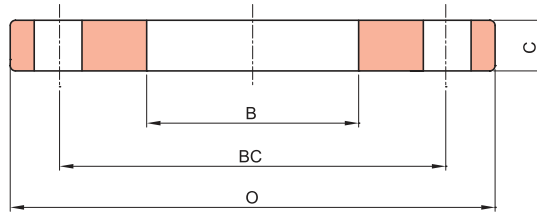
AWWA FLANGES

- Class B (86 psi) & D (175-150 psi) steel-ring Flanges
- Class D (175-150 psi) steel-hub Flanges
- Class E (275 psi) steel- hub Flanges
- Class E (275 psi) steel- ring Flanges
- Class F (300 psi) steel- ring Flanges
- Blind - Flange thickness



C207-01 STEEL-RING FLANGES

CLASS B (86PSI) & D (175-150PSI)



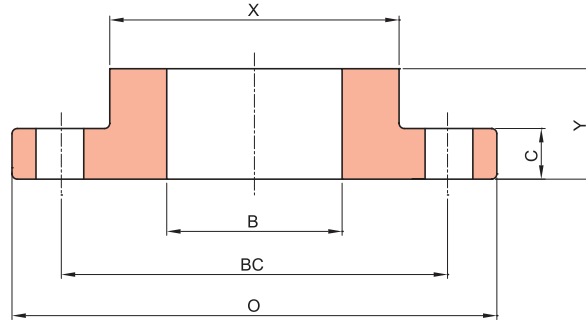
Unit : mm

Nominal Pipe Size	O.D. of Flange O	I.D. of Flange B	No. of Bolt Holes	Diam. of Bolt Circle BC	Diam. Of Bolt Hole H	Thickness of Flange	
						Class B C	Class D C
4	228.6	116.1	8	190.5	19.1	15.9	15.9
5	254.0	143.8	8	215.9	22.2	15.9	15.9
6	279.4	170.7	8	241.3	22.2	17.5	17.5
8	342.9	221.5	8	298.5	22.2	17.5	17.5
10	406.4	276.4	12	362.0	25.4	17.5	17.5
12	482.6	327.2	12	431.8	25.4	17.5	20.6
14	533.4	360.4	12	476.3	28.6	17.5	23.8
16	596.9	411.2	16	539.8	28.6	17.5	25.4
18	635.0	462.0	16	577.9	31.8	17.5	27.0
20	698.5	512.8	20	635.0	31.8	17.5	28.6
22	749.3	563.6	20	692.2	34.9	19.1	30.2
24	812.8	614.4	20	749.3	34.9	19.1	31.8
26	870.0	To be specified by customer.	24	806.5	34.9	20.6	33.3
28	927.1		28	863.6	34.9	22.2	33.3
30	984.3		28	914.4	34.9	22.2	34.9
32	1060.5		28	977.9	41.3	23.8	38.1
34	1111.3		32	1028.7	41.3	23.8	38.1
36	1168.4		32	1085.9	41.3	25.4	41.3
38	1238.3		32	1149.4	41.3	25.4	41.3
40	1289.1		36	1200.2	41.3	25.4	41.3
42	1346.2		36	1257.3	41.3	28.6	44.5
44	1403.4		40	1314.5	41.3	28.6	44.5
46	1454.2		40	1365.3	41.3	28.6	44.5
48	1511.3		44	1422.4	41.3	31.8	47.6
50	1568.5		44	1479.6	47.6	31.8	50.8
52	1625.6		44	1536.7	47.6	31.8	50.8
54	1682.8	44	1593.9	47.6	34.9	54.0	
60	1854.2	52	1759.0	47.6	38.1	57.2	
66	2032.0	52	1930.4	47.6	41.3	63.5	
72	2197.1	60	2095.5	47.6	44.5	66.7	



C207-01 STEEL-HUB FLANGES

CLASS D (175-150PSI)



