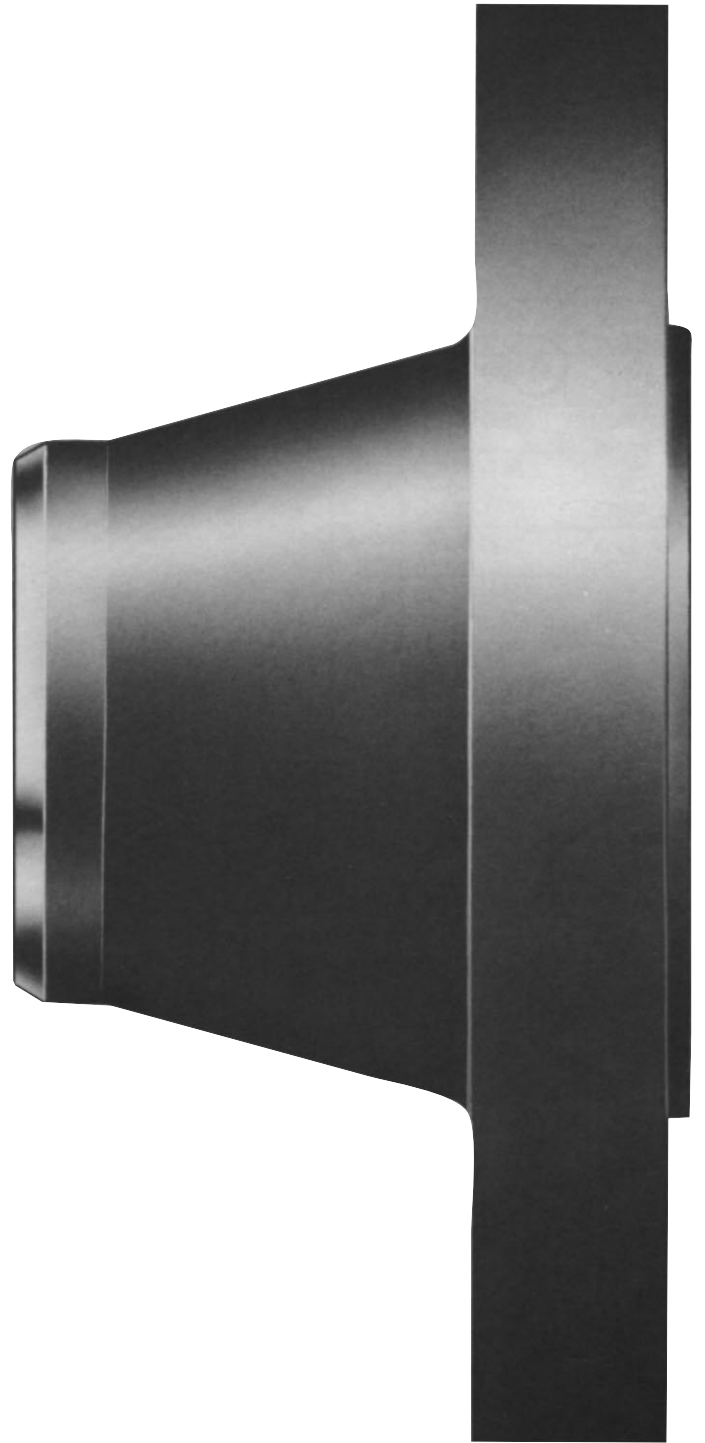
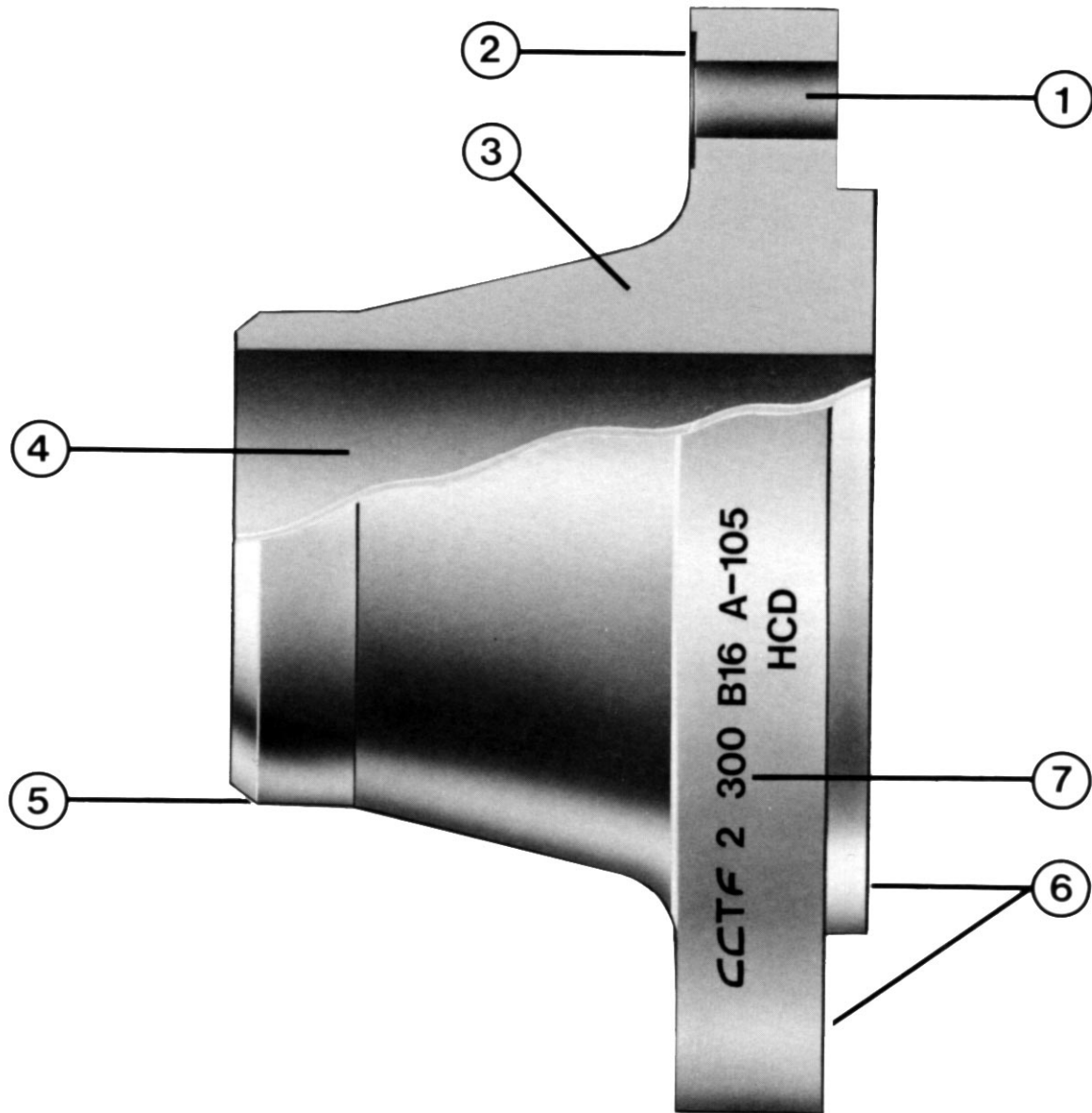


CSSTA

FORGED STEEL FLANGES





1. Holes accurately drilled for ease of assembly.
2. Spot facing ensures seating of fasteners true and square.
3. Grain flow controlled for maximum strength.
4. Smooth accurate bore for unrestricted flow.
5. Machined bevel and land facilitate good welding.
6. All faces machined within tolerances to ensure true alignment.
7. Full identification of size, pressure class, material and heat code.

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FLANGE TYPES, FACINGS AND FINISHES

ANSI FLANGES

Most forged steel flanges correspond to the requirements of the American Standards Association (ASME/ANSI Standard B16.5) and the ASTM Specification A-105.

The following types are manufactured and stocked:

Welding Neck flanges, available in all pressure ratings and sizes, are butt-welded to the end of the pipe, and are usually specified when service conditions are severe and excellent workmanship necessary. Since the inside diameter of the flange must match that of the pipe, the flange bore should be specified in ordering.

Slip-on flanges, also available in most pressure ratings and sizes, are a popular type due to their ease of application. This flange slips over the end of the pipe and is usually set so that the flange face is about .375" (9.5mm) beyond the end of the pipe. This permits double-welding of the flange - one strength fillet weld to join the hub of the flange to the pipe, and a seal fillet weld inside the flange at the end of the pipe. Where operating conditions permit, the seal weld is omitted.

Slip-on flanges are most frequently used at lower pressure - Class 150 (PN 20) or Class 300 (PN 50) primary service pressure ratings. Many pipe designers are reluctant to use slip-ons for higher pressures, since (1) the joint between the flange and pipe is not as strong as in the welding neck type; and (2) the junction of the flange and pipe is more susceptible to corrosion.

Screwed or Threaded flanges are attached to the pipe like any other screwed fittings, and may be back-welded to seal the joint between pipe and flange. Although still available in most sizes and pressure ratings, screwed fittings today are used almost exclusively in smaller pipe sizes and at low pressures.

Lap Joint or Van Stone flanges are used on piping equipped with lap joint stub ends or with lapped pipe. They may be used at all pressures and are available in a full size range. These flanges slip over the pipe, and are not welded or otherwise fastened to it; bolting pressure is transmitted to the gasket by the pressure of the flange against the back of the pipe lap.

Lap Joint flanges have certain special advantages: (1) freedom to swivel around the pipe facilitates the lining up of opposing flange bolt holes; (2) lack of contact with the fluid in the pipe often permits the use of inexpensive carbon steel flanges with corrosion resistant pipe or tubing; (3) in systems which erode or corrode quickly, the flanges may be salvaged for re-use.

Socket-welding flanges contain a recess in the back of the flange to receive the end of the pipe, which is attached by a fillet weld around the hub of the flange. Since socket-welding connections are not as strong as butt-welded joints, the use of this type of flange is almost always confined to NPS 4 (DN 100) and smaller sizes, and to the lower pressure ratings. Its chief advantage lies in the ease of preparation and installation.

Blind flanges, available in all sizes and pressure ratings, are solid forgings used to close off the end of a piping system and to gain easy access to the interior of the line.

Reducing flanges are available. Refer to page 18.

FLANGE FACINGS

Unless otherwise specified, Class 150 (PN 20) and Class 300 (PN 50) flanges in all types except lap joint (or Van Stone) flanges are furnished with a .06" (1.6mm) raised face (which is included in the flange thickness dimension). Heavier pressure ratings are machined with a .25" (6.4 mm) raised face, in addition to the designated flange thickness.

When so ordered, these flange types can be furnished with a variety of other facings, such as male and female, ring joint, tongue and groove, etc.

Lap Joint flanges are machined with a flat face and a fillet radius to accommodate the stub end or pipe lap.

FLANGE FINISHES

The finish of contact faces of pipe flanges and connecting end flanges of fittings shall be judged by visual comparison with AARH Standards and not by instruments having stylus tracers and electronic amplification (see ANSI/ASME B46.1)

The finishes required are given below. Other finishes may be furnished upon application.

RAISED FACE AND LARGE MALE AND FEMALE: Either a serrated-concentric or serrated-spiral finish having from 45 to 55 grooves per inch (0.6 to 1mm pitch) shall be used. The cutting tool employed shall have an approximate 0.06" (1.6mm) or larger radius. The resultant surface shall have a 125 to 250 microinch roughness.

TONGUE AND GROOVE AND SMALL MALE AND FEMALE: The gasket contact shall not exceed 125 microinch roughness.

RING JOINT: The side wall surface of gasket groove shall not exceed 63 microinch roughness.

OTHER TYPES

In addition to the ANSI flanges, the following types are carried in stock:

Orifice flanges are used for measuring fluid flow in piping systems. Their design conforms to the recommendations of the American Gas Association's Committee on Gas Measurement. Commonly furnished as either welding neck or slip-on type, they may also be ordered as screwed flanges. Orifice unions are available in Class 300 (PN 50) and heavier pressure ratings.

Each Orifice flange is equipped with two radially-drilled, tapped holes for metering, and with jack-screws to facilitate separation of the joint for removal of the orifice metering plate. Orifice flanges, unless otherwise specified, are furnished in pairs as a flange union, complete with bolts, nuts and jack-screws - but without the orifice plate. Gaskets are supplied with raised face flange unions, but not for ring-joint faced flanges, which use an integral gasket and orifice plate.

Light Weight Slip-on flanges, drilled to Class 125 ANSI Standards but of lighter construction than the regular slip-on type, are available for low-pressure systems.

Large Diameter flanges, in sizes beyond the B16.5 range, are available for special installations. Dimensions given herein are those most commonly used; however, flanges and rolled rings for large diameter pipe or for vessels and tanks can readily be made to other specifications.

Long Welding Necks are used primarily for outlets for vessels and tanks. Drilled to ANSI Standards, they are forged with long, heavy-wall, straight hubs, and finished with square cut ends.

MATERIAL AND MANUFACTURING STANDARDS

The manufacturing of forged steel flanges is governed by industry standards written by (1) the American Society for Testing and Materials (ASTM); (2) the American National Standards Institute (ANSI); (3) the Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS); (4) the American Petroleum Institute (API); (5) the Canadian Standards Association (CSA); (6) the American Society of Mechanical Engineers (ASME); and (7) the Pipe Fabrication Institute (PFI). They cover specifications for materials, methods of manufacture, dimensions and quality control procedures. CCTF forged steel flanges conform to all applicable standards.

ASTM SPECIFICATIONS

ASTM specifications are, basically, materials specifications. They regulate approved raw materials from which flanges can be made - ingots, or blooms, billets, slabs or bars. In addition, they govern the methods of manufacture, quality control procedures and markings of forged steel flanges. ASTM specifications are divided into five categories:

- A105 - Carbon grades for high temperature service
- A181 - Carbon grades for general service
- * A182 - Alloy and stainless grades for high temperature service
- A350 - Carbon and alloy grades for low temperature service

*CCTF flanges are available in a wide range of alloy and stainless steels, including grades F304, F304L, F316, F316L. Please refer to CCTF catalogue "Stainless Steel Flanges" for the popular Classes 150 and 300 (PN 20 and 50).

MSS, API, AWWA, ANSI AND CSA STANDARDS

ANSI, MSS and API standards govern flange dimensions and tolerances. ASME/ANSI B16.5, titled "Steel Pipe Flanges and Flanged Fittings", is the basic standard. It covers forged steel flanges, sizes NPS 1/2 (DN 15) through NPS 24 (DN 600). CSA standard CAN3-Z245 12-M96 covers the manufacture, dimensions, tolerances and material requirements for pipe line flanges. ASME/ANSI B16.36 covers Orifice flanges. The following MSS, API and AWWA standards are written to supplement B16.5:

MSS SP-6:	Flange facings
MSS SP-9:	Spot facing for bronze, iron and steel flanges
MSS SP-25:	Marking of flanges
MSS SP-39:	Bolts and nuts for flanges
API6A:	Wellhead equipment
AWWA C207:	Hub flanges

The following codes are not flange specifications, but they influences the manufacture of forged steel flanges:

ASME:	Boiler and Pressure Vessel Code
ASME/ANSI B31.1:	Power Piping
ASME/ANSI B31.3:	Petroleum and refinery piping
ASME/ANSI B31.4:	Liquid petroleum transportation piping systems
ASME/ANSI B31.5:	Refrigeration piping
ASME/ANSI B31.8:	Gas transmission and distribution piping systems
ANSI/ASME B36.10M:	Standard for wrought steel pipe
ANSI/ASME B36.19M:	Standard for stainless steel pipe
ANSI/ASME B16.47:	Large diameter pipe line flanges NPS 22 (DN 550) and NPS 26 (DN 650) through NPS 36 (DN900)

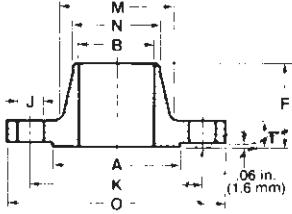
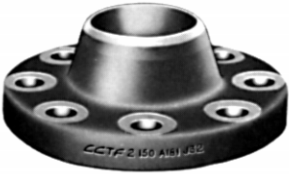
METRIC EQUIVALENTS

The International System (SI) metric equivalent of British units are shown throughout this catalogue.

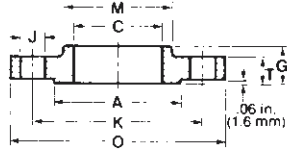
NPS (Nominal Pipe Size)	= DN* (Nominal Diameter)
Operating Pressure Class	= PN* (Pressure Number)
1 inch	= 25.4 millimetres
1 pound, weight	= 0.4536 kilograms
1 pound, pressure	= 0.06895 bars
1 p.s.i., stress	= 0.006895 megapascals (MPa)

*From the SI designations, Diamètre Nominal and Pression Nominale.

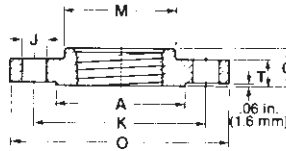
WELDING NECK



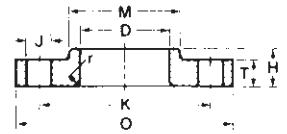
SLIP-ON



THREADED



LAP JOINT



NPS	DN	FLANGE OUTSIDE DIAMETER O	FLANGE ² THICKNESS MIN. T	RAISED FACE DIA. A	BORE			LENGTH TRU HUB ²		
					WELDING NECK & SOCKET WELDING B ³	SLIP-ON & SOCKET WELD SOCKET MIN. C	LAP JOINT MIN. D	WELDING NECK F	SLIP-ON, THREADED & SOCK. WELD G	LAP JOINT H
1/2	15	3.50	.44	1.38	.62	.88	.90	1.88	.62	.62
3/4	20	3.88	.50	1.69	.82	1.09	1.11	2.06	.62	.62
1	25	4.25	.56	2.00	1.05	1.36	1.38	2.19	.69	.69
1 1/4	32	4.62	.62	2.50	1.38	1.70	1.72	2.25	.81	.81
1 1/2	40	5.00	.69	2.88	1.61	1.95	1.97	2.44	.88	.88
2	50	6.00	.75	3.62	2.07	2.44	2.46	2.50	1.00	1.00
2 1/2	65	7.00	.88	4.12	2.47	2.94	2.97	2.75	1.12	1.12
3	80	7.50	.94	5.00	3.07	3.57	3.60	2.75	1.19	1.19
3 1/2	90	8.50	.94	5.50	3.55	4.07	4.10	2.81	1.25	1.25
4	100	9.00	.94	61.9	4.03	4.57	4.60	3.00	1.31	1.31
5	125	10.00	.94	7.31	5.05	5.66	5.69	3.50	1.44	1.44
6	150	11.00	1.00	8.50	6.07	6.72	6.75	3.50	1.56	1.56
8	200	13.50	1.12	10.62	7.98	8.72	8.75	4.00	1.75	1.75
10	250	16.00	1.19	12.75	10.02	10.88	10.92	4.00	1.94	1.94
12	300	19.00	1.25	15.00	12.00	12.88	12.92	4.50	2.19	2.19
14	350	21.00	1.38	16.25	To be specified by purchaser	14.14	14.18	5.00	2.25	3.12
16	400	23.50	1.44	18.50		359.2	360.2	127.0	57	79
18	450	25.00	1.56	21.00		16.16	16.19	5.00	2.50	3.44
20	500	27.50	1.69	23.00		410.4	411.2	127.0	64	87
24	600	32.00	1.88	27.25		18.18	18.20	5.50	2.69	3.81
						461.8	462.3	139.7	68	97
						20.20	20.25	5.69	2.88	4.06
						513.1	514.3	144.5	73	103
						24.25	24.25	6.00	3.25	4.38
						615.9	615.9	152.4	83	111

¹ Socket Welding Flanges, sizes NPS 3 1/2 (DN 90) and larger are not covered by ASME/ANSI B16.5.

² Includes .06" (1.6 mm) raised face.

³ These dimensions correspond to inside diameters of pipe as given in ANSI/ASME B36.10M for Standard Wall Pipe. Thickness of Standard Wall is the same as Schedule 40 in size NPS 10 (DN 250) and smaller.

INCHES
MILLIMETRES

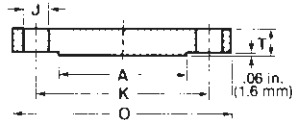
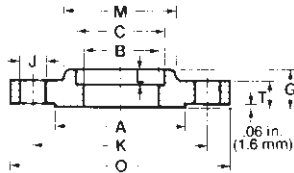
SOCKET WELDING



BLIND



CLASS 150 (PN20) FLANGES FORGED STEEL ASTM A-105 ASME/ANSI B16.5



NPS	DN	DRILLING			DEPTH OF SOCKET L	DIAMETER OF HUB		LAP JOINT FILLET RADIUS r	APPROXIMATE WEIGHT			
		NO. OF HOLES	DIA. OF HOLES J	DIA. OF BOLT CIRCLE K		AT BASE M	AT CHAMFER N		WELDING NECK	SLIP-ON, THREADED & SOCKET WELDING ¹	BLIND	LAP JOINT
1/2	15	4	.62	2.38	.38	1.19	.84	.12	2	1	1	1
3/4	20	4	.62	2.75	.44	1.50	1.05	.12	2	2	2	2
1	25	4	.62	3.12	.50	1.94	1.32	.12	3	2	2	2
1 1/4	32	4	.62	3.50	.56	2.31	1.66	.19	3	3	3	3
1 1/2	40	4	.62	3.88	.62	2.56	1.90	.25	4	3	4	3
2	50	4	.75	4.75	.69	3.06	2.38	.31	6	5	5	5
2 1/2	65	4	.75	5.50	.75	3.56	2.88	.31	8	7	7	7
3	80	4	.75	6.00	.81	4.25	3.50	.38	10	8	9	8
3 1/2	90	8	.75	7.00	-	4.81	4.00	.38	12	11	13	11
4	100	8	.75	7.50	-	5.31	4.50	.44	15	13	17	13
5	125	8	.88	8.50	-	6.44	5.56	.44	19	15	20	15
6	150	8	.88	9.50	-	7.56	6.63	.50	24	19	26	19
8	200	8	.88	11.75	-	9.69	8.63	.50	39	30	45	30
10	250	12	1.00	14.25	-	12.00	10.75	.50	52	43	70	43
12	300	12	1.00	17.00	-	14.38	12.75	.50	80	64	110	64
14	350	12	1.12	18.75	-	15.75	14.00	.50	110	90	140	105
16	400	16	1.12	21.25	-	18.00	16.00	.50	140	98	180	140
18	450	16	1.25	22.75	-	19.88	18.00	.50	150	130	220	160
20	500	20	1.25	25.00	-	22.00	20.00	.50	180	165	285	195
24	600	20	1.38	29.50	-	26.12	24.00	.50	260	220	430	275
		20	35	749.3	-	663.6	609.6	13	118	99.8	195.0	125.0

For bevel of Welding Neck, see page 48.

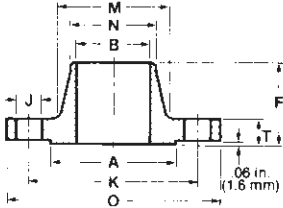
Gasket dimensions - page 20.

Bolting dimensions - page 22.

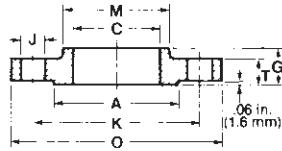
Flange facing dimensions - page 20.

POUNDS
KILOGRAMS

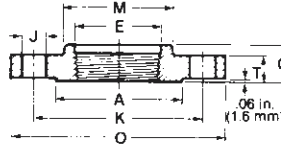
WELDING NECK



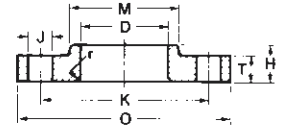
SLIP-ON



THREADED



LAP JOINT



NPS	DN	FLANGE OUTSIDE DIAMETER O	FLANGE ² THICKNESS MIN. T	RAISED FACE DIA. A	BORE			LENGTH THRU HUB ²			
					WELDING NECK & SOCKET WELD B ³	SLIP-ON & SOCKET WELD SOCKET MIN. C	LAP JOINT MIN. D	THREADED COUNTER-BORE MIN. E	WELDING NECK F	SLIP-ON, THREADED & SOCK. WELD G	LAP JOINT H
1/2	15	3.75	.56	1.38	.62	.88	.90	.93	2.06	.88	.88
3/4	20	4.62	.62	1.69	.82	1.09	1.11	1.14	2.25	1.00	1.00
1	25	4.88	.69	2.00	1.05	1.36	1.38	1.41	2.44	1.06	1.06
1 1/4	32	5.25	.75	2.50	1.38	1.70	1.72	1.75	2.56	1.06	1.06
1 1/2	40	6.12	.81	2.88	1.61	1.95	1.97	1.99	2.69	1.19	1.19
2	50	6.50	.88	3.62	2.07	2.44	2.46	2.50	2.75	1.31	1.31
2 1/2	65	7.50	1.00	4.12	2.47	2.94	2.97	3.00	3.00	1.50	1.50
3	80	8.25	1.12	5.00	3.07	3.57	3.60	3.63	3.12	1.69	1.69
3 1/2	90	9.0	1.19	5.50	3.55	4.07	4.10	4.13	3.19	1.75	1.75
4	100	10.0	1.25	6.19	4.03	4.57	4.60	4.63	3.38	1.88	1.88
5	125	11.0	1.38	7.31	5.05	5.66	5.69	5.69	3.88	2.00	2.00
6	150	12.5	1.44	8.50	6.07	6.72	6.75	6.75	3.88	2.06	2.06
8	200	15.0	1.62	10.62	7.98	8.72	8.75	8.75	4.38	2.44	2.44
10	250	17.5	1.88	12.75	10.02	10.88	10.92	10.88	4.62	2.62	3.75
12	300	20.5	2.00	15.00	12.00	12.88	12.92	12.94	5.12	2.88	4.00
14	350	23.0	2.12	16.25	To be specified by purchaser	14.14	14.18	14.19	5.62	3.00	4.38
16	400	25.5	2.25	18.50		359.2	360.2	360	142.9	76	111
18	450	28.0	2.38	21.00		16.16	16.19	16.19	5.75	3.25	4.75
20	500	30.5	2.50	23.00		410.4	411.2	411	146.0	83	121
24	600	36.0	2.75	27.25		18.18	18.20	18.19	6.25	3.50	5.12
						461.8	462.3	462	158.7	89	130
					20.20	20.25	20.19	6.38	3.75	5.50	
					513.1	514.3	513	161.9	95	140	
					24.25	24.25	24.19	6.62	4.19	6.00	
					615.9	615.9	614	168.3	106	152	

¹ Socket Welding Flanges, sizes NPS 3 1/2 (DN 90) and larger are not covered by ASME/ANSI B16.5.

² Includes .06" (1.6 mm) raised face.

³ These dimensions correspond to inside diameters of pipe as given in ANSI/ASME B36.10M for Standard Wall Pipe. Thickness of Standard Wall is the same as Schedule 40 in size NPS 10 (DN 250) and smaller.

