

# AWWA FLANGES

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# GENERAL SPECIFICATIONS

## AWWA C207-07 FLANGES

### 1. Standard Finishes for Contact Face of AWWA Flange

Flanges of all classes shall be flat faced—that is, without projection or raised face. The dimensions given for thickness are minimum. The flanges shall be faced smooth or may have a serrated finish of approximately 32 serrations per inch, approximately 1/64 in. deep. Serrations may be either spiral or concentric.

### 2. Dimensional Tolerances for AWWA Flanges

Dimension		Tolerance (inch)
Bore		+ 1/16,-0
Outside diameter		± 1/8
Thickness	18 in. and smaller	+ 1/8,-0
	20 in. and larger	+ 3/16,-0
Length though Hub	18 in. and smaller	+ 1/8,-1/32
	20 in. and larger	+ 3/16,-1/16
Bolt Circle Diameter		± 1/16
Bolt Hole Spacing		± 1/32

Note : For other dimensional tolerances, see ANSI B16.5

### 3. Bolting

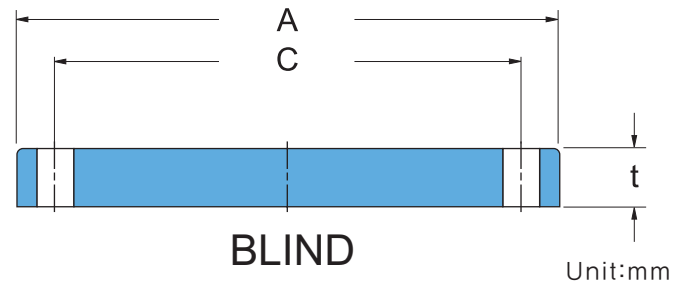
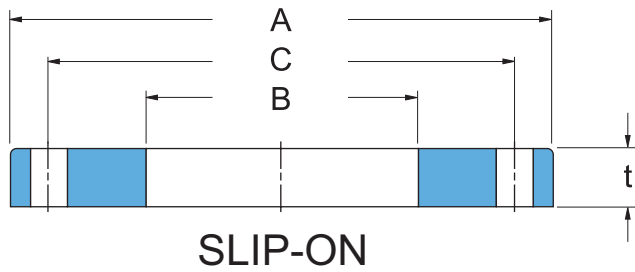
Bolts and nuts shall be carbon steel ASTM A307, Grades A or B. Bolts shall have regular unfinished square or hexagonal heads, and nuts shall have regular square or hexagonal dimensions all in accordance with ANSI B18.21 for wrench head bolts and nuts and wrench openings.

All bolts and nuts shall be threaded in accordance with ANSI B1.1 for screw threads, coarse-thread series, Class 2A and 2B fit.

### 4. Gaskets

These standards are predicated on the user of either a cloth-inserted rubber gasket 1/16 in. thick or an asbestos ring gasket that is either 1/16 in. or 1/8 in. thick, at the purchaser's option. The gasket shall extend from the inside diameter of the flange to at least the inside edge of the bolt holes, or it may.

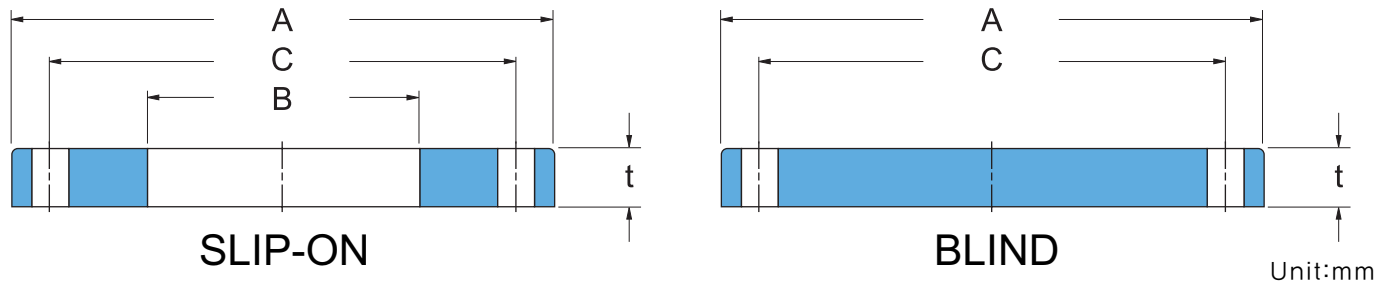
**TABLE 2 CLASS B (Blinds from table 7)**  
AWWA Standard Steel Ring Flanges, Class B (86psi)



