

# ANSI/ASME B16.5 Flange Connections

## Pressure/Temperature Ratings (in PSIG)

### Material Group 1.1

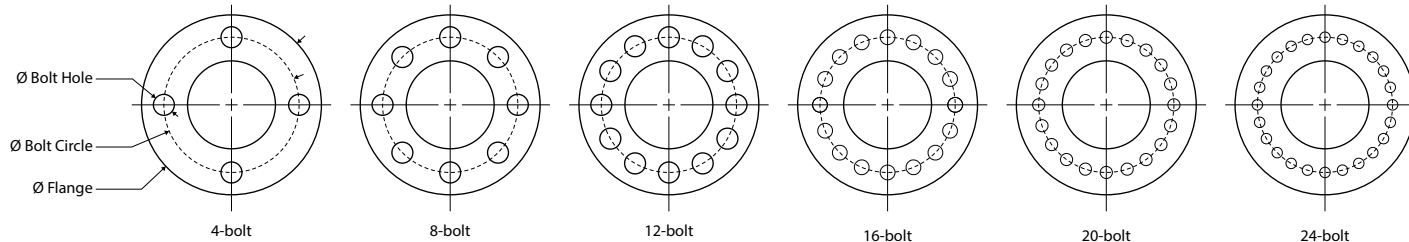
Temp (°F)	Class						
	150	300	400	600	900	1500	2500
-20 to 100	290	750	1000	1500	2250	3750	6250
200	260	750	1000	1500	2250	3750	6250
300	230	730	970	1455	2185	3640	6070
400	200	705	940	1405	2110	3520	5865
500	170	665	885	1330	1995	3325	5540
600	140	605	805	1210	1815	3025	5040
650	125	590	785	1175	1765	2940	4905
700	110	555	740	1110	1665	2775	4630
750	95	505	675	1015	1520	2535	4230
800	80	410	550	825	1235	2055	3430
850	65	320	425	640	955	1595	2655
900	50	225	295	445	670	1115	1855
950	35	135	185	275	410	685	1145
1000	20	85	115	170	255	430	715

### Material Group 1.2

Temp (°F)	Class						
	150	300	400	600	900	1500	2500
< 100	285	740	985	1480	2220	3705	6170
200	260	680	905	1360	2035	3395	5655
300	230	655	870	1310	1965	3270	5450
400	200	635	845	1265	1900	3170	5280
500	170	605	805	1205	1810	3015	5025
600	140	570	755	1135	1705	2840	4730
650	125	550	730	1100	1650	2745	4575
700	110	530	710	1060	1590	2655	4425
750	95	505	675	1015	1520	2535	4230
800	80	410	550	825	1235	2055	3430
850	65	320	425	640	955	1595	2655
900	50	230	305	460	690	1150	1915
950	35	135	185	275	410	685	1145
1000	20	85	115	170	255	430	715

Material Group No.	Material Nominal Designation	Forging	Casting	Plate	Bar	Tubular
1.1	C, C-SI C-MN-SI C-MN-SI-V	A105, A350 Gr. LF2 A350 Gr. LF6 Cl.1	A216 Gr. WCB	A515 Gr. 70 A516 Gr. 70 A537 Gr. Cl.1	A675 Gr. 70 A105 A350 Gr. LF2 A696 Gr. C	A672 Gr. B70 A672 Gr. C70
1.2	C-SI 2 1/2NI 3 1/2NI C-MN-SI C-MN-SI-V	A350 Gr. LF3 A350 Gr. LF6 Cl.2	A352 Gr. LC2 A352 Gr. LC3 A216 Gr. WCC A352 Gr. LCC	A203 Gr. B A203 Gr. E	A350 Gr. LF3	A106 Gr. C