INCHES
MILLIMETRES

SOCKET WELDING



BLIND

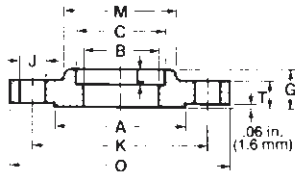


CLASS 300 (PN50) FLANGES

FORGED STEEL

ASTM A-105

1 ASME/ANSI B16.5



NPS	DN	DRILLING			DEPTH OF SOCKET L	DIAMETER OF HUB			APPROXIMATE WEIGHT			
		NO. OF HOLES	DIA. OF HOLES J	DIA. OF BOLT CIRCLE K		AT BASE M	AT CHAMFER N	LAP JOINT FILLET RADIUS r	WELDING NECK	SLIP-ON, THREADED & SOCKET WELDING ¹	BLIND	LAP JOINT
1/2		4	.62	2.62	.38	1.50	.84	.12	2	2	2	2
	15	4	16	66.7	10	38.1	21.4	3	0.9	0.9	0.9	0.9
3/4		4	.75	3.25	.44	1.88	1.05	.12	3	3	3	3
	20	4	20	82.5	11	47.6	26.6	3	1.4	1.4	1.4	1.4
1		4	.75	3.50	.50	2.12	1.32	.12	4	3	3	3
	25	4	.20	88.9	13	53.8	33.5	3	1.8	1.4	1.4	1.4
1 1/4		4	.75	3.88	.56	2.50	1.66	.19	5	4	4	4
	32	4	20	98.4	14	63.5	42.1	5	2.3	1.8	1.8	1.8
1 1/2		4	.88	4.50	.62	2.75	1.90	.25	7	6	6	6
	40	4	23	114.3	16	69.9	48.3	6	3.2	2.7	2.7	2.7
2		8	.75	5.00	.69	3.31	2.38	.31	9	7	8	7
	50	8	20	127.0	17	84.1	60.3	8	4.1	3.2	3.6	3.2
2 1/2		8	.88	5.88	.75	3.94	2.88	.31	12	10	12	10
	65	8	23	149.2	19	100.0	73.0	8	5.4	4.5	5.4	4.5
3		8	.88	6.62	.81	4.62	3.50	.38	15	13	16	13
	80	8	23	168.3	21	117.5	88.9	10	6.8	5.9	7.3	5.9
3 1/2		8	.88	7.25	-	5.25	4.00	.38	18	17	21	17
	90	8	23	184.1	-	133.3	101.6	10	8.2	7.7	9.5	7.7
4		8	.88	7.88	-	5.75	4.50	.44	25	22	27	22
	100	8	23	200.0	-	146.0	114.3	11	11.3	10.0	12.2	10.0
5		8	.88	9.25	-	7.00	5.56	.44	32	28	35	28
	125	8	23	234.9	-	177.8	141.3	11	14.5	12.7	15.9	12.7
6		12	.88	10.62	-	8.12	6.63	.50	42	39	50	39
	150	12	23	269.9	-	206.4	168.3	13	19.0	17.7	22.7	17.7
8		12	1.00	13.0	-	10.25	8.63	.50	67	58	81	58
	200	12	26	330.2	-	260.3	219.1	13	30.4	26.3	36.7	26.3
10		16	1.12	15.25	-	12.62	10.75	.50	91	81	125	91
	250	16	29	387.3	-	320.7	273.0	13	41.3	36.7	56.7	41.3
12		16	1.25	17.75	-	14.75	12.75	.50	140	115	185	140
	300	16	32	450.8	-	374.6	323.8	13	63.5	52.2	83.9	63.5
14		20	1.25	20.25	-	16.75	14.00	.50	180	165	250	190
	350	20	32	514.3	-	425.5	355.6	13	81.6	74.8	113	86.2
16		20	1.38	22.50	-	19.00	16.00	.50	250	190	295	250
	400	20	35	571.5	-	482.6	406.4	13	113	86.2	134	113
18		24	1.38	24.75	-	21.00	18.00	.50	320	250	395	295
	450	24	35	628.6	-	533.4	457.2	13	145	113	179	134
20		24	1.38	27.00	-	23.12	20.00	.50	400	315	505	370
	500	24	35	685.80	-	587.4	508.0	13	181	143	229	168
24		24	1.62	32.00	-	27.62	24.00	.50	580	475	790	550
	600	24	42	812.80	-	701.7	609.6	13	263	215	358	249

¹ Socket Welding Flanges, sizes NPS 3 1/2 (DN 90) and larger are not covered by ASME/ANSI B16.5.

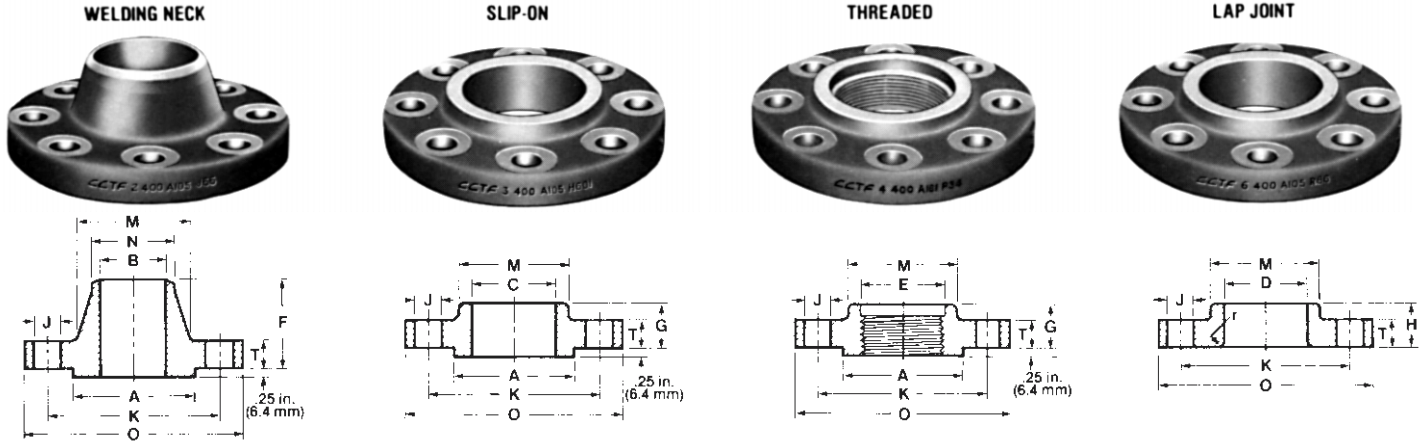
For bevel of Welding Neck, see page 48.

Gasket dimensions - page 20.

Bolting dimensions - page 22.

Flange facing dimensions - page 20.

POUNDS
KILOGRAMS



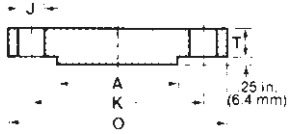
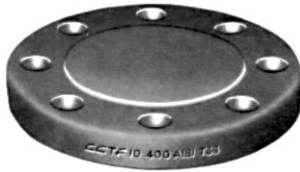
For sizes NPS 1/2 (DN 15) through NPS 3 1/2 (DN 90) use Class 600 (PN 100) flanges.¹

NPS	DN	FLANGE OUTSIDE DIAMETER O	FLANGE ² THICKNESS MIN. T	RAISED FACE DIA. A	BORE			LENGTH TRU HUB ²			
					WELDING NECK B	SLIP-ON, MIN. C	LAP JOINT MIN. D	THREADED COUNTER-BORE MIN. E	WELDING NECK F	SLIP-ON, THREADED G	LAP JOINT H
4	100	10	1.38	6.19	To be specified by purchaser	4.57	4.60	4.63	3.5	2	2
		254	35.0	157.2		116.1	116.8	118	88.9	51	51
5	125	11	1.50	7.31		5.66	5.69	5.69	4	2.12	2.12
		279	38.5	185.7		143.7	144.5	145	101.6	54	54
6	150	12.5	1.62	8.5		6.72	6.75	6.75	4.06	2.25	2.25
		318	41.5	215.9		170.7	171.4	171	103.2	57	57
8	200	15	1.88	10.62		8.72	8.75	8.75	4.62	2.69	2.69
		381	48.0	269.9		221.5	222.2	222	117.5	68	68
10	250	17.5	2.12	12.75		10.88	10.92	10.88	4.88	2.88	4
		445	54.0	323.8		276.2	277.4	276	123.8	73	102
12	300	20.5	2.25	15.00		12.88	12.92	12.94	5.38	3.12	4.25
		520	57.5	381.0		327.0	328.2	329	136.5	79	108
14	350	23	2.38	16.25		14.14	14.18	14.19	5.88	3.31	4.62
		585	60.5	412.8		359.2	360.2	360	149.2	84	117
16	400	25.5	2.5	18.50		16.16	16.19	16.19	6	3.69	5
		650	63.5	469.9		410.4	411.2	411	152.4	94	127
18	450	28	2.62	21		18.18	18.20	18.19	6.5	3.88	5.38
		710	67.0	533.4		461.8	462.3	462	165.1	98	137
20	500	30.5	2.75	23		20.20	20.25	20.19	6.62	4	5.75
		775	70.0	584.2		513.1	514.3	513	168.3	102	146
24	600	36	3	27.25		24.25	24.25	24.19	6.88	4.5	6.25
		915	76.5	692.2		616.0	616.0	614	174.6	114	159

¹ Including SOCKET WELDING FLANGES

² Does not include .25" (6.4 mm) raised face.

BLIND



CLASS 400 (PN 68) FLANGES

FORGED STEEL
ASTM A-105
ASME/ANSI B16.5

NPS	DN	DRILLING			DIAMETER OF HUB			LAP JOINT FILLET RADIUS r	APPROXIMATE WEIGHT			
		NO. OF HOLES	DIAMETER OF HOLES J	DIAMETER OF BOLT CIRCLE K	AT BASE	AT CHAMFER	WELDING NECK		SLIP-ON, THREADED	BLIND	LAP JOINT	
					M	N						
4		8	1	7.88	5.75	4.50	.44	35	26	33	25	
	100	8	26	200.0	146.0	114.3	11	15.8	11.7	15	11.3	
5		8	1	9.25	7.0	5.56	.44	43	31	44	29	
	125	8	26	234.9	177.8	141.3	11	19	14	20	13	
6		12	1	10.62	8.12	6.63	.5	57	44	61	42	
	150	12	26	269.9	206.4	168.3	13	25.5	20	27.5	19	
8		12	1.12	13.0	10.25	8.63	.5	89	67	100	64	
	200	12	29	330.2	260.3	219.1	13	40	30	45	29	
10		16	1.25	15.25	12.62	10.75	.5	126	91	155	112	
	250	16	32	387.3	320.7	273.0	13	57	41	70	50	
12		16	1.38	17.75	14.75	12.75	.5	177	129	226	152	
	300	16	35	450.8	374.7	323.8	13	80	58	102	68	
14		20	1.38	20.25	16.75	14.00	.5	233	191	310	210	
	350	20	35	514.3	425.5	355.6	13	105	86	140	95	
16		20	1.5	22.5	19.0	16.00	.5	294	253	398	280	
	400	20	39	571.5	482.6	406.4	13	132	114	179	126	
18		24	1.5	24.75	21.0	18.00	.5	360	310	502	345	
	450	24	39	628.7	533.4	457.2	13	162	140	226	155	
20		24	1.62	27	23.12	20.00	.5	445	378	621	420	
	500	24	42	685.8	587.4	508.0	13	200	170	279	189	
24		24	1.88	32	27.62	24.00	.5	640	539	936	615	
	600	24	48	812.8	701.7	609.6	13	288	243	421	277	

For level of Welding Neck, see page 48.

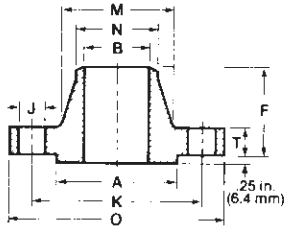
Gasket dimensions - page 20.

Bolting dimensions - page 22.

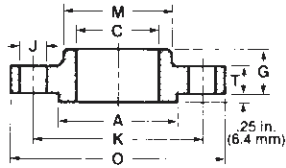
Flange facing dimensions - page 20.

POUNDS
KILOGRAMS

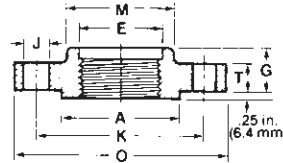
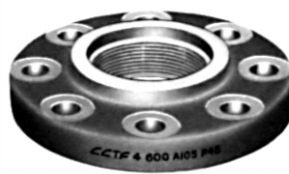
WELDING NECK



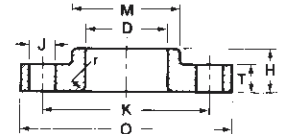
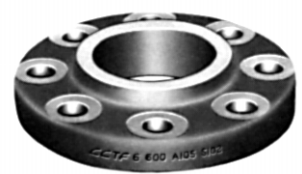
SLIP-ON



THREADED



LAP JOINT



NPS	DN	FLANGE OUTSIDE DIAMETER O	FLANGE ² THICKNESS MIN. T	RAISED FACE DIA. A	BORE			LENGTH TRU HUB ²			
					WELDING NECK & 'SOCKET WELDING B	SLIP-ON & 'SOCK. WELD. SOCKET MIN. C	LAP JOINT MIN. D	THREADED COUNTER-BORE MIN. E	WELDING NECK F	SLIP-ON, THREADED 'SOCKET WELDING G	LAP JOINT H
1/2		3.75	.56	1.38		.88	.90	.93	2.06	.88	.88
	15	95	14.5	34.9		22.2	22.9	23.5	52.4	22	22
3/4		4.62	.62	1.69		1.09	1.11	1.14	2.25	1.00	1.0
	20	117	16.0	42.9		27.8	28.2	29.0	57.1	25	25
1		4.88	.69	2.0		1.36	1.38	1.41	2.44	1.06	1.06
	25	124	17.5	50.8		34.5	34.9	36.0	61.9	27	27
1 1/4		5.25	.81	2.5		1.70	1.72	1.75	2.62	1.12	1.12
	32	133	21.0	63.5		43.3	43.7	44.5	66.7	29	29
1 1/2		6.12	.88	2.88		1.95	1.97	1.99	2.75	1.25	1.25
	40	156	22.5	73.0		49.6	50.0	50.5	69.8	32	32
2		6.5	1.0	3.62		2.44	2.46	2.50	2.88	1.44	1.44
	50	165	25.5	92.1		61.9	62.5	63.5	73.0	37	37
2 1/2		7.5	1.12	4.12		2.94	2.97	3.00	3.12	1.62	1.62
	65	191	29.0	104.8		74.6	75.4	76.0	79.4	41	41
3		8.25	1.25	5.0		3.57	3.60	3.63	3.25	1.81	1.81
	80	210	32.0	127.0		90.7	91.4	92.0	82.5	46	46
3 1/2		9.0	1.38	5.5		4.07	4.10	4.13	3.38	1.94	1.94
	90	229	35.0	139.7		103.4	104.1	105	85.7	49	49
4		10.75	1.5	6.19		4.57	4.60	4.63	4.0	2.12	2.12
	100	273	38.5	157.2		116.1	116.8	118	101.6	54	54
5		13.0	1.75	7.31		5.66	5.69	5.69	4.5	2.38	2.38
	125	330	44.5	185.7		143.7	144.5	145	114.3	60	60
6		14.0	1.88	8.5		6.72	6.75	6.75	4.62	2.62	2.62
	150	356	48.0	215.9		170.7	171.4	171	117.3	67	67
8		16.5	2.19	10.62		8.72	8.75	8.75	5.25	3.0	3.0
	200	419	55.5	269.9		221.5	222.2	222	133.3	76	76
10		20.0	2.5	12.75		10.88	10.92	10.88	6.0	3.38	4.38
	250	510	63.5	323.8		276.2	277.4	276	152.4	86	111
12		22.0	2.62	15.0		12.88	12.92	12.94	6.12	3.62	4.62
	300	560	66.5	381.0		327.0	328.2	329	155.6	92	117
14		23.75	2.75	16.25		14.14	14.18	14.19	6.5	3.69	5.0
	350	605	70.0	412.8		359.2	360.2	360	165.1	94	127
16		27.0	3.0	18.5		16.16	16.19	16.19	7.0	4.19	5.5
	400	685	76.5	469.9		410.4	411.2	411	177.5	106	140
18		29.25	3.25	21.0		18.18	18.20	18.19	7.25	4.62	6.0
	450	745	83.0	533.4		461.8	462.3	462	184.1	117	152
20		32.0	3.5	23.0		20.20	20.25	20.19	7.5	5.0	6.4
	500	815	89.0	584.2		513.1	514.3	513	190.5	127	165
24		37.0	4.0	27.25		24.25	24.25	24.19	8.0	5.5	7.25
	600	940	102.0	692.2		615.9	615.9	614	203.2	140	184

¹ Socket Welding Flanges, sizes NPS 3 1/2 (DN 90) and larger are not covered by ASME/ANSI B16.5.

² Does not include .25" (6.4 mm) raised face.

INCHES
MILLIMETRES

SOCKET WELDING



BLIND

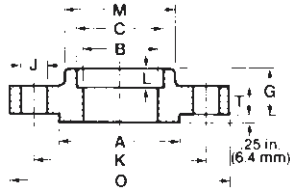


CLASS 600 (PN 100) FLANGES

FORGED STEEL

ASTM A-105

1 ASME/ANSI B16.5



NPS	DN	DRILLING			'DEPTH OF SOCKET	DIAMETER OF HUB			APPROXIMATE WEIGHT			
		NO. OF HOLES	DIA. OF HOLES	DIA. OF BOLT CIRCLE		AT BASE	AT CHAMFER	LAP JOINT FILLET RADIUS	WELDING NECK	SLIP-ON, THREADED & SOCKET WELDING ¹	BLIND	LAP JOINT
			J	K	L	M	N	r				
1/2		4	.62	2.62	.38	1.5	.84	.12	2	2	2	2
	15	4	16	66.7	10	38.1	21.4	3	0.9	0.9	0.9	0.9
3/4		4	.75	3.25	.44	1.88	1.05	.12	4	3	3	3
	20	4	20	82.5	11	47.6	26.6	3	1.8	1.4	1.4	1.4
1		4	.75	3.5	.50	2.12	1.32	.12	4	4	4	4
	25	4	.20	88.9	13	54.0	33.5	3	1.8	1.8	1.8	1.8
1 1/4		4	.75	3.88	.56	2.5	1.66	.19	6	5	5	5
	32	4	20	98.4	14	63.9	42.1	5	2.7	2.3	2.3	2.3
1 1/2		4	.88	4.5	.62	2.75	1.90	.25	8	7	8	7
	40	4	23	114.3	16	69.8	48.3	6	3.6	3.2	3.6	3.2
2		8	.75	5.0	.69	3.31	2.38	.31	12	9	10	9
	50	8	20	127.0	17	84.1	60.3	8	5.4	4.1	4.5	4.1
2 1/2		8	.88	5.88	.75	3.94	2.88	.31	18	13	15	12
	65	8	23	149.2	19	100.0	73.0	8	8.2	5.9	6.8	5.4
3		8	.88	6.62	.81	4.62	3.50	.38	23	16	20	15
	80	8	23	168.3	21	117.5	88.9	10	10.4	7.3	9.1	6.8
3 1/2		8	1.0	7.25	-	5.25	4.00	.38	26	21	29	20
	90	8	26	184.1	-	133.3	101.6	10	11.8	9.5	13.2	9.1
4		8	1.0	8.5	-	6.0	4.50	.44	42	37	41	36
	100	8	26	215.9	-	152.4	114.3	11	19.0	16.8	18.6	16.3
5		8	1.12	10.5	-	7.44	5.56	.44	68	63	68	61
	125	8	29	266.7	-	188.9	141.3	11	31.0	28.6	30.8	27.7
6		12	1.12	11.5	-	8.75	6.63	.50	81	80	86	78
	150	12	29	292.1	-	222.2	168.3	13	36.7	36.3	39.0	35.4
8		12	1.25	13.75	-	10.75	8.63	.50	120	115	140	110
	200	12	32	349.2	-	273.0	219.1	13	54.4	52.2	63.5	49.9
10		16	1.38	17.0	-	13.5	10.75	.50	190	170	230	170
	250	16	35	431.8	-	342.9	273.0	13	86.2	77.1	104	77.2
12		20	1.38	19.25	-	15.75	12.75	.50	225	200	295	200
	300	20	35	488.9	-	400.0	323.8	13	102	90.7	134	90.7
14		20	1.50	20.75	-	17.0	14.0	.50	280	230	355	250
	350	20	39	527.0	-	431.8	355.6	13	127	104	161	113
16		20	1.62	23.75	-	19.5	16.0	.50	390	330	495	365
	400	20	42	603.2	-	495.2	406.4	13	177	150	225	166
18		20	1.75	25.75	-	21.5	18.0	.50	475	400	630	435
	450	20	45	654.0	-	546.1	457.2	13	215	181	286	197
20		24	1.75	28.5	-	24.0	20.0	.50	590	510	810	570
	500	24	45	723.9	-	609.6	508.0	13	268	231	367	259
24		24	2.0	33.0	-	28.25	24.0	.50	830	730	1250	810
	600	24	51	838.2	-	717.5	609.6	13	376	331	567	367

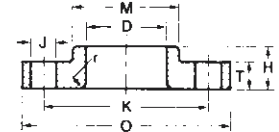
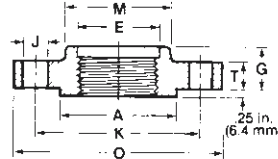
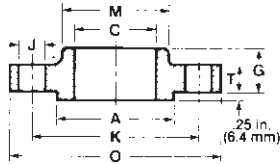
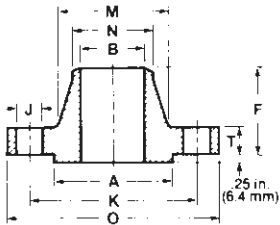
For bevel of Welding Neck, see page 48.

Gasket dimensions - page 20.

Bolting dimensions - page 22.

Flange facing dimensions - page 20.

POUNDS
KILOGRAMS



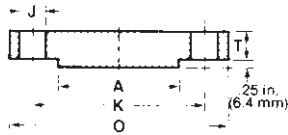
For sizes NPS 1/2 (DN 15) through NPS 2 1/2 (DN 65) use Class 1500 (PN 250) flanges.¹

NPS	DN	FLANGE OUTSIDE DIAMETER O	FLANGE ² THICKNESS MIN. T	RAISED FACE DIA. A	BORE			LENGTH TRU HUB ²			
					WELDING NECK B	SLIP-ON, MIN. C	LAP JOINT MIN. D	THREADED COUNTER-BORE MIN. E	WELDING NECK F	SLIP-ON, THREADED G	LAP JOINT H
3	80	9.50	1.50	5.00	To be specified by purchaser	3.57	3.60	3.63	4.00	2.12	2.12
		241	38.5	127.0		90.7	91.4	92	101.6	54	54
4	100	11.50	1.75	6.19		4.57	4.60	4.63	4.50	2.75	2.75
		292	44.5	157.2		116.1	116.8	118	114.3	70	70
5	125	13.75	2.0	7.31		5.66	5.69	5.69	5.00	3.12	3.12
		349	51.0	185.7		143.7	144.5	145	127.0	79	79
6	150	15.00	2.19	8.50		6.72	6.75	6.75	5.50	3.38	3.38
		381	56.0	215.9		170.7	171.4	171	139.7	86	86
8	200	18.50	2.5	10.62		8.72	8.75	8.75	67.38	4.00	4.50
		470	63.5	269.9		221.5	222.2	222	161.9	102	114
10	250	21.50	2.75	12.75		10.88	10.92	10.88	7.25	4.25	5.00
		545	70.0	323.8		276.2	277.4	276	184.2	108	127
12	300	24.00	3.12	15.00		12.88	12.92	12.94	7.88	4.62	5.62
		610	79.5	381.0		327.0	328.2	329	200.0	117	143
14	350	25.25	3.38	16.25		14.14	14.18	14.19	8.38	5.12	6.12
		640	86.0	412.8		359.2	360.2	360	212.7	130	156
16	400	27.75	3.5	18.50		16.16	16.19	16.19	8.50	5.25	6.50
		705	89.0	469.9		410.4	411.2	411	215.9	133	165
18	450	31.00	4.0	21.00		18.18	18.20	18.19	9.00	6.00	7.50
		785	102.0	533.4		461.8	462.3	462	228.8	152	191
20	500	33.75	4.25	23.00		20.20	20.25	20.19	9.75	6.25	8.25
		855	108.0	584.2		513.1	514.3	513	247.6	159	210
24	600	41.00	5.5	27.25		24.25	24.25	24.19	11.50	8.00	10.50
		1040	140.0	692.2		615.9	615.9	614	292.1	203	267

¹ Including SOCKET WELDING FLANGES

² Does not include .25" (6.4 mm) raised face.

BLIND



CLASS 900 (PN 150) FLANGES FORGED STEEL ASTM A-105 ASME/ANSI B16.5

For sizes NPS 1/2 (DN 15) through NPS 2 1/2 (DN 65) use Class 1500 (PN 250) flanges. ¹

NPS	DN	DRILLING		DIAMETER OF HUB			LAP JOINT FILLET RADIUS r	APPROXIMATE WEIGHT			
		NO. OF HOLES	DIAMETER OF HOLES J	DIAMETER OF BOLT CIRCLE K	AT BASE M	AT CHAMFER N		WELDING NECK	SLIP-ON, THREADED	BLIND	LAP JOINT
3		8	1.00	7.50	5.00	3.50	.38	.31	31	31	47
	80	8	26	190.5	127.0	88.9	10	14.1	14.1	14.1	21.3
4		8	1.25	9.25	6.25	4.50	.44	51	53	54	51
	100	8	32	234.9	158.7	114.3	11	23.1	24.0	24.5	23.1
5		8	1.38	11.00	7.50	5.56	.44	86	83	87	81
	125	8	35	279.4	190.5	141.3	11	39.0	37.6	39.5	36.7
6		12	1.25	12.50	9.25	6.63	.50	110	110	115	105
	150	12	32	317.5	234.9	168.3	13	49.9	49.9	52.2	47.6
8		12	1.50	15.50	11.75	8.63	.50	175	170	200	190
	200	12	39	393.7	298.4	219.1	13	79.4	77.1	90.7	86.2
10		16	1.50	18.50	14.50	10.75	.50	260	245	290	275
	250	16	39	469.9	368.3	273.0	13	118	111	132	125
12		20	1.50	21.00	16.50	12.75	.50	325	325	415	370
	300	20	39	533.4	419.1	323.8	13	147	147	188	168
14		20	1.62	22.00	17.75	14.00	.50	400	400	520	415
	350	20	42	558.8	450.8	355.6	13	181	181	236	188
16		20	1.75	24.25	20.00	16.00	.50	495	425	600	465
	400	20	45	615.9	508.0	406.4	13	225	193	272	211
18		20	2.00	27.00	22.25	18.00	.50	680	600	850	650
	450	20	51	685.8	565.1	457.2	13	308	272	386	295
20		20	2.12	29.50	24.50	20.00	.50	830	730	1075	810
	500	20	54	749.3	622.3	508.0	13	376	331	488	367
24		20	2.62	35.50	29.5	24.00	.50	1500	1400	2025	1550
	600	20	67	901.7	749.3	609.6	13	680	635	918	703

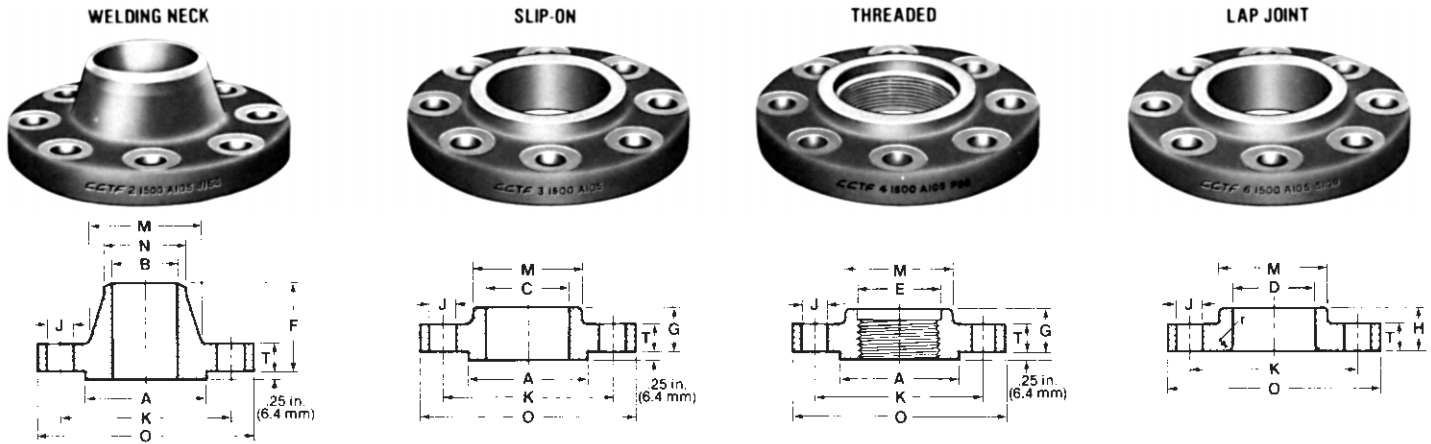
For level of Welding Neck, see page 48.

Gasket dimensions - page 20.

Bolting dimensions - page 22.

Flange facing dimensions - page 20.

