



SC MFG. GROUP

DBA HIDALGO METALS ENTERPRISE LTD.

ONTARIO, CANADA
OVER TWENTY YEARS IN PRODUCTION

REFERENCE TABLES · 2026

FLANGES

Forged flanges and rings, Class 150 to 2500, in sizes up to 60".

The dimension tables we work to for each class and each standard, the pressure-temperature ratings, approximate weights and the tolerances we hold. Specifications can be customised at your request.

ASME/ANSI B16.5, MSS SP-6, 25 & 51

ASTM/ASME A/SA-182, permanently identified

Orifice, long welding neck, figure 8, reducing

ASME B16.47 Series A and B up to 60"

Weld neck, slip-on, socket weld, threaded, lap joint, blind

Flange rings and blinds

150-2500

PRESSURE CLASS

1/2"-60"

NOMINAL SIZE

24

MATERIAL GROUPS RATED

1,500+

TON PRESS

01 THE RANGE

CLASS 150 - 2500

Class 150 through Class 2500, made in accordance with ASME/ANSI B16.5 and MSS SP-6, SP-25 and SP-51, from ASTM/ASME A/SA-182 material, permanently identified. Alongside the common weld neck, slip-on, socket weld, threaded, lap joint and blind flanges we make orifice flanges, long welding neck flanges, flange rings, figure 8 flanges, reducing flanges and blinds. Large diameter flanges above 24" follow ASME B16.47, Series A to MSS SP-44 and Series B to API 605.

How the tables read. All dimensions are in inches unless stated otherwise. O is the outside diameter, C the flange thickness, R the raised face diameter and r the fillet radius. B is the bore, Y the length through hub, T the minimum thread length, Q the counterbore diameter, D the socket depth, A the hub diameter at the bevel and X the hub diameter. One table of flange dimensions and one of drilling and bolting is given for each pressure class; each nominal size is a single row.

STANDARDS	MATERIAL	FACINGS
ASME/ANSI B16.5 and B16.47; MSS SP-6, SP-25, SP-44, SP-51; API 605; ANSI B16.36 for orifice flanges.	ASTM/ASME A/SA-182 forgings, permanently identified. Twenty-four material groups are rated in the pressure-temperature tables.	Raised face, male, female, tongue and groove, and ring joint. A 0.06" raised face is standard for Class 150 and 300; 0.25" for Class 400 and heavier.

BORE B1

Bore B1 for weld neck and socket weld flanges is to be specified by the purchaser throughout the dimension tables.

02 CLASS 150

ASME B16.5 · NPS 1/2" TO 24" · 21 SIZES

FLANGE DIMENSIONS

INCHES

NPS	O.D. O	THK. C	R.F. DIA R	FILLET R	BORE B2 SLIP-ON	BORE B3 LAP JT.	HUB Y1 WELD NECK	HUB Y2 SLIP-ON	HUB Y3 LAP JT.	THREAD T	SOCKET D	HUB BEVEL A	HUB DIA X
1/2	3 1/2	7/16	1 3/8	1/8	0.88	0.9	1 7/8	5/8	5/8	0.62	3/8	0.84	1 3/16
3/4	3 7/8	1/2	1 11/16	1/8	1.09	1.11	2 1/16	5/8	5/8	0.62	7/16	1.05	1 1/2
1	4 1/4	9/16	2	1/8	1.36	1.38	2 3/16	11/16	11/16	0.69	1/2	1.32	1 15/16
1 1/4	4 5/8	5/8	2 1/2	3/16	1.7	1.72	2 1/4	13/16	13/16	0.81	9/16	1.66	2 5/16
1 1/2	5	11/16	2 7/8	1/4	1.95	1.97	2 7/16	7/8	7/8	0.88	5/8	1.9	2 9/16
2	6	3/4	3 5/8	5/16	2.44	2.46	2 1/2	1	1	1	11/16	2.38	3 1/16
2 1/2	7	7/8	4 1/8	5/16	2.94	2.97	2 3/4	1 1/8	1 1/8	1.12	3/4	2.88	3 9/16
3	7 1/2	15/16	5	3/8	3.57	3.6	2 3/4	1 3/16	1 3/16	1.19	13/16	3.5	4 1/4
3 1/2	8 1/2	15/16	5 1/2	3/8	4.07	4.1	2 13/16	1 1/4	1 1/4	1.25	7/8	4	4 13/16
4	9	15/16	6 3/16	7/16	4.57	4.6	3	1 5/16	1 5/16	1.31	15/16	4.5	5 5/16
5	10	15/16	7 5/16	7/16	5.66	5.69	3 1/2	1 7/16	1 7/16	1.44	15/16	5.56	6 7/16
6	11	1	8 1/2	1/2	6.72	6.75	3 1/2	1 9/16	1 9/16	1.56	1 1/16	6.63	7 9/16
8	13 1/2	1 1/8	10 5/8	1/2	8.72	8.75	4	1 3/4	1 3/4	1.75	1 1/4	8.63	9 11/16
10	16	1 3/16	12 3/4	1/2	10.88	10.92	4	1 15/16	1 15/16	1.94	1 5/16	10.75	12
12	19	1 1/4	15	1/2	12.88	12.92	4 1/2	2 3/16	2 3/16	2.19	1 9/16	12.75	14 3/8
14	21	1 3/8	16 1/4	1/2	14.14	14.18	5	2 1/4	2 1/8	2.25	1 5/8	14	15 3/4
16	23 1/2	1 7/16	18 1/2	1/2	16.16	16.19	5	2 1/2	3 7/16	2.5	1 3/4	16	18
18	25	1 9/16	21	1/2	18.18	18.2	5 1/2	2 11/16	3 13/16	2.69	1 15/16	18	19 7/8
20	27 1/2	1 11/16	23	1/2	20.2	20.25	5 11/16	2 7/8	4 1/16	2.88	2 1/8	20	22
22	29 1/2	1 13/16	25 1/4	1/2	22.22	22.25	5 7/8	3 1/8	4 1/4	—	2 3/8	22	24 1/4
24	32	1 7/8	27 1/4	1/2	24.25	24.25	6	3 1/4	4 3/8	3.25	2 1/2	24	26 1/8

DRILLING AND BOLTING

INCHES · BOLT AND STUD LENGTHS

NPS	BOLT CIRCLE	DIA. HOLES	NO. OF BOLTS	DIA. OF BOLTS	STUD 0.06" R.F.	STUD RING JOINT	HEX 0.06" R.F.
1/2	2 3/8	5/8	4	1/2	2.25	—	2
3/4	2 3/4	5/8	4	1/2	2.5	—	2
1	3 1/8	5/8	4	1/2	2.5	3	2.25
1 1/4	3 1/2	5/8	4	1/2	2.75	3.25	2.25
1 1/2	3 7/8	5/8	4	1/2	2.75	3.25	2.5
2	4 3/4	3/4	4	5/8	3.25	3.75	2.75
2 1/2	5 1/2	3/4	4	5/8	3.5	4	3
3	6	3/4	4	5/8	3.5	4	3
3 1/2	7	3/4	8	5/8	3.5	4	3
4	7 1/2	3/4	8	5/8	3.5	4	3
5	8 1/2	7/8	8	3/4	3.75	4.25	3.25
6	9 1/2	7/8	8	3/4	4	4.5	3.25
8	11 3/4	7/8	8	3/4	4.25	4.75	3.5
10	14 1/4	1	12	7/8	4.5	5	4
12	17	1	12	7/8	4.75	5.25	4
14	18 3/4	1 1/8	12	1	5.25	5.75	4.5
16	21 1/4	1 1/8	16	1	5.25	5.75	4.5
18	22 3/4	1 1/4	16	1 1/8	5.75	6.25	5
20	25	1 1/4	20	1 1/8	6.25	6.75	5.5
22	27 1/4	1 3/8	20	1 1/8	6.5	—	5.5
24	29 1/2	1 3/8	20	1 1/4	6.75	7.25	6

Bore B1, weld neck and socket, is to be specified by the purchaser.

02 CLASS 300

ASME B16.5 · NPS 1/2" TO 24" · 21 SIZES

FLANGE DIMENSIONS

INCHES

NPS	O.D. O	THK. C	R.F. DIA R	FILLET R	BORE B2 SLIP-ON	BORE B3 LAP JT.	HUB Y1 WELD NECK	HUB Y2 SLIP-ON	HUB Y3 LAP JT.	THREAD T	CBORE Q	SOCKET D	HUB BEVEL A	HUB DIA X
1/2	3 3/4	9/16	1 3/8	1/8	0.88	0.9	2 1/16	7/8	7/8	0.63	15/16	3/8	0.84	1 1/2
3/4	4 5/8	5/8	1 11/16	1/8	1.09	1.11	2 1/4	1	1	0.63	1 9/64	7/16	1.05	1 7/8
1	4 7/8	11/16	2	1/8	1.36	1.38	2 7/16	1 1/16	1 1/16	0.69	1 27/64	1/2	1.32	2 1/8
1 1/4	5 1/4	3/4	2 1/2	3/16	1.7	1.72	2 9/16	1 1/16	1 1/16	0.81	1 3/4	9/16	1.66	2 1/2
1 1/2	6 1/8	13/16	2 7/8	1/4	1.95	1.97	2 11/16	1 3/16	1 3/16	0.88	2	5/8	1.9	2 3/4
2	6 1/2	7/8	3 5/8	5/16	2.44	2.46	2 3/4	1 5/16	1 5/16	1.13	2 1/2	11/16	2.38	3 5/16
2 1/2	7 1/2	1	4 1/8	5/16	2.94	2.97	3	1 1/2	1 1/2	1.25	3	3/4	2.88	3 15/16
3	8 1/4	1 1/8	5	3/8	3.57	3.6	3 1/8	1 11/16	1 11/16	1.25	3 41/64	13/16	3.5	4 5/8
3 1/2	9	1 3/16	5 1/2	3/8	4.07	4.1	3 3/16	1 3/4	1 3/4	1.44	4 9/64	7/8	4	5 1/4
4	10	1 1/4	6 3/16	7/16	4.57	4.6	3 3/8	1 7/8	1 7/8	1.44	4 41/64	15/16	4.5	5 3/4
5	11	1 3/8	7 5/16	7/16	5.66	5.69	3 7/8	2	2	1.69	5 45/64	15/16	5.56	7
6	12 1/2	1 7/16	8 1/2	1/2	6.72	6.75	3 7/8	2 1/16	2 1/16	1.81	6 3/4	1 1/16	6.63	8 1/8
8	15	1 5/8	10 5/8	1/2	8.72	8.75	4 3/8	2 7/16	2 7/16	2	8 3/4	1 1/4	8.63	10 1/4
10	17 1/2	1 7/8	12 3/4	1/2	10.88	10.92	4 5/8	2 5/8	3 3/4	2.19	10 51/64	1 5/16	10.75	12 5/8
12	20 1/2	2	15	1/2	12.88	12.92	5 1/8	2 7/8	4	2.38	12 61/64	1 9/16	12.75	14 3/4
14	23	2 1/8	16 1/4	1/2	14.14	14.18	5 5/8	3	4 3/8	2.5	14 3/16	1 5/8	14	16 3/4
16	25 1/2	2 1/4	18 1/2	1/2	16.16	16.19	5 3/4	3 1/4	4 3/4	2.69	16 3/16	1 3/4	16	19
18	28	2 3/8	21	1/2	18.18	18.2	6 1/4	3 1/2	5 1/8	2.75	18 3/16	1 15/16	18	21
20	30 1/2	2 1/2	23	1/2	20.2	20.25	6 3/8	3 3/4	5 1/2	2.88	20 3/16	2 1/8	20	23 1/8
22	33	2 5/8	25 1/4	1/2	22.22	22.25	6 1/2	4	5 3/4	3.13	—	2 3/8	22	25 1/4
24	36	2 3/4	27 1/4	1/2	24.25	24.25	6 5/8	4 3/16	6	3.25	24 3/16	2 1/2	24	27 5/8

