Kofco

KOREA MOVENEX CO.,LTD

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KOREA MOVENEX CO.,LTD

Kofco

AVAILABLE FOR YOUR BETTER PIPING!

Manufacturer of Better Flanges

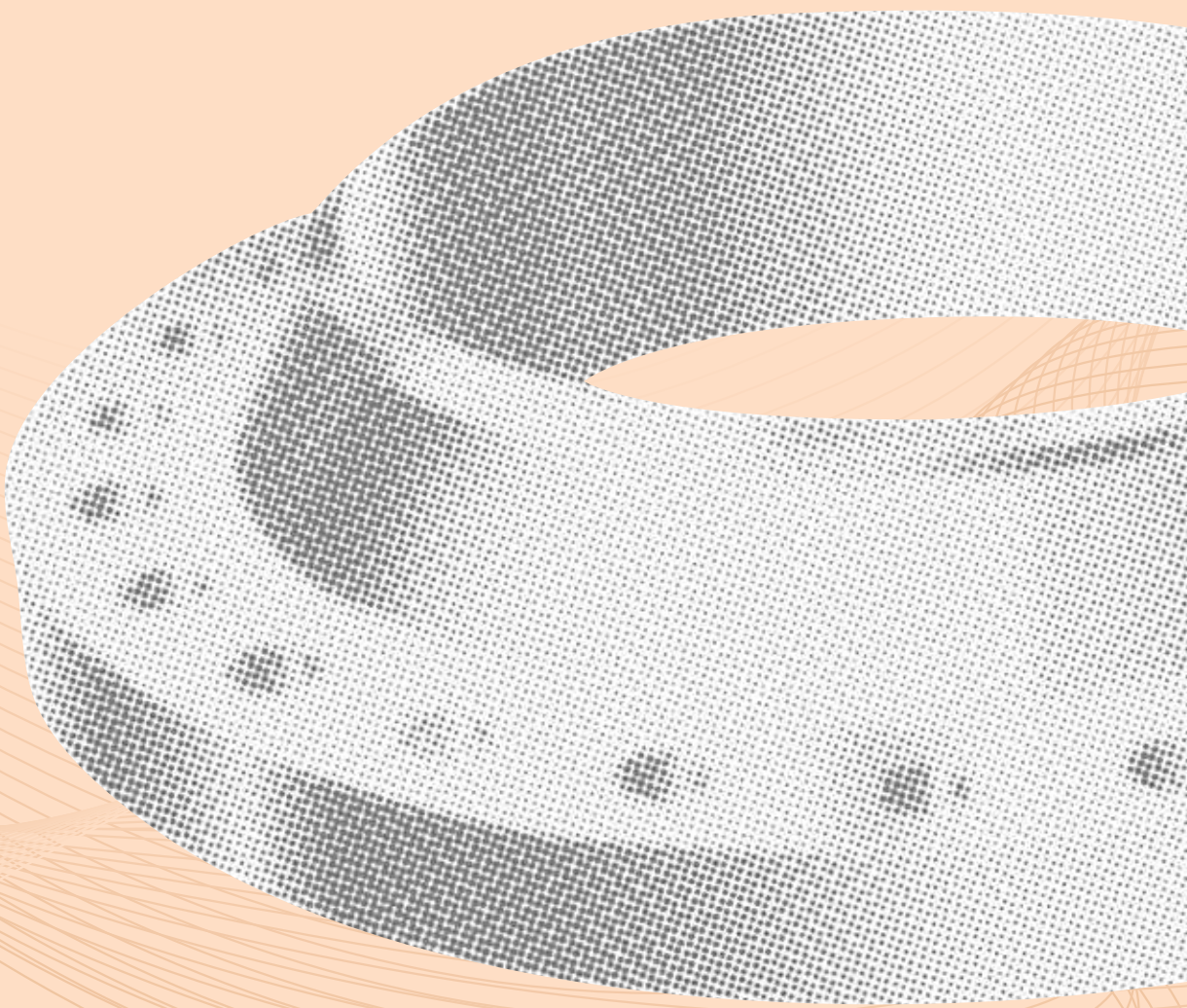
Forged Steel Flanges

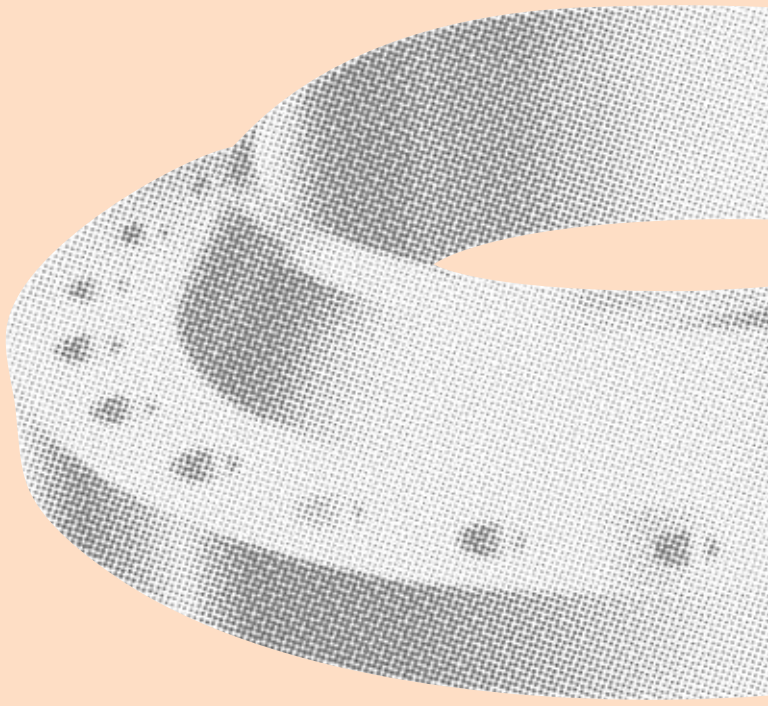
Non-Ferrous Flanges

Steel Plate Flanges

In Accordance with ASME, AWWA

Other Special Steel & Forged Flanges





CONTENTS

ISO-9001

We, KOREA MOVENEX CO.,LTD are certified for the quality management system from ISO in flange industries.

ISO 9000 series is the representative for international quality system and foreign trades.
Our desire for quality and technical advancement has overcome the steep export barrier.
We have proved worldwide again for quality by securing in certificate of approval for ISO 9001.
We will do our best to produce the better products and to improve technical development.

LRQA

Current issue date: 11 April 2023
Expiry date: 28 February 2026
Certificate identity number: 10521122

Original approval(s):
ISO 9001 - 6 April 1993

Certificate of Approval

This is to certify that the Management System of:

Korea Movenex Co., Ltd. - Plant #2

45, Sinyeocheon-ro 35beon-gil, Nam-gu, Ulsan 44781, Republic of Korea

has been approved by LRQA to the following standards:

ISO 9001:2015

Approval number(s): ISO 9001 – 0070676

This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.

The scope of this approval is applicable to:

Manufacture of flanges and forging products.

Il-Hyoung Lee

Korea Operations Manager

Issued by: LRQA Limited

UKAS MANAGEMENT SYSTEMS 0001

What is ISO 9000 Series?

This is the quality assurance standard that established by ISO (International Standardization Organization). ISO 9000 series has become the prerequisite for successful international trades.

FORWARD