POUNDS
KILOGRAMS



NPS	DN	FLANGE OUTSIDE DIAMETER O	FLANGE ² THICKNESS MIN. T	RAISED FACE DIA. A	BORE			LENGTH TRU HUB ²			
					WELDING NECK & SOCKET WELDING B	'SLIP-ON & SOCK. WELD. SOCKET MIN. C	LAP JOINT MIN. D	THREADED COUNTER-BORE MIN. E	WELDING NECK F	'SLIP-ON, THREADED, SOCKET WELDING G	LAP JOINT H
1/2	15	4.75	.88	1.38	To be specified by purchaser	0.88	.90	.93	2.38	1.25	1.25
		121	22.5	34.9		22.2	22.9	23.5	60.3	32	32
3/4	20	5.12	1.00	1.69		1.09	1.11	1.14	2.75	1.38	1.38
		130	25.5	42.9		27.8	28.2	29.0	69.8	35	35
1	25	5.88	1.12	2.00		1.36	1.38	1.41	2.88	1.62	1.62
		149	29.0	50.8		34.5	34.9	36.0	73.0	41	41
1 1/4	32	6.25	1.12	2.50		1.70	1.72	1.75	2.88	1.62	1.62
		159	29.0	63.5		43.3	43.7	44.5	73.0	41	41
1 1/2	40	7.00	1.25	2.88		1.95	1.97	1.99	3.25	1.75	1.75
		178	32.0	73.0		49.6	50.0	50.5	82.5	44	44
2	50	8.50	1.50	3.62		2.44	2.46	2.50	4.00	2.25	2.25
		216	38.5	92.1		61.9	62.5	63.5	101.6	57	57
2 1/2	65	9.62	1.62	4.12		2.94	2.97	3.00	4.12	2.50	2.50
		244	41.5	104.8		74.6	75.4	76.0	104.8	64	64
3	80	10.50	1.88	5.00		-	3.60	3.63	4.62	2.88	2.88
		267	48.0	127.0		-	91.4	92.0	117.5	73	73
4	100	12.25	2.12	6.19		-	4.60	4.63	4.88	3.56	3.56
		311	54.0	157.2		-	116.8	118	123.8	90	90
5	125	14.75	2.88	7.31		-	5.69	5.69	6.12	4.12	4.12
		375	73.5	185.7		-	144.5	145	155.6	105	105
6	150	15.50	3.25	8.50		-	6.75	6.75	6.75	4.69	4.69
		394	83.0	215.9		-	171.4	171	171.4	119	119
8	200	19.00	3.62	10.62		-	8.75	8.75	8.38	5.62	5.62
		483	92.0	269.9		-	222.2	222	212.7	143	143
10	250	23.00	4.25	12.75		-	10.92	10.88	10.00	6.25	7.00
		585	108.0	323.8		-	277.4	276	254.0	159	178
12	300	26.50	4.88	15.00		-	12.92	12.94	11.12	7.12	8.62
		675	124.0	381.0		-	328.2	329	282.6	181	219
14	350	29.50	5.25	16.25	-	14.18	-	11.75	-	9.50	
		750	133.5	412.8	-	360.2	-	298.4	-	241	
16	400	32.50	5.75	18.50	-	16.19	-	12.25	-	10.25	
		825	146.5	469.9	-	411.2	-	311.1	-	260	
18	450	36.00	6.38	21.00	-	18.20	-	12.88	-	10.88	
		915	162.0	533.4	-	462.3	-	327.0	-	276	
20	500	38.75	7.00	23.00	-	20.25	-	14.00	-	11.50	
		985	178.0	584.2	-	514.3	-	355.6	-	292	
24	600	46.00	8.00	27.25	-	24.25	-	16.00	-	13.00	
		1170	203.5	692.2	-	615.9	-	406.4	-	330	

¹ Socket Welding and Slip-on Flanges, size NPS 3 1/2 (DN 80) and larger are not covered by ASME/ANSI B16.5.

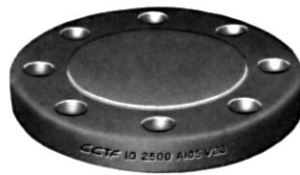
² Does not include .25" (6.4 mm) raised face.

INCHES
MILLIMETRES

SOCKET WELDING



BLIND

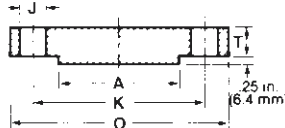
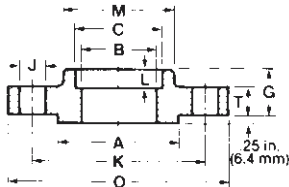


CLASS 1500 (PN 250) FLANGES

FORGED STEEL

ASTM A-105

ASME/ANSI B16.5



NPS	DN	DRILLING			'DEPTH OF SOCKET	DIAMETER OF HUB			APPROXIMATE WEIGHT			
		NO. OF HOLES	DIA. OF HOLES	DIA. OF BOLT CIRCLE		AT BASE	AT CHAMFER	LAP JOINT FILLET RADIUS	WELDING NECK	'SLIP-ON, THREADED & 'SOCKET WELDING	BLIND	LAP JOINT
			J	K	L	M	N	r				
1/2		4	.88	3.25	.38	1.50	.84	.12	5	4	4	4
	15	4	23	82.5	10	38.1	21.4	3	2.3	1.8	1.8	1.8
3/4		4	.88	3.50	.44	1.75	1.05	.12	6	5	6	5
	20	4	23	88.9	11	44.4	26.6	3	2.7	2.3	2.7	2.3
1		4	1.00	4.00	.50	2.06	1.32	.12	9	8	8	8
	25	4	26	101.6	13	52.4	33.5	3	4.1	3.6	3.6	3.6
1 1/4		4	1.00	4.38	.56	2.50	1.66	.19	10	9	9	9
	32	4	26	111.1	14	63.5	42.1	5	4.5	4.1	4.1	4.1
1 1/2		4	1.12	4.88	.62	2.75	1.90	.25	13	12	13	12
	40	4	29	123.8	16	69.8	48.3	6	5.9	5.4	5.9	5.4
2		8	1.00	6.50	.69	4.12	2.38	.31	25	25	25	25
	50	8	26	165.1	17	104.8	60.3	8	11.3	11.3	11.3	11.3
2 1/2		8	1.12	7.50	.75	4.88	2.88	.31	36	36	35	35
	65	8	29	190.5	19	123.8	73.0	8	16.3	16.3	15.9	16.0
3		8	1.25	8.00	-	5.25	3.50	.38	48	48	48	47
	80	8	32	203.2	-	133.3	88.9	10	21.8	21.8	21.8	21.3
4		8	1.38	9.50	-	6.38	4.50	.44	73	73	73	75
	100	8	35	241.3	-	161.9	114.3	11	33.1	33.1	33.1	34.0
5		8	1.62	11.50	-	7.75	5.56	.44	130	130	140	140
	125	8	42	292.1	-	196.8	141.3	11	59.0	59.0	63.5	63.5
6		12	1.50	12.50	-	9.00	6.63	.50	165	165	160	170
	150	12	39	317.5	-	228.6	168.3	13	75	75	72.6	77.1
8		12	1.75	15.50	-	11.50	8.63	.50	275	260	300	285
	200	12	45	393.7	-	292.1	219.1	13	125	118	136	129
10		12	2.00	19.00	-	14.50	10.75	.50	455	435	510	485
	250	12	51	482.6	-	368.3	273.0	13	206	197	231	220
12		16	2.12	22.50	-	17.75	12.75	.50	690	580	690	630
	300	16	54	571.5	-	450.6	323.8	13	313	263	313	286
14		16	2.38	25.00	-	19.50	14.00	.50	940	-	975	890
	350	16	61	635.0	-	495.3	355.6	13	426	-	442	404
16		16	2.62	27.75	-	21.75	16.00	.50	1250	-	1300	1150
	400	16	67	704.8	-	552.4	406.4	13	567	-	590	522
18		16	2.88	30.50	-	23.50	18.00	.50	1625	-	1750	1475
	450	16	74	774.7	-	569.9	457.2	13	737	-	795	669
20		16	3.12	32.75	-	25.25	20.00	.50	2050	-	2225	1775
	500	16	80	831.8	-	641.3	508.0	13	930	-	1010	805
24		16	3.62	39.00	-	30.00	24.00	.50	3325	-	3625	2825
	600	16	92	990.6	-	762.0	609.6	13	1510	-	1644	1326

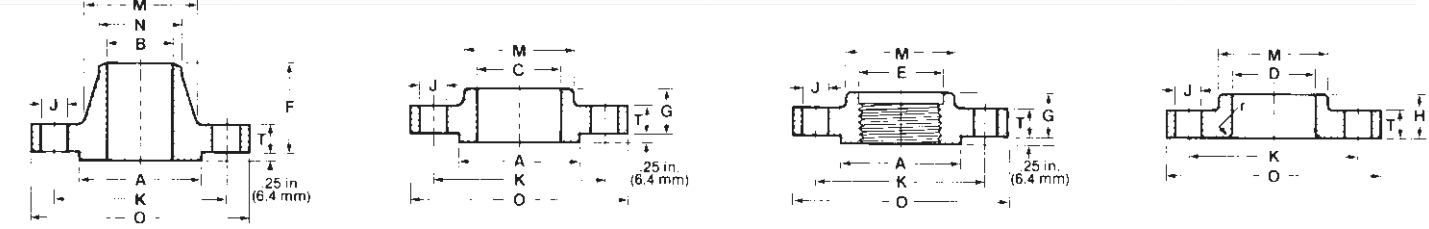
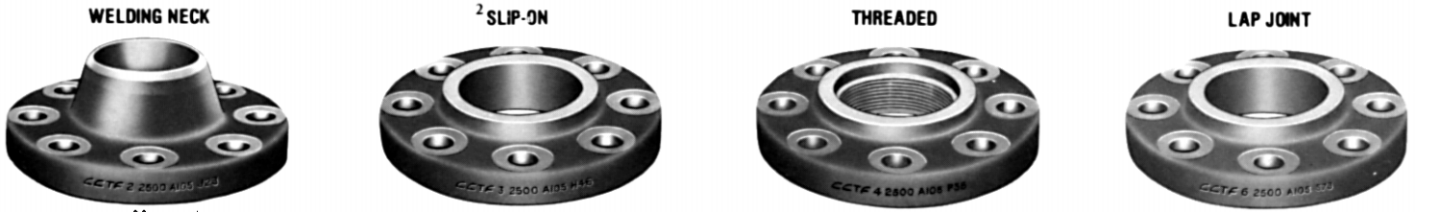
For bevel of Welding Neck, see page 48.

Gasket dimensions - page 20.

Bolting dimensions - page 22.

Flange facing dimensions - page 20.

POUNDS
KILOGRAMS



NPS	DN	FLANGE OUTSIDE DIAMETER O	FLANGE ¹ THICKNESS T	RAISED FACE DIA. A	BORE			LENGTH TRU HUB ¹			
					WELDING NECK & SOCKET WELDING B	SLIP-ON ² & SOCK. WELD. ² SOCKET MIN. C	LAP JOINT MIN. D	THREADED COUNTER-BORE MIN. E	WELDING NECK F	SLIP-ON ² THREADED SOCKET ² WELDING G	LAP JOINT H
1/2	15	5.25	1.19	1.38	To be specified by purchaser	0.88	.90	0.93	2.88	1.56	1.56
		133	30.5	34.9		22.2	22.9	23.5	73.0	40	40
3/4	20	5.50	1.25	1.69		1.09	1.11	1.14	3.12	1.69	1.69
		140	32.0	42.9		27.8	28.2	29.0	79.4	43	43
1	25	6.25	1.38	2.00		1.36	1.38	1.41	3.50	1.88	1.88
		159	35.0	50.8		34.5	34.9	36.0	88.9	48	48
1 1/4	32	7.25	1.50	2.50		1.70	1.72	1.75	3.75	2.06	2.06
		184	38.5	63.5		43.3	43.7	44.5	95.2	52	52
1 1/2	40	8.00	1.75	2.88		1.95	1.97	1.99	4.38	2.38	2.38
		203	44.5	73.0		49.6	50.0	50.5	111.4	60	60
2	50	9.25	2.00	3.62		2.44	2.46	2.50	5.00	2.75	2.75
		235	51.0	92.1		61.9	62.5	63.5	127.0	70	70
2 1/2	65	10.50	2.25	4.12		2.94	2.97	3.00	5.62	3.12	3.12
		267	57.5	104.8		74.6	75.4	76	142.9	79	79
3	80	12.00	2.62	5.00		3.57	3.60	3.63	6.62	3.62	3.62
		305	67.0	127.0		90.7	91.4	92	168.2	92	92
4	100	14.00	3.00	6.19		4.57	4.60	4.63	7.50	4.25	4.25
		356	76.5	157.2		116.1	116.8	118	190.5	108	108
5	125	16.50	3.62	7.31		5.66	5.69	5.69	9.00	5.12	5.12
		419	92.5	185.7		143.7	144.5	145	228.6	130	130
6	150	19.00	4.25	8.50		6.72	6.75	6.75	10.75	6.0	6.0
		483	108.0	215.9		170.7	171.4	171	273.0	152	152
8	200	21.75	5.00	10.62		8.72	8.75	8.75	12.50	7.0	7.0
		552	127.0	269.9		221.5	222.2	222	317.5	178	178
10	250	26.50	6.50	12.75	10.88	10.92	10.88	16.50	9.0	9.0	
		675	165.5	323.8	276.2	277.4	276	419.4	229	229	
12	300	30.00	7.25	15.00	12.88	12.92	12.94	18.25	10.0	10.0	
		760	184.5	381.0	327.0	328.2	329	463.6	254	254	

¹ Dimensions do not include .25" (6.4 mm) raised face.
² Class 2500 (PN 420) Socket Welding and Slip-on Flanges not covered by ANSI B16.5

REDUCING FLANGES ASME/ANSI B16.5 —

Hub dimensions shall be at least as large as those of the standard flanges of the size to which the reduction is being made, except that flanges reduced to a size smaller than those shown in the accompanying table may be used without hubs.

For threaded flanges, tapped smaller than the reduced size in the table, Blind Flanges may be used.

Flange thickness, outside diameter, drilling template and

facing dimensions, shall be the same as those of a standard flange of the nominal pipe size from which the reduction is being made.

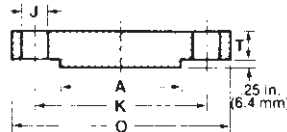
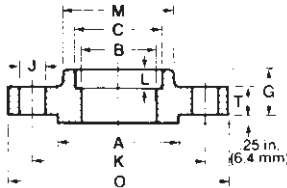
Reducing flanges are specified by giving firstly the size from which the reduction is made, followed by the reduced size.

Example: NPS 6 x 4 Class 300 reducing threaded flange. (DN 150 x 100, PN 50 reducing threaded flange.)

INCHES
MILLIMETRES

² SOCKET WELDING

BLIND



CLASS 2500 (PN 420) FLANGES* FORGED STEEL ASTM A-105 ¹ASME/ANSI B16.5

NPS	DN	DRILLING			DEPTH OF SOCKET ²	DIAMETER OF HUB			LAP JOINT FILLET RADIUS r	APPROXIMATE WEIGHT			
		NO. OF HOLES	DIA. OF HOLES J	DIA. OF BOLT CIRCLE K		AT BASE M	AT CHAMFER N	WELDING NECK		SLIP-ON, ² THREADED & SOCKET ² WELDING	BLIND	LAP JOINT	
1/2		4	.88	3.50	.38	1.69	.84	.12	7	7	7	7	
	15	4	23	88.9	10	42.9	21.4	3	3.2	3.2	3.2	3.2	
3/4		4	.88	3.75	.44	2.00	1.05	.12	8	8	8	8	
	20	4	23	95.2	11	50.8	26.6	3	3.6	3.6	3.6	3.6	
1		4	1.00	4.25	.50	2.25	1.32	.12	12	11	11	11	
	25	4	26	107.9	13	57.1	33.5	3	5.4	5.0	5.0	5.0	
1 1/4		4	1.12	5.12	.56	2.88	1.66	.19	17	16	17	16	
	32	4	29	130.2	14	73.0	42.1	5	7.7	7.3	7.7	7.3	
1 1/2		4	1.25	5.75	.62	3.12	1.90	.25	25	22	23	22	
	40	4	32	146.0	16	79.4	48.3	6	11.3	10	10.4	10	
2		8	1.12	6.75	.69	3.75	2.38	.31	42	38	39	37	
	50	8	29	171.4	17	95.2	60.3	8	19.0	17.2	17.7	16.8	
2 1/2		8	1.25	7.75	.75	4.50	2.88	.31	52	55	56	53	
	65	8	32	196.8	19.0	114.3	73.0	8	23.6	24.9	25.4	24	
3		8	1.38	9.00	-	5.25	3.50	.38	94	83	86	80	
	80	8	35	228.6	-	133.3	88.9	10	42.6	37.6	39	36.3	
4		8	1.62	10.75	-	6.50	4.50	.44	145	125	135	120	
	100	8	42	273.0	-	165.1	114.3	11	65.8	56.7	61.2	54.4	
5		8	1.88	12.75	-	8.00	5.56	.44	245	210	225	205	
	125	8	48	323.8	-	203.2	141.3	11	111	95.3	102	93.0	
6		8	2.12	14.50	-	9.25	6.63	.50	380	325	345	315	
	150	8	54	368.3	-	234.9	168.3	13	172	147	156	143	
8		12	2.12	17.25	-	12.00	8.63	.50	580	485	530	470	
	200	12	54	438.1	-	304.8	219.1	13	263	220	240	213	
10		12	2.62	21.25	-	14.75	10.75	.50	1075	930	1025	900	
	250	12	67	539.7	-	374.8	273.0	13	488	422	465	408	
12		12	2.88	24.38	-	17.38	12.75	.50	1525	1100	1300	1100	
	300	12	74	619.1	-	441.3	323.8	13	692	499	590	499	

* Class 2500 (PN 420) Socket Welding and Slip-on Flanges are not covered by ASME/ANSI B16.5.
Bevel of Welding Neck, see page 48
Flange facing and gasket dimensions, see page 20.
Bolting dimensions, see page 22.

CLASS 150 — 2500 (PN 20 - 420)

Nominal Pipe Size	DN	Smallest Size of Reducing Outlet Requiring Hub Flanges
1	25	1/2
1 1/4	32	1/2
1 1/2	40	1/2
2	50	1
2 1/2	65	1 1/4
3	80	1 1/4

Nominal Pipe Size	DN	Smallest Size of Reducing Outlet Requiring Hub Flanges
3 1/2	90	1 1/2
4	100	1 1/2
5	125	1 1/2
6	150	2 1/2
8	200	3 1/2
10	250	3 1/2

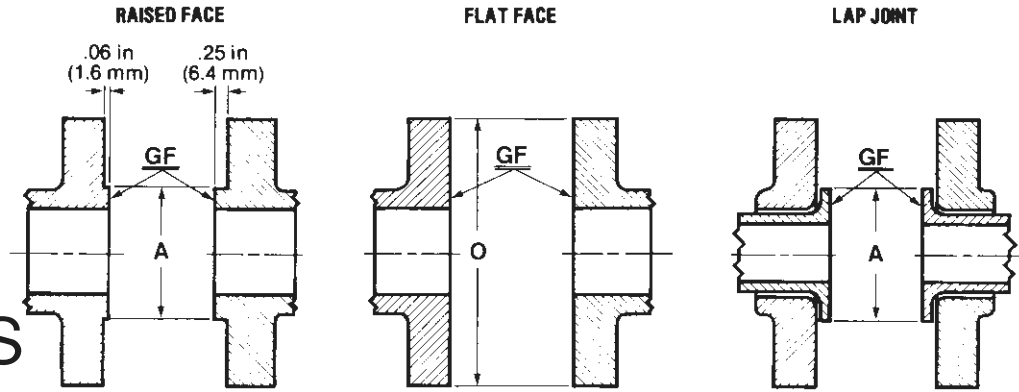
Nominal Pipe Size	DN	Smallest Size of Reducing Outlet Requiring Hub Flanges
12	300	3 1/2
14	350	3 1/2
16	400	4
18	450	4
20	500	4
24	600	4

POUNDS
KILOGRAMS

Reducing Flanges are generally supplied as Slip-on or Threaded; however Reducing Welding Neck flanges are available by special order.

FLANGE FACING AND GASKET DIMENSIONS

RAISED FACE, FLAT FACE, LAP JOINT



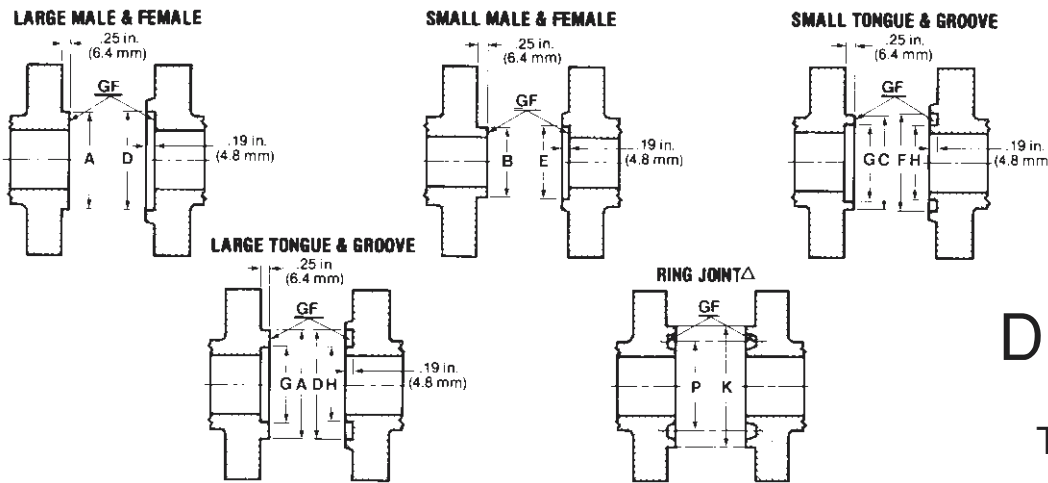
NPS	*FLANGE FACING		GASKET DIMENSIONS								FULL FACE TYPE OUTSIDE DIAMETER	FLAT RING OR FULL FACE TYPES INSIDE DIAMETER	
	DN	A	O	FLAT RING TYPE GASKET (EXTENDING TO INSIDES OF BOLTS) OUTSIDE DIAMETER						CL. 1500			CL. 2500
				CL. 150	CL. 300	CL. 400	CL. 600	CL. 900	CL. 1500				
1/2	1.38	1.88	Same as flange outside diameter, see pages 6 - 19.	1.88	2.12	2.12	2.12	2.50	2.50	2.75	Same as flange outside diameter, see pages 6 - 19.	0.84	
	15	35		48	54	54	54	64	64	70		21	
3/4	1.69	2.25		2.25	2.62	2.62	2.62	2.75	2.75	3.00		1.06	
	20	43		57	67	67	67	70	70	76		27	
1	2	2.62		2.62	2.88	2.88	2.88	3.12	3.12	3.38		1.31	
	25	51		67	73	73	73	79	79	86		33	
1 1/4	2.5	3.00		3.00	3.25	3.25	3.25	3.50	3.50	4.12		1.66	
	32	64		76	83	83	83	89	89	105		42	
1 1/2	2.88	3.38		3.38	3.75	3.75	3.75	3.88	3.88	4.62		1.91	
	40	73		86	95	95	95	98	98	117		49	
2	3.62	4.12		4.12	4.38	4.38	4.38	5.62	5.62	5.75		2.38	
	50	92		105	111	111	111	143	143	146		60	
2 1/2	4.12	4.88		4.88	5.12	5.12	5.12	6.50	6.50	6.62		2.88	
	65	105		124	130	130	130	165	165	168		73	
3	5	5.38		5.38	5.88	5.88	5.88	6.62	6.88	7.75		3.5	
	80	127		137	149	149	149	168	175	197		89	
3 1/2	5.5	6.38		6.38	6.50	6.38	6.38	-	-	-		4	
	90	140		162	165	162	162	-	-	-		102	
4	6.19	6.88		6.88	7.12	7.00	7.62	8.12	8.25	9.25		4.5	
	100	157		175	181	178	194	206	210	235		114	
5	7.31	7.75		7.75	8.50	8.38	9.50	9.75	10.00	11.00		5.56	
	125	185		197	216	213	241	248	254	279		141	
6	8.5	8.75		8.75	9.88	9.75	10.50	11.38	11.12	12.50		6.62	
	150	216		222	251	248	267	289	2.83	318		168	
8	10.62	11.00		11.00	12.12	12.00	12.62	14.12	13.88	15.25		8.62	
	200	270		279	308	305	321	359	352	387		219	
10	12.75	13.38		13.38	14.25	14.12	15.75	17.12	17.12	18.75		10.75	
	250	324		340	362	359	400	435	435	476		273	
12	15	16.12	16.12	16.62	16.50	18.00	19.62	20.50	21.62	12.75			
	300	381	410	422	419	457	498	520	550	324			
14	16.25	17.75	17.75	19.12	19.00	19.38	20.50	22.75	-	14			
	350	413	451	486	483	492	520	580	-	356			
16	18.5	20.25	20.25	21.25	21.12	22.25	22.62	25.25	-	16			
	400	470	515	540	537	565	575	640	-	407			
18	21	21.62	21.62	23.50	23.38	24.12	25.12	27.75	-	18			
	450	533	550	595	595	615	640	705	-	457			
20	23	23.88	23.88	25.75	25.50	26.88	27.50	29.75	-	20			
	500	584	605	655	648	685	700	755	-	508			
24	27.25	28.25	28.25	30.5	30.25	31.12	33.00	35.50	-	24			
	600	692	718	775	770	790	839	902	-	610			

Gasket Facing is indicated on the facing drawings by "GF".

Dimensions conform to ASME/ANSI B16.5 and ANSI B16.21, where applicable.

* A tolerance of $\pm 0.16"$ (0.44 mm) is allowed on the inside and outside diameters of all facings.

Δ For Ring Joint dimensions see page 30.



FLANGE FACING AND GASKET DIMENSIONS

MALE & FEMALE,
TONGUE & GROOVE

NPS	DN	*FLANGE FACINGS DIMENSIONS							GASKET DIMENSIONS					
		OUTSIDE DIAMETER						INSIDE DIAMETER		OUTSIDE DIAMETER			INSIDE DIAMETER	
		LARGE MALE; LARGE TONGUE	SMALL MALE	SMALL TONGUE	LARGE FEMALE; LARGE GROOVE	SMALL FEMALE	SMALL GROOVE	LARGE TONGUE; SMALL TONGUE	LARGE GROOVE; SMALL GROOVE	LARGE MALE & FEMALE. LARGE TONGUE & GROOVE	SMALL MALE & FEMALE	SMALL TONGUE & GROOVE	LARGE MALE & FEMALE	LARGE OR SMALL TONGUE & GROOVE
1/2	15	1.38	0.72	1.38	1.44	0.78	1.44	1.00	0.94	1.38	0.72	1.38	0.84	1.00
3/4	20	1.69	.94	1.69	1.75	1.00	1.75	1.31	1.25	1.69	.94	1.69	1.06	1.31
1	25	2.00	1.19	1.88	2.06	1.25	1.94	1.5	1.44	2.00	1.19	1.88	1.31	1.50
1 1/4	32	2.50	1.5	2.25	2.56	1.56	2.31	1.88	1.81	2.50	1.50	2.25	1.66	1.88
1 1/2	40	2.88	1.75	2.50	2.94	1.81	2.56	2.12	2.06	2.88	1.75	2.50	1.91	2.12
2	50	3.62	2.25	3.25	3.69	2.31	3.31	2.88	2.81	3.62	2.25	3.25	2.38	2.88
2 1/2	65	4.12	2.69	3.75	4.19	2.75	3.81	3.38	3.31	4.12	2.69	3.75	2.88	3.38
3	80	5.00	3.31	4.62	5.06	3.38	4.69	4.25	4.19	5.00	3.31	4.62	3.5	4.25
3 1/2	90	5.50	3.81	5.12	5.56	3.88	5.19	4.75	4.69	5.50	3.81	5.12	4	4.75
4	100	6.19	4.31	5.69	6.25	4.38	5.75	5.19	5.12	6.19	4.31	5.69	4.5	5.19
5	125	7.31	5.38	6.81	7.38	5.44	6.88	6.31	6.25	7.31	5.38	6.81	5.56	6.31
6	150	8.50	6.38	8.00	8.56	6.44	8.06	7.5	7.44	8.50	6.38	8.00	6.62	7.50
8	200	10.62	8.38	10.00	10.69	8.44	10.06	9.38	9.31	10.62	8.38	10.00	8.62	9.38
10	250	12.75	10.5	12.00	12.81	10.56	12.06	11.25	11.19	12.75	10.50	12.00	10.75	11.25
12	300	15.0	12.5	14.25	15.06	12.56	14.31	13.5	13.44	15.00	12.50	14.25	12.75	13.50
14	350	16.25	13.75	15.50	16.31	13.81	15.56	14.75	14.69	16.25	13.75	15.50	14	14.75
16	400	18.5	15.75	17.62	18.56	15.81	17.69	16.75	16.69	18.50	15.75	17.62	16	16.75
18	450	21.0	17.75	20.12	21.06	17.81	20.19	19.25	19.19	21.00	17.75	20.12	18	19.25
20	500	23.0	19.75	22.0	23.06	19.81	22.06	21.0	20.94	23.00	19.75	22.0	20	21.00
24	600	27.25	23.75	26.25	27.41	23.81	26.31	25.25	25.19	27.25	23.75	26.25	24	25.25

Gasket Facing is indicated on the facing drawings by "GF".