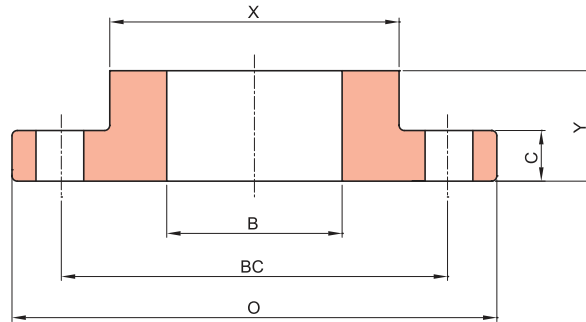
Unit : mm

Nominal Pipe Size	O.D. of Flange	O.D. of Hub	I.D. of Flange	No. of Bolt Holes	Diam. of Bolt Circle	Diam. Of Bolt Hole	Thickness of Flange	
	O	X	B		BC	H	C	Y
4	228.6	134.9	116.1	8	190.5	19.1	12.7	22.2
5	254.0	160.3	143.8	8	215.9	22.2	14.3	31.8
6	279.4	192.1	170.7	8	241.3	22.2	14.3	31.8
8	342.9	246.1	221.5	8	298.5	22.2	14.3	31.8
10	406.4	304.8	276.4	12	362.0	25.4	17.5	31.8
12	482.6	365.1	327.2	12	431.8	25.4	17.5	31.8
14	533.4	400.1	360.4	12	476.3	28.6	19.1	31.8
16	596.9	457.2	411.2	16	539.8	28.6	19.1	31.8
18	635.0	504.8	462.0	16	577.9	31.8	19.1	31.8
20	698.5	558.8	512.8	20	635.0	31.8	19.1	31.8
22	749.3	616.0	563.6	20	692.2	34.9	25.4	44.5
24	812.8	663.6	614.4	20	749.3	34.9	25.4	44.5
26	870.0	723.9	665.2	24	806.5	34.9	25.4	44.5
28	927.1	774.7	716.0	28	863.6	34.9	25.4	44.5
30	984.3	825.5	766.8	28	914.4	34.9	25.4	44.5
32	1060.5	882.7	817.6	28	977.9	41.3	28.6	44.5
34	1111.3	933.5	868.4	32	1028.7	41.3	28.6	44.5
36	1168.4	984.3	919.2	32	1085.9	41.3	28.6	44.5
38	1238.3	1035.1	970.0	32	1149.4	41.3	28.6	44.5
40	1289.1	1092.2	1020.8	36	1200.2	41.3	28.6	44.5
42	1346.2	1143.0	1071.6	36	1257.3	41.3	31.8	44.5
44	1403.4	1193.8	1122.4	40	1314.5	41.3	31.8	57.2
46	1454.2	1244.6	1173.2	40	1365.3	41.3	31.8	57.2
48	1511.3	1295.4	1224.0	44	1422.4	41.3	34.9	63.5
50	1568.5	1346.2	1274.8	44	1479.6	47.6	34.9	63.5
52	1625.6	1397.0	1325.6	44	1536.7	47.6	34.9	63.5
54	1682.8	1447.8	1376.4	44	1593.9	47.6	34.9	63.5
60	1854.2	1600.2	1528.8	52	1759.0	47.6	38.1	69.9
66	2032.0	1752.6	1681.2	52	1930.4	47.6	38.1	69.9
72	2197.1	1905.0	1833.6	60	2095.5	47.6	38.1	69.9



C207-01 STEEL-HUB FLANGES

CLASS E (275PSI)