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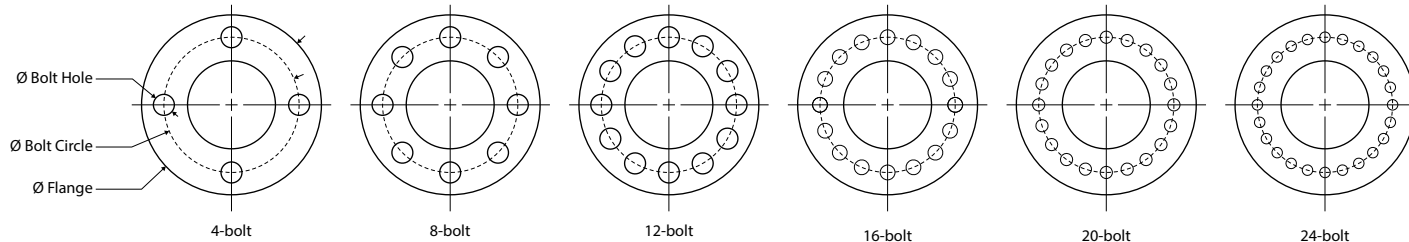
## Dimensions (in inches) Class 150

NPS	Ø of Flange	No. of Bolts	Ø of Bolts	Ø of Bolt Holes	Ø of Bolt Circle
1/4	3-3/8	4	1/2	0.62	2-1/4
1/2	3-1/2	4	1/2	0.62	2-3/8
3/4	3-7/8	4	1/2	0.62	2-3/4
1	4-1/4	4	1/2	0.62	3-1/8
1-1/4	4-5/8	4	1/2	0.62	3-1/2
1-1/2	5	4	1/2	0.62	3-7/8
2	6	4	5/8	0.75	4-3/4
2-1/2	7	4	5/8	0.75	5-1/2
3	7-1/2	4	5/8	0.75	6
3-1/2	8-1/2	8	5/8	0.75	7
4	9	8	5/8	0.75	7-1/2
5	10	8	3/4	0.88	8-1/2
6	11	8	3/4	0.88	9-1/2
8	13-1/2	8	3/4	0.88	11-3/4
10	16	12	7/8	1	14-1/4
12	19	12	7/8	1	17
14	21	12	1	1.12	18-3/4
16	23-1/2	16	1	1.12	21-1/4
18	25	16	1-1/8	1.25	22-3/4
20	27-1/2	20	1-1/8	1.25	25
24	32	20	1-1/4	1.38	29-1/2

## Class 300

NPS	Ø of Flange	No. of Bolts	Ø of Bolts	Ø of Bolt Holes	Ø of Bolt Circle
1/4	3-3/8	4	1/2	0.62	2-1/4
1/2	3-3/4	4	1/2	0.62	2-5/8
3/4	4-5/8	4	5/8	0.75	3-1/4
1	4-7/8	4	5/8	0.75	3-1/2
1-1/4	5-1/4	4	5/8	0.75	3-7/8
1-1/2	6-1/8	4	3/4	0.88	4-1/2
2	6-1/2	8	5/8	0.75	5
2-1/2	7-1/2	8	3/4	0.88	5-7/8
3	8-1/4	8	3/4	0.88	6-5/8
3-1/2	9	8	3/4	0.88	7-1/4
4	10	8	3/4	0.88	7-7/8
5	11	8	3/4	0.88	9-1/4
6	12-1/2	12	3/4	0.88	10-5/8
8	15	12	7/8	1	13
10	17-1/2	16	1	1.12	15-1/4
12	20-1/2	16	1-1/8	1.25	17-3/4
14	23	20	1-1/8	1.25	20-1/4
16	25-1/2	20	1-1/4	1.38	22-1/2
18	28	24	1-1/4	1.38	24-3/4
20	30-1/2	24	1-1/4	1.38	27
24	36	24	1-1/2	1.62	32