Δ For Ring Joint dimensions see page 30.

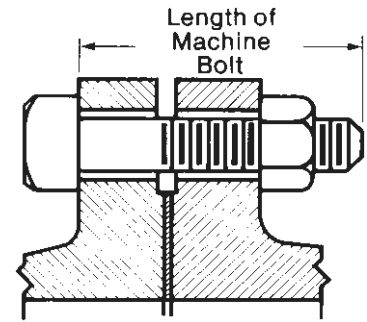
* A tolerance of ±0.16" (0.44 mm) is allowed on the inside and outside diameters of all facings.

Dimensions conform to ASME/ANSI B16.5 and ANSI B16.21, where applicable.

INCHES
MILLIMETRES

BOLT AND STUD DIMENSIONS*

CONTINUED ON PAGE 23



NPS DN	CLASS 150 (PN 20) FLANGES						CLASS 300 (PN 50) FLANGES					CLASS 400 (PN 64) FLANGES				
	NO. OF BOLTS	DIA. OF BOLTS (inches)	LENGTH			NO. OF BOLTS	DIA. OF BOLTS (inches)	LENGTH			NO. OF BOLTS	DIA. OF BOLTS (inches)	LENGTH OF STUD BOLTS			
			STUD BOLTS		MACHINE BOLTS			STUD BOLTS		MACHINE BOLTS			STUD BOLTS			
			.06 1.6 RAISED FACE	RING JOINT	.06 1.6 RAISED FACE			.06 1.6 RAISED FACE	RING JOINT	.06 1.6 RAISED FACE			.25 6.4 RAISED FACE	MALE & FEMALE TONGUE & GROOVE	RING JOINT	
1/2	4	1/2	2.50	-	2.00	4	1/2	2.75	3.00	2.25	4	1/2	3.25	3.00	3.00	
15	4	1/2	65	-	50	4	1/2	70	75	55	4	1/2	85	75	75	
3/4	4	1/2	2.50	-	2.25	4	5/8	3.00	3.50	2.50	4	5/8	3.50	3.25	3.50	
20	4	1/2	65	-	55	4	5/8	75	90	6.5	4	5/8	90	85	90	
1	4	1/2	2.75	3.25	2.25	4	5/8	3.25	3.75	2.75	4	5/8	3.75	3.50	3.75	
25	4	1/2	70	85	55	4	5/8	85	95	70	4	5/8	95	90	95	
1 1/4	4	1/2	2.75	3.25	2.50	4	5/8	3.25	3.75	2.75	4	5/8	4.00	3.75	4.00	
32	4	1/2	70	85	65	4	5/8	85	95	70	4	5/8	100	95	100	
1 1/2	4	1/2	3.00	3.50	2.50	4	3/4	3.75	4.25	3.00	4	3/4	4.25	4.00	4.25	
40	4	1/2	75	90	65	4	3/4	95	110	75	4	3/4	110	100	110	
2	4	5/8	3.25	3.75	2.75	8	5/8	3.50	4.25	3.00	8	5/8	4.25	4.00	4.50	
50	4	5/8	85	95	70	8	5/8	90	110	75	8	5/8	110	100	115	
2 1/2	4	5/8	3.50	4.00	3.00	8	3/4	4.00	4.75	3.50	8	3/4	4.75	4.50	5.00	
65	4	5/8	90	100	75	8	3/4	100	120	90	8	3/4	120	115	130	
3	4	5/8	3.75	4.25	3.25	8	3/4	4.25	5.00	3.75	8	3/4	5.00	4.75	5.25	
80	4	5/8	95	110	85	8	3/4	110	125	95	8	3/4	130	120	135	
3 1/2	8	5/8	3.75	4.25	3.25	8	3/4	4.50	5.25	3.75	8	7/8	5.50	5.25	5.75	
90	8	5/8	95	110	85	8	3/4	115	135	95	8	7/8	140	135	145	
4	8	5/8	3.75	4.25	3.25	8	3/4	4.50	5.25	4.00	8	7/8	5.50	5.25	5.75	
100	8	5/8	95	110	85	8	3/4	115	135	100	8	7/8	140	135	145	
5	8	3/4	4.00	4.50	3.25	8	3/4	4.75	5.50	4.25	8	7/8	5.75	5.50	6.00	
125	8	3/4	100	115	85	8	3/4	120	140	110	8	7/8	145	140	155	
6	8	3/4	4.00	4.50	3.50	12	3/4	5.00	5.75	4.25	12	7/8	6.00	5.75	6.25	
150	8	3/4	100	115	90	12	3/4	130	145	110	12	7/8	155	145	160	
8	8	3/4	4.25	4.75	3.75	12	7/8	5.50	6.25	4.75	12	1	6.75	6.50	7.00	
200	8	3/4	110	120	95	12	7/8	140	160	120	12	1	175	165	180	
10	12	7/8	4.75	5.25	4.00	16	1	6.25	7.00	5.50	16	1 1/8	7.50	7.25	7.75	
250	12	7/8	120	135	100	16	1	160	180	140	16	1 1/8	190	185	195	
12	12	7/8	4.75	5.25	4.25	16	1 1/8	6.75	7.50	6.00	16	1 1/4	8.00	7.75	8.25	
300	12	7/8	120	135	110	16	1 1/8	175	190	155	16	1 1/4	205	195	210	
14	12	1	5.25	4.75	4.50	20	1 1/8	7.00	7.75	6.25	20	1 1/4	8.25	8.00	8.50	
350	12	1	135	145	115	20	1 1/8	180	195	160	20	1 1/4	210	205	215	
16	16	1	5.50	6.00	4.75	20	1 1/4	7.50	8.25	6.50	20	1 3/8	8.75	8.50	9.00	
400	16	1	140	155	120	20	1 1/4	190	210	165	20	1 3/8	225	215	230	
18	16	1 1/8	6.00	6.50	5.00	24	1 1/4	7.75	8.50	6.75	24	1 3/8	9.00	8.75	9.25	
450	16	1 1/8	150	165	125	24	1 1/4	195	215	175	24	1 3/8	230	225	235	
20	20	1 1/8	6.25	6.75	5.50	24	1 1/4	8.25	9.00	7.25	24	1 1/2	9.75	9.50	10.00	
500	20	1 1/8	160	175	140	24	1 1/4	210	230	185	24	1 1/2	250	240	255	
24	20	1 1/4	7.00	7.50	6.00	24	1 1/2	9.25	10.25	8.00	24	1 3/4	10.75	10.50	11.25	
600	20	1 1/4	180	190	155	24	1 1/2	235	260	205	24	1 3/4	275	265	285	

* Length of Stud Bolt does not include the height of the points.

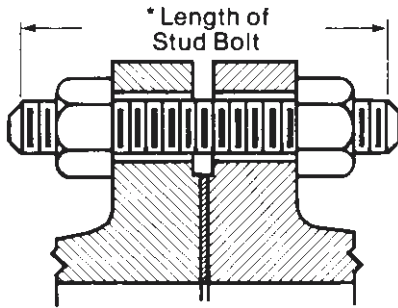
Bolt sizes are in inches.

Length of Male & Female and Tongue & Groove Stud Bolts are .25" (6.4 mm) less than those for the same size of .25" (6.4 mm) Raised Face Stud Bolts.

INCHES
MILLIMETRES

BOLT AND STUD DIMENSIONS

CONTINUED



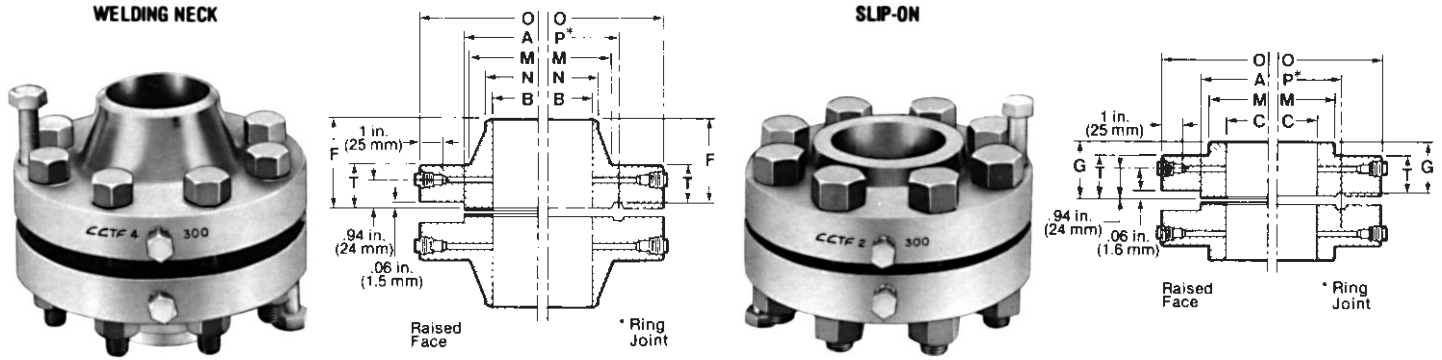
NPS DN	CLASS 600 (PN 100) FLANGES				CLASS 900 (PN 150) FLANGES				CLASS 1500 (PN 250) FLANGES				CLASS 2500 (PN 420) FLANGES			
	NO. OF BOLTS	DIA. OF BOLTS (inches)	LENGTH OF STUD BOLTS		NO. OF BOLTS	DIA. OF BOLTS (inches)	LENGTH OF STUD BOLTS		NO. OF BOLTS	DIA. OF BOLTS (inches)	LENGTH OF STUD BOLTS		NO. OF BOLTS	DIA. OF BOLTS (inches)	LENGTH OF STUD BOLTS	
			.25 6.4 RAISED FACE	RING JOINT			.25 6.4 RAISED FACE	RING JOINT			.25 6.4 RAISED FACE	RING JOINT			.25 6.4 RAISED FACE	RING JOINT
1/2	4	1/2	3.25	3.00	4	3/4	4.25	4.25	4	3/4	4.25	4.25	4	3/4	5.25	5.25
15	4	1/2	85	75	4	3/4	110	110	4	3/4	110	110	4	3/4	135	135
3/4	4	5/8	3.50	3.50	4	3/4	4.50	4.50	4	3/4	4.50	450	4	3/4	5.25	5.25
20	4	5/8	90	90	4	3/4	115	115	4	3/4	115	115	4	3/4	135	135
1	4	5/8	3.75	3.75	4	7/8	5.00	5.00	4	7/8	5.00	5.00	4	7/8	5.75	5.75
25	4	5/8	95	95	4	7/8	125	125	4	7/8	125	125	4	7/8	145	145
1 1/4	4	5/8	4.00	4.00	4	7/8	5.00	5.00	4	7/8	5.00	5.00	4	1	6.25	6.50
32	4	5/8	100	100	4	7/8	125	125	4	7/8	125	125	4	1	160	165
1 1/2	4	3/4	4.25	4.25	4	1	5.50	5.50	4	1	5.50	5.50	4	1 1/8	7.00	7.25
40	4	3/4	110	110	4	1	140	140	4	1	140	140	4	1 1/8	180	185
2	8	5/8	4.25	4.50	8	7/8	5.75	5.75	8	7/8	5.75	5.75	8	1	7.25	7.50
50	8	5/8	110	115	8	7/8	145	145	8	7/8	145	145	8	1	185	190
2 1/2	8	3/4	4.75	5.00	8	1	6.25	6.25	8	1	6.25	6.25	8	1 1/8	8.00	8.25
65	8	3/4	120	125	8	1	160	160	8	1	160	160	8	1 1/8	205	210
3	8	3/4	5.00	5.25	8	7/8	5.75	6.00	8	1 1/8	7.00	7.00	8	1 1/4	9.00	9.25
80	8	3/4	130	135	8	7/8	145	155	8	1 1/8	180	180	8	1 1/4	230	235
3 1/2	8	7/8	5.50	5.75	-	-	-	-	-	-	-	-	-	-	-	-
90	8	7/8	140	145	-	-	-	-	-	-	-	-	-	-	-	-
4	8	7/8	5.75	6.00	8	1 1/8	6.75	7.00	8	1 1/4	7.75	7.75	8	1 1/2	10.25	10.75
100	8	7/8	145	155	8	1 1/8	175	180	8	1 1/4	195	195	8	1 1/2	260	275
5	8	1	6.50	6.75	8	1 1/4	7.50	7.75	8	1 1/2	9.75	9.75	8	1 3/4	12.00	12.75
125	8	1	165	175	8	1 1/4	190	195	8	1 1/2	250	250	8	1 3/4	305	325
6	12	1	6.75	7.00	12	1 1/8	7.75	7.75	12	1 3/8	10.25	10.50	8	2	13.75	14.50
150	12	1	175	180	12	1 1/8	195	195	12	1 3/8	260	265	8	2	350	370
8	12	1 1/8	7.75	7.75	12	1 3/8	8.75	9.00	12	1 5/8	11.50	12.00	12	2	15.25	16.00
200	12	1 1/8	195	195	12	1 3/8	225	230	12	1 5/8	295	305	12	2	390	405
10	16	1 1/4	8.50	8.75	16	1 3/8	9.25	9.50	12	1 7/8	13.25	13.75	12	2 1/2	19.50	20.50
250	16	1 1/4	215	225	16	1 3/8	235	240	12	1 7/8	335	350	12	2 1/2	495	520
12	20	1 1/4	8.75	9.00	20	1 3/8	10.00	10.25	16	2	14.75	15.50	12	2 3/4	21.50	22.50
300	20	1 1/4	225	230	20	1 3/8	255	260	16	2	375	395	12	2 3/4	545	570
14	20	1 3/8	9.25	9.50	20	1 1/2	10.75	11.25	16	2 1/4	16.00	17.00				
350	20	1 3/8	235	240	20	1 1/2	275	285	16	2 1/4	405	430				
16	20	1 1/2	10.00	10.25	20	1 5/8	11.25	11.75	16	2 1/2	17.50	18.50				
400	20	1 1/2	255	260	20	1 5/8	285	300	16	2 1/2	445	470				
18	20	1 5/8	10.75	11.00	20	1 7/8	12.75	13.50	16	2 3/4	19.50	20.50				
450	20	1 5/8	275	280	20	1 7/8	325	345	16	2 3/4	495	520				
20	24	1 5/8	11.50	11.75	20	2	13.50	14.25	16	3	21.50	22.50				
500	24	1 5/8	295	300	20	2	345	360	16	3	545	570				
24	24	1 7/8	13.00	13.25	20	2 1/2	17.25	18.00	16	3 1/2	24.50	25.75				
600	24	1 7/8	330	335	20	2 1/2	440	455	16	3 1/2	620	655				

* Length of Stud Bolt does not include the height of the points

Bolt sizes are in inches.

Length of Male & Female and Tongue & Groove Stud Bolts are .25" (6.4 mm) less than those for the same size of .25" (6.4 mm) Raised Face Stud Bolts.

INCHES
MILLIMETRES



NPS	DN	FLANGE OUTSIDE DIAMETER O	△ FLANGE THICKNESS		RAISED FACE DIAMETER A	BORE		△ LENGTH THRU HUB			
			RAISED FACE T	RING JOINT T		WELDING NECK B	SLIP-ON C	WELDING NECK		SLIP-ON AND THREADED	
								RAISED FACE F	RING JOINT F	RAISED FACE G	RING JOINT G
CLASS 300 (PN 50)											
1		4.88	1.50	1.25	2.00	1.05	1.36	3.25	3.00	1.88	1.62
	25	124	38.5	32.0	50.80	26.6	34.5	82.6	76.2	48	41.3
1 1/4	□	5.25	1.50	1.25	2.50	1.38	1.70	3.31	3.06	1.81	1.56
	□ 32	133	38.5	32.0	63.50	35.1	43.2	84.1	77.8	46	39.7
1 1/2		6.12	1.50	1.25	2.88	1.61	1.95	3.38	3.12	1.88	1.62
	40	156	38.5	32.0	73.05	40.9	49.5	85.8	79.4	48	41.3
2		6.50	1.50	1.25	3.62	2.07	2.44	3.38	3.12	1.94	1.69
	50	165	38.5	32.0	92.10	52.5	62.0	85.8	79.4	49	42.9
2 1/2		7.50	1.50	1.25	4.12	2.47	2.94	3.50	3.25	2.00	1.75
	65	191	38.5	32.0	104.80	62.7	74.5	88.9	82.6	51	44.5
3		8.25	1.50	1.25	5.00	3.07	3.57	3.50	3.25	2.06	1.81
	80	210	38.5	32.0	127.00	77.9	90.5	88.9	82.6	52	46.0
4		10.0	1.50	1.25	6.19	4.03	4.57	3.62	3.38	2.12	1.88
	100	254	38.5	32.0	157.20	102.3	116.0	92.1	85.7	54	47.6
5	□	11.0	1.50	1.38	7.31	5.05	5.66	4.00	3.88	2.12	2.00
	□ 125	279	38.5	35.0	185.70	128.2	143.8	101.6	98.4	54	50.8
6		12.5	1.50	1.44	8.50	6.07	6.72	3.94	3.88	2.12	2.06
	150	318	38.5	36.5	215.90	154.1	171.0	100.0	98.4	54	52.4
8		15.0	1.62	1.62	10.62	7.98	8.72	4.38	4.38	2.44	2.44
	200	381	41.5	41.5	269.90	202.7	221.0	111.2	111.1	62	61.9
10		17.5	1.88	1.88	12.75	10.02	10.88	4.62	4.62	2.62	2.62
	250	445	48.0	48.0	323.90	254.5	276.0	117.5	117.5	67	66.7
12		20.5	2.00	2.00	15.00	12.00	12.88	5.12	5.12	2.88	2.88
	300	520	51.0	51.0	381.00	304.8	327.0	130.2	130.2	73	73.0
14		23.0	2.12	2.12	16.25	13.25	14.14	5.62	5.62	3.00	3.00
	350	585	54.0	54.0	412.80	336.6	359.0	142.9	142.9	76	76.2
16		25.5	2.25	2.25	18.50	15.25	16.16	5.75	5.75	3.25	3.25
	400	650	57.5	57.5	469.90	387.4	410.0	146.1	146.1	83	82.6
18		28.0	2.38	2.38	21.00	17.25	18.18	6.25	6.25	3.50	3.50
	450	710	60.5	60.5	533.40	438.2	462.0	158.8	158.8	89	88.9
20		30.5	2.50	2.50	23.00	19.25	20.20	6.38	6.38	3.75	3.75
	500	775	63.5	63.5	584.20	489.0	513.0	162.0	161.9	95	95.3
24		36.0	2.75	2.75	27.25	23.25	24.25	6.62	6.62	4.19	4.19
	600	915	70.0	70.0	692.20	590.6	616.0	168.3	168.3	106	106.4

#ASME/ANSI B16.36 does not cover Class 300 Threaded Orifice Flanges in sizes above NPS 8 (DN 200).

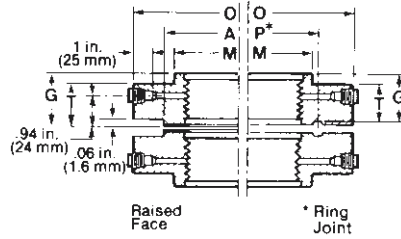
□ Not included in ASME/ANSI B16.36.

*Details of Ring Joint facings are given on page 30.

FOR FURTHER DETAILS, REFER TO PAGE 4 "OTHER TYPES".

△ 0.06" (1.6 mm) Raised Face is included in Flange Thickness T, and length through Hub, F & G.

THREADED



CLASS 300 (PN 50) FORGED ORIFICE FLANGES ASTM A-105 ASME/ANSI B16.36

NPS DN	DRILLING			BOLTING		DIAMETER OF HUB		APPROXIMATE WEIGHT					
	NO. OF HOLES	DIA. OF HOLES	DIA. OF BOLT CIRCLE	BOLT DIA. (inches)	LENGTH		AT BASE M	AT CHAMFER N	WELDING NECK		SLIP-ON AND THREADED		
					RAISED FACE	RING JOINT			RAISED FACE	RING JOINT	RAISED FACE	RING JOINT	
CLASS 300 (PN 50)													
1 25	4	0.69 18	3.50 89	5/8 5/8	4.00 102	4.75 121	2.12 54.0	1.32 33.5	18 8	20 9	15 7	17 7.5	
1 1/4 □ 32	4	0.69 17.5	3.88 99	5/8 5/8	4.00 102	4.75 121	2.50 63.5	1.66 42.2	21 9.5	23 10.5	17 7.5	20 9	
1 1/2 40	4	0.81 18	4.50 114	3/4 3/4	4.25 108	5.00 127	2.75 70	1.90 48.5	28 12.5	30 13.5	24 11	28 13	
2 50	8	0.69 18	5.00 127	5/8 5/8	4.00 102	4.75 120	3.31 84	2.38 60.5	33 15	36 16	27 12	31 14	
2 1/2 65	8	0.81 21	5.88 149	3/4 3/4	4.25 108	5.00 127	3.94 100	2.88 73.0	43 19.5	46 21	36 16	42 19	
3 80	8	0.81 21	6.62 168	3/4 3/4	4.25 108	5.00 127	4.62 117	3.50 89.0	48 21.5	52 23.5	42 19	48 22	
4 100	8	0.81 21	7.88 200	3/4 3/4	4.25 108	5.00 127	5.75 146	4.50 114.0	68 30.5	73 33	60 27	66 30	
5 □ 125	8	0.88 23	9.25 235	3/4 3/4	4.25 108	5.50 140	7.00 178	5.56 141.2	78 35	89 40	69 31	80 36	
6 150	12	0.88 23	10.62 270	3/4 3/4	4.25 108	5.50 140	8.12 206	6.63 168.0	100 45	115 52	94 42.5	110 50	
8 200	12	1.00 26	13.00 330	7/8 7/8	4.50 115	6.00 153	10.25 260	8.63 219.0	155 70	180 81	135 61	160 73	
10 250	16	1.12 29	15.25 387	1 1	5.50 140	6.50 165	12.62 321	10.75 273.0	220 99	255 115	200 90	230 104	
12 300	16	1.25 32	17.75 451	1 1/8 1 1/8	5.50 140	7.00 178	14.75 375	12.75 324.0	330 149	380 171	280 125	325 147	
14 350	20	1.25 32	20.25 514	1 1/8 1 1/8	6.00 153	7.00 178	16.75 425.5	14.00 356.0	425 191	485 218	395 178	450 204	
16 400	20	1.38 35	22.50 572	1 1/4 1 1/4	6.50 165	8.00 204	19.00 483	16.00 406.0	590 266	660 297	465 209	535 243	
18 450	24	1.38 35	24.75 629	1 1/4 1 1/4	6.50 165	8.00 204	21.00 535	18.00 457.0	750 338	830 374	610 275	690 313	
20 500	24	1.38 35	27.00 686	1 1/4 1 1/4	7.00 178	8.00 204	23.12 585	20.00 508.0	910 410	1025 461	740 336	840 381	
24 600	24	1.62 42	32.00 813	1 1/2 1 1/2	7.50 191	9.00 229	27.62 700	24.00 610.0	1350 608	1500 675	1125 510	1300 590	

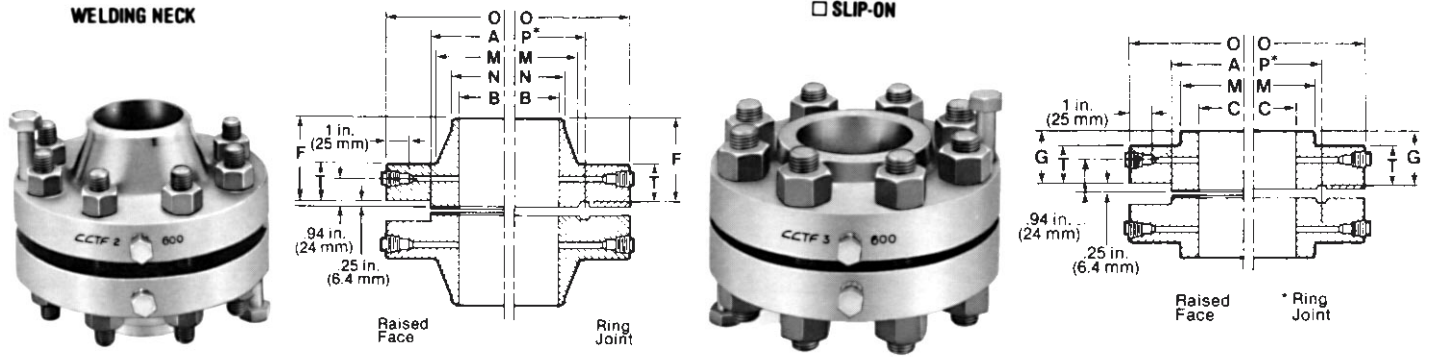
The tapped metering holes are drilled as follows:

1/2" for sizes NPS 4 (DN 100) and over

3/8" for sizes NPS 3 (DN 80)

1/4" for sizes NPS 1 1/2 (DN 65) and under.

POUNDS
KILOGRAMS



†CLASS 400 (PN 68)

NPS	DN	FLANGE OUTSIDE DIAMETER	A FLANGE THICKNESS		RAISED FACE DIAMETER	BORE		A LENGTH TRU HUB			
			RAISED FACE	RING JOINT		WELDING NECK	SLIP-ON	WELDING NECK		SLIP-ON AND THREADED	
								F	F	RAISED FACE	RING JOINT
		O	T	T	A	B	C	F	F	G	G
4	100	10	1.38	1.38	6.19	As specified by purchaser	4.57	3.5	3.5	2	2
		254	35.0	35.0	157.2		116.1	88.9	88.9	50.8	50.8
5 □	□ 125	11	1.50	1.50	7.31		5.66	4.0	4	2.12	2.12
		279	38.5	38.1	185.7		143.8	101.6	101.6	54.0	54.0
6	150	12.5	1.62	1.62	8.50		6.72	4.06	4.06	2.25	2.25
		318	41.5	41.5	215.9		170.7	103.2	103.2	57.2	57.2
8	200	15	1.88	1.88	10.62		8.72	4.62	4.62	2.69	2.69
		381	48.0	48.0	269.9		221.5	117.5	117.4	68.3	68.3
10	250	17.5	2.12	2.12	12.75		10.88	4.88	4.88	2.88	2.88
		445	54.0	54.0	323.9		276.4	123.5	123.8	73.0	73.0
12	300	20.5	2.25	2.25	15.00		12.88	5.38	5.38	3.12	3.12
		520	57.5	57.5	381.0		327.2	136.5	136.5	79.4	79.4

†CLASS 600 (PN 100)

NPS	DN	FLANGE OUTSIDE DIAMETER	A FLANGE THICKNESS		RAISED FACE DIAMETER	BORE		A LENGTH TRU HUB			
			RAISED FACE	RING JOINT		WELDING NECK	SLIP-ON	WELDING NECK		SLIP-ON AND THREADED	
								F	F	RAISED FACE	RING JOINT
		O	T	T	A	B	C	F	F	G	G
4	100	10.75	1.50	1.50	6.19	As specified by purchaser	4.57	4.00	4.00	2.12	2.12
		273	38.5	38.1	157.2		116.1	101.6	101.6	54.0	54.0
5 □	□ 125	13.00	1.75	1.75	7.31		5.66	4.50	4.50	2.38	2.38
		330	44.5	44.5	185.7		143.8	114.3	114.3	60.5	60.5
6	150	14.00	1.88	1.88	8.50		6.72	4.62	4.62	2.62	2.62
		356	48.0	48.0	215.9		170.7	117.5	117.5	66.7	66.7
8	200	16.50	2.19	2.19	10.62		8.72	5.25	5.25	3.00	3.00
		419	56.0	56.0	269.9		221.5	133.4	133.4	76.2	76.2
10	250	20.00	2.50	2.50	12.75		10.88	6.00	6.00	3.38	3.38
		510	63.5	63.5	323.9		276.4	152.4	152.4	85.7	85.7
12	300	22.00	2.62	2.62	15.00		12.88	6.12	6.12	3.62	3.62
		560	67.0	67.0	381.0		327.2	155.6	155.6	92.1	92.1

Δ .25" (6.4 mm) Raised Face s not included in Flange Thickness T, and Length through Hub F & G.