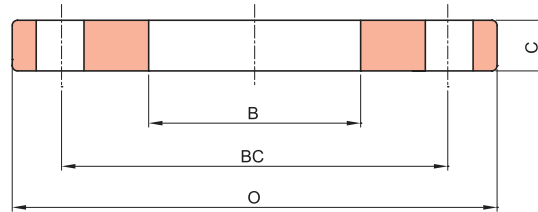
Unit : mm

Nominal Pipe Size	O.D. of Flange	O.D. of Hub	I.D. of Flange	No. of Bolt Holes	Diam. of Bolt Circle	Diam. Of Bolt Hole	Thickness of Flange	
	O	X	B		BC	H	C	Y
4	228.6	134.9	116.1	8	190.5	19.1	23.8	33.3
5	254.0	163.5	143.8	8	215.9	22.2	23.8	36.5
6	279.4	192.1	170.7	8	241.3	22.2	25.4	39.7
8	342.9	246.1	221.5	8	298.5	22.2	28.6	44.5
10	406.4	304.8	276.4	12	362.0	25.4	30.2	49.2
12	482.6	365.1	327.2	12	431.8	25.4	31.8	55.6
14	533.4	400.1	360.4	12	476.3	28.6	34.9	57.2
16	596.9	457.2	411.2	16	539.8	28.6	36.5	63.5
18	635.0	504.8	462.0	16	577.9	31.8	39.7	68.3
20	698.5	558.8	512.8	20	635.0	31.8	42.9	73.0
22	749.3	609.6	563.6	20	692.2	34.9	46.0	79.4
24	812.8	663.6	614.4	20	749.3	34.9	47.6	82.6
26	870.0	723.9	665.2	24	806.5	34.9	50.8	85.7
28	927.1	781.1	716.0	28	863.6	34.9	52.4	87.3
30	984.3	831.9	766.8	28	914.4	34.9	54.0	88.9
32	1060.5	889.0	817.6	28	977.9	41.3	57.2	92.1
34	1111.3	939.8	868.4	32	1028.7	41.3	58.7	93.7
36	1168.4	997.0	919.2	32	1085.9	41.3	60.3	95.3
38	1238.3	1060.5	970.0	32	1149.4	41.3	60.3	95.3
40	1289.1	1111.3	1020.8	36	1200.2	41.3	63.5	98.4
42	1346.2	1168.4	1071.6	36	1257.3	41.3	66.7	101.6
44	1403.4	1219.2	1122.4	40	1314.5	41.3	66.7	101.6
46	1454.2	1270.0	1173.2	40	1365.3	41.3	68.3	103.2
48	1511.3	1327.2	1224.0	44	1422.4	41.3	69.9	104.8
50	1568.5	1378.0	1274.8	44	1479.6	47.6	69.9	104.8
52	1625.6	1435.1	1325.6	44	1536.7	47.6	73.0	108.0
54	1682.8	1492.3	1376.4	44	1593.9	47.6	76.2	111.1
60	1854.2	1657.4	1528.8	52	1759.0	47.6	79.4	114.3
66	2032.0	1816.1	1681.2	52	1930.4	47.6	85.7	123.8
72	2197.1	1993.9	1833.6	60	2095.5	47.6	88.9	127



C207-01 STEEL-RING FLANGES

CLASS E (275PSI)



Unit : mm

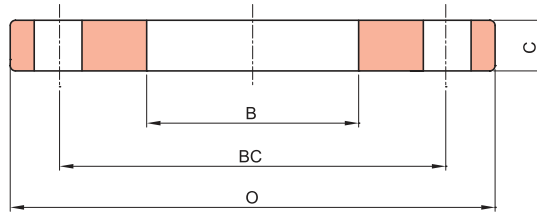
Nominal Pipe Size	O.D. of Flange	I.D. of Flange	No. of Bolt Holes	Diam. of Bolt Circle	Diam. Of Bolt Hole	Thickness of Flange
	O	B		BC	H	C
4	228.6	116.1	8	190.5	19.1	28.6
5	254.0	143.8	8	215.9	22.2	30.2
6	279.4	170.7	8	241.3	22.2	33.4
8	342.9	221.5	8	298.5	22.2	38.1
10	406.4	276.4	12	362.0	25.4	39.7
12	482.6	327.2	12	431.8	25.4	44.5
14	533.4	360.4	12	476.3	28.6	47.6
16	596.9	411.2	16	539.8	28.6	50.8
18	635.0	462.0	16	577.9	31.8	54.0
20	698.5	512.8	20	635.0	31.8	60.3
22	749.3	563.6	20	692.2	34.9	63.5
24	812.8	614.4	20	749.3	34.9	66.7
26	870.0		24	806.5	34.9	69.9
28	927.1		28	863.6	34.9	69.9
30	984.3		28	914.4	34.9	73.0
32	1060.5		28	977.9	41.3	76.2
34	1111.3		32	1028.7	41.3	76.2
36	1168.4		32	1085.9	41.3	79.4
38	1238.3		32	1149.4	41.3	79.4
40	1289.1		36	1200.2	41.3	82.6
42	1346.2		36	1257.3	41.3	85.7
44	1403.4		40	1314.5	41.3	85.7
46	1454.2		40	1365.3	41.3	87.3
48	1511.3		44	1422.4	41.3	88.9
50	1568.5		44	1479.6	47.6	88.9
52	1625.6		44	1536.7	47.6	92.1
54	1682.8		44	1593.9	47.6	95.3
60	1854.2		52	1759.0	47.6	98.4
66	2032.0		52	1930.4	47.6	108.0
72	2197.1		60	2095.5	47.6	111.1