DRILLING AND BOLTING

INCHES · BOLT AND STUD LENGTHS

NPS	BOLT CIRCLE	DIA. HOLES	NO. OF BOLTS	DIA. OF BOLTS	STUD 0.06" R.F.	STUD RING JOINT	HEX 0.06" R.F.
1/2	2 5/8	5/8	4	1/2	2.5	3	2.25
3/4	3 1/4	3/4	4	5/8	3	3.5	2.5
1	3 1/2	3/4	4	5/8	3	3.5	2.5
1 1/4	3 7/8	3/4	4	5/8	3.25	3.75	2.75
1 1/2	4 1/2	7/8	4	3/4	3.5	4	3
2	5	3/4	8	5/8	3.5	4	3
2 1/2	5 7/8	7/8	8	3/4	4	4.5	3.25
3	6 5/8	7/8	8	3/4	4.25	4.75	3.5
3 1/2	7 1/4	7/8	8	3/4	4.25	5	3.75
4	7 7/8	7/8	8	3/4	4.5	5	3.75
5	9 1/4	7/8	8	3/4	4.75	5.25	4.25
6	10 5/8	7/8	12	3/4	4.75	5.5	4.25
8	13	1	12	7/8	5.5	6	4.75
10	15 1/4	1 1/8	16	1	6.25	6.75	5.5
12	17 3/4	1 1/4	16	1 1/8	6.75	7.25	5.75
14	20 1/4	1 1/4	20	1 1/8	7	7.5	6.25
16	22 1/2	1 3/8	20	1 1/4	7.5	8	6.5
18	24 3/4	1 3/8	24	1 1/4	7.75	8.25	6.75
20	27	1 3/8	24	1 1/4	8	8.75	7.25
22	29 1/4	1 5/8	24	1 1/4	8.25	—	7.5
24	32	1 5/8	24	1 1/2	9	10	8

Bore B1, weld neck and socket, is to be specified by the purchaser.

02 CLASS 600

ASME B16.5 · NPS 1/2" TO 24" · 21 SIZES

FLANGE DIMENSIONS

INCHES

NPS	O.D. O	THK. C	R.F. DIA R	FILLET R	BORE B2 SLIP-ON	BORE B3 LAP JT.	HUB Y1 WELD NECK	HUB Y2 SLIP-ON	HUB Y3 LAP JT.	THREAD T	SOCKET D	HUB BEVEL A	HUB DIA X
1/2	3 3/4	9/16	1 3/8	1/8	0.88	0.9	2 1/16	7/8	7/8	0.63	3/8	0.84	1 1/2
3/4	4 5/8	5/8	1 11/16	1/8	1.09	1.11	2 1/4	1	1	0.63	7/16	1.05	1 7/8
1	4 7/8	11/16	2	1/8	1.36	1.38	2 7/16	1 1/16	1 1/16	0.69	1/2	1.32	2 1/8
1 1/4	5 1/4	13/16	2 1/2	3/16	1.7	1.72	2 5/8	1 1/8	1 1/8	0.81	9/16	1.66	2 1/2
1 1/2	6 1/8	7/8	2 7/8	1/4	1.95	1.97	2 3/4	1 1/4	1 1/4	0.88	5/8	1.9	2 3/4
2	6 1/2	1	3 5/8	5/16	2.44	2.46	2 7/8	1 7/16	1 7/16	1.13	11/16	2.38	3 5/16
2 1/2	7 1/2	1 1/8	4 1/8	5/16	2.94	2.97	3 1/8	1 5/8	1 5/8	1.25	3/4	2.88	3 15/16
3	8 1/4	1 1/4	5	3/8	3.57	3.6	3 1/4	1 13/16	1 13/16	1.38	13/16	3.5	4 5/8
3 1/2	9	1 3/8	5 1/2	3/8	4.07	4.1	3 3/8	1 15/16	1 15/16	1.56	7/8	4	5 1/4
4	10 3/4	1 1/2	6 3/16	7/16	4.57	4.6	4	2 1/8	2 1/8	1.63	15/16	4.5	6
5	13	1 3/4	7 5/16	7/16	5.66	5.69	4 1/2	2 3/8	2 3/8	1.88	15/16	5.56	7 7/16
6	14	1 7/8	8 1/2	1/2	6.72	6.75	4 5/8	2 5/8	2 5/8	2	1 1/16	6.63	8 3/4
8	16 1/2	2 3/16	10 5/8	1/2	8.72	8.75	5 1/4	3	3	2.25	1 1/4	8.63	10 3/4
10	20	2 1/2	12 3/4	1/2	10.88	10.92	6	3 3/8	4 3/8	2.56	1 5/16	10.75	13 1/2
12	22	2 5/8	15	1/2	12.88	12.92	6 1/8	3 5/8	4 5/8	2.75	1 9/16	12.75	15 3/4
14	23 1/4	2 3/4	16 1/4	1/2	14.14	14.18	6 1/2	3 11/16	5	2.88	1 5/8	14	17
16	27	3	18 1/2	1/2	16.16	16.19	7	4 3/16	5 1/2	3.06	1 3/4	16	19 1/2
18	29 1/4	3 1/4	21	1/2	18.18	18.2	7 1/4	4 5/8	6	3.13	1 15/16	18	21 1/2
20	32	3 1/2	23	1/2	20.2	20.25	7 1/2	5	6 1/2	3.25	2 1/8	20	24
22	34 1/4	3 3/4	25 1/4	1/2	22.22	24.25	7 3/4	5 1/4	6 7/8	—	2 3/8	22	26 1/4
24	37	4	27 1/4	1/2	24.25	24.25	8	5 1/2	7 1/4	3.63	2 1/2	24	28 1/4

DRILLING AND BOLTING

INCHES · BOLT AND STUD LENGTHS

NPS	BOLT CIRCLE	DIA. HOLES	NO. OF BOLTS	DIA. OF BOLTS	STUD 0.25" R.F.	STUD RING JOINT
1/2	2 5/8	5/8	4	1/2	3	3
3/4	3 1/4	3/4	4	5/8	3.5	3.5
1	3 1/2	3/4	4	5/8	3.5	3.5
1 1/4	3 7/8	3/4	4	5/8	3.75	3.75
1 1/2	4 1/2	7/8	4	3/4	4.25	4.25
2	5	3/4	8	5/8	4.25	4.25
2 1/2	5 7/8	7/8	8	3/4	4.75	4.75
3	6 5/8	7/8	8	3/4	5	5
3 1/2	7 1/4	1	8	7/8	5.5	5.5
4	8 1/2	1	8	7/8	5.75	5.75
5	10 1/2	1 1/8	8	1	6.5	6.5
6	11 1/2	1 1/8	12	1	6.75	6.75
8	13 3/4	1 1/4	12	1 1/8	7.5	7.75
10	17	1 3/8	16	1 1/4	8.5	8.5
12	19 1/4	1 3/8	20	1 1/4	8.75	8.75
14	20 3/4	1 1/2	20	1 3/8	9.25	9.25
16	23 3/4	1 5/8	20	1 1/2	10	10
18	25 3/4	1 3/4	20	1 5/8	10.75	10.75
20	28 1/2	1 3/4	24	1 5/8	11.25	11.5
22	30 5/8	1 7/8	24	1 5/8	—	—
24	33	2	24	1 7/8	13	13.25

Bore B1, weld neck and socket, is to be specified by the purchaser.

02 CLASS 900

ASME B16.5 • NPS 3" TO 24" • 12 SIZES

FLANGE DIMENSIONS

INCHES

NPS	O.D. O	THK. C	R.F. DIA R	FILLET R	BORE B2 SLIP-ON	BORE B3 LAP JT.	HUB Y1 WELD NECK	HUB Y2 SLIP-ON	HUB Y3 LAP JT.	THREAD T	HUB BEVEL A	HUB DIA X
3	9 1/2	1 1/2	5	3/8	3.57	3.6	4	2 1/8	2 1/8	1.63	3.5	5
4	11 1/2	1 3/4	6 3/16	7/16	4.57	4.6	4 1/2	2 3/4	2 3/4	1.88	4.5	6 1/4
5	13 3/4	2	7 5/16	7/16	5.66	5.69	5	3 1/8	3 1/8	2.13	5.56	7 1/2
6	15	2 3/16	8 1/2	1/2	6.72	6.75	5 1/2	3 3/8	3 3/8	2.25	6.63	9 1/4
8	18 1/2	2 1/2	10 5/8	1/2	8.72	8.75	6 3/8	4	4 1/2	2.5	8.63	11 3/4
10	21 1/2	2 3/4	12 3/4	1/2	10.88	10.92	7 1/4	4 1/4	5	2.81	10.75	14 1/2
12	24	3 1/8	15	1/2	12.88	12.92	7 7/8	4 5/8	5 5/8	3	12.75	16 1/2
14	25 1/4	3 3/8	16 1/4	1/2	14.14	14.18	8 3/8	5 1/8	6 1/8	3.25	14	17 3/4
16	27 3/4	3 1/2	18 1/2	1/2	16.16	16.19	8 1/2	5 1/4	6 1/2	3.38	16	20
18	31	4	21	1/2	18.18	18.2	9	6	7 1/2	3.5	18	22 1/4
20	33 3/4	4 1/4	23	1/2	20.2	20.25	9 3/4	6 1/4	8 1/4	3.63	20	24 1/2
24	41	5 1/2	27 1/4	1/2	24.25	24.25	11 1/2	8	10 1/2	4	24	29 1/2

DRILLING AND BOLTING

INCHES • BOLT AND STUD LENGTHS

NPS	BOLT CIRCLE	DIA. HOLES	NO. OF BOLTS	DIA. OF BOLTS	STUD 0.25" R.F.	STUD M&F / T&G	STUD RING JOINT
3	7 1/2	1	8	7/8	5.75	5.5	5.75
4	9 1/4	1 1/4	8	1 1/8	6.75	6.5	6.75
5	11	1 3/8	8	1 1/4	7.5	7.25	7.5
6	12 1/2	1 1/4	12	1 1/8	7.5	7.25	7.75
8	15 1/2	1 1/2	12	1 3/8	8.75	8.5	8.75
10	18 1/2	1 1/2	16	1 3/8	9.25	9	9.25
12	21	1 1/2	20	1 3/8	10	9.75	10
14	22	1 5/8	20	1 1/2	10.75	10.5	11
16	24 1/4	1 3/4	20	1 5/8	11.25	11	11.5
18	27	2	20	1 7/8	12.75	12.5	13.25
20	29 1/2	2 1/8	20	2	13.75	13.5	14.25
24	35 1/2	2 5/8	20	2 1/2	17.25	17	18

Sizes 1/2" through 2 1/2" are identical with Class 1500. Thickness and length through hub do not include the 1/4" raised face. See the Class 300 table for dimensions Q and D. Bore B1, weld neck and socket, is to be specified by the purchaser.