It is a great pleasure for me to introduce to our friends and customers Korea Movenex Co., Ltd., an affiliate of the Seohan Group, largest business conglomerate in Korea.

Since its establishment in 1974, we have supplied a wide spectrum of quality product for its customers around the world. we are recognized among clients for the excellence of quality and technology.

Our highest standard of technology coupled with the up-to-date production facilities enable to win an unrivaled reputation. Major production facilities include the latest model of forging presses, multispindle drilling machines, CNC lathes, spectrometers, coordinate measuring machines, plasma cutters, billet shears and many other types of equipment.
By utilizing its up-to-date production facilities and skilled manpower, we commenced the fabrication of various steel structures for shipbuilding in 1977. On the basis of this experience and accumulate technology, we have fabricated large steel structures and industrial machinery required for petrochemical plants, power plants, industrial plants and many other construction projects.

Equipped with the most modern machinery, we also produce a variety automobile parts which are Half shaft, Front Axle and other commercial auto parts.

Korea Movenex Co., Ltd.'s quality assurance and computerized production systems are so excellent as to meet the various kind of customer's requirements.

Korea Movenex Co., Ltd. will continue its efforts to satisfy customer's demand by supplying top quality products and services. We look forward to your continued encouragement and support in the years ahead.

Sincerely Yours,

KOREA MOVENEX CO., LTD

President

RESEARCH & DEVELOPMENT

We, Korea Movenex Co., Ltd., always provide our customers with high quality products which conform to international codes and standards.