† Flanges size NPS 3 (DN80) and smaller are identical to Class 300 flanges, except for bolting steel specifications, compliance with which then permits their use for these higher Class ratings.

□ Not covered by ASME/ANSI B16.36.

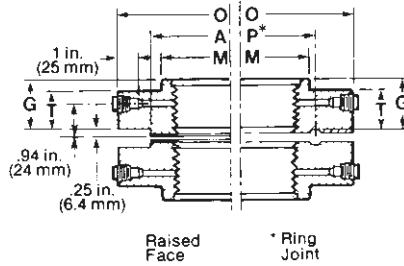
Welding Neck Orifice Flanges in sizes NPS 14 through 24 (DN 350 through 600), as covered by ASME/ANSI B16.36, are available upon application.

* Details of Ring Joint facings are given on page 30.

FOR FURTHER DETAILS, REFER TO PAGE 4 "OTHER TYPES".

INCHES
MILLIMETRES

□ THREADED



**CLASS 400 (PN 68)
CLASS 600 (PN 100)
FORGED
#ORIFICE FLANGES
ASTM A-105
ASME/ANSI B16.36
ASME/ANSI B16.36a**

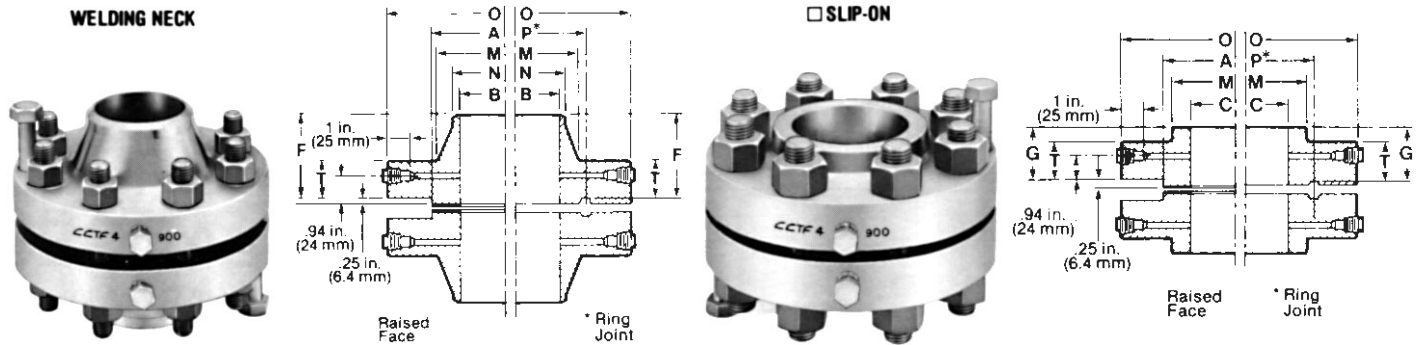
NPS DN	DRILLING			BOLT DIA. (inches)	BOLTING LENGTH		DIAMETER OF HUB		APPROXIMATE WEIGHT			
	NO. OF HOLES	DIA. OF HOLES	DIA. OF BOLT CIRCLE		RAISED FACE	RING JOINT	AT BASE M	AT CHAMFER N	WELDING NECK		SLIP-ON AND SCREWED	
									RAISED FACE	RING JOINT	RAISED FACE	RING JOINT
4	8	1	7.88	7/8	5.5	6.0	5.75	4.50	83	92	65	74
100	8	26	200.0	7/8	140	153	146.1	114.3	37	41.5	29	33.5
5 □	8	1	9.25	7/8	5.75	6.25	7.0	5.56	99	110	75	85
□ 125	8	26	235.0	7/8	146	159	177.8	141.2	45	50	34	38
6	12	1	10.62	7/8	6.25	6.5	8.12	6.63	135	145	110	120
150	12	26	269.7	7/8	159	165	206.4	168.4	61	65	50	54
8	12	1.12	13.0	1	6.75	7.25	10.25	8.63	205	225	165	180
200	12	29	330.2	1	172	185	260.4	219.2	90	101	74	81
10	16	1.25	15.25	1 1/8	7.5	8.0	12.62	10.75	300	325	235	255
250	16	32	387.3	1 1/8	191	204	320.7	273.1	135	146	106	115
12	16	1.38	17.75	1 1/4	8.0	8.5	14.75	12.75	420	445	330	355
300	16	35	450.8	1 1/4	205	216	374.6	323.8	189	200	149	160

NPS DN	DRILLING			BOLT DIA. (inches)	BOLTING LENGTH		DIAMETER OF HUB		APPROXIMATE WEIGHT			
	NO. OF HOLES	DIA. OF HOLES	DIA. OF BOLT CIRCLE		RAISED FACE	RING JOINT	AT BASE M	AT POINT OF WELDING N	WELDING NECK		SLIP-ON AND THREADED	
									RAISED FACE	RING JOINT	RAISED FACE	RING JOINT
4	8	1.00	8.50	7/8	6.00	6.5	6.00	4.50	97	110	87	98
100	8	26	216	7/8	152	165	152	114	44	50	39	44
5 □	8	1.13	10.50	1	5.50	7.00	7.44	5.56	115	170	145	160
□ 125	8	29	267	1	140	178	189	141	52	77	66	72
6	12	1.13	11.50	1	7.00	7.5	8.75	6.63	195	210	190	205
150	12	29	292	1	178	191	222	168	89	95	86	92
8	12	1.25	13.75	1 1/8	7.75	8.25	10.75	8.63	285	305	275	295
200	12	32	349	1 1/8	197	210	273	219	129	138	125	133
10	16	1.38	17.00	1 1/4	8.75	9.25	13.50	10.75	450	485	410	445
250	16	35	432	1 1/4	222	235	343	273	204	220	186	200
12	20	1.38	19.25	1 1/4	9.00	9.5	15.75	12.75	540	580	490	530
300	20	35	489	1 1/4	229	241	400	324	245	263	222	239

The tapped metering holes are drilled as follows:

1/2" for sizes NPS 4 (DN 100) and over.

POUNDS
KILOGRAMS



CLASS 900 (PN 150) For sizes 2 1/2 and smaller, use Class 1500 (PN 250)

NPS	DN	FLANGE THICKNESS		RAISED FACE DIAMETER	BORE		LENGTH THRU HUB			
		RAISED FACE	RING JOINT		WELDING NECK	SLIP-ON	WELDING NECK		SLIP-ON AND THREADED	
							F	F	RAISED FACE	RING JOINT
O	T	T	A	B	C	F	F	G	G	
3	80	9.50	1.50	1.50	5.00	3.57	4.00	4.00	2.12	2.12
		241	38.5	38.5	127.0	90.7	101.6	101.6	54.0	54.0
4	100	11.50	1.75	1.75	6.19	4.57	4.50	4.50	2.75	2.75
		292	44.5	44.5	157.2	116.1	114.3	114.3	70.0	70.0
5	125	13.75	2.00	2.00	7.31	5.66	5.00	5.00	3.12	3.12
		350	51.0	51.0	185.7	143.8	127.0	127	79.4	79.4
6	150	15.00	2.19	2.19	8.50	6.72	5.50	5.50	3.38	3.38
		381	56.0	56.0	215.9	170.7	139.7	139.7	85.7	85.7
8	200	18.50	2.50	2.50	10.63	8.72	6.38	6.38	4.00	4.00
		470	63.5	63.5	270.0	221.5	161.9	161.9	101.6	101.6
10	250	21.50	2.75	2.75	12.75	10.88	7.25	7.25	4.25	4.25
		546	70.0	70.0	323.9	276.4	184.2	184.2	108.0	108.0
12	300	24.00	3.12	3.12	15.00	12.88	7.88	7.88	4.62	4.62
		610	79.5	79.5	381.0	327.2	200.0	200.0	117.5	117.5

†CLASS 1500 (PN 250)

NPS	DN	FLANGE THICKNESS		RAISED FACE DIAMETER	BORE		LENGTH THRU HUB			
		RAISED FACE	RING JOINT		WELDING NECK	SLIP-ON	WELDING NECK		SLIP-ON AND THREADED	
							F	F	RAISED FACE	RING JOINT
O	T	T	A	B	C	F	F	G	G	
1	25	5.88	1.50	1.50	2.00	1.36	3.25	3.25	1.88	1.75
		149	38.5	38.5	50.8	34.5	82.55	82.55	47.6	44.5
1 1/4	32	6.25	1.38	1.38	2.50	1.70	2.88	2.88	1.88	1.75
		159	34.9	34.9	63.5	43.2	73.15	73.15	47.6	44.5
1 1/2	40	7.00	1.50	1.50	2.88	1.95	3.50	3.50	1.88	1.75
		178	38.5	38.5	73.0	49.5	88.90	88.90	47.6	44.5
2	50	8.50	1.50	1.50	3.62	2.44	4.00	4.00	2.25	2.25
		216	38.5	38.5	92.1	62.0	101.6	101.6	57.2	57.2
2 1/2	65	9.62	1.62	1.62	4.12	2.94	4.12	4.12	2.50	2.50
		245	41.5	41.5	104.8	74.7	104.8	104.8	63.5	63.5
3	80	10.50	1.88	1.88	5.00	3.57	4.62	4.62	2.88	2.88
		267	48.0	48.0	127.0	90.7	117.5	117.5	73.0	73.0
4	100	12.25	2.12	2.12	6.19	4.57	4.88	4.88	3.56	3.56
		312	54.0	54.0	157.2	116.1	123.8	123.8	90.5	90.4
5	125	14.75	2.88	2.88	7.31	5.66	6.12	6.12	4.12	4.12
		375	73.0	73.0	185.7	143.8	155.6	155.6	104.8	104.8
6	150	15.50	3.25	3.25	8.50	6.72	6.75	6.75	4.69	4.69
		394	83.0	83.0	215.9	170.7	171.4	171.4	119.1	119.1
8	200	19.00	3.62	3.62	10.62	8.72	8.38	8.38	5.62	5.62
		483	92.5	92.5	269.9	221.5	212.7	212.7	142.9	142.9
10	250	23.00	4.25	4.25	12.75	10.88	10.00	10.00	6.25	6.25
		585	108.0	108.0	323.9	276.4	254.0	254.0	158.8	158.8
12	300	26.50	4.88	4.88	15.00	12.88	11.12	11.12	7.12	7.12
		675	124.0	124.0	381.0	327.2	282.6	282.6	181.0	181.0

Sizes NPS 14 (DN 350) and larger, on application.

† Class 2500 (PN 400) Welding Neck Orifice Flanges, NPS 1 through 12 (DN 25 through 300), as covered by ASME/ANSI B16.36 are available upon application.

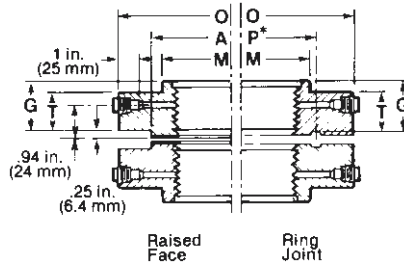
□ Not covered by ASME/ANSI B16.36.

* Details of Ring Joint facings are given on page 30.

FOR FURTHER DETAILS, REFER TO PAGE 4 "OTHER TYPES".

△ 0.25" (6.4 mm) Raised Face is not included in Flange Thickness T, and Length through Hub F & G.

☐ THREADED



CLASS 900 (PN 150) CLASS 1500 (PN 250) FORGED TORIFICE FLANGES ASTM A-105 ASME/ANSI B16.36

NPS	DN	DRILLING		BOLTING			DIAMETER OF HUB		APPROXIMATE WEIGHT				
		NO. OF HOLES	DIA. OF HOLES	DIA. OF BOLT CIRCLE	BOLT DIA. (inches)	RAISED FACE	RING JOINT	AT BASE M	AT POINT OF WELDING N	WELDING NECK		SLIP-ON AND THREADED	
										RAISED FACE	RING JOINT	RAISED FACE	RING JOINT
3		8	1.00	7.50	7/8	6.0	6.5	5.00	3.50	75	84	65	74
	80	8	26	191	7/8	153	165	127	89.0	34	38	30	33
4		8	1.25	9.25	1 1/8	7.00	7.5	6.25	4.50	125	140	130	145
	100	8	32	235	1 1/8	178	191	159	114.0	57	64	59	65
5		8	1.38	11.00	1 1/4	7.50	8.00	7.50	5.56	205	225	200	215
	125	8	36	279	1 1/4	191	204	191	141.3	93	102	91	97
6		12	1.25	12.50	1 1/8	7.75	8.25	9.25	6.63	260	290	260	285
	150	12	32	318	1 1/8	197	210	235	168.0	118	132	118	128
8		12	1.50	15.50	1 3/8	9.00	9.5	11.75	8.63	420	450	410	435
	200	12	39	394	1 3/8	229	241	298	219.0	191	204	186	196
10		16	1.50	18.50	1 3/8	9.5	10.0	14.50	10.75	610	660	580	620
	250	16	39	470	1 3/8	241	254	368	273.0	277	299	263	279
12		20	1.50	21.00	1 3/8	10.25	10.75	16.50	12.75	760	820	760	820
	300	20	39	533	1 3/8	260	273	419	324.0	345	372	345	360

NPS	DN	DRILLING		BOLT DIA. (inches)	BOLTING LENGTH		DIAMETER OF HUB		APPROXIMATE WEIGHT				
		NO. OF HOLES	DIA. OF HOLES		DIA. OF BOLT CIRCLE	RAISED FACE	RING JOINT	AT BASE M	AT POINT OF WELDING N	WELDING NECK		SLIP-ON AND THREADED	
				RAISED FACE						RING JOINT	RAISED FACE	RING JOINT	RAISED FACE
1		4	1.00	4.00	7/8	6.00	6.25	2.06	1.32	29	28	26	26
	25	4	26	102	7/8	153	159	52	33.5	13	13	12	12
1 1/4		4	1.00	4.38	7/8	5.50	5.75	2.50	1.66	31	31	29	29
	32	4	26	111	7/8	140	147	64	42.2	14	14	13	13
1 1/2		4	1.12	4.88	1	6.25	6.50	2.75	1.90	38	40	36	38
	40	4	29	124	1	159	166	70	48.5	17	18	16	17
2		8	1.00	6.50	7/8	6.00	6.50	4.12	2.38	63	72	63	71
	50	8	26	165	7/8	153	166	105	60.5	29	33	29	32
2 1/2		8	1.12	7.50	1	6.50	7.00	4.88	2.88	90	100	90	100
	65	8	29	191	1	165	178	124	73.0	41	45	41	45
3		8	1.25	8.00	1 1/8	7.25	7.75	5.25	3.50	120	135	120	135
	80	8	32	203	1 1/8	185	197	133	89.0	54	61	54	61
4		8	1.38	9.50	1 1/4	8.00	8.50	6.38	4.50	180	195	180	195
	100	8	35	241	1 1/4	204	216	162	114.0	82	88	82	88
5		8	1.62	11.50	1 1/2	9.75	10.25	7.75	5.56	320	345	320	340
	125	8	42	292	1 1/2	248	261	197	141.0	145	157	145	153
6		12	1.50	12.50	1 3/8	10.50	11.00	9.00	6.63	405	440	405	435
	150	12	39	318	1 3/8	267	280	229	168.0	184	200	184	196
8		12	1.75	15.50	1 5/8	11.75	12.50	11.50	8.63	630	730	600	680
	200	12	45	394	1 5/8	299	318	292	219.0	286	331	272	305
10		12	2.00	19.00	1 7/8	13.50	14.25	14.50	10.75	1100	1175	1050	1125
	250	12	51	483	1 7/8	343	362	368	273.0	499	533	476	506
12		16	2.12	22.50	2	15.00	16.00	17.75	12.75	1675	1825	1475	1550
	300	16	54	572	2	381	407	451	324.0	760	828	664	698

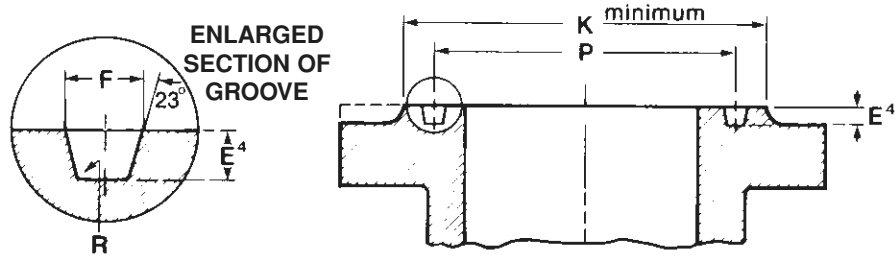
FOR FURTHER DETAILS, REFER TO PAGE 4 "OTHER TYPES".

The tapped metering holes are drilled as follows:
1/2" for sizes NPS 4 (DN 100) and over.
3/8" for sizes NPS 3 (DN 80).
1/4" for sizes NPS 2 1/2 (DN 65) and under.

INCHES	POUNDS
MILLIMETRES	KILOGRAMS

RING JOINT DIMENSIONS

ASME/ANSI B16.5



CLASS PN	NOMINAL PIPE SIZE							RING NUMBER	GROOVE DIMENSIONS				DIAMETER OF RAISED FACE K				
	150 20	300 50	400 64	600 100	900 160	1500 250	2500 400		PITCH DIA. P	DEPTH E ⁴	WIDTH F	BOTT. RADIUS R	150 20	300 400,600 50,64,100	900 160	1500 250	2500 400
NPS DN		1/2 15		1/2 15				R11 R11	1.344 34.14	0.219 5.56	0.281 7.14	.03 .8		2 51.0			
NPS DN						1/2 15		R12 R12	1.562 39.67	0.250 6.35	0.344 8.74	.03 .8			2.38 60.5		
NPS DN		3/4 20		3/4 20			1/2 15	R13 R13	1.688 42.88	0.250 6.35	0.344 8.74	.03 .8	2.5 63.5			2.56 65.0	
NPS DN						3/4 20		R14 R14	1.750 44.45	0.250 6.35	0.344 8.74	.03 .8			2.62 66.5		
NPS DN	1 25							R15 R15	1.875 47.62	0.250 6.35	0.344 8.74	.03 .8	2.50 63.5				
NPS DN		1 25		1 25		1 25	3/4 20	R16 R16	2.000 50.80	0.250 6.35	0.344 8.74	.03 .8	2.75 70.0		2.81 71.5	2.88 73.0	
NPS DN	1 1/4 32							R17 R17	2.250 57.15	0.250 6.35	0.344 8.74	.03 .8	2.88 73.0				
NPS DN		1 1/4 32		1 1/4 32		1 1/4 32	1 25	R18 R18	2.375 60.32	0.250 6.35	0.344 8.74	.03 .8	3.12 79.5		3.19 81.0	3.25 82.5	
NPS DN	1 1/2 40							R19 R19	2.562 65.07	0.250 6.35	0.344 8.74	.03 .8	3.25 82.5				
NPS DN		1 1/2 40		1/2 40		1 1/2 40		R20 R20	2.688 68.28	0.250 6.35	0.344 8.74	.03 .8	3.56 90.5		3.62 92.0		
NPS DN							1 1/4 32	R21 R21	2.844 72.24	0.312 7.92	0.469 11.91	.03 .8				4 102	
NPS DN	2 50							R22 R22	3.250 82.55	0.250 6.35	0.344 8.74	.03 .8	4 102				
NPS DN		2 50		2 50			1 1/2 40	R23 R23	3.250 82.55	0.312 7.92	0.469 11.91	.03 .8	4.25 108			4.5 114	
NPS DN						2 50		R24 R24	3.750 95.25	0.312 7.92	0.469 11.91	.03 .8			4.88 124		
NPS DN	2 1/2 65							R25 R25	4.000 101.60	0.250 6.35	0.344 8.74	.03 .8	4.75 121				
NPS DN		2 1/2 65		2 1/2 65			2 50	R26 R26	4.000 101.60	0.312 7.92	0.469 11.91	.03 .8	5 127			5.25 133	
NPS DN						2 1/2 65		R27 R27	4.250 107.95	0.312 7.92	0.469 11.91	.03 .8			5.38 137		
NPS DN							2 1/2 65	R28 R28	4.375 111.12	0.375 9.52	0.531 13.49	.06 1.5				5.88 149	
NPS DN	3 80							R29 R29	4.500 114.30	0.250 6.35	0.344 8.74	.03 .8	5.25 133				
NPS DN		(1) (1)		(1) (1)				R30 R30	4.625 117.48	0.312 7.92	0.469 11.91	.03 .8					
NPS DN		3 (1) 80		3 (1) 80	3 80			R31 R31	4.875 123.82	0.312 7.92	0.469 11.91	.03 .8	5.75 146	6.12 156			
NPS DN							3 80	R32 R32	5.000 127.00	0.375 9.52	0.531 13.49	.06 1.5				6.62 168	

¹ For NPS 3 (DN 80) Lap Joint Stub Ends (ASME/ANSI B16.9) Class 300 & 600 (PN 50 & 100), Ring Number R30 is used instead of R31.

² For sizes NPS 1/2 - NPS 3 1/2 (DN 15 - DN 90), use same data as Class 600 (PN 100).

³ For sizes NPS 1/2 - NPS 2 1/2 (DN 15 - DN 65) use same data as Class 1500 (PN 250).

⁴ Height of raised portion is equal to the depth of groove dimensions "E" but is not subjected to the tolerance for "E". Former full-face contour may be used.

TOLERANCES

E (depth) + 0.16 (+ 0.40 mm) - 0.00 (-0.00 mm)

F (width) ± 0.008 (±0.20 mm)

P (pitch) ± 0.005 (± 0.13 mm)

R (radius) Max.

23° (angle) ± 1/2°

INCHES
MILLIMETRES

RING JOINT DIMENSIONS continued

CLASS PN	NOMINAL PIPE SIZE							RING NUMBER	GROOVE DIMENSIONS				DIAMETER OF RAISED FACE K				
	150	300	400	600	900	1500	2500		PITCH DIA.	DEPTH	WIDTH	BOTT. RADIUS	150	300	900	1500	2500
	20	50	64	100	160	250	400		P	E ¹	F	R	20	400,600, 50,64,100	160	250	400
NPS DN	3 1/2 90							R33	5.188	0.250	0.344	.03	6.06				
NPS DN		3 1/2 90		3 1/2 90				R34	5.188	0.312	0.469	.03		6.25			
NPS DN						3 80		R35	5.375	0.312	0.469	.03				6.62	
NPS DN	4 100							R36	5.875	0.250	0.344	.03	6.75				
NPS DN		4 100	4 100	4 100	4 100			R37	5.875	0.312	0.469	.03		6.88	7.12		
NPS DN							4 100	R38	6.188	0.438	0.656	.06					8 203
NPS DN						4 100		R39	6.375	0.312	0.469	.03				7.62	
NPS DN	5 125							R40	6.750	0.250	0.344	.03	7.62				
NPS DN		5 125	5 125	5 125	5 125			R41	7.125	0.312	0.469	.03		8.25	8.5		
NPS DN							5 125	R42	7.500	0.500	0.781	.06					9.5 241
NPS DN	6 150							R43	7.625	0.250	0.344	.03	8.62				
NPS DN						5 125		R44	7.625	0.312	0.469	.03				9 229	
NPS DN		6 150	6 150	6 150	6 150			R45	8.312	0.312	0.469	.03		9.5	9.5		
NPS DN						6 150		R46	8.312	0.375	0.531	.06				9.75	
NPS DN							6 150	R47	9.000	0.500	0.781	.06					11 279
NPS DN	8 200							R48	9.750	0.250	0.344	.03	10.75				
NPS DN		8 200	8 200	8 200	8 200			R49	10.625	0.312	0.469	.03		11.88	12.12		
NPS DN						8 200		R50	10.625	0.438	0.656	.06				12.5	
NPS DN							8 200	R51	11.000	0.562	0.906	.06					13.38 340
NPS DN	10 250							R52	12.000	0.250	0.344	.03	13				
NPS DN		10 250	10 250	10 250	10 250			R53	12.750	0.312	0.469	.03		14	14.25		
NPS DN						10 250		R54	12.750	0.438	0.656	.06				14.62 371	
NPS DN							10 250	R55	13.500	0.688	1.188	.09					16.75 425

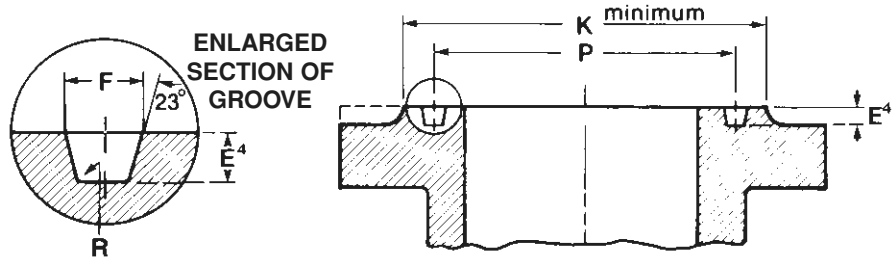
FOR FOOTNOTES, REFER TO PAGE 30

CONTINUED ON PAGE 32

INCHES
MILLIMETRES

RING JOINT DIMENSIONS

continued

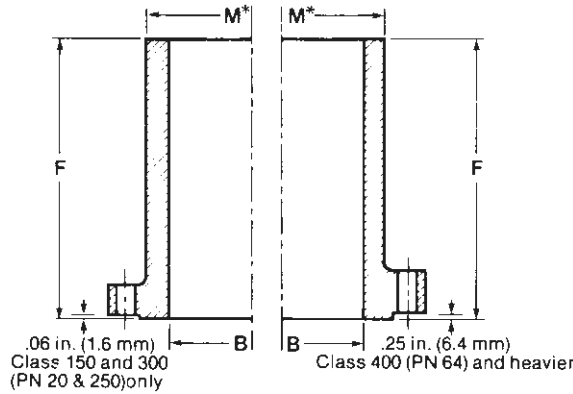


CLASS PN	NOMINAL PIPE SIZE							RING NUMBER	GROOVE DIMENSIONS				DIAMETER OF RAISED FACE K				
	150	300	400	600	900	1500	2500		PITCH DIA.	DEPTH	WIDTH	BOTT. RADIUS	150	300,	900	1500	2500
	20	50	64	100	160	250	400		P	E'	F	R	20	50,64,100	160	250	400
NPS DN	12 300							R56 R56	15.000 381.00	0.250 6.35	0.344 8.74	.03 .8	16 406				
NPS DN		12 300	12 300	12 300	12 300			R57 R57	15.000 381.00	0.312 7.92	0.469 11.91	.03 .8		16.25 413	16.5 419		
NPS DN						12 300		R58 R58	15.000 381.00	0.562 14.27	0.906 23.01	.06 1.5				17.25 438	
NPS DN	14 350							R59 R59	15.625 396.88	0.250 6.35	0.344 8.74	.03 .8	16.75 425				
NPS DN						12 300		R60 R60	16.000 406.40	0.688 17.48	1.312 33.32	.09 2.4					19.5 495
NPS DN		14 350	14 350	14 350				R61 R61	16.500 419.10	0.312 7.92	0.469 11.91	.03 .8		18 457			
NPS DN					14 350			R62 R62	16.500 419.10	0.438 11.13	0.656 16.66	.06 1.5			18.38 467		
NPS DN						14 350		R63 R63	16.500 419.10	0.625 15.88	1.062 26.97	.09 2.4				19.25 489	
NPS DN	16 400							R64 R64	17.875 454.02	0.250 6.35	0.344 8.74	.03 .8	19 483				
NPS DN		16 400	16 400	16 400				R65 R65	18.500 469.90	0.312 7.92	0.469 11.91	.03 .8		20 508			
NPS DN					16 400			R66 R66	18.500 469.90	0.438 11.13	0.656 16.66	.06 1.5			20.62 524		
NPS DN						16 400		R67 R67	18.500 469.90	0.688 17.48	1.188 30.18	.09 2.4				21.5 546	
NPS DN	18 450							R68 R68	20.375 517.52	0.250 6.35	0.344 8.74	.03 .8	21.5 546				
NPS DN		18 450	18 450	18 450				R69 R69	21.000 533.40	0.312 7.92	0.469 11.91	.03 .8		22.62 575			
NPS DN					18 450			R70 R70	21.000 533.40	0.500 12.70	0.781 19.84	.06 1.5			23.38 594		
NPS DN						18 450		R71 R71	21.000 533.40	0.688 17.48	1.188 30.18	.09 2.4				24.12 613	
NPS DN	20 500							R72 R72	22.000 558.80	0.250 6.35	0.344 8.74	.03 .8	23.5 597				
NPS DN		20 500	20 500	20 500				R73 R73	23.000 584.20	0.375 9.52	0.531 13.49	.06 1.5		25 635			
NPS DN					20 500			R74 R74	23.000 584.20	0.500 12.70	0.781 19.84	.06 1.5			25.5 648		
NPS DN						20 500		R75 R75	23.000 584.20	0.688 17.48	1.312 33.32	.09 2.4				26.5 673	
NPS DN	24 600							R76 R76	26.500 673.10	0.250 6.35	0.344 8.74	.03 .8	28 711				
NPS DN		24 600	24 600	24 600				R77 R77	27.250 692.15	0.438 11.13	0.656 16.66	.06 1.5		29.5 749			
NPS DN					24 600			R78 R78	27.250 692.15	0.625 15.88	1.062 26.97	.09 2.4			30.38 772		
NPS DN						24 600		R79 R79	27.250 692.15	0.812 20.62	1.438 36.53	.09 2.4				31.25 794	