02 CLASS 1500

ASME B16.5 · NPS 1/2" TO 24" · 19 SIZES

FLANGE DIMENSIONS

INCHES

NPS	O.D. O	THK. C	R.F. DIA R	FILLET R	BORE B2 SLIP-ON	BORE B3 LAP JT.	HUB Y1 WELD NECK	HUB Y2 SLIP-ON	HUB Y3 LAP JT.	THREAD T	SOCKET D	HUB BEVEL A	HUB DIA X
1/2	4 3/4	7/8	1 3/8	1/8	0.88	0.9	2 3/8	1 1/4	1 1/4	0.88	3/8	0.84	1 1/2
3/4	5 1/8	1	1 11/16	1/8	1.09	1.11	2 3/4	1 3/8	1 3/8	1	7/16	1.05	1 3/4
1	5 7/8	1 1/8	2	1/8	1.36	1.38	2 7/8	1 5/8	1 5/8	1.13	1/2	1.32	2 1/16
1 1/4	6 1/4	1 1/8	2 1/2	3/16	1.7	1.72	2 7/8	1 5/8	1 5/8	1.19	9/16	1.66	2 1/2
1 1/2	7	1 1/4	2 7/8	1/4	1.95	1.97	3 1/4	1 3/4	1 3/4	1.25	5/8	1.9	2 3/4
2	8 1/2	1 1/2	3 5/8	5/16	2.44	2.46	4	2 1/4	2 1/4	1.5	11/16	2.38	4 1/8
2 1/2	9 5/8	1 5/8	4 1/8	5/16	2.94	2.97	4 1/8	2 1/2	2 1/2	1.88	3/4	2.88	4 7/8
3	10 1/2	1 7/8	5	3/8	3.57	3.6	4 5/8	2 7/8	2 7/8	2	13/16	3.5	5 1/4
4	12 1/4	2 1/8	6 3/16	7/16	4.57	4.6	4 7/8	3 9/16	3 9/16	2.25	15/16	4.5	6 3/8
5	14 3/4	2 7/8	7 5/16	7/16	5.66	5.69	6 1/8	4 1/8	4 1/8	2.5	15/16	5.56	7 3/4
6	15 1/2	3 1/4	8 1/2	1/2	6.72	6.75	6 3/4	4 11/16	4 11/16	2.75	1 1/16	6.63	9
8	19	3 5/8	10 5/8	1/2	8.72	8.75	8 3/8	5 5/8	5 5/8	3	1 1/4	8.63	11 1/2
10	23	4 1/4	12 3/4	1/2	10.88	10.92	10	6 1/4	7	3.31	1 5/16	10.75	14 1/2
12	26 1/2	4 7/8	15	1/2	12.88	12.92	11 1/8	7 1/8	8 5/8	3.63	1 9/16	12.75	17 3/4
14	29 1/2	5 1/4	16 1/4	1/2	14.14	14.18	11 3/4	—	9 1/2	—	1 5/8	14	19 1/2
16	32 1/2	5 3/4	18 1/2	1/2	16.16	16.19	12 1/4	—	10 1/4	—	1 3/4	16	21 3/4
18	36	6 3/8	21	1/2	18.18	18.2	12 7/8	—	10 7/8	—	1 15/16	18	23 1/2
20	38 3/4	7	23	1/2	20.2	20.25	14	—	11 1/2	—	2 1/8	20	25 1/4
24	46	8	27 1/4	1/2	24.25	24.25	16	—	13	—	2 1/2	24	30

DRILLING AND BOLTING

INCHES · BOLT AND STUD LENGTHS

NPS	BOLT CIRCLE	DIA. HOLES	NO. OF BOLTS	DIA. OF BOLTS	STUD 0.25" R.F.	STUD M&F / T&G	STUD RING JOINT
1/2	3 1/4	7/8	4	3/4	4.25	4	4.25
3/4	3 1/2	7/8	4	3/4	4.5	4.25	4.5
1	4	1	4	7/8	5	4.75	5
1 1/4	4 3/8	1	4	7/8	5	4.75	5
1 1/2	4 7/8	1 1/8	4	1	5.5	5.25	5.5
2	6 1/2	1	8	7/8	5.75	5.5	5.75
2 1/2	7 1/2	1 1/8	8	1	6.25	6	6.25
3	8	1 1/4	8	1 1/8	7	6.75	7
4	9 1/2	1 3/8	8	1 1/4	7.75	7.5	7.75
5	11 1/2	1 5/8	8	1 1/2	9.75	9.5	9.75
6	12 1/2	1 1/2	12	1 3/8	10.25	10	10.5
8	15 1/2	1 3/4	12	1 5/8	11.5	11.25	12.75
10	19	2	12	1 7/8	13.25	13	13.5
12	22 1/2	2 1/8	16	2	14.75	14.5	15.25
14	25	2 3/8	16	2 1/4	16	15.75	16.75
16	27 3/4	2 5/8	16	2 1/2	17.5	17.25	18.5
18	30 1/2	2 7/8	16	2 3/4	19.5	19.25	20.75
20	32 3/4	3 1/8	16	3	21.25	21	22.25
24	39	3 5/8	16	3 1/2	24.25	24	25.5

See the Class 300 table for dimensions Q and D. Bore B1, weld neck and socket, is to be specified by the purchaser.

02 CLASS 2500

ASME B16.5 · NPS 1/2" TO 12" · 14 SIZES

FLANGE DIMENSIONS

INCHES

NPS	O.D. O	THK. C	R.F. DIA R	FILLET R	BORE B2 SLIP-ON	BORE B3 LAP JT.	HUB Y1 WELD NECK	HUB Y2 SLIP-ON	HUB Y3 LAP JT.	THREAD T	HUB BEVEL A	HUB DIA X
1/2	5 1/4	1 3/16	1 3/8	1/8	0.88	0.9	2 7/8	1 9/16	1 9/16	1.13	0.84	1 11/16
3/4	5 1/2	1 1/4	1 11/16	1/8	1.09	1.11	3 1/8	1 11/16	1 11/16	1.25	1.05	2
1	6 1/4	1 3/8	2	1/8	1.36	1.38	3 1/2	1 7/8	1 7/8	1.38	1.32	2 1/4
1 1/4	7 1/4	1 1/2	2 1/2	3/16	1.7	1.72	3 3/4	2 1/16	2 1/16	1.5	1.66	2 7/8
1 1/2	8	1 3/4	2 7/8	1/4	1.95	1.97	4 3/8	2 3/8	2 3/8	1.75	1.9	3 1/8
2	9 1/4	2	3 5/8	5/16	2.44	2.46	5	2 3/4	2 3/4	2	2.38	3 3/4
2 1/2	10 1/2	2 1/4	4 1/8	5/16	2.94	2.97	5 5/8	3 1/8	3 1/8	2.25	2.88	4 1/2
3	12	2 5/8	5	3/8	3.57	3.6	6 5/8	3 5/8	3 5/8	2.5	3.5	5 1/4
4	14	3	6 3/16	7/16	4.57	4.6	7 1/2	4 1/4	4 1/4	2.75	4.5	6 1/2
5	16 1/2	3 5/8	7 5/16	7/16	5.66	5.69	9	5 1/8	5 1/8	3	5.56	8
6	19	4 1/4	8 1/2	1/2	6.72	6.75	10 3/4	6	6	3.25	6.63	9 1/4
8	21 3/4	5	10 5/8	1/2	8.72	8.75	12 1/2	7	7	3.75	8.63	12
10	26 1/2	6 1/2	12 3/4	1/2	10.88	10.92	16 1/2	9	9	4.25	10.75	14 3/4
12	30	7 1/4	15	1/2	12.88	12.92	18 1/4	10	10	4.75	12.75	17 3/8

DRILLING AND BOLTING

INCHES · BOLT AND STUD LENGTHS

NPS	BOLT CIRCLE	DIA. HOLES	NO. OF BOLTS	DIA. OF BOLTS	STUD 0.25" R.F.	STUD M&F / T&G	STUD RING JOINT
1/2	3 1/2	7/8	4	3/4	4.75	4.5	4.75
3/4	3 3/4	7/8	4	3/4	5	4.75	5
1	4 1/4	1	4	7/8	5.5	5.25	5.5
1 1/4	5 1/8	1 1/8	4	1	6	5.75	6
1 1/2	5 3/4	1 1/4	4	1 1/8	6.75	6.5	6.75
2	6 3/4	1 1/8	8	1	7	6.75	7
2 1/2	7 3/4	1 1/4	8	1 1/8	7.75	7.5	8
3	9	1 3/8	8	1 1/4	8.75	8.5	9
4	10 3/4	1 5/8	8	1 1/2	10	9.75	10.25
5	12 3/4	1 7/8	8	1 3/4	11.75	11.5	12.25
6	14 1/2	2 1/8	8	2	13.5	13.25	14
8	17 1/4	2 1/8	12	2	15	14.75	15.5
10	21 1/4	2 5/8	12	2 1/2	19.25	19	20
12	24 3/8	2 7/8	12	2 3/4	21.25	21	22

See the Class 300 table for dimensions Q and D. Bore B1, weld neck and socket, is to be specified by the purchaser.

03 CLASS 150 — SERIES A

MSS SP-44 · NPS 26" TO 60"

Above 24", flanges follow ASME B16.47 in two series: Series A to MSS SP-44 and Series B to API 605. Approximate welding neck flange weights are given in pounds.

NPS	O.D. O	THK. MIN. C	R.F. DIA R	HUB DIA X	HUB LENGTH Y	FILLET R	BOLT CIRCLE	DIA. HOLES	NO. OF HOLES	APPROX. WT. W.N.F. (LB)
26	34 1/4	2 11/16	29 1/2	26 5/8	4 3/4	3/8	31 3/4	1 3/8	24	300
28	36 1/2	2 13/16	31 1/2	28 5/8	4 15/16	7/16	34	1 3/8	28	345
30	38 3/4	2 15/16	33 3/4	30 3/4	5 3/8	7/16	36	1 3/8	28	400
32	41 3/4	3 3/16	36	32 3/4	5 11/16	7/16	38 1/2	1 5/8	28	505
34	43 3/4	3 1/4	38	34 3/4	5 7/8	1/2	40 1/2	1 5/8	32	540
36	46	3 9/16	40 1/4	36 3/4	6 3/16	1/2	42 3/4	1 5/8	32	640
38	48 3/4	3 7/16	42 1/4	39	6 3/16	1/2	45 1/4	1 5/8	32	720
40	50 3/4	3 9/16	44 1/4	41	6 7/16	1/2	47 1/4	1 5/8	36	775
42	53	3 13/16	47	43	6 3/4	1/2	49 1/2	1 5/8	36	890
44	55 1/4	4	49	45	7	1/2	51 3/4	1 5/8	40	990
46	57 1/4	4 1/16	51	47 1/8	7 5/16	1/2	53 3/4	1 5/8	40	1060
48	59 1/2	4 1/4	53 1/2	49 1/8	7 9/16	1/2	56	1 5/8	44	1185
50	61 3/4	4 3/8	55 1/2	51 1/4	8	1/2	58 1/4	1 7/8	44	1270
52	64	4 9/16	57 1/2	53 1/4	8 1/4	1/2	60 1/2	1 7/8	44	1410
54	66 1/4	4 3/4	59 1/2	55 1/4	8 1/2	1/2	62 3/4	1 7/8	44	1585
56	68 3/4	4 7/8	62	57 3/8	9	1/2	65	1 7/8	48	1760
58	71	5 1/16	64	59 3/8	9 1/4	1/2	67 1/4	1 7/8	48	1915
60	73	5 3/16	66	61 3/8	9 7/16	1/2	69 1/4	1 7/8	52	2045

Sizes 12" through 24" are identical to ANSI B16.5 except where a single taper hub is required. Bore B and hub diameter at bevel A are to be specified by the purchaser. SP-44 Class 150 blinds and welding neck flanges have the same thickness.