Under the strict Quality Assurance System of Korea Movenex Co., Ltd., every production complies with all applicable specifications and drawings. Our excellent quality control engineers control all processes from initial inquiry to the final design, material purchasing, manufacturing and testing.
Our ultramodern laboratory facilities for the Quality Assurance include spectrometers for material analysis, universal test machines for physical property testing, coordinate measuring machines for multi dimension check, air emission spectrometers, ultrasonic testers and metallic microscopes. Such the latest equipment is managed by superb engineers and well-trained technicians.

Korea Movenex Co., Ltd. is proud of its superlative Quality Assurance system designed to meet the requirements of its customers.


BAIRD


GRANITE 80

FLANGE PRODUCTION

Our major equipments are air-drop hammers, forging presses, ring roll mill machine, multi-spindle drill machines, automatic lathes, heat treatment furnaces and many other computerized systems.

Korea Movenex Co., Ltd. produces high quality products tasking advantage of these facilities and accumulated technology.

Korea Movenex Co., Ltd. will continue its total effort to supply top quality products for worldwide clients.


2000
T/PRESS


KOREA FLANGE CO., LTD.

QUALITY ASSURANCE

Korea Movnex Co.,Ltd is fully equipped with the most up-to-date facilities and

staffed with excellent engineers and technicians to produce top quality products that meet the requirements of clients.

Since its establishment in 1974, Korea Movnex Co.,Ltd has specialized in the production of a wide range of flanges using accumulated technology and strict quality assurance system.
Our technology and products are earning an excellent reputation from customers around the world. Korea Movnex Co.,Ltd has obtained quality certificates from international organizations such as Shell International Petroleum, ExxonMobil, USCG, Lloyd's Register of Shipping, ARAMCO Overseas Company, Nippon Kaiji Kyokai, Lloyd's Register Quality Assurance (for ISO 9001) and many other authorities.
Our products include carbon steel, non-ferrous and lined flanges to the specifications of ASME, ASME Ser.A & B and AWWA as well as many other special flanges.


RINA


GL


DET NORSKE VERITAS
APPROVAL OF MANUFACTURER
CERTIFICATE

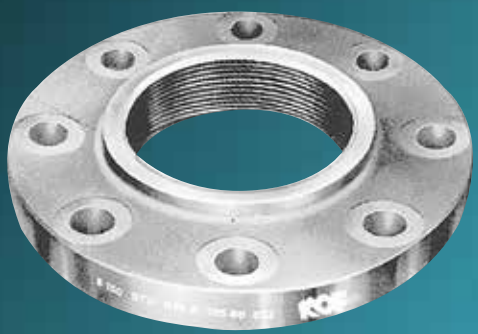

ABS
CERTIFICATE OF
KOREA FLANGE CO., LTD.,
ULSAN, KOREA


Korean Standards Association
CERTIFICATE OF APPROVAL
KOREA FLANGE INDUSTRY Co., Ltd.
KSA

KOFCO FLANGE

Welding Neck Flanges

The welding neck flange is normally referred to as the “high hub” flange. It is designed to transfer stresses to the pipe, there by reducing high stress concentrations at the base of the flange. The welding neck flange is the best designed butt-welded flange of those currently available because of its inherent structural value. It is expensive because of the designed.

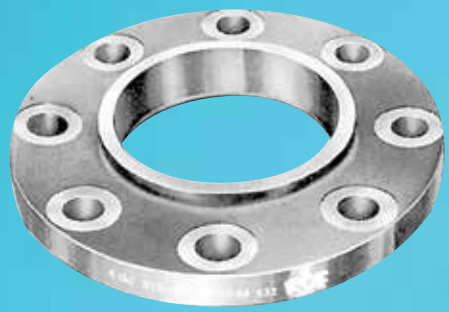


Threaded (Screwed) Flanges

The threaded flange is similar to the slip-on flange, but the bore is threaded. Its chief merit is that it can be assembled without welding, explaining its use in low pressure services at ordinary atmospheric temperatures, and in highly explosive areas where welding creates a hazard.

Slip-on Flanges

The slip-on flange has a low hub because the pipe slips into the flange prior to welding. It is welded both inside and out to provide sufficient strength and prevent leakage. Slip on flanges are all bored slightly larger than the O. D. of the matching pipe. They are preferred over welding neck flanges by many users due to their lower initial cost, but final installation cost is probably not much less than that of the welding neck flange because of the additional welding involved.



Lap Joint Flanges

The lap joint flange is practically identical to a slip-on flange except it has a radius at the intersection of the bore and flange face. This radius is necessary to have the flange accommodate a lap joint stub end. Normally, a lap joint flange and the lap joint stub end are mated together in an assembly system.

Blind Flanges

The blind flange is a flange without a bore. It is used to close off the ends of a piping system and/or a pressure vessel opening. It also permits easy access to the interior of a line or vessel once it has been sealed and must be reopened.