FOR FOOTNOTES, REFER TO PAGE 30

INCHES
MILLIMETRES

LONG WELDING NECKS



NOMINAL SIZE AND BORE	LENGTH THRU HUB		HUB DIAMETER CLASS 150 PN 20 *M	WEIGHTS						
	CLASS 150 THRU 600	CLASS 900 THRU 2500		CLASS 150 PN 20	CLASS 300 PN 50	CLASS 400 PN 64	CLASS 600 PN 100	CLASS 900 PN 160	CLASS 1500 PN 250	CLASS 2500 PN 400
	PN 20 THRU 100	PN 160 THRU 400								
B	F	F								
1.00	9	9	2.00	8	10	11	11	15	15	20
25.4	229	229	50.8	3.6	4.5	5	5	7	7	9
1.25	9	9	2.38	10	14	14	14	18	18	30
31.8	229	229	60.3	4.5	6.5	6.5	6.5	8	8	13.5
1.50	9	9	2.62	12	17	17	17	23	23	38
38.1	229	229	66.7	5.5	7.7	7.7	7.7	10.5	10.5	17
2.00	9	9	3.25	17	19	21	21	44	44	55
50.8	229	229	82.6	7.7	9	9.5	9.5	20	20	25
2.50	9	12	3.75	22	28	29	29	72	72	85
63.5	229	305	95.3	10	13	13	13	32.5	32.5	38.5
3.00	9	12	4.25	26	36	38	38	65	84	125
76.2	229	305	108.0	12	16.5	17.5	17.5	29.5	38	57
3.50	9	-	4.88	32	45	48	48	-	-	-
88.9	229	-	123.8	14.5	20.5	21.5	22	-	-	-
4.00	12	12	5.50	47	54	67	80	98	118	185
101.6	305	305	139.7	21.5	24.5	30	36.5	44	53	84
5.00	12	12	6.50	58	86	90	128	143	195	300
127.0	305	305	165.1	26.5	39	41	58	65	88	135
6.00	12	12	7.75	77	108	115	158	199	235	450
152.4	305	305	196.9	35	49	52	72	90	106	203
8.00	12	12	9.75	103	150	160	215	310	366	600
203.2	305	305	247.7	47	68	72	98	140	165	270
10.00	12	12	12.00	144	218	230	343	356	594	1045
254.0	305	305	304.8	66	99	104	156	161	268	471
12.00	12	12	14.38	207	289	301	409	541	872	1420
304.8	305	305	365.1	94	131	136	186	244	393	639
14.00	12	12	16.00	212	342	357	432	568	1030	-
355.6	305	305	406.4	96	155	161	196	256	464	-
16.00	12	12	18.00	250	426	443	564	670	1335	-
406.4	305	305	457.2	114	193	199	256	302	601	-
18.00	12	12	20.00	274	493	513	654	949	1750	-
457.2	305	305	508.0	125	224	231	297	427	788	-
20.00	12	12	22.00	314	575	602	840	1040	2130	-
508.0	305	305	558.8	143	261	271	381	468	959	-
24.00	12	12	26.25	426	823	856	1100	1775	3180	-
609.6	305	305	666.8	194	374	385	499	799	1431	-

SPECIFICATIONS: Long Welding Necks conform to ASTM specification A-105. Except as shown above, Long Welding Necks conform dimensionally to ASME/ANSI Standard B16.5.

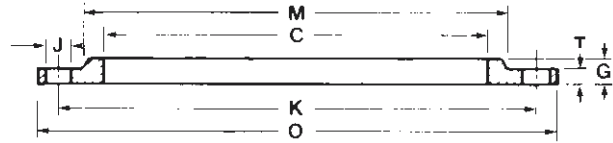
*Dimension "M" is given here for Class 150 (PN 20) Long Welding Necks only. For Class 300 (PN 50) and higher pressure ratings, outside diameter of the neck is the same as dimension "M" of ANSI flanges of comparable pressure rating (see pages 8 to 18).

Facing and Finish: see page 4.
 Gasket dimensions: see page 20.
 Bolting dimensions: see page 22.

INCHES	POUNDS
MILLIMETRES	KILOGRAMS

LARGE DIAMETER FORGED STEEL FLANGES CLASS 125 LW¹ SLIP-ON FLANGES²

³ASTM A181 CLASS 60



NPS	DN	FLANGE OUTSIDE DIAMETER O	FLANGE THICKNESS T	'BORE DIAMETER C	LENGTH THRU HUB G	DIAMETER OF HUB AT BASE M	DRILLING			APPROX. WEIGHT	
							NO. OF HOLES	DIAMETER OF HOLES J	BOLT DIAMETER		DIA. OF BOLT CIRCLE K
26		34.25	1.00	As specified by purchaser	1.75	28.50	24	1.38	1 1/4	31.75	123
	650	870	25.4		44.5	723.9	24	35	1 1/4	806.5	56
28		36.5	1.00		1.75	30.50	28	1.38	1 1/4	34.00	141
	700	927	25.4		44.5	774.7	28	35	1 1/4	863.6	64
30		38.75	1.00		1.75	32.50	28	1.38	1 1/4	36.00	151
	750	985	25.4		44.5	825.5	28	35	1 1/4	914.4	68.5
32		41.75	1.12		1.75	34.75	28	1.62	1 1/2	38.50	207
	800	1061	28.6		44.5	882.7	28	41	1 1/2	977.9	94
34		43.75	1.12		1.75	36.75	32	1.62	1 1/2	40.50	218
		1111	28.6		44.5	933.5	32	41	1 1/2	1028.7	99
36		46	1.12		1.75	38.75	32	1.62	1 1/2	42.75	233
	900	1169	28.6		44.5	984.3	32	41	1 1/2	1085.9	106
38		48.75	1.12		1.75	40.75	32	1.62	1 1/2	45.25	261
		1238	28.6		44.5	1035.1	32	41	1 1/2	1149.4	118
40		50.75	1.12		1.75	43.00	36	1.62	1 1/2	47.25	283
	1000	1289	28.6		44.5	1092	36	41	1 1/2	1200.2	128
42		53	1.25		1.75	45.00	36	1.62	1 1/2	49.50	332
	1100	1346	31.8		44.5	1143	36	41	1 1/2	1257.3	151
44		55.25	1.25		2.25	47.00	40	1.62	1 1/2	51.75	353
		1404	31.8		57.2	1194	40	41	1 1/2	1314.5	160
46		57.25	1.25		2.25	49.00	40	1.62	1 1/2	53.75	364
		1454	3.8		57.2	1245	40	41	1 1/2	1365.3	165
48		59.5	1.38		2.50	51.00	44	1.62	1 1/2	56.00	425
	1200	1511	34.9		63.5	1295	44	41	1 1/2	1422.4	193
50		61.75	1.38		2.50	53.00	44	1.88	1 3/4	58.25	455
		1569	34.9		63.5	1346	44	48	1 3/4	1479.6	206
52		64	1.38		2.50	55.00	44	1.88	1 3/4	60.50	470
	1300	1626	34.9		63.5	1397	44	48	1 3/4	1536.7	213
54		66.25	1.38	2.50	57.00	44	1.88	1 3/4	62.75	510	
	1400	1683	34.9	63.5	1448	44	48	1 3/4	1593.9	231	
60		73	1.50	2.75	63.00	52	1.88	1 3/4	69.25	645	
	1500	1854	38.1	69.9	1600	52	48	1 3/4	1759.0	293	
66		80	1.50	2.75	69.00	52	1.88	1 3/4	76.00	760	
		2032	38.1	69.9	1753	52	48	1 3/4	1930.4	345	
72		86.5	1.50	2.75	75.00	60	1.88	1 3/4	82.50	845	
	1800	2197	38.1	69.9	1905	60	48	1 3/4	2095.5	383	
84		99.75	1.75	3.00	87.50	64	2.12	2	95.50	1015	
		2534	44.5	76.2	2223	64	54	2	2425.7	460	
96		113.25	2.00	3.25	100.00	68	2.38	2 1/4	108.50	1660	
	2400	2877	50.8	82.6	2540	68	61	2 1/4	2755.9	753	

¹ Class 125LW Slip-on Flanges in pipe sizes NPS 6 to 96 (DN 150 to 2400) are identical with AWWA Class D Flanges, as shown on page 40, and have the same diameter and drilling as Class 125 Cast Iron Flanges, ANSI B16.1

These flanges are designed for use with full face gaskets, but ring gaskets extending to the inside edge of the bolt holes may also be used.

² Blind Flanges are available on request.

³ Can also be furnished in A181 Class 70 and A105 or any other material that can be forged or rolled.

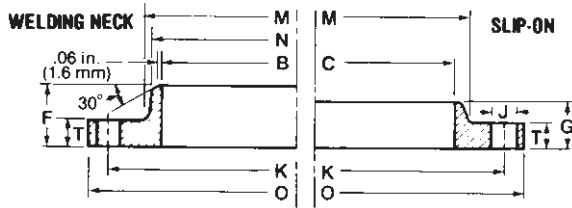
⁴ When specifying bore it is recommended that this dimension be .19" (4.88 mm) larger than the nominal O.D. of the pipe.

NOTE: At the time of printing this catalogue the metric Pressure Number (PN) equivalent of the Class 125 pressure rating of these LW flanges had not been established, neither had the metric Nominal Diameter (DN) conversions for various NPS sizes.

INCHES	POUNDS
MILLIMETRES	KILOGRAMS

LARGE DIAMETER FORGED STEEL FLANGES

¹CLASS 125 AMERICAN STANDARD WELDING NECK & ²SLIP-ON FLANGES ³ASTM A181 CLASS 60



NPS	DN	FLANGE OUTSIDE DIA. O	FLANGE THICKNESS T	DIA. OF RAISED FACE R	BORE		LENGTH THRU HUB		DIAMETER OF HUB		DRILLING			APPROXIMATE WEIGHT	
					WELDING NECK B	SLIP-ON C	WELDING NECK F	SLIP-ON G	AT BASE M	AT POINT OF WELDING N	NO. OF HOLES	DIA. OF HOLES J	DIA. OF BOLT CIRCLE K	WELDING NECK	SLIP-ON
26		34.25	2.00	29.25		26.25	5.00	3.38	28.50	26	24	1.38	31.75	262	233
	650	870	50.8	743		666.8	127.0	85.7	723.9	660	24	35	806.5	118	105
28		36.5	2.06	31.25		28.25	5.06	3.44	30.75	28	28	1.38	34.00	291	275
	700	927	52.4	794		717.6	128.6	87.3	781.1	711	28	35	863.6	131	124
30		38.75	2.12	33.75		30.25	5.12	3.5	32.75	30	28	1.38	36.00	341	300
	750	985	54.0	857		768.4	130.2	88.9	831.9	762	28	35	914.4	154	135
32		41.75	2.25	35.75		32.25	5.25	3.62	35.00	32	28	1.62	38.50	412	370
	800	1061	57.2	908		819.2	133.4	92.1	889.0	813	28	41	977.9	186	167
34		43.75	2.31	37.75		34.25	5.31	3.69	37	34	32	1.62	40.50	439	410
	-	1111	58.7	959		870.0	134.9	93.7	939.8	864	32	41	1028.7	198	185
36		46	2.38	40.25		36.25	5.38	3.75	39.25	36	32	1.62	42.75	495	460
	900	1169	60.3	1022		920.8	136.5	95.3	997.0	914	32	41	1085.9	223	207
38		48.75	2.38	42.25		38.25	5.38	3.75	41.75	38	32	1.62	45.25	573	525
	-	1238	60.3	1073		971.6	136.5	95.3	1060.5	965	32	41	1149.4	258	236
40		50.75	2.50	44.25		40.25	5.50	3.88	43.75	40	36	1.62	47.25	619	575
	1000	1289	63.5	1124		1022.4	139.7	98.4	1111.3	1016	36	41	1200.2	279	259
42		53	2.62	47		42.25	5.62	4.00	46.00	42	36	1.62	49.50	715	660
	1100	1346	66.7	1194		1073.2	142.9	101.6	1168.4	1067	36	41	1257.3	322	297
44		55.25	2.62	49		44.25	5.62	4.00	48.00	44	40	1.62	51.75	755	695
	-	1404	66.7	1245	specified	1124.0	142.9	101.6	1219.2	1118	40	41	1314.5	340	313
46		57.25	2.69	51		46.25	5.69	4.06	50.00	46	40	1.62	53.75	805	730
	-	1454	68.3	1295	by	1174.8	144.5	103.2	1270.0	1168	40	41	1365.3	362	329
48		59.5	2.75	53.5		48.25	5.75	4.12	52.25	48	44	1.62	56.00	880	810
	1200	1511	69.9	1359	purchaser	1225.6	146.1	104.8	1327.2	1219	44	41	1422.4	396	365
50		61.75	2.75	55.5		50.25	5.75	4.12	54.25	50	44	1.88	58.25	915	840
	-	1569	69.9	1410		1276.4	146.1	104.8	1378.0	1270	44	48	1479.6	412	378
52		64.0	2.88	57.5		52.25	5.88	4.25	56.50	52	44	1.88	60.50	1020	925
	1300	1626	73.0	1461		1327.2	149.2	108.0	1435.1	1321	44	48	1536.7	459	416
54		66.25	3.00	59.75		54.25	6.00	4.38	58.75	54	44	1.88	62.75	1110	1040
	1400	1683	76.2	1518		1378.0	152.4	111.1	1492.3	1372	44	48	1593.9	500	468
60		73.0	3.12	66		60.25	6.12	4.50	65.25	60	52	1.88	69.25	1360	1275
	1500	1854	79.4	1676		1530.4	155.6	114.3	1657.4	1524	52	48	1759.0	612	574
66		80.0	3.38	73		66.25	6.38	4.88	71.50	66	52	1.88	76.00	1770	1625
	-	2032	85.7	1855		1682.8	161.9	123.8	1816.1	1676	52	48	1930.4	797	731
72		86.5	3.50	79.5		72.25	6.50	5.00	78.50	72	60	1.88	82.50	2125	1950
	1800	2197	88.9	2019		1835.2	165.1	127.0	1993.9	1829	60	48	2095.5	956	878
84		99.75	3.88	92.5		84.25	6.88	5.38	90.50	84	64	2.12	95.50	2825	2620
	-	2534	98.4	2350		2140.0	174.6	136.5	2298.7	2134	64	54	2425.7	1271	1179
96		113.25	4.25	105.5		96.25	7.25	5.75	102.75	96	68	2.38	108.50	3830	3295
	2400	2877	108.0	2680		2444.8	184.2	146.1	2609.9	2438	68	61	2755.9	1724	1483

¹ These flanges have the same pressure ratings, dimensions and drillings as Class 125 Cast Iron Flanges, ASME/ANSI B16.1. Class 125 American Standard slip-on flanges are also the same as AWWA Class E flanges.

² Blind Flanges are available on request.

³ Can also be furnished in A181 Class 70 and A105 or any other material that can be forged or rolled.

⁴ When ordering Welding Necks, specify thickness and O.D. of pipe or vessel to which the flange is to be welded.

⁵ All sizes are regularly furnished with flat face. A .06" (1.6 mm) raised face can be furnished on request.

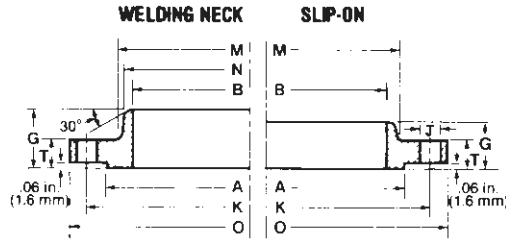
NOTE: At the time of printing this catalogue the metric Pressure Number (PN) equivalent of the Class 125 pressure rating of these flanges had not been established, neither had the metric Nominal Diameter (DN) conversions for various NPS sizes.

INCHES	POUNDS
MILLIMETRES	KILOGRAMS



LARGE DIAMETER FORGED STEEL FLANGES

**1 CLASS 250
AMERICAN STANDARD
WELDING NECK &
2 SLIP-ON FLANGES
3 ASTM A181-CLASS 60**



NPS	FLANGE OUTSIDE DIAMETER	FLANGE THICKNESS	BORE	LENGTH THRU HUB	DIA. OF HUB AT BASE	DIA. OF HUB AT POINT OF WELDING	DIA. OF RAISED FACE	DRILLING				APPROX. WEIGHT	
								NO. OF HOLES	DIAMETER OF HOLES	DIA. OF BOLTS	DIA. OF BOLT CIRCLE		
DN	O	T	B	G	M	N	A	J	K				
WELDING NECK													
26		38.25	2.81		5.81	30.50	26	32.44	28	1.88	1 3/4	34.50	535
	650	972	71.4		147.6	774.7	660	823.9	28	48	1 3/4	876.3	241
28		40.75	2.94		5.94	33.00	28	34.94	28	1.88	1 3/4	37.00	640
	700	1035	74.6		150.9	838.2	711	887.5	28	48	1 3/4	939.8	289
30		43.0	3.00		6.00	35.25	30	37.19	28	1.88	1 3/4	39.25	695
	750	1092	76.2		152.4	895.4	762	944.6	28	48	1 3/4	997.0	313
32		45.25	3.12		6.12	37.50	32	39.44	28	1.88	1 3/4	41.50	780
	800	1150	79.4		155.6	952.5	813	1001.8	28	48	1 3/4	1054.1	351
34		47.5	3.25		6.25	39.50	34	41.44	28	1.88	1 3/4	43.50	885
		1207	82.6		158.8	1003.3	864	1052.5	28	48	1 3/4	1104.9	398
36		50	3.38	As specified	6.38	41.50	36	43.69	32	2.12	2	46.00	965
	900	1270	85.7		161.9	1054.1	914	1109.7	32	54	2	1168.4	434
38		52.25	3.44	by purchaser	6.44	43.50	38	45.69	32	2.12	2	48.00	1040
		1327	87.3		163.5	1104.9	965	1160.5	32	54	2	1219.2	468
40		54.5	3.56		6.56	45.75	40	47.94	36	2.12	2	50.25	1150
	1000	1384	90.5		166.7	1162.1	1016	1217.6	36	54	2	1276.4	518
42		57	3.69		6.94	47.75	42	50.44	36	2.12	2	52.75	1340
	1100	1448	93.7		176.2	1212.9	1067	1281.1	36	54	2	1339.9	603
44		59.25	3.75		7.00	49.75	44	52.69	36	2.12	2	55.00	1420
		1505	95.3		177.8	1263.7	1118	1338.3	36	54	2	1397.0	639
46		61.5	3.88		7.12	51.75	46	54.94	40	2.12	2	57.25	1525
		1562	98.4		181.0	1314.5	1169	1395.4	40	54	2	1545.2	686
48		65	4.00		7.25	54.00	48	58.44	40	2.12	2	60.75	1850
	1200	1651	101.6		184.2	1371.6	1219	1484.3	40	54	2	1543.1	833
SLIP-ON													
26		38.25	2.81	26.25	4.75	30.50	-	32.44	28	1.88	1 3/4	34.50	530
	650	972	71.4	666.8	120.7	774.7	-	823.9	28	48	1 3/4	876.3	239
28		40.75	2.94	28.25	5.00	33.00	-	34.94	28	1.88	1 3/4	37.00	630
	700	1035	74.6	717.6	127.0	838.2	-	887.5	28	48	1 3/4	939.8	284
30		43	3.00	30.25	5.00	35.25	-	37.19	28	1.88	1 3/4	39.25	700
	750	1093	76.2	768.4	127.0	895.4	-	944.6	28	48	1 3/4	997.0	315
32		45.25	3.12	32.25	5.12	37.50	-	39.44	28	1.88	1 3/4	41.50	800
	800	1150	79.4	819.2	130.2	952.5	-	1001.8	28	48	1 3/4	1054.1	360
34		47.5	3.25	34.25	5.25	39.50	-	41.44	28	1.88	1 3/4	43.50	895
		1207	82.6	870.0	133.4	1003.3	-	1052.5	28	48	1 3/4	1104.9	403
36		50	3.38	36.25	5.38	41.50	-	43.69	32	2.12	2	46.00	975
	900	1270	85.7	920.8	136.5	1054.1	-	1109.7	32	54	2	1168.4	439
38		52.25	3.44	38.25	5.50	43.50	-	45.69	32	2.12	2	48.00	1070
		1328	87.3	971.6	139.7	1104.9	-	1160.5	32	54	2	1219.2	482
40		54.5	3.56	40.25	5.50	45.75	-	47.94	36	2.12	2	50.25	1180
	1000	1385	90.5	1022.4	139.7	1162.1	-	1217.6	36	54	2	1276.4	531
42		57	3.69	42.25	5.62	47.75	-	50.44	36	2.12	3	52.75	1310
	1100	1448	93.7	1073.2	142.9	1212.9	-	1281.1	36	54	2	1339.9	590
44		59.25	3.75	44.25	5.75	49.75	-	52.69	36	2.12	2	55.00	1420
		1505	95.3	1124.0	146.1	1263.7	-	1338.3	36	54	2	1397.0	639
46		61.5	3.88	46.25	5.88	51.75	-	54.94	40	2.12	2	57.25	1510
		1562	98.4	1174.8	149.2	1314.5	-	1395.4	40	54	2	1454.2	680
48		65	4.00	48.25	6.00	54.00	-	58.44	40	2.12	2	60.75	1825
	1200	1651	101.6	1225.6	152.4	1371.6	-	1484.3	40	54	2	1543.1	821

¹ These flanges have the same pressure ratings, dimensions and drillings as Class 250 Cast Iron Flanges ASME/ANSI B16.1.
² Blind Flanges are available upon application.
³ Can also be furnished in A181 Class 70, and A-105 or any other material that can be forged or rolled.

NOTE: At the time of printing this catalogue the metric Pressure Number (PN) equivalent of the Class 125 pressure rating of these LW flanges had not been established, neither had the metric Nominal Diameter (DN) conversions for various NPS sizes.

INCHES	POUNDS
MILLIMETRES	KILOGRAMS



LARGE DIAMETER FORGED STEEL FLANGES

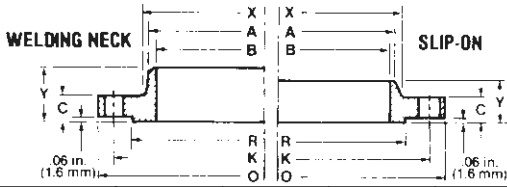
CLASS 75

PRESSURE VESSEL FLANGES

²WELDING NECK & SLIP-ON

For Nominal I.D. Vessels

⁴ASTM A181 - CLASS 60



NOMINAL SIZE (INSIDE DIAMETER)	FLANGE OUTSIDE DIAMETER	FLANGE THICKNESS	BORE	LENGTH THRU HUB	DIA. OF HUB AT BASE	DIA. OF HUB AT POINT OF WELDING	DIA. OF RAISED FACE	DRILLING				APPROX. WEIGHT
								NO. OF HOLES	DIAMETER OF HOLES	DIA. OF BOLTS	DIA. OF BOLT CIRCLE	
WELDING NECK												
26	31.5	1.25	As specified by purchaser	3.00	27.12	As specified by purchaser	28.62	32	1	7/8	29.62	95
660	800	31.8		76.2	688.8		727.1	32	26	7/8	752.5	43
28	33.5	1.25	As specified by purchaser	3.00	29.12	As specified by purchaser	30.62	36	1	7/8	31.62	105
711	85	31.8		76.2	739.8		777.9	36	26	7/8	803.3	47
30	35.5	1.25	As specified by purchaser	3.00	31.12	As specified by purchaser	32.62	36	1	7/8	33.62	112
762	902	31.8		76.2	790.6		828.7	36	26	7/8	854.1	51
32	38.25	1.25	As specified by purchaser	3.25	33.38	As specified by purchaser	35.00	36	1.12	1	36.12	141
813	972	31.8		82.6	847.7		889.0	36	29	1	917.6	64
34	40.25	1.25	As specified by purchaser	3.25	35.38	As specified by purchaser	37.00	40	1.12	1	38.12	153
864	1023	31.8		82.6	898.5		939.8	40	29	1	968.4	69
36	42.25	1.25	As specified by purchaser	3.25	37.38	As specified by purchaser	39.00	40	1.12	1	40.12	165
914	1073	31.8		82.6	949.3		990.6	40	29	1	1019.2	74
42	49	1.25	As specified by purchaser	3.50	43.75	As specified by purchaser	45.50	48	1.25	1 1/8	46.75	205
1067	1245	31.8		88.9	1111.3		1155.7	48	32	1 1/8	1187.5	92
48	55	1.25	As specified by purchaser	3.75	49.75	As specified by purchaser	51.50	52	1.25	1 1/8	52.75	245
1219	1397	31.8		95.3	1263.7		1308.1	52	32	1 1/8	1339.9	110
54	61.25	1.38	As specified by purchaser	4.00	56.00	As specified by purchaser	57.75	64	1.25	1 1/8	59.00	305
1372	1556	35.1		101.6	1422.4		1466.9	64	32	1 1/8	1498.6	137
60	67.25	1.62	As specified by purchaser	4.38	62.00	As specified by purchaser	63.75	72	1.25	1 1/8	65.00	410
1524	1708	41.3		111.1	1574.8		1619.3	72	32	1 1/8	1651.0	185
66	74	1.88	As specified by purchaser	4.88	68.0	As specified by purchaser	70.12	72	1.38	1 1/4	71.50	575
1676	1880	47.6		123.8	1727.2		1781.2	72	35	1 1/4	1816.1	259
72	80	2.25	As specified by purchaser	5.25	74.00	As specified by purchaser	76.12	80	1.38	1 1/4	77.50	720
1829	2032	57.2		133.4	1879.6		1933.6	80	35	1 1/4	1968.5	324
SLIP-ON												
26	33	1.25	As specified by purchaser	2.25	28.50	-	30.00	32	1	7/8	31.00	115
660	838	31.8		57.2	723.9	-	762.0	32	26	7/8	787.4	52
28	35	1.25	As specified by purchaser	2.25	30.50	-	32.00	36	1	7/8	33.00	140
711	889	31.8		57.2	774.7	-	812.8	36	26	7/8	838.2	63
30	37	1.25	As specified by purchaser	2.25	32.50	-	34.00	36	1	7/8	35.00	155
762	940	31.8		57.2	825.5	-	863.6	36	26	7/8	889.0	70
32	39.5	1.25	As specified by purchaser	2.50	34.62	-	36.25	40	1.12	1	37.38	165
813	1004	31.8		63.5	879.5	-	920.8	40	29	1	949.3	74
34	41.5	1.25	As specified by purchaser	2.50	36.62	-	38.25	40	1.12	1	39.38	175
864	1054	31.8		63.5	930.3	-	971.6	40	29	1	1000.1	79
36	43.5	1.25	As specified by purchaser	2.50	38.62	-	40.25	44	1.12	1	41.38	190
914	1105	31.8		63.5	981.1	-	1022.4	44	29	1	1050.9	86
42	50	1.25	As specified by purchaser	2.75	44.75	-	46.50	48	1.25	1 1/8	47.75	225
1067	1270	31.8		69.9	1136.6	-	1181.1	48	32	1 1/8	1212.9	101
48	56	1.25	As specified by purchaser	2.88	50.75	-	52.50	56	1.25	1 1/8	53.75	260
1219	1423	31.8		73.0	1289.1	-	1333.5	56	32	1 1/8	1365.3	117
54	62.5	1.38	As specified by purchaser	3.12	57.25	-	59.00	68	1.25	1 1/8	60.25	325
1372	1588	34.9		79.4	1454.2	-	1498.6	68	32	1 1/8	1530.4	146
60	68.5	1.62	As specified by purchaser	3.62	63.25	-	65.00	72	1.25	1 1/8	66.25	440
1524	1740	41.3		92.1	1606.6	-	1651.0	72	32	1 1/8	1682.8	198
66	75.5	1.75	As specified by purchaser	4.00	69.50	-	71.62	72	1.38	1 1/4	73.00	575
1676	1918	44.5		101.6	1765.3	-	1819.2	72	35	1 1/4	1854.2	259
72	81.5	2	As specified by purchaser	4.50	75.50	-	77.62	80	1.38	1 1/4	79.00	725
1829	2070	50.8		114.3	1917.7	-	1971.7	80	35	1 1/4	2006.6	326

¹ Alternate designation: 50 lb PRESSURE AT 100°F (38°C).