03 CLASS 150 — SERIES B

API 605 · NPS 26" TO 60"

NPS	O.D. O	THK. MIN. C	R.F. DIA R	HUB DIA X	HUB LENGTH Y	HUB BEVEL A	FILLET R	BOLT CIRCLE	DIA. HOLES	NO. OF HOLES	APPROX. WT. W.N.F. (LB)
26	30 15/16	1 5/8	28	26 15/16	3 1/2	26.06	3/8	29 5/16	7/8	36	120
28	32 15/16	1 3/4	30	28 15/16	3 3/4	28.06	3/8	31 5/16	7/8	40	140
30	34 15/16	1 3/4	32	31	3 15/16	30.06	3/8	33 5/16	7/8	44	150
32	37 1/16	1 13/16	34	33 1/16	4 1/4	32.06	3/8	35 7/16	7/8	48	170
34	39 9/16	1 15/16	36 1/4	35 1/8	4 11/32	34.06	3/8	37 11/16	1	40	210
36	41 5/8	2 1/16	38 1/4	37 3/16	4 5/8	36.06	3/8	39 3/4	1	44	240
38	44 1/4	2 1/8	40 1/4	39 1/4	4 7/8	38.13	3/8	42 1/8	1 1/8	40	290
40	46 1/4	2 3/16	42 1/2	41 5/16	5 1/16	40.13	3/8	44 1/8	1 1/8	44	310
42	48 1/4	2 5/16	44 1/2	43 3/8	5 1/4	42.13	7/16	46 1/8	1 1/8	48	345
44	50 1/4	2 3/8	46 1/2	45 3/8	5 3/8	44.13	7/16	48 1/8	1 1/8	52	370
46	52 13/16	2 7/16	48 5/8	47 7/16	5 11/16	46.13	7/16	50 9/16	1 1/4	40	435
48	54 13/16	2 9/16	50 3/4	49 1/2	5 7/8	48.13	7/16	52 9/16	1 1/4	44	480
50	56 13/16	2 11/16	52 3/4	51 1/2	6 1/16	50.13	7/16	54 9/16	1 1/4	48	520
52	58 13/16	2 3/4	54 3/4	53 9/16	6 3/16	52.13	7/16	56 9/16	1 1/4	52	550
54	61	2 13/16	56 3/4	55 5/8	6 3/8	54.13	7/16	58 3/4	1 1/4	56	620
56	63	2 7/8	58 3/4	57 11/16	6 9/16	56.13	9/16	60 3/4	1 1/4	60	650
58	65 15/16	2 15/16	60 3/4	59 11/16	6 7/8	58.13	9/16	63 7/16	1 3/8	48	780
60	67 15/16	3	63	61 13/16	7 1/16	60.13	9/16	65 7/16	1 3/8	52	850

Sizes 12" through 24" are identical to ANSI B16.5 except where a single taper hub is required. Bore B is to be specified by the purchaser.

03 CLASS 300 — SERIES B

API 605 • NPS 26" TO 60"

NPS	O.D. 0	THK. C WELD NECK	THK. C BLIND	R.F. DIA R	HUB DIA X	HUB LENGTH Y	HUB BEVEL A	FILLET R	BOLT CIRCLE	DIA. HOLES	NO. OF HOLES	APPROX. WT. W.N.F. (LB)
26	34.12	3.5	3.5	29	27.62	5.69	26.19	0.56	31.62	1.38	32	400
28	36.25	3.5	3.5	31	29.75	5.88	28.19	0.56	33.75	1.38	36	450
30	39	3.69	3.69	33.25	32	6.22	30.25	0.56	36.25	1.5	36	550
32	41.5	4.06	4.06	35.5	34	6.62	32.25	0.62	38.5	1.62	32	685
34	43.62	4.06	4.06	37.5	36.12	6.81	34.25	0.62	40.62	1.62	36	750
36	46.12	4.06	4.06	39.75	38	7.12	36.25	0.62	42.88	1.75	32	840
38	48.12	4.38	4.38	41.75	40	7.56	38.25	0.62	44.88	1.75	36	915
40	50.12	4.56	4.56	43.88	42	7.81	40.25	0.62	46.88	1.75	40	990
42	52.5	4.69	4.69	46	44	8.06	42.31	0.62	49	1.88	36	1135
44	54.5	5	5	48	46.19	8.44	44.31	0.62	51	1.88	40	1235
46	57.5	5.06	5.12	50	48.38	8.75	46.31	0.62	53.75	2	36	1470
48	59.5	5.06	5.31	52.25	50.31	8.81	48.31	0.62	55.75	2	40	1575
50	61.5	5.44	5.5	54.25	52.38	9.25	50.31	0.62	57.75	2	44	1710
52	63.5	5.62	5.68	56.25	54.44	9.56	52.31	0.62	59.75	2	48	1840
54	65.88	5.38	5.88	58.25	56.5	9.44	54.31	0.62	62.12	2	48	1980
56	69.5	6.06	6.18	60.5	58.81	10.56	56.31	0.69	65	2.38	36	2595
58	71.94	6.06	6.38	62.75	60.94	10.81	58.31	0.69	67.44	2.38	40	2770
60	73.94	5.94	6.56	65	62.94	10.69	60.31	0.69	69.44	2.38	40	2870

Bore B is to be specified by the purchaser.

03 CLASS 600 — SERIES A AND B

MSS SP-44 AND API 605 · NPS 26" TO 60"

SERIES A (MSS SP-44)

NPS 26" TO 36"

NPS	O.D. Ø	THK. C WELD NECK	THK. C BLIND	R.F. DIA R	HUB DIA X	HUB LENGTH Y	HUB BEVEL A	FILLET R	BOLT CIRCLE	DIA. HOLES	NO. OF HOLES	APPROX. WT. W.N.F. (LB)
26	40	4.25	4.94	29.5	29.44	8.75	26	0.5	36	2	28	940
28	42.25	4.38	5.19	31.5	31.62	9.25	28	0.5	38	2.12	28	1060
30	44.5	4.5	5.5	33.75	33.94	9.75	30	0.5	42.5	2.12	28	1210
32	47	4.62	5.81	36	36.12	10.25	32	0.5	42.5	2.38	28	1375
34	49	4.75	6.06	38	38.31	10.62	34	0.56	44.5	2.38	28	1540
36	51.75	4.88	6.38	40.25	40.62	11.12	36	0.56	47	2.62	28	1705

SERIES B (API 605)

NPS 26" TO 36"

NPS	O.D. Ø	THK. C WELD NECK	THK. C BLIND	R.F. DIA R	HUB DIA X	HUB LENGTH Y	HUB BEVEL A	FILLET R	BOLT CIRCLE	DIA. HOLES	NO. OF HOLES	APPROX. WT. W.N.F. (LB)
26	35	4.38	4.35	28.62	27.5	7.12	26	0.5	31.75	1.75	28	550
28	37.5	4.56	4.56	30.88	29.62	7.5	28	0.5	34	1.88	28	650
30	40.25	4.94	5	33.12	31.75	8.06	30	0.5	36.5	2	28	810
32	42.75	5.12	5.31	35.25	33.88	8.5	32	0.5	38.75	2.12	28	950
34	45.75	5.56	5.68	37.5	36	9.19	34	0.56	41.5	2.38	24	1205
36	47.75	5.75	5.94	39.75	38.12	9.56	36	0.56	43.5	2.38	28	1340

SERIES A AND SERIES B

NPS 38" TO 60"

NPS	O.D. Ø	THK. C WELD NECK	THK. C BLIND	R.F. DIA R	HUB DIA X	HUB LENGTH Y	HUB BEVEL A	FILLET R	BOLT CIRCLE	DIA. HOLES	NO. OF HOLES	APPROX. WT. W.N.F. (LB)
38	50	6	6.12	41.5	40.25	10	38	0.56	45.75	2.38	28	1470
40	52	6.25	6.38	43.75	42.25	10.38	40	0.56	47.75	2.38	32	1630
42	55.25	6.62	6.75	46	44.38	11	42	0.56	50.5	2.62	28	2030
44	57.25	6.81	7	48.25	46.5	11.38	44	0.56	52.5	2.62	32	2160
46	59.5	7.06	7.31	50.25	48.62	11.81	46	0.56	54.75	2.62	32	2410
48	62.75	7.44	7.69	52.5	50.75	12.44	48	0.56	57.5	2.88	32	2855
50	65.75	7.75	8	54.5	52.88	12.94	50	0.56	60	3.12	28	3330
52	67.75	8	8.25	56.5	54.88	13.25	52	0.56	62	3.12	32	3560
54	70	8.25	8.56	58.75	57	13.75	54	0.56	64.25	3.12	32	3920
56	73	8.56	8.88	60.75	59.12	14.25	56	0.62	66.75	3.38	32	4280
58	75	8.75	9.12	63	61.12	14.56	58	0.62	68.75	3.38	32	4640
60	78.5	9.19	9.56	65.25	63.38	15.31	60	0.69	71.75	3.62	28	5000

Bore B is to be specified by the purchaser.

04 LONG WELDING NECK FLANGES

CLASS 150 AND CLASS 300

CLASS 150

NPS AND BORE J • 20 SIZES

NPS AND BORE J	O.D. O	MIN. FLANGE THK. Q	MIN. WALL THK.	HUB DIA. AT WELD H	HUB LENGTH Y	R.F. DIA R	NO. OF HOLES	DIA. HOLES	DIA. BOLTS	BOLT CIRCLE	APPROX. WT. (LB)
0.5	3.5	0.44	0.36	1.25	9	1.38	4	0.62	0.5	2.38	8
0.75	3.88	0.5	0.38	1.62	9	1.69	4	0.62	0.5	2.75	8
1	4.25	0.56	0.5	2	9	2	4	0.62	0.5	3.12	8
1.25	4.62	0.62	0.56	2.38	9	2.5	4	0.62	0.5	3.5	10
1.5	5	0.69	0.56	2.62	9	2.88	4	0.62	0.5	3.88	12
2	6	0.75	0.62	3.25	9	3.62	4	0.75	0.62	4.75	16
2.5	7	0.88	0.62	3.75	9	4.12	4	0.75	0.62	5.5	21
3	7.5	0.94	0.62	4.25	9	5	4	0.75	0.62	6	24
3.5	8.5	0.94	0.69	4.88	9	5.5	8	0.75	0.62	7	31
4	9	0.94	0.75	5.5	12	6.19	8	0.75	0.62	7.5	47
5	10	0.94	0.75	6.5	12	7.31	8	0.88	0.75	8.5	57
6	11	1	0.88	7.75	12	8.5	8	0.88	0.75	9.5	77
8	13.5	1.12	0.88	9.75	12	10.62	8	0.88	0.75	11.75	103
10	16	1.19	1	12	12	12.75	12	1	0.88	14.25	150
12	19	1.25	1.19	14.38	12	15	12	1	0.88	17	215
14	21	1.38	1	16	12	16.25	12	1.12	1	18.75	221
16	23.5	1.44	1	18	12	18.5	16	1.12	1	21.25	254
18	25	1.56	1	20	12	21	16	1.25	1.12	22.75	278
20	27.5	1.69	1	22	12	23	20	1.25	1.12	25	324
24	32	1.88	1.12	26.25	12	27.25	20	1.38	1.25	29.5	439

CLASS 300

NPS AND BORE J • 20 SIZES

NPS AND BORE J	O.D. O	MIN. FLANGE THK. Q	MIN. WALL THK.	HUB DIA. AT WELD H	HUB LENGTH Y	R.F. DIA R	NO. OF HOLES	DIA. HOLES	DIA. BOLTS	BOLT CIRCLE	APPROX. WT. (LB)
0.5	3.75	0.56	0.5	1.5	9	1.38	4	0.62	0.5	2.62	10
0.75	4.62	0.62	0.56	1.88	9	1.69	4	0.75	0.62	3.25	10
1	4.88	0.69	0.56	2.12	9	2	4	0.75	0.62	3.5	10
1.25	5.25	0.75	0.62	2.5	9	2.5	4	0.75	0.62	3.88	14
1.5	6.12	0.81	0.62	2.75	9	2.88	4	0.88	0.75	4.5	17
2	6.5	0.88	0.62	3.25	9	3.62	8	0.75	0.62	5	19
2.5	7.5	1	0.72	3.94	9	4.12	8	0.88	0.75	5.88	28
3	8.25	1.12	0.81	4.62	9	5	8	0.88	0.75	6.62	36
3.5	9	1.19	0.88	5.25	9	5.5	8	0.88	0.75	7.25	45
4	10	1.25	0.88	5.75	12	6.19	8	0.88	0.75	7.88	54
5	11	1.38	1	7	12	7.31	8	0.88	0.75	9.25	86
6	12.5	1.44	1.06	8.12	12	8.5	12	0.88	0.75	10.62	108
8	15	1.62	1.12	10.25	12	10.62	12	1	0.88	13	150
10	17.5	1.88	1.31	12.62	12	12.75	16	1.12	1	15.25	218
12	20.5	2	1.38	14.75	12	15	16	1.25	1.12	17.75	289
14	23	2.12	1.38	16.75	12	16.25	20	1.25	1.12	20.25	342
16	25.5	2.25	1.5	19	12	18.5	20	1.38	1.25	22.5	426
18	28	2.38	1.5	21	12	21	24	1.38	1.25	24.75	493
20	30.5	2.5	1.56	23.12	12	23	24	1.38	1.25	27	575
24	36	2.75	1.81	27.62	12	27.25	24	1.62	1.5	32	823