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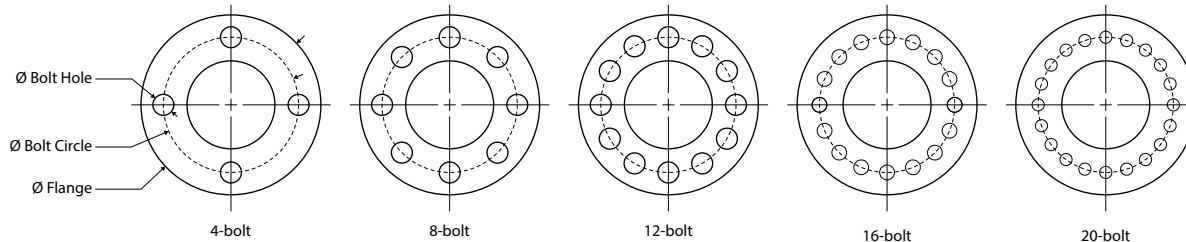
## Dimensions (in inches) Class 400

NPS	Ø of Flange	No. of Bolts	Ø of Bolts	Ø of Bolt Holes	Ø of Bolt Circle
1/4	3-3/8	4	1/2	0.62	2-1/4
1/2	3-3/4	4	1/2	0.62	2-5/8
3/4	4-5/8	4	5/8	0.75	3-1/4
1	4-7/8	4	5/8	0.75	3-1/2
1-1/4	5-1/4	4	5/8	0.75	3-7/8
1-1/2	6-1/8	4	3/4	0.88	4-1/2
2	6-1/2	8	5/8	0.75	5
2-1/2	7-1/2	8	3/4	0.88	5-7/8
3	8-1/4	8	3/4	0.88	6-5/8
3-1/2	9	8	7/8	1	7-1/4
4	10	8	7/8	1	7-7/8
5	11	8	7/8	1	9-1/4
6	12-1/2	12	7/8	1	10-5/8
8	15	12	1	1.12	13
10	17-1/2	16	1-1/8	1.25	15-1/4
12	20-1/2	16	1-1/4	1.38	17-3/4
14	23	20	1-1/4	1.38	20-1/4
16	25-1/2	20	1-3/8	1.5	22-1/2
18	28	24	1-3/8	1.5	24-3/4
20	30-1/2	24	1-1/2	1.62	27
24	36	24	1-3/4	1.88	32

## Class 600

NPS	Ø of Flange	No. of Bolts	Ø of Bolts	Ø of Bolt Holes	Ø of Bolt Circle
1/4	3-3/8	4	1/2	0.62	2-1/4
1/2	3-3/4	4	1/2	0.62	2-5/8
3/4	4-5/8	4	5/8	0.75	3-1/4
1	4-7/8	4	5/8	0.75	3-1/2
1-1/4	5-1/4	4	5/8	0.75	3-7/8
1-1/2	6-1/8	4	3/4	0.88	4-1/2
2	6-1/2	8	5/8	0.75	5
2-1/2	7-1/2	8	3/4	0.88	5-7/8
3	8-1/4	8	3/4	0.88	6-5/8
3-1/2	9	8	7/8	1	7-1/4
4	10-3/4	8	7/8	1	8-1/2
5	13	8	1	1.12	10-1/2
6	14	12	1	1.12	11-1/2
8	16-1/2	12	1-1/8	1.25	13-3/4
10	20	16	1-1/4	1.38	17
12	22	20	1-1/4	1.38	19-1/4
14	23-3/4	20	1-3/8	1.5	20-3/4
16	27	20	1-1/2	1.62	23-3/4
18	29-1/4	20	1-5/8	1.75	25-3/4
20	32	24	1-5/8	1.75	28-1/2
24	37	24	1-7/8	2	33