To be specified by customer.



C207-01 STEEL-RING FLANGES

CLASS F (300PSI)



Unit : mm

Nominal Pipe Size	O.D. of Flange	I.D. of Flange	No. of Bolt Holes	Diam. of Bolt Circle	Diam. Of Bolt Hole	Thickness of Flange
	O	B		BC	H	C
4	254.0	116.1	8	200.2	22.2	28.7
5	279.4	143.8	8	235.0	22.2	30.7
6	317.5	170.9	12	269.8	22.2	33.3
8	381.0	221.7	12	330.2	25.4	33.3
10	444.5	276.4	16	387.4	28.6	38.1
12	529.6	327.2	16	450.9	31.8	41.4
14	584.2	360.4	20	514.4	31.8	49.3
16	647.7	411.2	20	571.5	34.9	54.4
18	711.2	462.0	24	628.7	34.9	57.2
20	774.7	512.8	24	685.8	34.9	59.2
22	838.2	563.6	24	743.0	34.9	63.5
24	914.4	614.4	24	812.8	41.3	68.3
26	971.6	666.8	28	876.3	47.6	76.2
28	1035.1	717.6	28	939.8	47.6	79.5
30	1092.2	768.4	28	997.0	47.6	80.0
32	1149.4	819.2	28	1054.1	47.6	82.6
34	1206.5	870.0	28	1104.9	47.6	85.9
36	1270.0	920.8	32	1168.4	54.0	87.9
38	1327.2	971.6	32	1219.2	54.0	88.9
40	1378.0	1022.4	36	1276.4	54.0	92.2
42	1447.8	1073.2	36	1339.9	54.0	96.8
44	1505.0	1124.0	36	1397.0	54.0	101.6
46	1562.1	1174.8	40	1454.2	54.0	104.9
48	1651.0	1225.6	40	1543.1	54.0	114.3