Nominal Pipe Size	O.D. of Flange	I.D. of Flange	Thickness of Flange(T)		DRILLING			WEIGHT(kg)	
			Slip-on	Blind	Number of Holes	Dia of Holes	Bolt Circle Diam.	Slip-on	Blind
4	228.6	116.1	15.9	15.9	8	19.1	190.5	8	11
5	254.0	143.8	15.9	15.9	8	22.2	215.9	9	14
6	279.4	170.7	17.5	17.5	8	22.2	241.3	11	19
8	342.9	221.5	17.5	17.5	8	22.2	298.5	15	28
10	406.4	276.4	17.5	17.5	12	25.4	362.0	19	39
12	482.6	327.2	17.5	18.3	12	25.4	431.8	28	58
14	533.4	360.4	17.5	20.1	12	28.6	476.3	34	78
16	596.9	411.2	17.5	22.7	16	28.6	539.8	41	110
18	635.0	462.0	17.5	24.1	16	31.8	577.9	41	132
20	698.5	512.8	17.5	26.4	20	31.8	635.0	49	175
22	749.3	563.6	19.1	28.8	20	34.9	692.2	57	219
24	812.8	614.4	19.1	30.9	20	34.9	749.3	67	277
26	870.0	665.2	20.6	33.2	24	34.9	806.5	80	341
28	927.1	716.2	22.2	35.5	28	34.9	863.6	94	414
30	984.3	766.8	22.2	37.5	28	34.9	914.4	105	493
32	1060.5	817.6	23.7	40.2	28	41.3	977.9	132	613
34	1111.3	868.4	23.7	42.2	32	41.3	1028.7	137	707
36	1168.4	919.2	25.4	44.5	32	41.3	1085.9	161	824
38	1238.3	970.0	25.4	47.1	32	41.3	1149.4	185	980
40	1289.1	1020.8	25.4	49.1	36	41.3	1200.2	193	1108
42	1346.2	1071.6	28.6	51.4	36	41.3	1257.3	234	1264
44	1403.4	1122.4	28.6	53.7	40	41.3	1314.5	249	1436
46	1454.2	1173.2	28.6	55.7	40	41.3	1365.3	260	1600
48	1511.3	1224.0	31.8	58.0	44	41.3	1422.4	306	1800
50	1568.5	1274.8	31.8	60.4	44	47.6	1479.6	317	2017
52	1625.6	1325.6	31.8	62.7	44	47.6	1536.7	339	2249
54	1682.8	1376.4	34.9	65.0	44	47.6	1593.9	397	2499
60	1854.2	1528.8	38.1	71.6	52	47.6	1759.0	508	3344
66	2032.0	1681.2	41.3	78.5	52	47.6	1930.4	664	4403
72	2197.1	1833.6	44.5	85.2	60	47.6	2095.5	802	5582
78	2362.2	1986.0	50.8	-	64	54.0	2260.6	1000	-
84	2533.7	2138.4	50.8	-	64	54.0	2425.7	1145	-
90	2705.1	2290.8	57.2	-	68	61.9	2590.8	1404	-
96	2876.6	2443.2	57.2	-	68	61.9	2755.9	1586	-
102	3048.0	2595.6	63.5	-	72	68.3	2908.3	1912	-
108	3219.5	2748.0	63.5	-	72	68.3	3067.1	2136	-
114	3390.9	2900.4	69.9	-	76	74.6	3219.5	2525	-
120	3562.4	3052.8	69.9	-	76	74.6	3371.9	2795	-
126	3733.8	3205.2	76.2	-	80	81.0	3537.0	3252	-
132	3905.3	3357.6	76.2	-	80	81.0	3702.1	3572	-
138	4076.7	3510.0	82.6	-	84	87.3	3860.8	4101	-
144	4248.2	3662.4	82.6	-	84	87.3	4019.6	4475	-