04 LONG WELDING NECK FLANGES

CLASS 600

CLASS 600

NPS AND BORE J • 14 SIZES

NPS AND BORE J	O.D. O	MIN. FLANGE THK. Q	MIN. WALL THK.	HUB DIA. AT WELD H	HUB LENGTH Y	R.F. DIA R	NO. OF HOLES	DIA. HOLES	DIA. BOLTS	BOLT CIRCLE	APPROX. WT. (LB)
0.5	3.75	0.56	0.5	1.5	9	1.38	4	0.62	0.5	2.62	11
0.75	4.62	0.62	0.56	1.88	9	1.69	4	0.75	0.62	3.25	11
1	4.88	0.69	0.56	2.12	9	2	4	0.75	0.62	3.5	11
1.25	5.25	0.81	0.62	2.5	9	2.5	4	0.75	0.62	3.88	14
1.5	6.12	0.88	0.62	2.75	9	2.88	4	0.88	0.75	4.5	17
2	6.5	1	0.62	3.25	9	3.62	8	0.75	0.62	5	21
2.5	7.5	1.12	0.72	3.94	9	4.12	8	0.88	0.75	5.88	29
3	8.25	1.25	0.81	4.62	9	5	8	0.88	0.75	6.62	38
3.5	9	1.38	0.88	5.25	9	5.5	8	1	0.88	7.25	48
4	10.75	1.5	1	6	12	6.19	8	1	0.88	8.5	80
5	13	1.75	1.25	7.5	12	7.31	8	1.12	1	10.5	128
6	14	1.88	1.38	8.75	12	8.5	12	1.12	1	11.5	158
8	16.5	2.19	1.38	10.75	12	10.62	12	1.25	1.12	13.75	215
10	20	2.5	1.75	13.5	12	12.75	16	1.38	1.25	17	339

RING TYPE JOINT • CLASS 600

GROOVE DIMENSIONS • 15 SIZES

NPS	GROOVE NUMBER	PITCH DIA. P	GROOVE DEPTH E	GROOVE WIDTH F	RADIUS AT BOTTOM R MAX	SPECIAL OVAL RING HEIGHT W
1	R16	2	0.25	0.344	0.03	1
1.5	R20	2.688	0.25	0.344	0.03	1
2	R23	3.25	0.312	0.469	0.03	1.06
2.5	R26	4	0.312	0.469	0.03	1.06
3	R31	4.875	0.312	0.469	0.03	1.06
4	R37	5.875	0.312	0.469	0.03	1.06
6	R45	8.312	0.312	0.469	0.03	1.06
8	R49	10.625	0.312	0.469	0.03	1.06
10	R53	12.75	0.312	0.469	0.03	1.06
12	R57	15	0.312	0.469	0.03	1.06
14	R61	16.5	0.312	0.469	0.03	1.06
16	R65	18.5	0.312	0.469	0.03	1.19
18	R69	21	0.312	0.469	0.03	1.19
20	R73	23	0.375	0.531	0.6	1.25
24	R77	27.25	0.438	0.656	0.6	1.44

Ring joint pitch diameter P and depth of groove vary with the flange pressure rating and are given in the class tables.

05 ORIFICE FLANGES — CLASS 300

ANSI B16.36 • WELDING NECK, SLIP-ON AND THREADED • NPS 1" TO 24"

NPS	O.D. O	THK. MIN. C	R.F. DIA R	HUB Y2 SLIP-ON / THD.	HUB Y1 WELD NECK	HUB DIA X	HUB CHAMFER A	CBORE BACK QB	CBORE FACE QF	CBORE DEPTH F	CBORE DEPTH G	BORE B2 SLIP-ON	PRESS. CONN. TT	BOLT CIRCLE	NO. OF HOLES	DIA. HOLES	DIA. BOLTS	MACHINE BOLT LENGTH	STUD BOLT LENGTH
1	4.88	1.5	2	1.88	3.25	2.12	1.32	1.41	1.3	1.44	0.75	1.36	—	3.5	4	0.69	0.62	4.5	5
1.5	6.12	1.5	2.88	1.88	3.38	2.75	1.9	1.99	1.89	1.47	0.72	1.95	—	4.5	4	0.81	0.75	4.75	5.25
2	6.5	1.5	3.62	1.94	3.38	3.31	2.38	2.5	2.36	1.5	0.69	2.44	—	5	8	0.69	0.62	4.5	5
2.5	7.5	1.5	4.12	2	3.5	3.94	2.88	3	2.84	1.75	0.56	2.94	—	5.88	8	0.81	0.75	4.75	5.25
3	8.25	1.5	5	2.06	3.5	4.62	3.5	3.63	3.46	1.81	0.56	3.57	—	6.62	8	0.81	0.75	4.75	5.25
4	10	1.5	6.19	2.12	3.62	5.75	4.5	4.63	4.45	1.88	0.56	4.57	—	7.88	8	0.81	0.75	4.75	5.25
6	12.5	1.5	8.5	2.12	3.94	8.12	6.63	6.75	6.57	1.88	0.31	6.72	—	10.62	12	0.88	0.75	4.75	5.25
8	15	1.62	10.62	2.44	4.38	10.25	8.63	8.75	8.55	2.19	0.44	8.72	—	13	12	1	0.88	5	5.75
10	17.5	1.88	12.75	2.62	4.62	12.62	10.75	—	—	10.88	0.5	—	—	15.25	16	1.12	1	5.75	6.5
12	20.5	2	15	2.88	5.12	14.75	12.75	—	—	12.88	0.5	—	—	17.75	16	1.25	1.12	6.25	7
14	23	2.12	16.25	3	5.62	16.75	14	—	—	14.14	0.5	—	—	20.25	20	1.25	1.12	6.5	7.25
16	25.5	2.25	18.5	3.25	5.75	19	16	—	—	16.16	0.5	—	—	22.5	20	1.38	1.25	7	7.75
18	28	2.38	21	3.5	6.25	21	18	—	—	18.18	0.5	—	—	24.75	24	1.38	1.25	7.25	8
20	30.5	2.5	23	3.75	6.38	23.12	20	—	—	20.2	0.5	—	—	27	24	1.38	1.25	7.5	8.5
24	36	2.75	27.25	4.19	6.62	27.62	24	—	—	24.25	0.5	—	—	32	24	1.62	1.5	8.25	9.5

Dimensions are in accordance with ASME/ANSI B16.5. Bolt lengths include an allowance for orifice and gasket thickness of 0.25 in. for NPS 1–12 and 0.38 in. for NPS 14–24; stud bolt lengths do not include point heights. Bore of weld neck flanges is to be specified by the purchaser. Threaded flanges are furnished in NPS 1–8 only, and counterbore dimensions are given for those sizes only.

05 ORIFICE FLANGES — CLASS 600

ANSI B16.36 • WELDING NECK • NPS 1" TO 24"

NPS	O.D. O	THK. MIN. C	R.F. DIA R	HUB LENGTH Y	R.F. HEIGHT H	HUB DIA X	HUB CHAMFER A	PRESS. CONN. TT	BOLT CIRCLE	NO. OF HOLES	DIA. HOLES R.F.	DIA. HOLES R.J.	DIA. BOLTS	STUD LENGTH R.F.	STUD LENGTH R.J.
1	4.88	1.5	2	3.25	0.06	2.12	1.32	0.25	3.5	4	0.69	0.75	0.62	5	5.5
1.5	6.12	1.5	2.88	3.38	0.06	2.75	1.9	0.25	4.5	4	0.88	0.88	0.75	5.25	5.5
2	6.5	1.5	3.62	3.38	0.06	3.31	2.38	0.25	5	8	0.75	0.75	0.62	5	5.5
2.5	7.5	1.5	4.12	3.5	0.06	3.94	2.88	0.25	5.88	8	0.88	0.88	0.75	5.25	5.75
3	8.25	1.5	5	3.5	0.06	4.62	3.5	0.38	6.62	8	0.88	0.88	0.75	5.25	5.75
4	10.75	1.5	6.19	4	0.25	6	4.5	0.5	8.5	8	1	1	0.88	6	6.5
6	14	1.88	8.5	4.62	0.25	8.75	6.63	0.5	11.5	12	1.12	1.12	1	7	7.5
8	16.5	2.19	10.62	5.25	0.25	10.75	8.63	0.5	13.75	12	1.25	1.25	1.12	7.75	8.25
10	20	2.5	12.75	6	0.25	13.5	10.75	0.5	17	16	1.38	1.38	1.25	8.75	9.25
12	22	2.62	15	6.12	0.25	15.75	12.75	0.5	19.25	20	1.38	1.38	1.25	9	9.5
14	23.75	2.75	16.25	6.5	0.25	17	14	0.5	20.75	20	1.5	1.5	1.38	9.5	10
16	27	3	18.5	7	0.25	19.5	16	0.5	23.75	20	1.62	1.62	1.5	10.25	10.75
18	29.25	3.25	21	7.25	0.25	21.5	18	0.5	25.75	20	1.75	1.75	1.62	11	11.5
20	32	3.5	23	7.5	0.25	24	20	0.5	28.5	24	1.75	1.75	1.62	11.75	12.5
24	37	4	27.25	8	0.25	28.25	24	0.5	33	24	2	2	1.88	13.25	13.75

Other NPT sizes may be furnished if required. Weld neck flanges NPS 3" and smaller are identical to Class 300 flanges except for bolting and may be used for such service. All other dimensions are in accordance with ASME/ANSI B16.5. The 0.06 in. height of raised face in NPS 1–3 is included in dimensions C and Y. Bolt lengths for raised face flanges include an allowance for orifice and gasket thickness of 0.25 in. for NPS 1–10, 0.75 in. for NPS 12–18 and 0.88 in. for NPS 20; stud bolt lengths do not include point heights. Bore is to be specified by the purchaser. Ring joint flanges in NPS 24" require an angular meter tap.

06 DIMENSIONS FOR FLANGE FACINGS

INCHES · NPS 1/2" TO 24"

Outside diameter — A raised face, large male, large tongue, and pipe lap · B small male · C small tongue · D large female, large groove · E small female · F small groove. Inside diameter — G large tongue and small tongue · H large groove and small groove.

NPS	A	B	C	D	E	F	G	H
0.5	1.38	0.72	1.38	1.44	0.78	1.44	1	0.94
0.75	1.69	0.94	1.69	1.75	1	1.75	1.31	1.25
1	2	1.19	1.88	2.06	1.25	1.94	1.5	1.44
1.25	2.5	1.5	2.25	2.56	1.56	2.31	1.88	1.81
1.5	2.88	1.75	2.5	2.94	1.81	2.56	2.12	2.06
2	3.62	2.25	3.25	3.69	2.31	3.31	2.88	2.81
2.5	4.12	2.69	3.75	4.19	2.75	3.81	3.38	3.31
3.00*	5	3.31	4.62	5.06	3.38	4.69	4.25	4.19
3.5	5.5	3.81	5.12	5.56	3.88	5.19	4.75	4.69
4	6.19	4.31	5.69	6.25	4.38	5.75	5.19	5.12
5	7.31	5.38	6.81	7.38	5.44	6.88	6.31	6.25
6.00*	8.5	6.38	8	8.56	6.44	8.06	7.5	7.44
8.00*	10.62	8.38	10	10.69	8.44	10.06	9.38	9.31
10	12.75	10.5	12	12.81	10.56	12.06	11.25	11.19
12	15	12.5	14.25	15.06	12.56	14.31	13.5	13.44
14	16.25	13.75	15.5	16.31	13.81	15.56	14.75	14.69
16	18.5	15.75	17.62	18.56	15.81	17.69	16.75	16.69
18	21	17.75	20.12	21.06	17.81	20.19	19.25	19.19
20	23	19.75	22	23.06	19.81	22.06	21	20.94
24	27.25	23.75	26.25	27.31	23.81	26.31	25.25	25.19

Finish. Raised face, male, female or tongue face. Groove face: grooves over 1" in width as above, 1" wide or less a smooth finish. Ring joint, smooth finish. A tolerance of $\pm 0.02"$ is allowed on inside and outside diameter on all facings.