BLIND - FLANGE THICKNESS

Nominal Pipe Size		Minimum Thickness*									
		Mating Flange ID		Class B		Class D#		Class E		Class F	
				86 psi	(593 kPa)			275 psi	(1,896 kPa)	300 psi	(2,068 kPa)
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
4	(100)	4.57	(116)	0.625	(15.88)	0.625	(15.88)	1.125	(25.58)	1.130	(28.70)
5	(125)	5.66	(144)	0.625	(15.88)	0.650	(16.51)	1.188	(30.18)	1.210	(30.73)
6	(150)	6.72	(171)	0.688	(17.48)	0.693	(17.60)	1.313	(33.35)	1.310	(33.27)
8	(200)	8.72	(221)	0.688	(17.48)	0.812	(20.62)	1.500	(38.10)	1.310	(33.27)
10	(250)	10.88	(276)	0.688	(17.48)	0.953	(24.21)	1.563	(39.70)	1.500	(38.10)
12	(300)	12.88	(327)	0.719	(18.26)	1.117	(28.37)	1.750	(44.45)	1.630	(41.40)
14	(350)	14.19	(360)	0.791	(20.10)	1.133	(28.78)	1.875	(47.63)	1.940	(49.28)
16	(400)	16.19	(411)	0.892	(22.66)	1.265	(32.13)	2.000	(50.80)	2.140	(54.36)
18	(450)	18.19	(462)	0.950	(24.13)	1.331	(33.81)	2.125	(53.98)	2.250	(57.15)
20	(500)	20.19	(513)	1.040	(26.42)	1.448	(36.77)	2.375	(60.33)	2.330	(59.18)
22	(550)	22.19	(564)	1.132	(28.75)	1.568	(39.83)	2.500	(63.50)	2.500	(63.50)
24	(600)	25.50	(648)	1.216	(30.89)	1.661	(42.18)	2.625	(66.68)	2.690	(68.33)
26	(650)	27.50	(699)	1.307	(33.20)	1.786	(45.37)	2.750	(69.85)	3.000	(76.20)
28	(700)	29.50	(749)	1.398	(35.50)	1.906	(48.41)	2.750	(69.85)	3.130	(79.50)
30	(750)	31.50	(800)	1.477	(37.53)	2.008	(51.00)	2.875	(73.03)	3.166	(80.42)
32	(800)	33.50	(851)	1.581	(40.16)	2.150	(54.60)	3.000	(76.20)	3.332	(84.62)
34	(850)	35.50	(902)	1.661	(42.19)	2.252	(57.21)	3.050	(77.47)	3.475	(88.27)
36	(900)	37.63	(956)	1.751	(44.48)	2.370	(60.20)	3.209	(81.51)	3.671	(93.25)
38	(950)	39.63	(1006)	1.853	(47.06)	2.506	(63.66)	3.394	(86.20)	3.815	(96.90)
40	(1000)	41.63	(1057)	1.933	(49.09)	2.609	(66.28)	3.533	(89.74)	3.982	(101.14)
42	(1050)	43.63	(1108)	2.023	(51.40)	2.729	(69.32)	3.695	(93.86)	4.171	(105.94)
44	(1100)	45.63	(1159)	2.114	(53.70)	2.849	(72.36)	3.857	(97.97)	4.338	(110.19)
46	(1150)	47.63	(1210)	2.194	(55.73)	2.952	(74.99)	3.997	(101.53)	4.505	(114.43)
48	(1200)	49.63	(1260)	2.285	(58.03)	3.072	(78.03)	4.159	(105.65)	4.781	(121.44)
50	(1250)	51.75	(1314)	2.377	(60.38)	3.196	(81.17)	4.327	(109.90)		
52	(1300)	53.75	(1365)	2.468	(62.69)	3.315	(84.21)	4.489	(114.02)		
54	(1350)	55.75	(1416)	2.559	(64.99)	3.435	(87.25)	4.651	(118.14)		
60	(1500)	61.75	(1568)	2.820	(71.63)	3.779	(95.99)	5.116	(129.95)		
66	(1650)	67.88	(1724)	3.092	(78.53)	4.136	(105.06)	5.601	(142.26)		
72	(1800)	73.88	(1876)	3.353	(85.17)	4.480	(113.80)	6.066	(154.08)		

NOTE:

- All flanges are flat faced.
- ASTM A-36 steel used (allowable stress 16,000 psi).
- ASTM A-307 Grade B bolts (7,000 psi allowable stress) used for class B and D.
- ASTM A193 Grade B7 bolts (25,000psi allowable stress) used for class E and F.
- For diameters over 48 in, designers should consider using dished heads welded to a standard flange.

* Design Method : ASME Boiler & Pressure Vessel Code, Sec. VIII, Div. 1.

Class D flanges are rated at 175 psi (1.207 kPa) for nominal pipe sizes ≤ 12 in.(600 mm), and 150 psi (1,034 kPa) for nominal pipe sizes >12 in. (600 mm)



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