**Notes :** (1) These flanges have the same "O.D" and drilling as ANSI/ASME B 16.1 Class 125 cast-iron flanges.  
 (2) In size 24in and smaller they also match ANSI/ASME B 16.5 150-psi standard for steel flanges.  
 (3) For nominal pipe size 26in and larger, if purchaser do not specify I.D, it shall be manufacturer's option.

**TABLE 2 CLASS D (Blinds from table 7)**  
AWWA Standard Steel Ring Flanges, Class D (175-150psi)

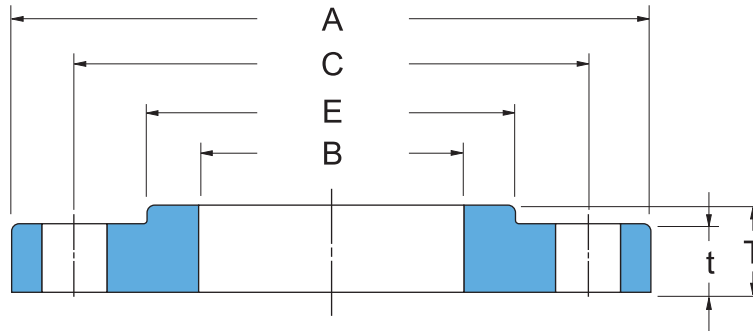


Nominal Pipe Size	O.D. of Flange	I.D. of Flange	Thickness of Flange(T)		DRILLING			WEIGHT(kg)	
			Slip-on	Blind	Number of Holes	Dia of Holes	Bolt Circle Diam.	Slip-on	Blind
							C		
4	228.6	116.1	15.9	15.9	8	19.1	190.5	8	11
5	254.0	143.8	16.5	16.5	8	22.2	215.9	9	14
6	279.4	170.7	17.5	17.6	8	22.2	241.3	11	19
8	342.9	221.5	17.5	20.6	8	22.2	298.5	15	33
10	406.4	276.4	17.5	24.2	12	25.4	362.0	19	54
12	482.6	327.2	20.6	28.4	12	25.4	431.8	33	90
14	533.4	360.4	23.7	28.8	12	28.6	476.3	47	111
16	596.9	411.2	25.4	32.1	16	28.6	539.8	60	155
18	635.0	462.0	27.0	33.8	16	31.8	577.9	64	185
20	698.5	512.8	28.6	36.8	20	31.8	635.0	79	244
22	749.3	563.6	30.2	39.8	20	34.9	692.2	90	304
24	812.8	614.4	31.8	42.2	20	34.9	749.3	112	378
26	870.0	665.2	33.3	45.4	24	34.9	806.5	129	466
28	927.1	716.2	33.3	48.4	28	34.9	863.6	141	565
30	984.3	766.8	34.9	51.0	28	34.9	914.4	164	671
32	1060.5	817.6	38.1	54.6	28	41.3	977.9	211	834
34	1111.3	868.4	38.1	57.2	32	41.3	1028.7	220	959
36	1168.4	919.2	41.3	60.2	32	41.3	1085.9	261	1116
38	1238.3	970.0	41.3	63.7	32	41.3	1149.4	301	1325
40	1289.1	1020.8	41.3	63.7	36	41.3	1200.2	313	1438
42	1346.2	1071.6	44.5	69.3	36	41.3	1257.3	364	1706
44	1403.4	1122.4	44.5	72.4	40	41.3	1314.5	387	1935
46	1454.2	1173.2	44.5	75.0	40	41.3	1365.3	404	2153
48	1511.3	1224.0	47.6	78.0	44	41.3	1422.4	460	2420
50	1568.5	1274.8	50.8	81.2	44	47.6	1479.6	507	2712
52	1625.6	1325.6	50.8	84.2	44	47.6	1536.7	542	3021
54	1682.8	1376.4	54.0	87.2	44	47.6	1593.9	614	3355
60	1854.2	1528.8	57.2	96.0	52	47.6	1759.0	763	4481
66	2032.0	1681.2	63.5	105.1	52	47.6	1930.4	1021	5890
72	2197.1	1833.6	66.7	113.8	60	47.6	2095.5	1203	7458
78	2362.2	1986.0	69.9	-	64	54.0	2260.6	1374	-
84	2533.7	2138.4	73.0	-	64	54.0	2425.7	1646	-
90	2705.1	2290.8	76.2	-	68	61.9	2590.8	1872	-
96	2876.6	2443.2	82.6	-	68	61.9	2755.9	2291	-
102	3048.0	2595.6	82.6	-	72	68.3	2908.3	2485	-
108	3219.5	2748.0	85.7	-	72	68.3	3067.1	2884	-
114	3390.9	2900.4	88.9	-	76	74.6	3219.5	3214	-
120	3562.4	3052.8	88.9	-	76	74.6	3371.9	3558	-
126	3733.8	3205.2	95.3	-	80	81.0	3537.0	4065	-
132	3905.3	3357.6	98.4	-	80	81.0	3702.1	4614	-
138	4076.7	3510.0	101.6	-	84	87.3	3860.8	5047	-
144	4248.2	3662.4	104.8	-	84	87.3	4019.6	5680	-