A 0.06" raised face is standard for Class 150 and 300 welding neck, slip-on, screwed and blind flanges, and is included in the flange thickness. A 0.25" raised face is standard for Class 400 and heavier, and is not included. Large female and large groove Class 150 in NPS 3", 6" and 8" are full faced to the outside diameter of the flange.

07 MATERIAL GROUPS

ANSI B16.5 • 24 GROUPS

Maximum working pressure in pounds per square inch, by material group and metal temperature. The rating tables that follow use the group number.

GROUP	MATERIAL	GROUP	MATERIAL
1.1	Carbon steel	2.3	Type 304L, Type 316L
1.2	Carbon steel	2.4	Type 321
1.3	Carbon steel	2.5	Types 347, 348
1.4	Carbon steel	2.6	Type 309
1.5	C-1/2 Mo	2.7	Type 310
1.7	1/2 Cr-1/2 Mo, Ni-Cr-Mo	3.1	Cr-Fe-Mo-Cu-Cb (20Cb)
1.9	1 1/4 Cr-1/2 Mo	3.2	Nickel alloy 200
1.1	2 1/4 Cr-1 Mo	3.4	Ni-Cu alloys 400, 405
1.13	5 Cr-1/2 Mo	3.5	Ni-Cr-Fe alloy 600
1.14	9 Cr-1 Mo	3.6	Ni-Fe-Cr alloy 800
2.1	Type 304	3.7	Ni-Mo alloy B2
2.2	Type 316	3.8	Nickel alloys

Where a cell is blank in the rating tables, no figure is given in the source tables. It does not mean the material is unrated at that temperature. Confirm the rating for your material and service at quotation.

07 FLANGE RATINGS — CLASS 150

WORKING PRESSURE, P.S.I. · 14 TEMPERATURES × 24 MATERIAL GROUPS

GROUP 1 MATERIALS

CARBON STEEL, MO AND CR-MO ALLOYS

TEMP. °F	1.1	1.2	1.3	1.4	1.5	1.7	1.9	1.1	1.13	1.14
-20 to 100	285	290	265	235	265	—	290	—	—	—
200	260	260	250	215	—	—	260	—	—	—
300	230	230	230	210	—	—	230	—	—	—
400	—	—	—	—	—	200	—	—	—	—
500	—	—	—	—	—	170	—	—	—	—
600	—	—	—	—	—	140	—	—	—	—
650	—	—	—	—	—	125	—	—	—	—
700	—	—	—	—	—	110	—	—	—	—
750	—	—	—	—	—	95	—	—	—	—
800	—	—	—	—	—	80	—	—	—	—
850	—	—	—	—	—	65	—	—	—	—
900	—	—	—	—	—	50	—	—	—	—
950	—	—	—	—	—	35	—	—	—	—
1000	—	—	—	—	—	20	—	—	—	—

GROUP 2 AND 3 MATERIALS

STAINLESS STEELS AND NICKEL ALLOYS

TEMP. °F	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.1	3.2	3.4	3.5	3.6	3.7	3.8
-20 to 100	275	275	230	275	275	260	260	230	140	230	275	275	290	290
200	235	240	195	235	245	230	230	215	140	200	260	255	260	260
300	205	215	175	210	225	220	220	200	140	190	230	230	230	230
400	180	195	160	190	—	200	—	—	140	185	—	200	200	—
500	170	170	145	—	—	170	—	—	140	—	—	170	—	—
600	140	140	140	—	—	140	—	—	140	—	—	140	—	—
650	125	125	125	—	—	125	—	—	—	—	—	125	—	—
700	110	110	110	—	—	110	—	—	—	—	—	110	—	—
750	95	95	95	—	—	95	—	—	—	—	—	95	—	—
800	80	80	80	—	—	80	—	—	—	—	—	80	—	—
850	65	65	65	—	—	65	—	—	—	—	—	—	—	—
900	50	50	—	—	—	50	—	—	—	—	—	—	—	—
950	35	35	—	—	—	35	—	—	—	—	—	—	—	—
1000	20	20	—	—	—	20	—	—	—	—	—	—	—	—

07 FLANGE RATINGS — CLASS 300

WORKING PRESSURE, P.S.I. · 24 TEMPERATURES × 24 MATERIAL GROUPS

GROUP 1 MATERIALS

CARBON STEEL, MO AND CR-MO ALLOYS

TEMP. °F	1.1	1.2	1.3	1.4	1.5	1.7	1.9	1.1	1.13	1.14
-20 to 100	740	750	695	620	695	750	750	750	750	750
200	675	750	655	560	680	750	710	715	750	750
300	655	730	640	550	655	730	675	675	730	730
400	635	705	620	530	640	705	660	650	705	705
500	600	665	585	500	620	665	640	640	665	665
600	550	605	535	455	—	—	605	605	—	—
650	535	590	525	450	—	—	590	590	—	—
700	535	570	520	450	—	—	570	570	—	—
750	505	505	475	445	—	—	530	530	—	—
800	410	410	390	370	—	—	510	510	500	510
850	—	270	—	—	—	—	485	485	440	485
900	—	170	—	—	—	—	450	450	355	450
950	—	105	—	—	280	345	380	380	260	370
1000	—	50	—	—	165	215	225	270	190	290
1050	—	—	—	—	—	190	140	200	140	190
1100	—	—	—	—	—	—	95	115	105	115
1150	—	—	—	—	—	—	50	105	70	75
1200	—	—	—	—	—	—	35	55	45	50
1250	—	—	—	—	—	—	—	—	—	—
1300	—	—	—	—	—	—	—	—	—	—
1350	—	—	—	—	—	—	—	—	—	—
1400	—	—	—	—	—	—	—	—	—	—
1450	—	—	—	—	—	—	—	—	—	—
1500	—	—	—	—	—	—	—	—	—	—

GROUP 2 AND 3 MATERIALS

STAINLESS STEELS AND NICKEL ALLOYS

TEMP. °F	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.1	3.2	3.4	3.5	3.6	3.7	3.8
-20 to 100	720	720	600	720	720	670	670	600	360	600	720	720	750	750
200	600	620	505	610	635	605	605	555	360	530	670	660	750	750
300	530	560	455	545	590	570	570	525	360	495	640	625	730	730
400	470	515	415	495	555	535	535	—	—	480	615	600	705	705
500	435	480	380	460	520	505	505	—	—	480	595	580	665	665
600	415	450	360	435	490	480	480	—	—	480	575	575	605	605
650	410	445	350	430	480	465	465	—	—	480	565	570	590	590
700	405	430	345	420	470	455	455	—	—	480	555	565	570	570
750	400	425	335	415	460	445	445	—	—	470	530	530	530	530
800	395	415	330	415	455	435	435	—	—	460	510	505	510	510
850	390	405	320	410	445	425	425	—	—	—	—	—	—	—
900	385	395	—	405	430	415	415	—	—	—	—	—	—	—
950	375	385	—	385	385	385	385	—	—	—	—	—	—	—
1000	325	365	—	355	365	335	350	—	—	—	—	—	—	—
1050	310	360	—	345	360	290	335	—	—	—	—	—	—	—
1100	260	325	—	300	325	225	290	—	—	—	—	—	—	—
1150	195	275	—	235	275	170	245	—	—	—	—	—	—	—
1200	155	205	—	180	170	130	205	—	—	—	—	—	—	—
1250	110	180	—	140	125	100	160	—	—	—	—	—	—	—
1300	85	140	—	105	95	80	120	—	—	—	—	—	—	—
1350	60	105	—	80	70	60	80	—	—	—	—	—	—	—
1400	50	75	—	60	50	45	55	—	—	—	—	—	—	—
1450	35	60	—	50	40	30	40	—	—	—	—	—	—	—
1500	25	40	—	40	35	25	25	—	—	—	—	—	—	—

07 FLANGE RATINGS — CLASS 600

WORKING PRESSURE, P.S.I. · 24 TEMPERATURES × 24 MATERIAL GROUPS

GROUP 1 MATERIALS

CARBON STEEL, MO AND CR-MO ALLOYS

TEMP. °F	1.1	1.2	1.3	1.4	1.5	1.7	1.9	1.1	1.13	1.14
-20 to 100	1480	1500	1390	1235	1390	1500	1500	1500	1500	1500
200	1350	1500	1315	1125	1360	1500	1425	1430	1500	1500
300	1315	1455	1275	1095	1305	1455	1345	1355	1455	1455
400	1270	1410	1235	1060	1280	1410	1315	1295	1410	1410
500	1200	1330	1165	995	1245	1330	1285	1280	1330	1330
600	1095	1210	1065	915	—	—	1210	1210	—	—
650	1075	1175	1045	895	—	—	1175	1175	—	—
700	1065	1135	1035	895	—	—	1135	1135	—	—
750	1010	1010	945	885	—	—	1065	1065	—	—
800	825	825	780	740	—	—	1015	1015	995	1015
850	—	535	—	—	—	—	975	975	880	975
900	—	345	—	—	—	—	900	900	705	900
950	—	205	—	—	560	685	755	755	520	740
1000	—	105	—	—	330	425	445	535	385	585
1050	—	—	—	—	—	380	275	400	280	380
1100	—	—	—	—	—	—	190	225	205	225
1150	—	—	—	—	—	—	105	205	140	150
1200	—	—	—	—	—	—	70	110	90	105
1250	—	—	—	—	—	—	—	—	—	—
1300	—	—	—	—	—	—	—	—	—	—
1350	—	—	—	—	—	—	—	—	—	—
1400	—	—	—	—	—	—	—	—	—	—
1450	—	—	—	—	—	—	—	—	—	—
1500	—	—	—	—	—	—	—	—	—	—

GROUP 2 AND 3 MATERIALS

STAINLESS STEELS AND NICKEL ALLOYS

TEMP. °F	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.1	3.2	3.4	3.5	3.6	3.7	3.8
-20 to 100	1440	1440	1200	1440	1440	1345	1345	1200	720	1200	1440	1440	1500	1500
200	1200	1240	1015	1220	1270	1210	1210	1115	720	1055	1345	1325	1500	1500
300	1055	1120	910	1090	1175	1140	1140	1045	720	990	1275	1250	1455	1455
400	940	1030	825	990	1110	1065	1065	—	720	955	1230	1200	1410	1410
500	875	955	765	915	1035	1010	1010	—	720	950	1185	1155	1330	1330
600	830	905	720	875	985	955	955	—	720	950	1145	1145	1210	1210
650	815	890	700	855	960	930	930	—	—	950	1130	1140	1175	1175
700	805	865	685	840	935	910	910	—	—	950	1115	1130	1135	1135
750	795	845	670	830	920	895	895	—	—	935	—	1065	1065	—
800	790	830	660	825	910	870	870	—	—	915	—	1015	1015	—
850	780	810	645	815	890	850	850	—	—	—	—	—	—	—
900	770	790	—	810	865	830	830	—	—	—	—	—	—	—
950	750	775	—	775	775	775	775	—	—	—	—	—	—	—
1000	645	725	—	715	725	670	700	—	—	—	—	—	—	—
1050	620	720	—	695	720	585	665	—	—	—	—	—	—	—
1100	515	645	—	605	645	445	585	—	—	—	—	—	—	—
1150	390	550	—	475	550	345	495	—	—	—	—	—	—	—
1200	310	410	—	365	345	260	410	—	—	—	—	—	—	—
1250	220	365	—	280	245	200	325	—	—	—	—	—	—	—
1300	165	275	—	210	185	160	240	—	—	—	—	—	—	—
1350	125	205	—	165	135	115	160	—	—	—	—	—	—	—
1400	90	150	—	125	105	90	110	—	—	—	—	—	—	—
1450	70	115	—	95	80	60	75	—	—	—	—	—	—	—
1500	50	85	—	75	70	50	50	—	—	—	—	—	—	—