Socket Welding Flanges

The socket welding flange is similar to a slip-on flange except it has a bore and a counter bore dimension. The counter bore is slightly larger than the O. D. of the matching pipe, allowing the pipe to be inserted into the flange similar to a slip-on flange. The diameter of the smaller bore is the same as the I. D. of the matching pipe. A restriction is built into the bottom of the bore which sets as a shoulder for the pipe to rest on. This eliminates any restriction in flow when using a socket welding flange.

STANDARD MARKING

NOMINAL SIZE

CLASS

NOMINAL
WALL THICKNESS

ASME STANDARD

TRADE MARK

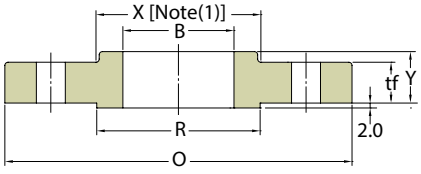
LOT

MATERIAL DESIGNATION

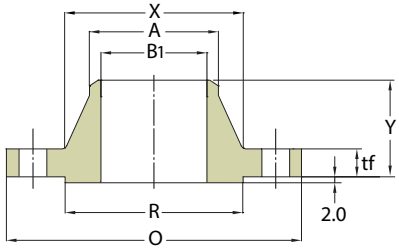
ASME B16.5 FLANGES

CLASS 150 FLANGES
CLASS 300 FLANGES
CLASS 400 FLANGES
CLASS 600 FLANGES
CLASS 900 FLANGES
CLASS 1500 FLANGES
CLASS 2500 FLANGES
RING JOINT FACINGS
REDUCING THREADED AND SLIP ON FLANGES

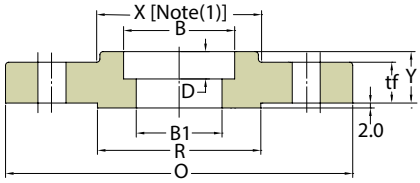
CLASS 150 FLANGES



Slip-on Welding



Welding Neck



Socket Welding
(NPS ½ to 3 Only)

ASME B16.5 FORGED FLANGES

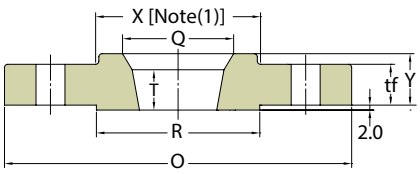
Nominal Pipe Size NPS	Outside Diameter of Flange	Thickness of Flange, Min.	Thickness Lap Joint Min.	Out side Diameter of Raised Face	Diameter of Hub	Hub Diameter Beginning of Chamfer Welding Neck	Length thru hub			Thread Length Threaded Min	Bore			Corner Radius of bore of Lapped Flange and pipe	Depth of Socket
							Threaded/ Slip-on/ Socket Welding	Lapped	Welding Neck		Slip-on/ Socket Welding, Min.	Lapped Min.	Welding Neck/ Socket Welding.		
	O	tf [Notes (2)~(4)]	tf	R	X	A [Note(5)]	Y			T	B		B_1 [Note(6)]	r	D
½	90.00	9.60	11.20	34.90	30.00	21.30	14.00	16.00	46.00	16.00	22.20	22.90	15.8	3.00	10.00
¾	100.00	11.20	12.70	42.90	38.00	26.70	14.00	16.00	51.00	16.00	27.70	28.20	20.9	3.00	11.00
1	110.00	12.70	14.30	50.80	49.00	33.40	16.00	17.00	54.00	17.00	34.50	34.90	26.6	3.00	13.00
1 ¼	115.00	14.30	15.90	63.50	59.00	42.20	19.00	21.00	56.00	21.00	43.20	43.70	35.1	5.00	14.00
1 ½	125.00	15.90	17.50	73.00	65.00	48.30	21.00	22.00	60.00	22.00	49.50	50.00	40.9	6.00	16.00
2	150.00	17.50	19.10	92.10	78.00	60.30	24.00	25.00	62.00	25.00	61.90	62.50	52.5	8.00	17.00
2 ½	180.00	20.70	22.30	104.80	90.00	73.00	27.00	29.00	68.00	29.00	74.60	75.40	62.7	8.00	19.00
3	190.00	22.30	23.90	127.00	108.00	88.90	29.00	30.00	68.00	30.00	90.70	91.40	77.9	10.00	21.00
3 ½	215.00	22.30	23.90	139.70	122.00	101.60	30.00	32.00	70.00	32.00	103.40	104.10	90.1	10.00	
4	230.00	22.30	23.90	157.20	135.00	114.30	32.00	33.00	75.00	33.00	116.10	116.80	102.3	11.00	
5	255.00	22.30	23.90	185.70	164.00	141.30	35.00	36.00	87.00	36.00	143.80	144.40	128.2	11.00	
6	280.00	23.90	25.40	215.90	192.00	168.30	38.00	40.00	87.00	40.00	170.70	171.40	154.1	13.00	
8	345.00	27.00	28.60	269.90	246.00	219.10	43.00	44.00	100.00	44.00	221.50	222.20	202.7	13.00	
10	405.00	28.60	30.20	323.80	305.00	273.00	48.00	49.00	100.00	49.00	276.20	277.40	254.6	13.00	
12	485.00	30.20	31.80	381.00	365.00	323.80	54.00	56.00	113.00	56.00	327.00	328.20	304.8	13.00	
14	535.00	33.40	35.00	412.80	400.00	355.60	56.00	79.00	125.00	57.00	359.20	360.20	To be Specified by purchaser	13.00	
16	595.00	35.00	36.60	469.90	457.00	406.40	62.00	87.00	125.00	64.00	410.50	411.20		13.00	
18	635.00	38.10	39.70	533.40	505.00	457.00	67.00	97.00	138.00	68.00	461.80	462.30		13.00	
20	700.00	41.30	42.90	584.20	559.00	508.00	71.00	103.00	143.00	73.00	513.10	514.40		13.00	
24	815.00	46.10	47.70	692.20	663.00	610.00	81.00	111.00	151.00	83.00	616.00	616.00		13.00	