Notes : (1) These flanges have the same "O.D" and drilling as ANSI/ASME B 16.1 Class 125 cast-iron flanges.  
 (2) In size 24in and smaller they also match ANSI/ASME B 16.5 150-psi standard for steel flanges.  
 (3) For nominal pipe size 26in and larger, if purchaser do not specify I.D, it shall be manufacturer's option.

# TABLE 3 CLASS D

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



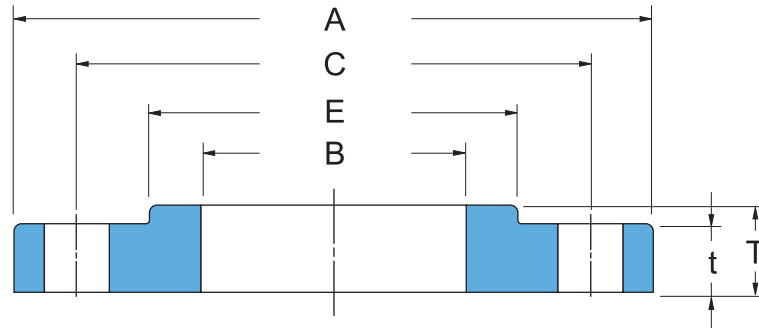
Unit:mm

Nominal Pipe Size	O.D. of Flange	I.D. of Flange	Thickness of Flange	Overall Thickness	Diam. of Hub	DRILLING			Weight (kg)
						Number of Holes	Dia of Holes	Bolt Circle Dia	
	A	B	f	T	E			C	
4	228.6	116.1	12.7	22.2	134.9	8	19.1	190.5	7
5	254.0	143.8	14.3	31.8	160.3	8	22.2	215.9	9
6	279.4	170.7	14.3	31.8	192.1	8	22.2	241.3	11
8	342.9	221.5	14.3	31.8	246.1	8	22.2	298.5	15
10	406.4	276.4	17.5	31.8	304.8	12	25.4	362.0	22
12	482.6	327.2	17.5	31.8	365.1	12	25.4	431.8	33
14	533.4	360.4	19.1	31.8	400.1	12	28.6	476.3	43
16	596.9	411.2	19.1	31.8	457.2	16	28.6	539.8	52
18	635.0	462.0	19.1	31.8	504.8	16	31.8	577.9	52
20	698.5	512.8	19.1	31.8	558.8	20	31.8	635.0	61
22	749.3	563.6	25.4	44.5	616.0	20	34.9	692.2	92
24	812.8	614.4	25.4	44.5	663.6	20	34.9	749.3	105
26	870.0	665.2	25.4	44.5	723.9	24	34.9	806.5	119
28	927.1	716.2	25.4	44.5	774.7	28	34.9	863.6	130
30	984.3	766.8	25.4	44.5	825.5	28	34.9	914.4	144