07 FLANGE RATINGS — CLASS 900

WORKING PRESSURE, P.S.I. · 24 TEMPERATURES × 24 MATERIAL GROUPS

GROUP 1 MATERIALS

CARBON STEEL, MO AND CR-MO ALLOYS

TEMP. °F	1.1	1.2	1.3	1.4	1.5	1.7	1.9	1.1	1.13	1.14
-20 to 100	2220	2250	2085	1850	2085	2250	2250	2250	2250	2250
200	2025	2250	1970	1685	2035	2250	2135	2150	2250	2250
300	1970	2185	1915	1640	1955	2185	2020	2030	2185	2185
400	1900	2115	1850	1585	1920	2115	1975	1945	2115	2115
500	1795	1995	1745	1495	1865	1995	1925	1920	1995	1995
600	1640	1815	1600	1370	—	—	1815	1815	—	—
650	1610	1765	1570	1345	—	—	1765	1765	—	—
700	1600	1705	1555	1345	—	—	1705	1705	—	—
750	1510	1510	1420	1325	—	—	1595	1595	—	—
800	1235	1235	1175	1110	—	—	1525	1525	1490	1525
850	—	805	—	—	—	—	1460	1460	1315	1460
900	—	515	—	—	—	—	1350	1350	1060	1350
950	—	310	—	—	845	1030	1130	1130	780	1110
1000	—	155	—	—	495	640	670	805	575	875
1050	—	—	—	—	—	565	410	595	420	565
1100	—	—	—	—	—	—	290	340	310	340
1150	—	—	—	—	—	—	155	310	205	225
1200	—	—	—	—	—	—	105	165	135	155
1250	—	—	—	—	—	—	—	—	—	—
1300	—	—	—	—	—	—	—	—	—	—
1350	—	—	—	—	—	—	—	—	—	—
1400	—	—	—	—	—	—	—	—	—	—
1450	—	—	—	—	—	—	—	—	—	—
1500	—	—	—	—	—	—	—	—	—	—

GROUP 2 AND 3 MATERIALS

STAINLESS STEELS AND NICKEL ALLOYS

TEMP. °F	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.1	3.2	3.4	3.5	3.6	3.7	3.8
-20 to 100	2160	2160	1800	2160	2160	2015	2015	1800	1080	1800	2160	2160	2250	2250
200	1800	1860	1520	1830	1910	1815	1815	1670	1080	1585	2015	1990	2250	2250
300	1585	1680	1360	1635	1765	1705	1705	1570	1080	1485	1915	1870	2185	2185
400	1410	1540	1240	1485	1665	1600	1600	—	1080	1435	1845	1800	2115	2115
500	1310	1435	1145	1375	1555	1510	1510	—	1080	1435	1780	1735	1995	1995
600	1245	1355	1080	1310	1475	1435	1435	—	1080	1435	1720	1720	1815	1815
650	1225	1330	1050	1280	1440	1395	1395	—	—	1435	1690	1705	1765	1765
700	1210	1295	1030	1260	1405	1370	1370	—	—	1435	1670	1690	1705	1705
750	1195	1270	1010	1245	1385	1340	1340	—	—	1405	—	1595	1595	—
800	1180	1245	985	1240	1370	1305	1305	—	—	1375	—	1520	1520	—
850	1165	1215	965	1225	1330	1275	1275	—	—	—	—	—	—	—
900	1150	1180	—	1215	1295	1245	1245	—	—	—	—	—	—	—
950	1125	1160	—	1160	1160	1160	1160	—	—	—	—	—	—	—
1000	965	1090	—	1070	1090	1010	1050	—	—	—	—	—	—	—
1050	925	1080	—	1040	1080	875	1000	—	—	—	—	—	—	—
1100	770	965	—	905	965	670	875	—	—	—	—	—	—	—
1150	585	825	—	710	825	515	740	—	—	—	—	—	—	—
1200	465	620	—	545	515	390	620	—	—	—	—	—	—	—
1250	330	545	—	420	370	300	485	—	—	—	—	—	—	—
1300	245	410	—	320	280	235	360	—	—	—	—	—	—	—
1350	185	310	—	245	205	175	235	—	—	—	—	—	—	—
1400	145	225	—	185	155	135	165	—	—	—	—	—	—	—
1450	105	175	—	145	125	95	115	—	—	—	—	—	—	—
1500	70	125	—	115	105	70	70	—	—	—	—	—	—	—

07 FLANGE RATINGS — CLASS 1500

WORKING PRESSURE, P.S.I. · 24 TEMPERATURES × 24 MATERIAL GROUPS

GROUP 1 MATERIALS

CARBON STEEL, MO AND CR-MO ALLOYS

TEMP. °F	1.1	1.2	1.3	1.4	1.5	1.7	1.9	1.1	1.13	1.14
-20 to 100	3705	3750	3470	3085	3470	3750	3750	3750	3750	3750
200	3375	3750	3280	2810	3395	3750	3560	3580	3750	3750
300	3280	3640	3190	2735	3260	3640	3365	3385	3640	3640
400	3170	3530	3085	2645	3200	3530	3290	3240	3530	3530
500	2995	3325	2910	2490	3105	3325	3210	3200	3325	3325
600	2735	3025	2665	2285	—	—	3025	3025	—	—
650	2685	2940	2615	2245	—	—	2940	2940	—	—
700	2665	2840	2590	2245	—	—	2840	2840	—	—
750	2520	2520	2365	2210	—	—	2660	2660	—	—
800	2060	2060	1955	1850	—	—	2540	2540	2485	2540
850	—	1340	—	—	—	—	2435	2435	2195	2435
900	—	860	—	—	—	—	2245	2245	1765	2245
950	—	515	—	—	1405	1715	1885	1885	1305	1850
1000	—	260	—	—	825	1065	1115	1340	960	1460
1050	—	—	—	—	—	945	685	995	705	945
1100	—	—	—	—	—	—	480	565	515	565
1150	—	—	—	—	—	—	260	515	345	380
1200	—	—	—	—	—	—	170	275	225	260
1250	—	—	—	—	—	—	—	—	—	—
1300	—	—	—	—	—	—	—	—	—	—
1350	—	—	—	—	—	—	—	—	—	—
1400	—	—	—	—	—	—	—	—	—	—
1450	—	—	—	—	—	—	—	—	—	—
1500	—	—	—	—	—	—	—	—	—	—

GROUP 2 AND 3 MATERIALS

STAINLESS STEELS AND NICKEL ALLOYS

TEMP. °F	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.1	3.2	3.4	3.5	3.6	3.7	3.8
-20 to 100	3600	3600	3000	3600	3600	3360	3360	3000	1800	3000	3600	3600	3750	3750
200	3000	3095	2530	3050	3180	3025	3025	2785	1800	2640	3360	3310	3750	3750
300	2640	2795	2270	2725	2940	2845	2845	2615	1800	2470	3190	3120	3640	3640
400	2350	2570	2065	2470	2770	2665	2665	—	1800	2390	3070	3000	3530	3530
500	2185	2390	1910	2290	2590	2520	2520	—	1800	2375	2965	2890	3325	3325
600	2075	2255	1800	2185	2460	2390	2390	—	1800	2375	2870	2870	3025	3025
650	2040	2220	1750	2135	2400	2330	2330	—	—	2375	2820	2845	2940	2940
700	2015	2160	1715	2100	2340	2280	2280	—	—	2375	2785	2820	2840	2840
750	1990	2110	1680	2075	2305	2230	2230	—	—	2340	2660	2650	2660	2660
800	1970	2075	1645	2065	2280	2170	2170	—	—	2290	2540	2535	2540	2540
850	1945	2030	1610	2040	2220	2125	2125	—	—	—	—	—	—	—
900	1920	1970	—	2030	2160	2075	2075	—	—	—	—	—	—	—
950	1870	1930	—	1930	1930	1930	1930	—	—	—	—	—	—	—
1000	1610	1820	—	1785	1820	1680	1750	—	—	—	—	—	—	—
1050	1545	1800	—	1730	1800	1460	1665	—	—	—	—	—	—	—
1100	1285	1610	—	1510	1610	1115	1460	—	—	—	—	—	—	—
1150	980	1370	—	1185	1370	860	1235	—	—	—	—	—	—	—
1200	770	1030	—	910	855	650	1030	—	—	—	—	—	—	—
1250	550	910	—	705	615	495	805	—	—	—	—	—	—	—
1300	410	685	—	530	465	395	600	—	—	—	—	—	—	—
1350	310	515	—	410	345	290	395	—	—	—	—	—	—	—
1400	240	380	—	310	255	225	275	—	—	—	—	—	—	—
1450	170	290	—	240	205	155	190	—	—	—	—	—	—	—
1500	120	205	—	190	170	120	120	—	—	—	—	—	—	—

07 FLANGE RATINGS — CLASS 2500

WORKING PRESSURE, P.S.I. · 24 TEMPERATURES × 24 MATERIAL GROUPS

GROUP 1 MATERIALS

CARBON STEEL, MO AND CR-MO ALLOYS

TEMP. °F	1.1	1.2	1.3	1.4	1.5	1.7	1.9	1.1	1.13	1.14
-20 to 100	6170	6250	5785	5145	5785	6250	6250	6250	6250	6250
200	5625	6250	5470	4680	5660	6250	5930	5965	6250	6250
300	5470	6070	5315	4560	5435	6070	5605	5640	6070	6070
400	5280	5880	5145	4405	5330	5880	5485	5400	5880	5880
500	4990	5540	4850	4150	5180	5540	5350	5330	5540	5540
600	4560	5040	4440	3805	—	—	5040	5040	—	—
650	4475	4905	4355	3740	—	—	4905	4905	—	—
700	4440	4730	4320	3740	—	—	4730	4730	—	—
750	4200	4200	3945	3685	—	—	4430	4430	—	—
800	3430	3430	3260	3085	—	—	4230	4230	4145	4230
850	—	2230	—	—	—	—	4060	4060	3660	4060
900	—	1430	—	—	—	—	3745	3745	2945	3745
950	—	860	—	—	2345	2860	3145	3145	2170	3085
1000	—	430	—	—	1370	1770	1860	2230	1600	2430
1050	—	—	—	—	—	1570	1145	1660	1170	1570
1100	—	—	—	—	—	—	800	945	860	945
1150	—	—	—	—	—	—	430	860	570	630
1200	—	—	—	—	—	—	285	460	370	430
1250	—	—	—	—	—	—	—	—	—	—
1300	—	—	—	—	—	—	—	—	—	—
1350	—	—	—	—	—	—	—	—	—	—
1400	—	—	—	—	—	—	—	—	—	—
1450	—	—	—	—	—	—	—	—	—	—
1500	—	—	—	—	—	—	—	—	—	—

GROUP 2 AND 3 MATERIALS

STAINLESS STEELS AND NICKEL ALLOYS

TEMP. °F	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.1	3.2	3.4	3.5	3.6	3.7	3.8
-20 to 100	6000	6000	5000	6000	6000	5600	5600	5000	3000	5000	6000	6000	6250	6250
200	5000	5160	4220	5080	5300	5040	5040	4640	3000	4400	5600	5520	6250	6250
300	4400	4660	3780	4540	4900	4740	4740	4360	3000	4120	5320	5200	6070	6070
400	3920	4280	3440	4120	4620	4440	4440	—	3000	3980	5120	5000	5880	5880
500	3640	3980	3180	3820	4320	4200	4200	—	3000	3960	4940	4820	5540	5540
600	3460	3760	3000	3640	4100	3980	3980	—	3000	3960	4780	4780	5040	5040
650	3400	3700	2920	3560	4000	3880	3880	—	—	3960	4700	4740	4905	4905
700	3360	3600	2860	3500	3900	3800	3800	—	—	3960	4640	4700	4730	4730
750	3320	3520	2800	3460	3840	3720	3720	—	—	3000	—	4430	4430	—
800	3280	3460	2740	3440	3800	3620	3620	—	—	3820	—	4230	4230	—
850	3240	3380	2680	3400	3700	3540	3540	—	—	—	—	—	—	—
900	3200	3280	—	3380	3600	3460	3460	—	—	—	—	—	—	—
950	3120	3220	—	3220	3220	3220	3220	—	—	—	—	—	—	—
1000	2685	3030	—	2970	3030	2800	2915	—	—	—	—	—	—	—
1050	2570	3000	—	2885	3000	2430	2770	—	—	—	—	—	—	—
1100	2145	2685	—	2515	2685	1860	2430	—	—	—	—	—	—	—
1150	1630	2285	—	1970	2285	1430	2060	—	—	—	—	—	—	—
1200	1285	1715	—	1515	1430	1085	1715	—	—	—	—	—	—	—
1250	915	1515	—	1170	1030	830	1345	—	—	—	—	—	—	—
1300	685	1145	—	885	770	660	1000	—	—	—	—	—	—	—
1350	515	860	—	685	570	485	660	—	—	—	—	—	—	—
1400	400	630	—	515	430	370	460	—	—	—	—	—	—	—
1450	285	485	—	400	345	260	315	—	—	—	—	—	—	—
1500	200	345	—	315	285	200	200	—	—	—	—	—	—	—

07 FLANGE RATINGS — MSS SP-44 AND API 605

WORKING PRESSURE, P.S.I.