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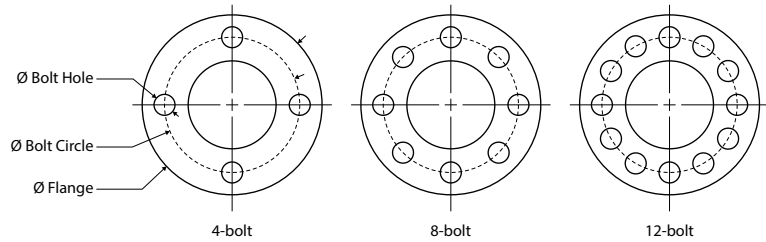


## Dimensions (in inches) Class 900

NPS	Ø of Flange	No. of Bolts	Ø of Bolts	Ø of Bolt Holes	Ø of Bolt Circle
1/2	4-3/4	4	3/4	0.88	3-1/4
3/4	5-1/8	4	3/4	0.88	3-1/2
1	5-7/8	4	7/8	1	4
1-1/4	6-1/4	4	7/8	1	4-3/8
1-1/2	7	4	1	1.12	4-7/8
2	8-1/2	8	7/8	1	6-1/2
2-1/2	9-5/8	8	1	1.12	7-1/2
3	9-1/2	8	7/8	1	7-1/2
4	11-1/2	8	1-1/8	1.25	9-1/4
5	13-3/4	8	1-1/4	1.38	11
6	15	12	1-1/8	1.25	12-1/2
8	18-1/2	12	1-3/8	1.5	15-1/2
10	21-1/2	16	1-3/8	1.5	18-1/2
12	24	20	1-3/8	1.5	21
14	25-1/4	20	1-1/2	1.62	22
16	27-3/4	20	1-5/8	1.75	24-1/2
18	31	20	1-7/8	2	27
20	33-3/4	20	2	2.12	29-1/2
24	41	20	2-1/2	2.62	35-1/2

## Class 1500

NPS	Ø of Flange	No. of Bolts	Ø of Bolts	Ø of Bolt Holes	Ø of Bolt Circle
1/2	4-3/4	4	3/4	0.88	3-1/4
3/4	5-1/8	4	3/4	0.88	3-1/2
1	5-7/8	4	7/8	1	4
1-1/4	6-1/4	4	7/8	1	4-3/8
1-1/2	7	4	1	1.12	4-7/8
2	8-1/2	8	7/8	1	6-1/2
2-1/2	9-5/8	8	1	1.12	7-1/2
3	10-1/2	8	1-1/8	1.25	8
4	12-1/4	8	1-1/4	1.38	9-1/2
5	14-3/4	8	1-1/2	1.62	11-1/2
6	15-1/2	12	1-3/8	1.5	12-1/2
8	19	12	1-5/8	1.75	15-1/2
10	23	12	1-7/8	2	19
12	26-1/2	16	2	2.12	22-1/2
14	29-1/2	16	2-1/4	2.38	25
16	32-1/2	16	2-1/2	2.62	27-3/4
18	36	16	2-3/4	2.88	30-1/2
20	38-3/4	16	3	3.12	32-3/4
24	46	16	3-1/2	3.62	39



## Dimensions (in inches)

### Class 2500

NPS	Ø of Flange	No. of Bolts	Ø of Bolts	Ø of Bolt Holes	Ø of Bolt Circle
1/2	5-1/4	4	3/4	0.88	3-1/2
3/4	5-1/2	4	3/4	0.88	3-3/4
1	6-1/4	4	7/8	1	4-1/4
1-1/4	7-1/4	4	1	1.12	5-1/8
1-1/2	8	4	1-1/8	1.25	5-3/4
2	9-1/4	8	1	1.12	6-3/4
2-1/2	10-1/2	8	1-1/8	1.25	7-3/4
3	12	8	1-1/4	1.38	9
4	14	8	1-1/2	1.62	10-3/4
5	16-1/2	8	1-3/4	1.88	12-3/4
6	19	8	2	2.12	14-1/2
8	21-3/4	12	2	2.12	17-1/4
10	26-1/2	12	2-1/2	2.62	21-1/4
12	30	12	2-3/4	2.88	24-3/8