32	1060.5	817.6	28.6	44.5	882.7	28	41.3	977.9	182
34	1111.3	868.4	28.6	44.5	933.5	32	41.3	1028.7	191
36	1168.4	919.2	28.6	44.5	984.3	32	41.3	1085.9	207
38	1238.3	970.0	28.6	44.5	1035.1	32	41.3	1149.4	237
40	1289.1	1020.8	28.6	44.5	1092.2	36	41.3	1200.2	249
42	1346.2	1071.6	31.8	44.5	1143.0	36	41.3	1257.3	287
44	1403.4	1122.4	31.8	57.2	1193.8	40	41.3	1314.5	334
46	1454.2	1173.2	31.8	57.2	1244.6	40	41.3	1365.3	348
48	1511.3	1224.0	34.9	63.5	1295.4	44	41.3	1422.4	407
50	1568.5	1274.8	34.9	63.5	1346.2	44	47.6	1479.6	421
52	1625.6	1325.6	34.9	63.5	1397.0	44	47.6	1536.7	448
54	1682.8	1376.4	34.9	63.5	1447.8	44	47.6	1593.9	475
60	1854.2	1528.8	38.1	69.9	1600.2	52	47.6	1759.0	605
66	2032.0	1681.2	38.1	69.9	1752.0	52	47.6	1930.4	718
72	2197.1	1833.6	38.1	69.9	1905.0	60	47.6	2095.5	803
78	2362.2	1986.0	44.5	76.2	2063.8	64	54.0	2260.6	1010
84	2533.7	2138.4	44.5	76.2	2222.5	64	54.0	2425.7	1160
90	2705.1	2290.8	50.8	82.6	2381.3	68	61.9	2590.8	1430
96	2876.6	2443.2	50.8	82.6	2540.0	68	61.9	2755.9	1618

Notes : (1) These flanges have the same "O.D" and drilling as ANSI/ASME B 16.1 Class 125 cast-iron flanges.  
 (2) In size 24in and smaller they also match ANSI/ASME B 16.5 150-psi standard for steel flanges.

# TABLE 4 CLASS E

## AWWA Standard Steel Hub Flanges, Class E (275psi)

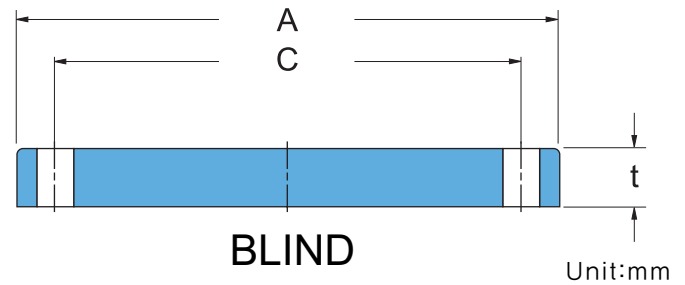
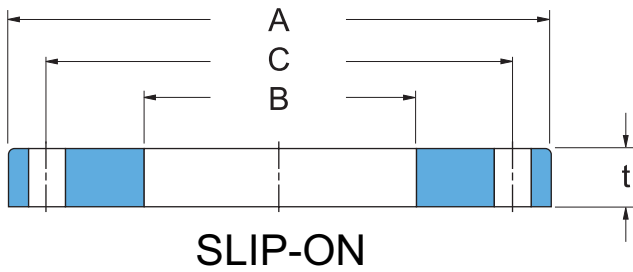