² Blind Flanges available upon application.

³ When ordering these flanges specify thickness and O.D. of the pipe or component with which they will be used. Pressure ratings are based on I.D. of pipe or vessel as listed in

"Nominal Size" column, with pipe or vessel thickness in the 0.25" (6.4 mm) to 0.5" (12.7 mm) range.

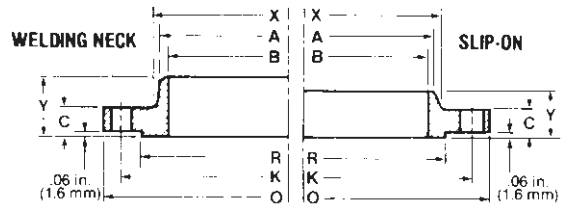
⁴ These flanges can also be supplied in any other material that can be forged or rolled.



LARGE DIAMETER
FORGED STEEL FLANGES
CLASS 175⁵

**WELDING NECK &
SLIP-ON FLANGES¹**

⁴ASTM A-105 & A181-CLASS 60



NOMINAL SIZE	FLANGE THICKNESS		BORE	LENGTH THRU HUB		DIA. OF HUB AT BASE	DIA. OF HUB AT POINT OF WELDING	DIA. OF RAISED FACE	DRILLING				APPROX. WEIGHT		
	OUTSIDE DIA.	WELDING NECK		SLIP-ON	WELDING NECK				SLIP-ON	NO. OF HOLES	DIA. OF HOLES	BOLT DIA.	DIA. OF BOLT CIRCLE	WELDING NECK	SLIP-ON
26	31.5	1.38	1.38	As specified by purchaser	3.38	2.75	27.62	As specified by purchaser	29.00	28	.88	3/4	29.88	125	110
660	800	34.9	34.9		85.7	69.9	701.7		736.6	28	23	3/4	758.8	56	50
28	33.5	1.38	1.38		3.38	2.75	29.62		31.00	28	.88	3/4	31.88	130	120
711	851	34.9	34.9		85.7	69.9	752.5		787.4	28	23	3/4	809.6	59	54
30	35.75	1.38	1.38		3.62	2.75	31.88		33.25	36	.88	3/4	34.12	145	135
762	908	34.9	34.9		92.1	69.9	809.6		844.6	36	23	3/4	866.8	65	61
32	37.75	1.38	1.38		3.62	2.75	33.88		32.25	36	.88	3/4	36.12	165	145
813	959	34.9	34.9		92.1	69.9	860.4		895.4	36	23	3/4	917.6	74	65
34	40.25	1.50	1.75		3.75	3.38	35.88		37.38	36	1	7/8	38.38	190	205
864	1023	38.1	44.5		95.3	85.7	911.2		949.3	36	26	7/8	974.7	86	92
36	42.25	1.50	1.75		3.75	3.38	37.88		39.38	36	1	7/8	40.38	210	215
914	1074	38.1	44.5		95.3	85.7	962.2		1000.1	36	26	7/8	1025.5	95	97
38	44.25	1.75	2.00		4.12	3.75	39.88		41.38	36	1	7/8	42.38	235	255
965	1124	44.5	50.8		104.8	95.3	1012.8		1050.9	36	26	7/8	1076.3	106	115
40	46.25	1.75	2.00		4.12	4.00	41.88		43.38	40	1	7/8	44.38	250	275
1016	1175	44.5	50.8		104.8	101.6	1063.6		1101.7	40	26	7/8	1127.1	113	124
42	49	2.00	2.38		4.50	4.38	44.12		45.75	40	1.12	1	46.88	345	370
1067	1245	50.8	60.3		114.3	111.1	1120.8		1162.1	40	29	1	1190.6	155	167
44	51	2.00	2.38		4.50	4.38	46.12		47.75	40	1.12	1	48.88	365	385
1118	1296	50.8	60.3		114.3	111.1	1171.6		1212.9	40	29	1	1241.4	164	173
46	53	2.00	2.38		4.50	4.62	48.12		49.75	40	1.12	1	50.88	380	410
1168	1347	50.8	60.3		114.3	117.5	1222.4		1263.7	40	29	1	1292.2	71	185
48	55	2.25	2.62		4.88	4.88	50.12		51.75	44	1.12	1	52.88	425	455
1219	1397	57.2	66.7		123.8	123.8	1273.2		1314.5	44	29	1	1343.0	191	205
50	57	2.25	2.62		4.88	4.88	52.12		53.75	44	1.12	1	54.88	455	475
1270	1448	57.2	66.7		123.8	123.8	1324.0		1365.3	44	29	1	1393.8	205	214
52	59.5	2.62	3.00		5.38	5.38	54.25		56.00	44	1.25	1 1/8	57.25	550	605
1321	1512	66.7	76.2		136.5	136.5	1378.0		1422.4	44	32	1 1/8	1454.2	248	272
54	61.5	2.62	3.00	5.38	5.38	56.25	58.00	44	1.25	1 1/8	59.25	590	625		
1372	1562	66.7	76.2	136.5	136.5	1428.8	1473.2	44	32	1 1/8	1505.0	266	281		
60	67.5	2.75	3.12	5.75	5.88	62.25	64.00	48	1.25	1 1/8	65.25	675	725		
1524	1715	69.9	79.4	146.1	149.2	1581.2	1625.6	48	32	1 1/8	1657.4	304	326		
66	73.5	3.12	4.00	6.12	.688	68.50	70.00	56	1.25	1 1/8	71.25	825	1020		
1676	1867	79.4	101.6	155.6	174.6	1739.9	1778.0	56	32	1 1/8	1809.8	371	459		
72	80	3.62	5.00	6.62	8.00	74.50	76.50	64	1.25	1 1/8	77.75	1060	1400		
1829	2032	92.1	127.0	168.3	203.2	1892.3	1943.1	64	32	1 1/8	1974.9	477	630		
84	94	3.00	5.00	7.00	8.50	88.00	90.12	72	1.38	1 1/4	91.50	1550	2225		
2134	2388	76.2	127.0	177.8	215.9	2235.2	2289.2	72	35	1 1/4	2324.1	698	1001		
96	106	3.5	5.00	7.50	9.00	100.0	102.12	88	1.38	1 1/4	103.50	1975	2575		
2438	2693	88.9	127.0	190.5	288.6	2540.0	2594.0	88	35	1 1/4	2628.9	889	1159		

¹ Blind Flanges are available upon application.

² When ordering, specify thickness and O.D. of pipe vessel to which flange is to be welded.

³ Sizes are INSIDE diameters of pipe or shell used with Welding Neck Flanges, and NOMINAL outside diameters of pipe or shell used with Slip-on Flanges.

⁴ These flanges can also be furnished in any other material that can be forged or rolled.

⁵ Alternate designation, 150 lb. WSP. at 750°F (399°C).

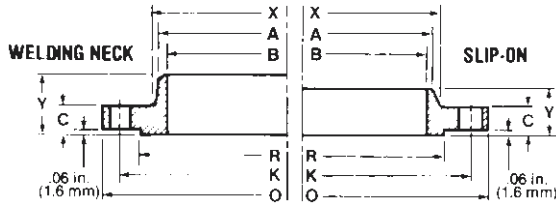
INCHES	POUNDS
MILLIMETRES	KILOGRAMS



LARGE DIAMETER
FORGED STEEL FLANGES
⁵CLASS 300

WELDING NECK &
SLIP-ON FLANGES¹

⁴ASTM A-105 & A181- CLASS 60



NOMINAL SIZE	FLANGE OUTSIDE DIA.	FLANGE THICKNESS		BORE	LENGTH THRU HUB			DIA. OF HUB AT POINT OF WELDING	DIA. OF HUB AT BASE	DIA. OF RAISED FACE	DRILLING			APPROX. WEIGHT						
		WELDING NECK	SLIP-ON		WELDING NECK	SLIP-ON	X				NO. OF HOLES	DIA. OF HOLES	BOLT DIA.	DIA. OF BOLT CIRCLE	WELDING NECK	SLIP-ON				
																	O	C	C	Y
26	32.75	2.50	2.50	As specified by purchaser	5.00	4.50	27.88	As specified by purchaser	29.50	28	1.12	1	30.62	250	230					
660	832	63.5	63.5		127.0	114.3	708.0							749.3	28	29	1	777.9	113	104
28	34.75	2.50	2.50		5.00	4.50	29.88							31.50	28	1.12	1	32.62	265	255
711	883	63.5	63.5		127.0	114.3	758.8							800.1	28	29	1	828.7	119	115
30	37	2.62	2.62		5.25	4.75	32.12							33.75	32	1.12	1	34.88	310	290
762	940	66.7	66.7		133.4	120.7	816.0							857.3	32	29	1	885.8	140	131
32	39	2.75	2.75		5.50	5.00	34.12							35.75	36	1.12	1	36.88	340	325
813	991	69.9	69.9		139.7	127.0	866.8							908.1	36	29	1	936.6	153	146
34	41	2.88	2.88		5.75	5.12	36.12							37.75	40	1.12	1	38.88	385	350
864	1042	73.0	73.0		146.1	130.2	917.6							958.9	40	29	1	987.4	173	158
36	43.75	3.12	3.12		6.13	5.62	38.5							40.25	40	1.25	1 1/8	41.50	475	460
914	1112	79.4	79.4		155.6	142.9	977.9							1022.4	40	32	1 1/8	1054.1	214	207
38	45.75	3.12	3.12		6.13	5.62	40.5							42.25	40	1.25	1 1/8	43.50	520	485
965	1162	79.4	79.4		155.6	142.9	1028.7							1073.2	40	32	1 1/8	1104.9	234	218
40	47.75	3.25	3.25		6.25	5.88	42.5							44.25	44	1.25	1 1/8	45.50	550	525
1016	1213	82.6	82.6		158.8	149.2	1079.5							1224.0	44	32	1 1/8	1155.7	248	236
42	50	3.50	3.50		6.50	6.12	44.75							46.50	48	1.25	1 1/8	47.75	650	625
1067	1270	88.9	88.9		165.1	155.6	1136.7							1181.1	48	32	1 1/8	1212.9	293	281
44	52.75	3.75	3.75		6.75	6.75	46.75							48.88	44	1.38	1 1/4	50.25	770	760
1118	1340	95.3	95.3		171.5	171.5	1187.5							1241.4	44	35	1 1/4	1276.4	347	342
46	54.75	4.25	4.25		7.25	7.25	48.75							50.88	48	1.38	1 1/4	52.25	895	880
1168	1391	108.0	108.0		184.2	184.2	1238.3							1292.2	48	35	1 1/4	1327.2	403	396
48	56.75	4.25	4.25		7.25	7.25	50.75							52.88	48	1.38	1 1/4	54.25	925	925
1219	1442	108.0	108.0		184.2	184.2	1289.1							1343.0	48	35	1 1/4	1378.0	416	416
52	61.5	4.25	-		7.50	-	55							57.25	52	1.5	1 3/8	58.75	1075	-
1321	1562	108.0	-		190.5	-	1397.0							1454.2	52	35	1 3/8	1492.3	484	-
54	63.5	4.50	4.75		7.75	8.25	57							59.25	52	1.5	1 3/8	60.75	1225	1160
1372	1613	114.3	120.7		196.9	209.6	1447.8							1505.0	52	35	1 3/8	1543.1	551	522
60	69.5	4.50	5.00		8.00	8.50	63							65.25	60	1.5	1 3/8	66.75	1325	1470
1524	1766	114.3	127.0		203.2	215.9	1600.2							1657.4	60	35	1 3/8	1695.5	596	662
66	77	4.00	-	.50	-	70	72.38	60	1.62	1 1/2	74.00	1680	-							
1676	1956	101.6	-	215.9	-	1778.0	1838.3	60	42	1 1/2	1879.6	756	-							
72	83	4.00	-	9.00	-	76	78.38	72	1.62	1 1/2	80.00	1875	-							
1829	2109	101.6	-	228.6	-	1930.4	1990.7	72	42	1 1/2	2032.0	844	-							
84	96.5	5.00	-	10.00	-	89	91.50	80	1.75	1 5/8	93.25	2950	-							
2134	2451	127.0	-	254.0	-	2260.6	2324.1	80	45	1 5/8	2368.6	1328	-							
96	109.25	6.25	-	11.25	-	101.25	103.88	84	1.88	1 3/4	105.75	4300	-							
2438	2775	158.85	-	285.8	-	2571.8	2638.4	84	48	1 3/4	2686.1	1935	-							

¹ Blind Flanges are available upon application.

² When ordering, specify thickness and O.D. of pipe vessel to which flange is to be welded.

³ Sizes are INSIDE diameters of pipe or shell used with Welding Neck Flanges, and nominal OUTSIDE diameters of pipe or shell used with Slip-on Flanges.

⁴ These flanges can also be furnished in any other material that can be forged or rolled.

⁵ Alternate designation, 300 lb. WSP. at 750°F (399°C).

INCHES	POUNDS
MILLIMETRES	KILOGRAMS

LARGE DIAMETER FORGED STEEL FLANGES

AWWA C207-55 HUB FLANGES²

ASTM A181-CLASS 60



NPS ³	DN	FLANGE THICKNESS C		BORE DIA. P	LENGTH THRU HUB Y		DIA. OF HUB AT BASE X		NO. OF HOLES	DIA. OF BOLT CIRCLE K	DIA. OF HOLES		APPROX. WEIGHT	
		CLASS B & D	CLASS E		CLASS B & D	CLASS E	CLASS B & D	CLASS E			CLASS B	CLASS D & E	CLASS B & D	CLASS E
6	11	.56	1.00	As specified by purchaser	1.25	1.56	7.56	7.56	8	9.50	.75	.88	14	19
150	280	14.3	25.4		31.8	39.7	192.1	192.0	8	241.3	20	23	6.3	9
8	13.5	.56	1.25		1.25	1.75	9.69	9.69	8	11.75	.75	.88	18	32
200	343	14.3	31.8		31.8	44.5	246.1	246.0	8	298.5	20	23	8	14.5
10	16	.69	1.19		1.25	1.94	12.00	12.00	12	14.25	.75	1	27	42
250	407	17.5	30.2		31.8	49.2	304.8	304.8	12	362.0	20	26	12	19
12	19	.69	1.25		1.25	2.19	14.38	14.38	12	17.00	.75	1	41	65
300	483	17.5	31.8		31.8	55.6	365.1	365.1	12	431.8	20	26	18.5	29
14	21	.75	1.38		1.25	2.25	15.75	15.75	12	18.75	.88	1.12	45	86
350	534	19.1	34.9		31.8	57.2	400.1	400.0	12	476.3	23	29	20	39
16	23.5	.75	1.44		1.25	2.50	18.00	18.00	16	21.25	.88	1.12	57	92
400	597	19.1	36.5		31.8	63.5	457.2	457.2	16	559.8	23	29	25.5	42
18	25	.75	1.56		1.25	2.69	19.88	19.88	16	22.75	.88	1.25	59	118
450	635	19.1	39.7		31.8	68.3	504.8	504.8	16	577.9	23	32	26.5	53
20	27.5	.75	1.69		1.25	2.88	22.00	22.00	20	25.00	.88	1.25	68	153
500	699	19.1	42.9		31.8	73.0	558.8	558.8	20	635.0	23	32	31	69
22	29.5	1	1.81		1.75	3.12	24.25	24.25	20	27.25	.88	1.38	75	177
550	750	25.4	46.0		44.5	79.4	616.0	616.0	20	692.2	23	35	34	80
24	32	1	1.88		1.75	3.25	26.12	26.12	20	29.50	.88	1.38	117	212
600	813	25.4	47.6		44.5	82.6	663.6	663.6	20	749.3	23	35	53	96
26	34.25	1	2.00		1.75	3.38	28.50	28.50	24	31.75	.88	1.38	126	235
650	870	25.4	50.8		44.5	85.7	723.9	723.9	24	806.5	23	35	57	106
28	36.5	1	2.06		1.75	3.44	30.50	30.75	28	34.00	.88	1.38	139	273
700	927	25.4	52.4		44.5	87.3	774.7	781.1	28	863.6	23	35	63	123
30	38.75	1	2.12		1.75	3.50	32.50	32.75	28	36.00	1	1.62	152	310
750	985	25.4	54.0		44.5	88.9	825.5	831.9	28	914.4	26	42	68	140
32	41.75	1.12	2.25		1.75	3.62	34.75	35.00	28	38.50	1	1.62	208	370
800	1061	28.6	57.2		44.5	92.1	882.7	889.0	28	977.9	26	42	94	167
36	46	1.12	2.38	1.75	3.75	38.75	39.25	32	42.75	1	1.62	235	460	
900	1169	28.6	60.3	44.5	95.3	984.3	997.0	32	1085.9	26	42	106	207	
40	50.75	1.12	2.50	1.75	3.88	43.00	43.75	36	47.25	1	1.62	281	527	
1000	1289	28.6	63.5	44.5	98.4	1092.2	1111.3	36	1200.2	26	42	127	259	
42	53	1.25	2.62	1.75	4.00	45.00	46.00	36	49.50	1.12	1.62	327	660	
1100	1347	31.8	66.7	44.5	101.6	1143.0	1168.4	36	1257.3	29	42	147	297	
48	59.5	1.38	2.75	2.50	4.12	51.00	52.25	44	56.00	1.12	1.62	420	800	
1200	1512	34.9	69.9	63.5	104.8	1295.4	1327.3	44	1422.4	29	42	189	360	
60	73	1.5	3.12	2.75	4.50	63.00	65.25	52	69.25	1.38	1.88	645	1275	
1500	1855	38.1	79.4	69.9	114.3	1600.2	1657.4	52	1759.0	35	48	291	574	
72	86.5	1.5	3.50	2.75	5.00	75.00	78.50	60	82.50	1.38	1.88	855	1950	
1800	2197	38.1	88.9	69.9	127.0	1905.0	1993.9	60	2095.5	35	48	385	878	
96	113.25	2.0	4.25	3.25	5.75	100.0	102.75	68	108.5	1.88	2.38	1730	3250	
2400	2877	50.8	108.0	82.6	146.1	2540.0	2609.9	68	2755.9	48	61	779	1463	

CLASS B FLANGES have a water service rating at atmospheric temperature of 86 psi. These flanges have the same outside diameter, bolt circle and number of bolts as ASME/ANSI B16.1 (25 psi cast-iron pipe flanges and flanged fittings).

In sizes NPS 48 (DN 1200) and under they have the same bolts, and in sizes over NPS 48 (DN 1200) they use larger bolts than specified by this 25 psi standard.

They also have the same outside diameter, bolt circle, and number of bolts as ASME/ANSI B16.1 (125 psi cast-iron pipe flanges and flanged fittings), but use smaller bolts.

CLASS D FLANGES have a water service rating at atmospheric temperature;

sizes NPS 6 to NPS 12 (DN 150 to DN 300) inclusive, 175 psi; sizes larger than NPS 12 (DN 300) 150 psi. These flanges have the same diameter and drilling as Class 125 cast-iron flanges. (ASME/ANSI B16.1).

CLASS E FLANGES have a water service rating at atmospheric temperature of 275 psi. These flanges have the same diameter and drilling as Class 125 cast-iron flanges (ASME/ANSI B16.1). In sizes NPS 24 (DN 600) and smaller they also match ASME/ANSI B16.5 150 psi standard for steel flanges.

All Flanges: Carbon steel bolts should be used. Cloth-inserted rubber gaskets .06" (1.6 mm) thick should be used and should extend from the I.D. of flange to at least the inside edge of the bolt holes.

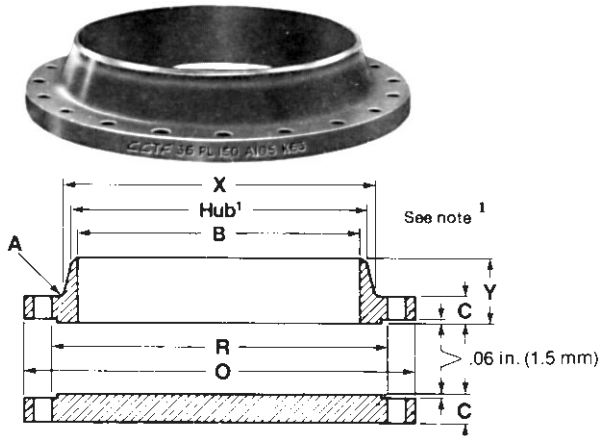
¹ Can also be furnished in A181 CLASS 70 and A-105, or any other material that can be forged or rolled.

³ For sizes other than those shown full information is available upon request.

² Ring and Blind flanges to match AWWA Hub flanges are available upon application.

LARGE DIAMETER
FORGED STEEL FLANGES
PIPE LINE FLANGES
CLASS 150 (PN 20)
WELDING NECK & BLIND

²ASTM A-105



NPS	DN	FLANGE OUTSIDE DIA. O	FLANGE THICKNESS (MIN.) ² C	LENGTH THRU HUB Y ¹	HUB DIA. AT BASE X	HUB DIA. AT POINT OF WELDING A	RAISED FACE DIA. R	DRILLING			FILLET RADIUS (MIN.) r	APPROX. WEIGHT	
								NO. OF BOLT HOLES	DIA. OF BOLT HOLES	DIA. OF BOLT CIRCLE		WELDING NECK	BLIND
26		34.25	2.69	4.75	26.62	26.00	29.50	24	1.38	31.75	.38	300	677
	650	870	68.5	121	675	660	749	24	35	806	10	136	307
28		36.50	2.81	4.94	28.62	28.00	31.50	28	1.38	34.00	.44	315	833
	700	925	71.5	125	725	711	800	28	35	863	11	143	378
30		38.75	2.94	5.38	30.75	30.00	33.75	28	1.38	36.00	.44	360	963
	750	985	74.5	137	780	762	857	28	35	914	11	163	437
32		41.75	3.18	5.69	32.75	32.00	36.00	28	1.62	38.50	.44	435	1200
	800	1060	81.0	144	830	813	914	28	41	978	11	197	544
34		43.75	3.25	5.88	34.75	34.00	38.00	32	1.62	40.50	.50	465	1342
		1110	82.5	149	380	863	965	32	41	1029	13	211	609
36		46.00	3.56	6.18	36.75	36.00	40.25	32	1.62	42.75	.50	520	1540
	900	1170	90.5	157	935	914	1022	32	41	1086	13	236	698
38		48.75	3.44	6.19	39.00	38.00	42.25	32	1.62	45.25	.50	778	1780
		1240	87.4	157	990	965	1073	32	41	1150	13	353	807
40		50.75	3.56	6.44	41.00	40.00	44.25	36	1.62	47.25	.50	831	1992
	1000	1290	90.5	164	1040	1016	1124	36	41	1200	13	377	903
42		53.00	3.81	6.75	43.00	42.00	47.00	36	1.62	49.50	.50	966	2332
	1100	1345	97.0	171	1090	1067	1194	36	41	1257	13	438	1058
44		55.25	4.00	7.00	45.00	44.00	49.00	40	1.62	51.75	.50	1058	2656
		1405	102.0	178	1145	1118	1245	40	41	1314	13	480	1205
46		57.25	4.06	7.31	47.12	46.00	51.00	40	1.62	53.75	.50	1131	2903
		1455	103.0	186	1195	1168	1295	40	41	1365	13	513	1317
48		59.50	4.25	7.56	49.12	48.00	53.50	44	1.62	56.00	.50	1248	3276
	1200	1510	108.0	192	1250	1219	1359	44	41	1422	13	566	1486
50		61.75	4.38	8.00	51.25	50.00	55.50	44	1.88	58.25	.50	1351	3605
		1570	111.0	203	1300	1270	1410	44	48	1480	13	613	1635
52		64.00	4.56	8.25	53.25	52.00	57.50	44	1.88	60.50	.50	1508	4043
	1300	1625	116.0	210	1355	1321	1460	44	48	1537	13	684	1834
54		66.25	4.75	8.50	55.25	54.00	59.50	44	1.88	62.75	.50	1667	4521
	1400	1685	121.0	216	1405	1372	1511	44	48	1594	13	756	2051
56		68.75	4.88	9.00	57.38	56.00	62.00	48	1.88	65.00	.50	1817	4981
		1745	124.0	229	1455	1422	1575	48	48	1651	13	824	2259
58		71.00	5.06	9.25	59.38	58.00	64.00	48	1.88	67.25	.50	2006	5540
		1805	129.0	235	1510	1473	1626	48	48	1708	13	910	2513
60		73.00	5.19	9.44	61.38	60.00	66.00	52	1.88	69.25	.50	2108	6000
	1500	1855	132.0	240	1560	1524	1676	52	48	1759	13	956	2722

¹ Includes .06" (1.5mm) raised face.

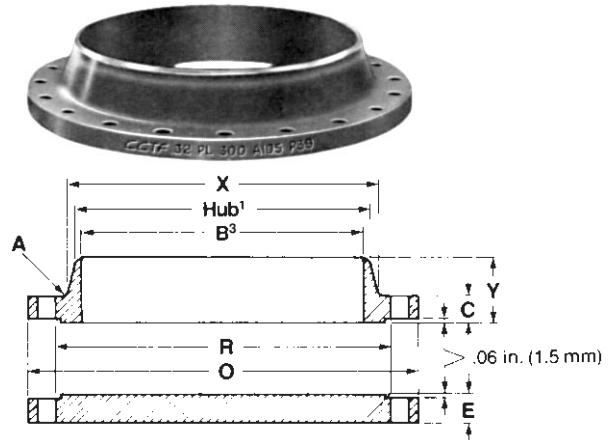
² Materials covered in this Standard are as in ASME/ANSI B16.5 except nickel based alloys are excluded.

³ Bore diameter as specified by Purchaser.