TABLE 1-A — PLANT PIPING AND PRESSURE VESSEL FLANGES

CLASS 75 TO CLASS 900

METAL TEMP. °F	CLASS 75	CLASS 150	CLASS 300	CLASS 400	CLASS 600	CLASS 900
75	150	300	400	600	900	
100	140	285	740	990	1480	2220
200	130	260	675	900	1350	2025
300	115	230	655	875	1315	1970
400	100	200	635	845	1270	1900
500	85	170	600	800	1200	1795
600	70	140	550	730	1095	1640
650	60	125	535	715	1075	1610
700	—	110	535	710	1065	1600
750	—	95	505	670	1010	1510
800	—	80	410	550	825	1235
850	—	65	270	355	535	805
900	—	50	170	230	345	515
950	—	35	105	140	205	310
1000c	—	20	50	70	105	155

TABLE 1-B — PIPE LINE FLANGES

CLASS 300 TO CLASS 900

METAL TEMP. °F	CLASS 300	CLASS 400	CLASS 600	CLASS 900
300	400	600	900	
100	740	990	1480	2220
250	740	990	1480	2220
300	715	955	1430	2145
350	690	925	1380	2070
400	665	890	1330	2000
450	640	860	1285	1925

Pressure in pounds per square inch gauge. Based on the pressure-temperature ratings in ANSI B16.5 (1977), for use with flanges designed in accordance with the ASME code or ANSI B31.3. 1000°F is the maximum service temperature for Classes 150 through 900. These ratings meet the requirements set out in ANSI B31.4 and B31.8.

08 APPROXIMATE WEIGHTS

CLASS 150 TO 2500 • NPS 1/2" TO 24" • POUNDS EACH

CLASS	NPS	WELD NECK	SLIP-ON, THREADED, SOCKET WELD	LAP JOINT	BLIND
Class 150	1/2	2	1	1	1
Class 150	3/4	2	2	2	2
Class 150	1	3	2	2	2
Class 150	1 1/4	3	3	3	3
Class 150	1 1/2	4	3	3	3
Class 150	2	6	5	5	5
Class 150	2 1/2	8	7	7	7
Class 150	3	12	11	11	9
Class 150	3 1/2	12	11	11	13
Class 150	4	15	13	13	17
Class 150	5	19	15	15	20
Class 150	6	24	19	19	26
Class 150	8	39	30	30	45
Class 150	10	52	43	43	70
Class 150	12	80	64	64	110
Class 150	14	110	90	105	140
Class 150	16	140	98	140	180
Class 150	18	150	130	160	220
Class 150	20	180	165	195	285
Class 150	22	225	185	245	355
Class 150	24	260	220	275	430
Class 300	1/2	2	2	2	2
Class 300	3/4	3	3	3	3
Class 300	1	4	3	3	3
Class 300	1 1/4	5	4	4	4
Class 300	1 1/2	7	6	6	6
Class 300	2	9	7	7	8
Class 300	2 1/2	12	10	10	12
Class 300	3	15	13	13	16
Class 300	3 1/2	18	17	17	21
Class 300	4	25	22	22	27
Class 300	5	32	28	28	35

CLASS	NPS	WELD NECK	SLIP-ON, THREADED, SOCKET WELD	LAP JOINT	BLIND
Class 300	6	42	39	39	50
Class 300	8	67	58	58	81
Class 300	10	91	81	91	124
Class 300	12	140	115	140	185
Class 300	14	180	165	190	250
Class 300	16	250	190	250	295
Class 300	18	320	250	295	395
Class 300	20	400	315	370	505
Class 300	22	465	370	435	640
Class 300	24	580	475	550	790
Class 600	1/2	2	2	2	2
Class 600	3/4	4	3	3	3
Class 600	1	4	4	4	4
Class 600	1 1/4	6	5	5	5
Class 600	1 1/2	8	7	7	7
Class 600	2	12	9	9	10
Class 600	2 1/2	18	13	12	15
Class 600	3	23	16	15	20
Class 600	3 1/2	26	21	20	29
Class 600	4	42	37	36	41
Class 600	5	68	63	61	68
Class 600	6	81	80	78	86
Class 600	8	120	115	110	140
Class 600	10	190	170	170	230
Class 600	12	225	200	200	295
Class 600	14	280	230	250	355
Class 600	16	390	330	365	495
Class 600	18	475	400	435	630
Class 600	20	590	510	570	810
Class 600	22	720	590	670	1000
Class 600	24	830	730	810	1250
Class 900	1/2	2	2	2	2

Weights are approximate, in pounds each, and are given for estimating shipping and handling. Confirm at quotation.

08 APPROXIMATE WEIGHTS

CLASS 150 TO 2500 • NPS 1/2" TO 24" • POUNDS EACH

CLASS	NPS	WELD NECK	SLIP-ON, THREADED, SOCKET WELD	LAP JOINT	BLIND
Class 900	3/4	4	3	3	3
Class 900	1	4	4	4	4
Class 900	1 1/4	6	5	5	5
Class 900	1 1/2	8	7	7	7
Class 900	2	12	9	9	10
Class 900	2 1/2	18	13	12	15
Class 900	3	31	26	25	29
Class 900	3 1/2	44	41	40	43
Class 900	4	53	53	51	54
Class 900	5	86	83	81	87
Class 900	6	110	110	105	115
Class 900	8	175	170	190	200
Class 900	10	260	245	275	290
Class 900	12	325	325	370	415
Class 900	14	400	400	415	520
Class 900	16	495	425	465	600
Class 900	18	680	600	650	850
Class 900	20	830	730	810	1075
Class 900	22	1212	1108	1227	1612
Class 900	24	1500	1400	1550	2025
Class 1500	1/2	5	4	4	4
Class 1500	3/4	6	5	5	6
Class 1500	1	9	8	8	8
Class 1500	1 1/4	10	9	9	9
Class 1500	1 1/2	13	12	12	13
Class 1500	2	25	25	25	25
Class 1500	2 1/2	36	36	35	35
Class 1500	3	48	48	47	48
Class 1500	3 1/2	63	63	63	63
Class 1500	4	73	73	75	73
Class 1500	5	130	130	140	140
Class 1500	6	165	165	170	160

CLASS	NPS	WELD NECK	SLIP-ON, THREADED, SOCKET WELD	LAP JOINT	BLIND
Class 1500	8	275	260	285	300
Class 1500	10	455	435	485	510
Class 1500	12	690	580	630	690
Class 1500	14	940	—	890	975
Class 1500	16	1250	—	1150	1300
Class 1500	18	1625	—	1475	1750
Class 1500	20	2050	—	1775	2225
Class 1500	22	2795	—	2392	3042
Class 1500	24	3325	—	2825	3625
Class 2500	1/2	7	7	7	7
Class 2500	3/4	8	8	8	8
Class 2500	1	12	11	11	11
Class 2500	1 1/4	17	16	16	17
Class 2500	1 1/2	25	22	22	23
Class 2500	2	42	38	37	39
Class 2500	2 1/2	52	55	53	56
Class 2500	3	94	83	80	86
Class 2500	3 1/2	124	108	104	115
Class 2500	4	145	125	120	135
Class 2500	5	245	210	205	225
Class 2500	6	380	325	315	345
Class 2500	8	580	485	470	530
Class 2500	10	1075	930	900	1025
Class 2500	12	1525	1100	1100	1300
Class 2500	14	—	—	—	—
Class 2500	16	—	—	—	—
Class 2500	18	—	—	—	—
Class 2500	20	—	—	—	—
Class 2500	22	—	—	—	27
Class 2500	24	—	—	—	—

09 DIMENSIONAL TOLERANCES

THREADED, SLIP-ON, LAP JOINT AND BLIND FLANGES

DIMENSION	CONDITION	TOLERANCE
Outside diameter*	When O.D. is 24" or less	$\pm 1/16"$
Outside diameter*	When O.D. is over 24"	$\pm 1/8"$
Inside diameter*	Threaded	Within limits on boring gauge
Inside diameter*	Slip-on and lap joint, 10" and smaller	$+1/32"$, $-0"$
Inside diameter*	12" and larger	$+1/16"$, $-0"$
Diameter of counterbore	Same as for inside diameter	—
Diameter of contact face	1/16" raised face	$\pm 1/32"$
Diameter of contact face	1/4" raised face tongue and groove, or male and female	$\pm 1/64"$
Outside diameter of hub*	12" and smaller	$+3/32"$, $-1/16"$
Outside diameter of hub*	14" and larger	$\pm 1/8"$
Drilling	Bolt circle	$\pm 1/16"$
Drilling	Bolt hole spacing	$\pm 1/32"$
Eccentricity of bolt circle and facing (with respect to bore*)	2 1/2" and smaller	1/32" max.
Eccentricity of bolt circle and facing (with respect to bore*)	3" and larger	1/16" max.
Length through hub*	18" and smaller	$+1/8"$ $-1/32"$
Length through hub*	20" and larger	$+3/16"$ $-1/16"$
Thickness	18" and smaller	$+1/8"$ $-0"$
Thickness	20" and larger	$+3/16"$ $-0"$

* Tolerances for these dimensions are not covered by ASME B16.5.

09 DIMENSIONAL TOLERANCES

WELDING NECK FLANGES

DIMENSION	CONDITION	TOLERANCE
Outside diameter*	When O.D. is 24" or less	$\pm 1/16"$
Outside diameter*	When O.D. is over 24"	$\pm 1/8"$
Inside diameter*	10" and smaller	$\pm 1/32"$
Inside diameter*	12" through 18"	$\pm 1/16"$
Inside diameter*	20" and larger	$+1/8" -1/16"$
Diameter of contact face	1/16" raised face	$\pm 1/32"$
Diameter of contact face	1/4" raised face tongue and groove, or male and female	$\pm 1/64"$
Diameter of hub at point of welding	5" and smaller	$+3/32", -1/32"$
Diameter of hub at point of welding	6" and larger	$+5/32", -1/32"$
Welding bevel standards	See drawings	—
Diameter of hub at base*	When hub base is 24" or less	$\pm 1/16"$
Diameter of hub at base*	When hub base is over 24"	$\pm 1/8"$
Drilling	Bolt circle	$\pm 1/16"$
Drilling	Bolt hole spacing	$\pm 1/32"$
Eccentricity of bolt circle and facing (with respect to bore*)	2 1/2" and smaller	1/32" max.
Eccentricity of bolt circle and facing (with respect to bore*)	3" and larger	1/16" max.
Length through hub*	10" and smaller	$\pm 1/16"$
Length through hub*	12" and larger	$\pm 1/8"$
Thickness	18" and smaller	$+1/8" -0"$
Thickness	20" and larger	$+3/16" -0"$

* Tolerances for these dimensions are not covered by ASME B16.5.

NOT LISTED?

Specifications can be customised at your request. Send the class, size, facing and material and we will quote it.