Unit:mm

Nominal Pipe Size	O.D. of Flange	I.D. of Flange	Thickness of Flange	Overall Thickness	Diam. of Hub	DRILLING			Weight (kg)
						Number of Holes	Dia of Holes	Bolt Circle Dia	
								C	
A	B	f	T	E					
4	228.6	116.1	23.8	33.3	134.9	8	19.1	190.5	13
5	254.0	143.8	23.8	36.5	163.5	8	22.2	215.9	14
6	279.4	170.7	25.4	39.7	192.1	8	22.2	241.3	17
8	342.9	221.5	28.6	44.5	246.1	8	22.2	298.5	28
10	406.4	276.4	30.2	49.2	304.8	12	25.4	362.0	37
12	482.6	327.2	31.8	55.6	365.1	12	25.4	431.8	59
14	533.4	360.4	34.9	57.2	400.1	12	28.6	476.3	78
16	596.9	411.2	36.5	63.5	457.2	16	28.6	539.8	101
18	635.0	462.0	39.7	68.3	504.8	16	31.8	577.9	110
20	698.5	512.8	42.9	73.0	558.8	20	31.8	635.0	139
22	749.3	563.6	46.0	79.4	609.6	20	34.9	692.2	162
24	812.8	614.4	47.6	82.6	663.6	20	34.9	749.3	197
26	870.0	665.2	50.8	85.7	723.9	24	34.9	806.5	235
28	927.1	716.0	52.4	87.3	781.1	28	34.9	863.6	269
30	984.3	766.8	54.0	88.9	831.9	28	34.9	914.4	303
32	1060.5	817.6	57.2	92.1	889.0	28	41.3	977.9	375
34	1111.3	868.4	58.7	93.7	939.8	32	41.3	1028.7	401
36	1168.4	919.2	60.3	95.3	997.0	32	41.3	1085.9	452
38	1238.3	970.0	60.3	96.1	1060.5	32	41.3	1149.4	528
40	1289.1	1020.8	63.5	98.4	1111.3	36	41.3	1200.2	573
42	1346.2	1071.6	66.7	101.6	1168.4	36	41.3	1257.3	648
44	1403.4	1122.4	66.7	101.6	1219.2	40	41.3	1314.5	688
46	1454.2	1173.2	68.3	103.2	1270.0	40	41.3	1365.3	733
48	1511.3	1224.0	69.9	104.8	1327.2	44	41.3	1422.4	799
50	1568.5	1274.8	69.9	104.8	1378.0	44	47.6	1479.6	827
52	1625.6	1325.6	73.0	108.0	1435.1	44	47.6	1536.7	922
54	1682.8	1376.4	76.2	111.1	1492.3	44	47.6	1593.9	1024
60	1854.2	1528.8	79.4	114.3	1657.4	52	47.6	1759.0	1253
66	2032.0	1681.2	85.7	123.8	1816.1	52	47.6	1930.4	1623
72	2197.1	1833.6	88.9	127.0	1993.9	60	47.6	2095.5	1922
78	2362.2	1986.0	98.4	136.5	2146.3	64	54.0	2260.6	2279
84	2533.7	2138.4	98.4	136.5	2298.7	64	54.0	2425.7	2586
90	2705.1	2290.8	108.0	146.1	2457.5	68	61.9	2590.8	3061
96	2876.6	2443.2	108.0	146.1	2609.9	68	61.9	2755.9	3432

Notes : (1) These flanges have the same "O.D" and drilling as ANSI/ASME B 16.1 Class 125 cast-iron flanges.  
 (2) In size 24in and smaller they also match ANSI/ASME B 16.5 150-psi standard for steel flanges.