INCHES	POUNDS
MILLIMETRES	KILOGRAMS



LARGE DIAMETER
FORGED STEEL FLANGES
WELDING NECK & BLIND
CLASS 300 (PN 50)
ASME B16.47 SERIES A
²ASTM A-105



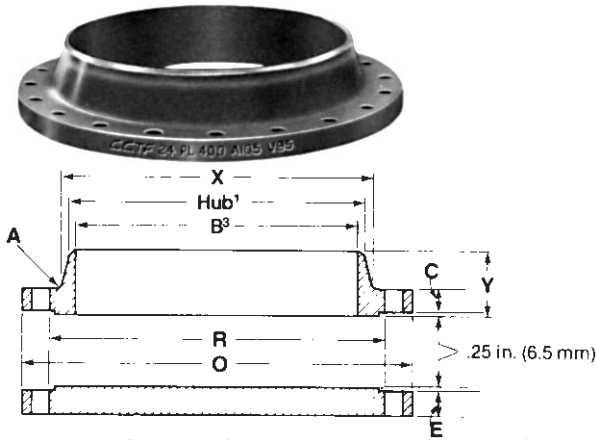
NPS	DN	FLANGE THICKNESS ³			LENGTH THRU HUB Y ¹	HUB DIA. AT BASE X	HUB DIA. AT POINT OF WELDING A	RAISED FACE DIA. R	DRILLING			FILLET RADIUS (MIN.) r	APPROX. WEIGHT	
		FLANGE OUTSIDE DIA. O	WELDING NECK C	BLIND E					NO. OF BOLT HOLES	DIA. OF BOLT HOLES	DIA. OF BOLT CIRCLE		WELDING NECK	BLIND
26	650	38.25	3.12	3.31	7.25	28.38	26.00	29.50	28	1.75	34.50	.38	615	1116
		970	79.5	84.0	184	720	660	749	28	44	876	10	279	506
28	700	40.75	3.38	3.56	7.75	30.50	28.00	31.50	28	1.75	37.00	.44	750	1362
		1035	85.5	90.5	197	775	711	800	28	44	940	11	340	618
30	750	43.00	3.62	3.75	8.25	32.56	30.00	33.75	28	1.88	39.25	.44	858	1590
		1090	92.0	95.0	210	825	762	857	28	48	997	11	390	721
32	800	45.25	3.88	3.94	8.75	34.69	32.00	36.00	28	2.00	41.50	.44	960	1862
		1150	98.5	100	222	880	813	914	28	51	1054	11	435	845
34		47.50	4.00	4.12	9.12	36.88	34.00	38.00	28	2.00	43.50	.50	1110	2134
		1205	102	105	232	935	863	965	28	51	1105	13	504	968
36	900	50.00	4.12	4.38	9.50	39.00	36.00	40.25	32	2.12	46.00	.50	1223	2586
		1270	105	111	241	990	914	1022	32	54	1168	13	560	1173
38		46.00	4.25	4.25	7.12	39.12	38.00	40.50	32	1.62	43.00	.50		
		1170	108	108	181	995	965	1029	32	41	1092	13		
40	1000	48.75	4.50	4.50	7.62	41.25	40.00	42.75	32	1.75	45.50	.50		
		1240	114	114	194	1050	1016	1086	32	44	1156	13		
42	1100	50.75	4.69	4.69	7.88	43.25	42.00	44.75	32	1.75	47.50	.50		
		1290	119	119	200	1100	1067	1137	32	44	1206	13		
44		53.25	4.88	4.88	8.12	45.25	44.00	47.00	32	1.88	49.75	.50		
		1355	124	124	206	1150	1118	1194	32	48	1264	13		
46		55.75	5.06	5.06	8.50	47.38	46.00	49.00	28	2.00	52.00	.50		
		1415	129	129	216	1205	1168	1245	28	51	1321	13		
48	1200	57.75	5.25	5.25	8.81	49.38	48.00	51.25	32	2.00	54.00	.50		
		1465	133	133	224	1255	1219	1314	32	51	1372	13		
50		60.25	5.50	5.50	9.12	51.38	50.00	53.50	32	2.12	56.25	.50		
		1530	140	140	232	1305	1270	1359	32	54	1429	13		
52	1300	62.25	5.69	5.69	9.38	53.38	52.00	55.50	32	2.12	58.25	.50		
		1580	144	144	238	1355	1321	1410	32	54	1480	13		
54	1400	65.25	6.00	6.00	9.94	55.50	54.00	57.75	28	2.38	61.00	.50		
		1660	152	152	252	1410	1372	1467	28	60	1549	13		
56		67.25	6.06	6.06	10.25	57.62	56.00	59.75	28	2.38	63.00	.50		
		1710	154	154	260	1465	1422	118	28	60	1600	13		
58		69.25	6.25	6.25	10.50	59.62	58.00	62.00	32	2.38	65.00	.50		
		1760	159	159	267	1515	1473	1575	32	60	1651	13		
60	1500	71.25	6.44	6.44	10.75	61.62	60.00	64.00	32	2.38	67.00	.50		
		1810	164	164	273	1565	1524	1626	32	60	1702	13		

¹ Includes .06" (1.5 mm) raised face.

² Materials covered in this Standard are as in ASME/ANSI B16.47 except nickel based alloys are excluded.

³ Bore diameter as specified by Purchaser.

INCHES	POUNDS
MILLIMETRES	KILOGRAMS



**LARGE DIAMETER
FORGED STEEL FLANGES**
PIPE LINE FLANGES
CLASS 400 (PN 68)
WELDING NECK & BLIND
ASME B16.47 SERIES A
²ASTM A-105

NPS	DN	FLANGE THICKNESS¹			LENGTH THRU HUB Y¹	HUB DIA. AT BASE X	HUB DIA. AT POINT OF WELDING A	RAISED FACE DIA. R	DRILLING			FILLET RADIUS (MIN.) r	APPROX. WEIGHT	
		FLANGE OUTSIDE DIA. O	WELDING NECK C	BLIND E					NO. OF BOLT HOLES	DIA. OF BOLT HOLES	DIA. OF BOLT CIRCLE		WELDING NECK	BLIND
26	650	38.25	3.50	3.88	7.62	28.62	26.00	29.50	28	1.88	34.50	.44	769	1226
		970	89.0	98.5	194	725	660	749	28	48	876	11	349	556
28	700	40.75	3.75	4.12	8.12	30.81	28.00	31.50	28	2.00	37.00	.50	902	1483
		1035	95.0	105	206	785	711	800	28	51	940	13	409	673
30	750	43.00	4.00	4.38	8.62	32.94	30.00	33.75	28	2.12	39.25	.50	1025	1760
		1090	102	111	219	835	762	857	28	54	997	13	465	798
32	800	45.25	4.25	4.56	9.12	35.00	32.00	36.00	28	2.12	41.50	.50	1188	2036
		1150	108	116	232	890	813	914	28	54	1054	13	539	924
34		47.50	4.38	4.81	9.50	37.19	34.00	38.00	28	2.12	43.50	.56	1340	2374
		1205	111	122	241	945	863	965	28	54	1105	14	608	1077
36	900	50.00	4.50	5.06	9.88	39.38	36.00	40.25	32	2.12	46.00	.56	1520	2756
		1270	114	129	251	1000	914	1022	32	54	1168	14	689	1250
38		47.50	4.88	4.88	8.12	39.50	38.00	40.5	32	1.88	44.00	.56		
		1205	124	124	206	1005	965	1035	32	48	1118	14		
40	1000	50.00	5.12	5.12	8.50	41.50	40.00	43.00	32	2.00	46.25	.56		
		1270	130	130	216	1055	1016	1092	32	51	1175	14		
42	1100	52.00	5.25	5.25	8.81	43.62	42.00	45.00	32	2.00	48.25	.56		
		1320	133	133	224	1110	1067	1143	32	51	1226	14		
44		54.50	5.50	5.50	9.18	45.62	44.00	47.25	32	2.12	50.50	.56		
		1385	140	140	233	1160	1118	1200	32	54	1283	14		
46		56.75	5.75	5.75	9.62	47.75	46.00	49.50	36	2.12	52.75	.56		
		1440	146	146	244	1215	1168	1257	36	54	1340	14		
48	1200	59.50	6.00	6.00	10.12	49.88	48.00	51.50	28	2.38	55.25	.56		
		1510	152	152	257	1265	1219	1308	28	60	1403	14		
50		61.75	6.19	6.25	10.56	52.00	50.00	53.62	32	2.38	57.50	.56		
		1570	157	159	268	1320	1270	1362	32	60	1460	14		
52	1300	63.75	6.38	6.44	10.88	54.00	52.00	55.62	32	2.38	59.50	.56		
		1620	162	164	276	1370	1321	1413	32	60	1511	14		
54	1400	67.00	6.69	6.75	11.38	56.12	54.00	57.88	28	2.62	62.25	.56		
		1700	170	171	289	1425	1372	1470	28	67	1581	14		
56		69.00	6.88	6.94	11.75	58.25	56.00	60.12	32	2.62	64.25	.56		
		1755	175	176	298	1480	1422	1527	32	67	1632	14		
58		71.00	7.00	7.12	12.06	60.25	58.00	62.12	32	2.62	66.25	.56		
		1805	178	181	306	1530	1473	1527	32	68	1683	14		
60	1500	74.25	7.31	7.44	12.56	62.38	60.00	64.38	32	2.88	69.00	.56		
		1885	186	189	319	1585	1524	1527	32	73	1753	14		

¹ Does not include .25" (6.5mm) raised face.

² Material covered in this Standard are as in ASME/ANSI B16.5 except nickel based alloys are excluded.

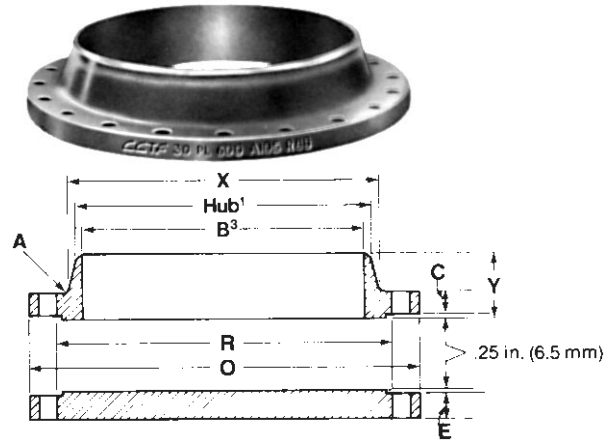
³ Bore diameter as specified by Purchaser.

⁴ These flanges can also be supplied in any material that can be forged or rolled.

INCHES	POUNDS
MILLIMETRES	KILOGRAMS



LARGE DIAMETER
FORGED STEEL FLANGES
PIPE LINE FLANGES
CLASS 600 (PN 100)
WELDING NECK & BLIND
ANSI/ASME B16.47 SERIES A
²ASTM A-105



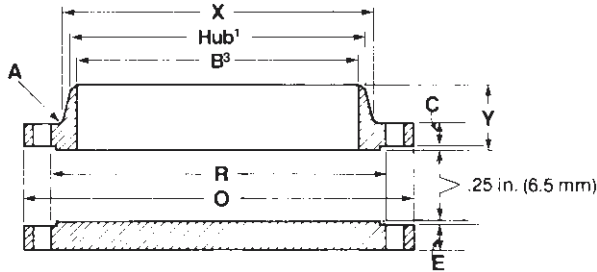
NPS	DN	FLANGE THICKNESS ¹		LENGTH THRU HUB	HUB DIA. AT BASE	HUB DIA. AT POINT OF WELDING	RAISED FACE DIA.	DRILLING			FILLET RADIUS (MIN.)	APPROX. WEIGHT		
		WELDING NECK	BLIND					NO. OF BOLT HOLES	DIA. OF BOLT HOLES	DIA. OF BOLT CIRCLE		WELDING NECK	BLIND	
	O	C	E	Y'	X	A	R				r			
26	650	40.00	4.25	4.94	8.75	29.44	26.00	29.50	28	2.00	36.00	.50	963	1734
		1015	108	125	222	748	660	749	28	51	914	13	437	786
28	700	42.25	4.38	5.19	9.25	31.62	28.00	31.50	28	2.12	38.00	.50	1120	1029
		1075	111	132	235	803	711	800	28	54	965	13	508	916
30	750	44.50	4.50	5.50	9.75	33.94	30.00	33.75	28	2.12	40.25	.50	1232	2398
		1130	114	140	248	862	762	857	28	54	1022	13	559	1088
32	800	47.00	4.62	5.81	10.25	36.12	32.00	36.00	28	2.38	42.50	.50	1500	2815
		1195	117	148	260	917	813	914	28	60	1080	13	680	1277
34		49.00	4.75	6.06	10.62	38.31	34.00	38.00	28	2.38	44.50	.56	1580	3206
		1245	121	154	270	973	863	965	28	60	1130	14	717	1454
36	900	51.75	4.88	6.38	11.12	40.62	36.00	40.25	28	2.38	47.00	.56	1750	3744
		1315	124	162	283	1032	914	1022	28	60	1194	14	794	1698
38		50.00	6.00	6.12	10.00	40.25	38.00	41.50	28	2.38	45.75	.56		
		1270	152	156	254	1022	965	1054	28	60	1162	14		
40	1000	52.00	6.25	6.38	10.38	42.25	40.00	43.75	32	2.38	47.75	.56		
		1320	159	162	264	1073	1016	1111	32	60	1213	14		
42	1100	55.25	6.62	6.75	11.00	44.28	42.00	46.00	28	2.62	50.50	.56		
		1405	168	171	279	1125	1067	1168	28	67	1283	14		
44		57.25	6.81	7.00	11.38	46.50	44.00	48.25	32	2.62	52.50	.56		
		1455	173	178	289	1181	1118	1226	32	67	1327	14		
46		59.50	7.06	7.31	11.81	48.62	46.00	50.25	32	2.62	54.75	.56		
		1510	179	186	300	1235	1168	1276	32	67	1391	14		
48	1200	62.75	7.44	7.69	12.44	50.75	48.00	52.50	32	2.88	57.50	.56		
		1595	189	195	316	1289	1219	1283	32	73	1467	14		
50		65.75	7.75	8.00	12.94	52.88	50.00	54.50	28	3.12	60.00	.56		
		1670	198	203	329	1343	1270	1384	28	79	1524	14		
52	1300	67.75	8.00	8.25	13.25	54.88	52.00	56.50	32	3.12	62.00	.56		
		1720	203	210	337	1394	1321	1435	32	79	1575	14		
54	1400	70.00	8.25	8.56	13.75	57.00	54.00	58.75	32	3.12	64.25	.56		
		1780	210	217	349	1448	1372	1492	32	79	1632	14		
56		73.00	8.56	8.88	14.25	59.12	56.00	60.75	32	3.38	66.75	.62		
		1855	217	225	362	1502	1422	1543	32	86	1695	16		
58		75.00	8.75	9.12	14.56	61.12	58.00	63.00	32	3.38	68.75	.62		
		1905	222	232	370	1552	1473	1600	32	86	1746	16		
60	1500	78.50	9.19	9.56	15.31	63.38	60.00	65.25	28	3.62	71.75	.69		
		1995	233	243	389	1610	1524	1657	28	92	1822	17		

¹ Includes .25" (6.5 mm) raised face.

² Materials covered in this Standard are as in ASME/ANSI B16.5 except nickel based alloys are excluded.

³ Bore diameter as specified by Purchaser.

INCHES	POUNDS
MILLIMETRES	KILOGRAMS



**LARGE DIAMETER
FORGED STEEL FLANGES**
PIPE LINE FLANGES
CLASS 900 (PN 150)
WELDING NECK & BLIND
ANSI/ASME B16.47 SERIES A
ASTM A-105

NPS	DN	FLANGE THICKNESS ³		LENGTH THRU HUB	HUB DIA. AT BASE	HUB DIA. AT POINT OF WELDING	RAISED FACE DIA.	DRILLING			FILLET RADIUS (MIN.)	APPROX. WEIGHT		
		WELDING NECK	BLIND					NO. OF BOLT HOLES	DIA. OF BOLT HOLES	DIA. OF BOLT CIRCLE		WELDING NECK	BLIND	
	O	C	E	Y¹	X	A	R				r			
26	650	42.75	5.50	6.31	11.25	30.50	26.00	29.50	20	2.88	37.50	.44	1614	2423
		1085	140	160	286	775	660	749	20	73	952	11	732	1099
28	700	46.00	5.62	6.75	11.75	32.75	28.00	31.50	20	3.12	40.25	.50	1894	3012
		1170	143	171	298	832	711	800	20	79	1022	13	859	1366
30	750	48.50	5.88	7.18	12.25	35.00	30.00	33.75	20	3.12	42.75	.50	2196	3564
		1230	149	183	311	889	762	857	20	79	1086	13	996	1617
32	800	51.75	6.25	7.62	13.00	37.25	32.00	36.00	20	3.38	45.50	.50	2628	4286
		1315	159	194	330	946	813	914	20	86	1156	13	1192	1944
34		55.00	6.50	8.06	13.75	39.62	34.00	38.00	20	3.62	48.25	.56	3100	5207
		1395	165	205	349	1006	864	965	20	92	1226	14	1407	2362
36	900	57.50	6.75	8.44	14.25	41.88	36.00	40.25	20	3.62	50.75	.56	3535	6003
		1460	171	214	362	1064	914	1022	20	92	1289	14	1603	2723
38		57.50	7.50	8.50	13.88	42.75	38.00	43.25	20	3.62	50.75	.75		
		1460	190	216	352	1073	965	1099	20	92	1289	19		
40	1000	59.50	7.75	8.81	14.31	44.38	40.00	45.75	24	3.62	52.75	.81		
		1510	197	224	364	1127	1016	1162	24	92	1340	21		
42	1100	61.50	8.12	9.12	14.62	46.31	42.00	47.75	24	3.62	54.75	.81		
		1560	206	232	37	1176	1067	1213	24	92	1391	21		
44		64.88	8.44	9.56	15.38	48.62	44.00	50.00	24	3.88	57.62	.88		
		1650	214	243	391	1235	1118	1270	24	98	1464	22		
46		68.25	8.88	10.06	16.18	50.88	46.00	52.50	24	4.12	60.50	.88		
		1735	225	256	411	1292	1168	1334	24	105	1537	22		
48		70.25	9.19	10.38	16.50	52.88	48.00	54.50	24	4.12	62.50	.94		
	1200	1785	233	264	419	1343	1219	1384	24	105	1588	24		

¹ Does not include .25" (6.5 mm) raised face.

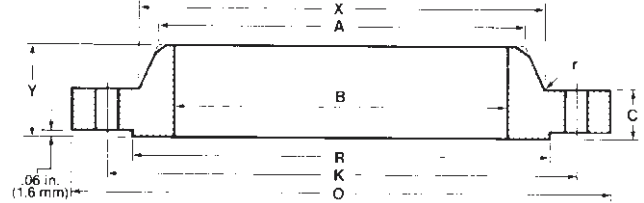
² Materials covered in this Standard are as in ASME/ANSI B16.5, except nickel based alloys are excluded.

³ Bore diameter as specified by Purchaser.

INCHES	POUNDS
MILLIMETRES	KILOGRAMS



LARGE DIAMETER
STEEL FLANGES
**CLASS 150 (PN 20) AND
CLASS 300 (PN 50)**
WELDING NECK
ASTM A-105²



NPS	FLANGE DIAMETER	FLANGE THICKNESS	RAISED FACE DIA.	BORE	HUB DIA. AT POINT OF WELDING	HUB DIA. AT BASE	LENGTH THRU HUB	FILLET RADIUS	DRILLING			APPROX. WEIGHT
									NO. OF HOLES	DIA. OF HOLES	DIA. OF BOLT CIRCLE	
DN	O	C	R	B	A	X	Y	r			K	
CLASS 150												
26	30.94	1.62	28.00	As specified by Customer	26.06	26.94	3.50	.38	36	.88	29.31	139
650	786	41.3	711.2		662.0	684.2	88.9	9.5	36	22.2	744.5	63
28	32.94	1.75	30.00		28.06	28.94	3.75	.38	40	.88	31.31	163
700	837	44.4	762.0		712.8	735.0	95.2	9.5	40	22.2	795.3	74
30	34.94	1.75	32.00		30.06	31.00	3.94	.38	44	.88	33.31	176
750	887	44.4	812.8		763.6	787.4	100.0	9.5	44	22.2	846.1	80
32	37.06	1.81	34.00		32.06	33.06	4.25	.38	48	.88	35.44	203
800	941	46.0	863.6		814.4	839.8	108.0	9.5	48	22.2	900.1	92
34	39.56	1.94	36.25		34.06	35.12	4.34	.38	40	1.00	37.69	249
*850	1005	49.2	920.8		865.2	892.2	110.3	9.5	40	25.4	957.3	113
36	41.62	2.06	38.25		36.06	37.19	4.62	.38	44	1.00	39.75	284
900	1057	52.4	971.6		916.0	944.6	117.5	9.5	44	25.4	1009.6	129
42	48.25	2.31	44.50	42.12	43.38	5.25	.44	48	1.12	46.12	406	
1100	1226	58.7	1130.3	1070.0	1101.7	133.4	11.1	48	28.6	1171.6	184	
48	54.81	2.56	50.75	48.12	49.50	5.88	.44	44	1.25	52.56	509	
1200	1392	65.1	1289.0	1222.4	1257.3	149.2	11.1	44	31.8	1335.1	231	
54	61.00	2.81	56.75	54.12	55.62	6.38	.44	56	1.25	58.75	632	
1400	1549	71.4	1441.4	1374.8	1412.9	161.9	11.1	56	31.8	1492.2	287	
60	67.94	3.00	63.00	60.12	61.81	7.06	.56	52	1.38	65.44	855	
1500	1726	76.2	1600.2	1527.2	1570.0	179.4	14.3	52	34.9	1662.1	388	
CLASS 300												
26	34.12	3.50	29.00	As specified by Customer	26.19	27.62	5.69	.56	32	1.38	31.62	399
650	867	88.9	736.6		665.2	701.7	144.5	14.3	32	34.9	803.3	181
28	36.25	3.50	31.00		28.19	29.75	5.88	.56	36	1.38	33.75	447
700	921	88.9	787.4		716.0	755.6	149.2	14.3	36	34.9	857.2	203
30	39.00	3.69	33.25		30.25	32.00	6.22	.56	36	1.50	36.25	590
750	991	93.7	844.6		768.4	812.8	158.0	14.3	36	38.1	920.8	268
32	41.50	4.06	35.50		32.25	34.00	6.62	.62	32	1.62	38.50	727
800	1054	103.2	901.7		819.2	863.6	168.3	15.9	32	41.3	977.9	330
34	43.62	4.06	37.50		34.25	36.12	6.81	.62	36	1.62	40.62	787
*850	1108	103.2	952.5		870.0	917.6	173.0	15.9	36	41.3	1031.9	357
36	46.12	4.06	39.75		36.25	38.00	7.12	.62	32	1.75	42.88	893
900	1172	103.2	1009.6		920.8	965.2	181.0	15.9	32	44.4	1089.0	405
42	52.50	4.69	46.00	42.31	44.00	8.06	.62	36	1.88	49.00	1252	
1100	1334	119.1	1168.4	1074.7	1117.6	204.8	15.9	36	47.6	1244.6	568	
48	59.50	5.06	52.25	48.31	50.31	8.81	.62	40	2.00	55.75	1611	
1200	1511	128.6	1327.2	1227.1	1277.9	223.8	15.9	40	50.8	1416.0	731	
54	65.88	5.38	58.25	54.31	56.50	9.44	.62	48	2.00	62.12	1979	
1400	1673	136.5	1479.6	1379.5	1435.1	239.7	15.9	48	50.8	1578.0	898	
60	73.94	5.94	65.00	60.31	62.94	10.69	.69	40	2.38	69.44	2890	
1500	1878	150.8	1651.0	1531.9	1598.6	271.5	17.5	40	60.3	1736.7	1311	

¹ Also available in Class 75. Particulars upon request.

² Materials covered in this Standard are the same as ASME/ANSI B16.5 except nickel base alloys are excluded.

³ Flange Thickness C and Length through Hub Y includes .06" (1.6 mm) raised face.

Materials extracted from API STANDARD 605, Second Edition, October 1978, Large Diameter Carbon Steel Flanges (Nominal Pipe Size 26 to 60, inclusive; Classes 75, 150 and 300) Tables 3, B-2 and B-3, reprinted by courtesy of the American Petroleum Institute.

INCHES	POUNDS
MILLIMETRES	KILOGRAMS

IDENTIFICATION

CCTF flanges, where the size and design permits, are marked with the following identification data in accordance with ASME/ANSI B16.5:

Trade Mark or name
 Primary service pressure
 Material designation

Nominal size
 B16 (ANSI designation)
 Heat code

FORGED FLANGE TOLERANCES

Millimetres in brackets

DIMENSION		WELDING NECK & SOCK. WELD	SLIP-ON & SOCK. WELD.	THREADED	LAP JOINT	BLIND
Outside Diameter	Flange O.D. 24 or less (609.6)	± .06 (1.6)	±.06 (1.6)	±.06 (1.6)	±.06 (1.6)	±.06 (1.6)
	Flange O.D. over 24 (609.6)	±.12 (3.2)	±.12 (3.2)	±.12 (3.2)	±.12 (3.2)	±.12 (3.2)
Bore	NPS 10 (DN 250) & less	±.03 (0.8) ²	+ .03 (0.8) ⁴ —0	+ .03 (0.8) —0	+ .03 (0.8) —0	—
	NPS 12 - 18 (DN 300 - 450)	±.06 (1.6) ²	+ .06 (1.6) ⁴ —0	+ .06 (1.6) —0	+ .06 (1.6) —0	—
	NPS 20 (DN 500) & over	+ .12 (3.2) ² — .06 (1.6)	+ .06 (1.6) ⁴ —0	+ .06 (1.6) —0	+ .06 (1.6) —0	—
Flange Thickness	NPS 18 (DN 450) & less)	+ .12 (3.2) —0	+ .12 (3.2) —0	+ .12 (3.2) —0	+ .12 (3.2) —0	+ .12 (3.2) —0
	NPS 20 (DN 500) & over	+ .19 (4.8) —0	+ .19 (4.8) —0	+ .19 (4.8) —0	+ .19 (4.8) —0	+ .19 (4.8) —0
Raised Face Diameter	.06 (1.6) raised face	±.03 (0.8)	±.03 (0.8)	±.03 (0.8)	—	±.03 (0.8)
	.25 (6.4) raised face	±.02 (0.5)	±.02 (0.5)	±.02 (0.5)	—	±.02 (0.5)
Drilling	Bolt circle	±.06 (1.6)	±.06 (1.6)	±.06 (1.6)	±.06 (1.6)	±.06 (1.6)
	Bolt hole spacing	±.03 (0.8)	±.03 (.08)	±.03 (0.8)	±.03 (0.8)	±.03 (0.8)
Eccentricity ³	NPS 2 1/2 (DN 65) & less NPS 3 (DN 80) & larger	.03 (0.8) max. .06 (1.6) max.	.03 (0.8) max. .06 (1.6) max.	.03 (0.8) max. .06 (1.6) max.	.03 (0.8) max. .06 (1.6) max.	—
Length Thru Hub (Welding Neck Flanges)	NPS 4 & less ±.06	—	—	—	—	—
	NPS 5 to 10 +.06 -.12	—	—	—	—	—
	NPS 12 & larger +.12 -.18	—	—	—	—	—
Diameter of Hub at Base	NPS 12 (DN 300) & less	±.09 (2.4) -.06 (1.6)	±.09 (2.4) -.06 (1.6)	±.09 (2.4) -.06 (1.6)	±.09 (2.4) -.06 (1.6)	—
	NPS 14 (DN 350) & over)	±.12 (3.2)	±.12 (3.2)	±.12 (3.2)	±.12 (3.2)	—
Diameter of Hub at Bevel	NPS 5 (DN 125) & less	+ .09 (2.4) -.03 (0.8)	—	—	—	—
	NPS 6 (DN 150) & over	+ .16 (4.0) ±.03 (0.8)	—	—	—	—
Thickness of Hub at Bevel	All sizes of welding neck	Minimum, —12 1/2& of matching nominal pipe wall thickness				

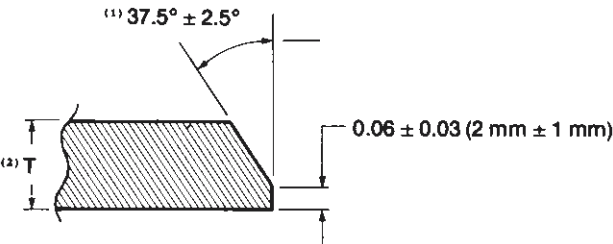
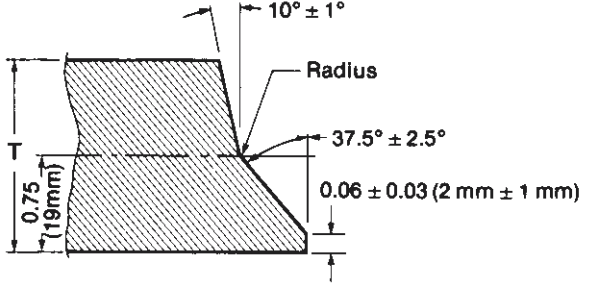
¹ These tolerances not covered by ASME/ANSI B16.5.

² Welding Neck and Socket Welding small bore.

³ Between bolt circle diameter and machined facing diameter.

⁴ Socket Welding Socket.

WELDING BEVELS - (WELD NECK FLANGES NO BACKING RINGS)

	<p style="text-align: right;">Compound bevel</p> 
<p>ASME/ANSI B16.5, ASME B16.47</p> <p>Nominal pipe wall thickness $T = 0.88$ (22.2 mm) max. For wall thickness less than 0.19 in. (4.8 mm) for carbon and ferritic alloy steel, and 0.125 in. (3.2 mm) austenitic alloy steel, ends may be cut square or slightly chamfered at manufacturer's option.</p>	<p>ASME/ANSI B16.5, ASME B16.47</p> <p>$T = \text{more than } 0.88''$ (22.4 mm)</p>