**TABLE 5 CLASS E (Blinds from table 7)**  
 AWWA Standard Steel Ring Flanges, Class E (275psi)

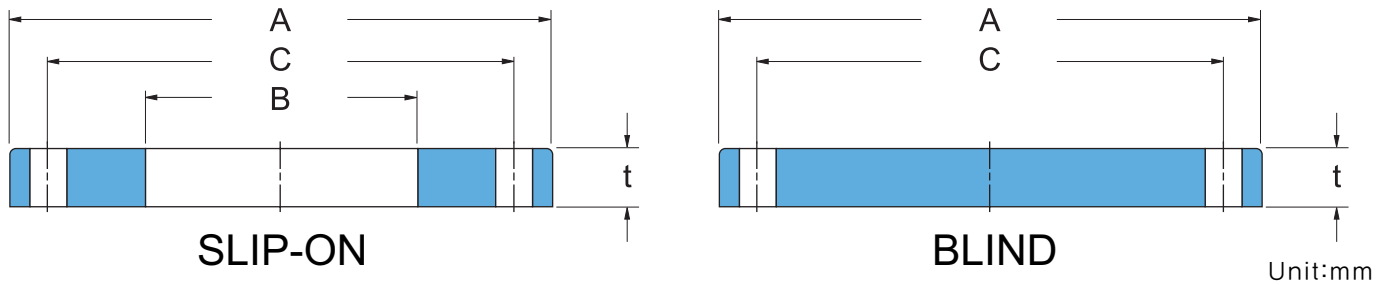


Nominal Pipe Size	O.D. of Flange	I.D. of Flange	Thickness of Flange(t)		DRILLING			WEIGHT(kg)	
			Slip-on	Blind	Number of Holes	Dia of Holes	Bolt Circle Diam. C	Slip-on	Blind
	A	B							
4	228.6	116.1	28.6	28.6	8	19.1	190.5	14	20
5	254.0	143.8	30.2	30.2	8	22.2	215.9	16	26
6	279.4	170.7	33.4	33.4	8	22.2	241.3	20	35
8	342.9	221.5	38.1	38.1	8	22.2	298.5	33	61
10	406.4	276.4	39.7	39.7	12	25.4	362.0	44	89
12	482.6	327.2	44.5	44.5	12	25.4	431.8	71	141
14	533.4	360.4	47.6	47.6	12	28.6	476.3	94	184
16	596.9	411.2	50.8	50.8	16	28.6	539.8	120	246
18	635.0	462.0	54.0	54.0	16	31.8	577.9	127	296
20	698.5	512.8	60.3	60.3	20	31.8	635.0	168	400
22	749.3	563.6	63.5	63.5	20	34.9	692.2	189	484
24	812.8	614.4	66.7	66.7	20	34.9	749.3	234	598
26	870.0	665.2	69.9	69.9	24	34.9	806.5	270	718
28	927.1	716.0	69.9	69.9	28	34.9	863.6	297	815
30	984.3	766.8	73.0	73.0	28	34.9	914.4	344	961
32	1060.5	817.6	76.2	76.2	28	41.3	977.9	422	1163
34	1111.3	868.4	76.2	77.5	32	41.3	1028.7	441	1299
36	1168.4	919.2	79.4	81.5	32	41.3	1085.9	502	1511
38	1238.3	970.0	79.4	86.2	32	41.3	1149.4	580	1795
40	1289.1	1020.8	82.6	89.7	36	41.3	1200.2	626	2025
42	1346.2	1071.6	85.7	93.9	36	41.3	1257.3	701	2309
44	1403.4	1122.4	85.7	98.0	40	41.3	1314.5	747	2715
46	1454.2	1173.2	87.3	101.5	40	41.3	1365.3	794	2813
48	1511.3	1224.0	88.9	105.6	44	41.3	1422.4	858	3276
50	1568.5	1274.8	88.9	109.9	44	47.6	1479.6	887	3671
52	1625.6	1325.6	92.1	114.0	44	47.6	1536.7	982	4091
54	1682.8	1376.4	95.3	118.1	44	47.6	1593.9	1083	4542
60	1854.2	1528.8	98.4	129.9	52	47.6	1759.0	1313	6066
66	2032.0	1681.2	108.0	142.3	52	47.6	1930.4	1736	7976
72	2197.1	1833.6	111.1	154.1	60	47.6	2095.5	2005	10099
78	2362.2	1986.0	120.7	-	64	54.0	2260.6	2374	-
84	2533.7	2138.4	120.7	-	64	54.0	2425.7	2719	-
90	2705.1	2290.8	130.2	-	68	61.9	2590.8	3197	-
96	2876.6	2443.2	130.2	-	68	61.9	2755.9	3613	-
102	3048.0	2595.6	139.7	-	72	68.3	2908.3	4206	-
108	3219.5	2748.0	139.7	-	72	68.3	3067.1	4700	-
114	3390.9	2900.4	149.2	-	76	74.6	3219.5	5395	-
120	3562.4	3052.8	149.2	-	76	74.6	3371.9	5972	-
126	3733.8	3205.2	158.8	-	80	81.0	3537.0	6775	-
132	3905.3	3357.6	158.8	-	80	81.0	3702.1	7442	-
138	4076.7	3510.0	171.5	-	84	87.3	3860.8	8517	-
144	4248.2	3662.4	171.5	-	84	87.3	4019.6	9295	-

**Notes :** (1) These flanges have the same "O.D" and drilling as ANSI/ASME B 16.1 Class 125 cast-iron flanges.  
 (2) In size 24in and smaller they also match ANSI/ASME B 16.5 150-psi standard for steel flanges.  
 (3) For nominal pipe size 26in and larger, if purchaser do not specify I.D, it shall be manufacturer's option.

# TABLE 6 CLASS F (Blinds from table 7)

AWWA Standard Steel Ring Flanges, Class F (300psi)



Nominal Pipe Size	O.D. of Flange	I.D. of Flange	Thickness of Flange(t)		DRILLING			WEIGHT(kg)	
			Slip-on	Blind	Number of Holes	Dia of Holes	Bolt Circle Diam.	Slip-on	Blind
							C		
4	254.0	116.1	28.7	28.7	8	22.2	200.2	18	25
5	279.4	143.8	30.7	30.7	8	22.2	235.0	22	33
6	317.5	170.9	33.3	33.3	12	22.2	269.7	30	46
8	381.0	221.7	33.3	33.3	12	25.4	330.2	40	66
10	444.5	276.4	38.1	38.1	16	28.6	387.4	56	102
12	520.7	327.2	41.4	41.4	16	31.8	450.9	83	152
14	584.2	360.4	49.3	49.3	20	31.8	514.4	128	228
16	647.7	411.2	54.4	54.4	20	34.9	571.5	167	310
18	711.2	462.0	57.2	57.2	24	34.9	628.7	204	392
20	774.7	512.8	59.2	59.2	24	34.9	685.8	247	482
22	838.2	563.6	63.5	63.5	24	34.9	743.0	307	606
24	914.4	614.4	68.3	68.3	24	41.3	812.8	388	776
26	971.6	666.8	76.2	76.2	28	47.6	876.3	451	977
28	1035.1	717.6	79.5	79.5	28	47.6	939.8	532	1156
30	1092.2	768.4	80.0	80.4	28	47.6	997.0	586	1303
32	1149.4	819.2	82.6	84.6	28	47.6	1054.1	657	1518
34	1206.5	870.0	85.9	88.3	28	47.6	1104.9	741	1745
36	1270.0	920.8	87.9	93.2	32	54.0	1168.4	802	2042
38	1327.2	971.6	88.9	96.9	32	54.0	1219.2	874	2317
40	1378.0	1022.4	92.2	101.1	36	54.0	1276.4	937	2608
42	1447.8	1073.2	96.8	105.9	36	54.0	1339.9	1103	3015
44	1505.0	1124.0	101.6	110.2	36	54.0	1397.0	1237	3388
46	1562.1	1174.8	104.9	114.4	40	54.0	1454.2	1344	3791
48	1651.0	1225.6	114.3	121.4	40	54.0	1543.1	1718	4494

- Notes :**
- (1) Pressure rating at atmospheric temperature is 300psi.
  - (2) These flanges have the same "O.D" and drilling as ANSI/ASME B 16.1 class 250 cast-iron pipe and flanged fittings.
  - (3) For nominal pipe size 26in and larger, if purchaser do not specify I.D, it shall be manufacturer's option.