Notes:

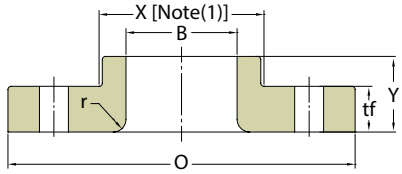
(1) This dimension is for large end of hub, which may be straight or tapered. Taper shall not exceed 7 deg on threaded, slip-on, socket-welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and the back face of the flange.

(2) The minimum thickness of these loose flanges, in sizes NPS 3 ½ and smaller, is slightly greater than the thickness of flange on fittings which are reinforced by being cast integral with the body of the fitting.

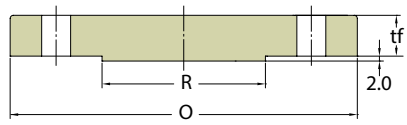
(3) The flat face may be either the full tf dimension of thickness plus 2mm or the tf dimension thickness without the raised face height.



Threaded



Lapped



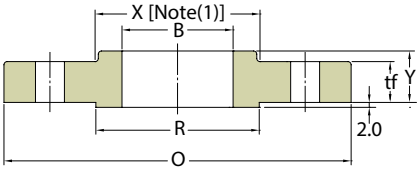
Blind

(Dimensions in mm)

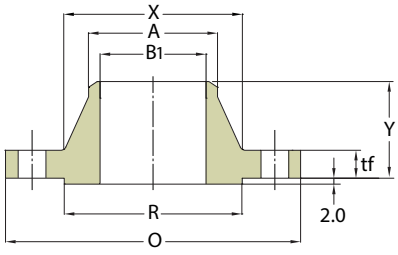
Drilling Template				Bolt Length			Approximate Weight										Nominal Pipe Size
Diameter of Bolt Circle	Number of Holes	Diameter of Holes, in.	Diameter of bolts, in.	Machine Bolt Length	Stud Bolt Length		Welding Neck		Slip-on Threaded		Lap Joint		Blind		Socket Welding		
				Raised Face	Raised Face	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb	Kg	lb	
60.30	4	⅝	½	50.00	55.00	-	0.51	1.12	0.47	1.04	0.51	1.12	0.47	1.04	0.47	1.04	½
69.90	4	⅝	½	50.00	65.00	-	0.73	1.61	0.58	1.28	0.64	1.41	0.63	1.39	0.59	1.30	¾
79.40	4	⅝	½	55.00	65.00	75.00	1.07	2.36	0.86	1.90	0.93	2.05	0.94	2.07	0.87	1.92	1
88.90	4	⅝	½	55.00	70.00	85.00	1.40	3.09	1.08	2.38	1.16	2.56	1.23	2.71	1.11	2.45	1 ¼
98.40	4	⅝	½	65.00	70.00	85.00	1.81	3.99	1.41	3.11	1.51	3.33	1.62	3.57	1.45	3.20	1 ½
120.70	4	¾	⅝	70.00	85.00	95.00	2.59	5.71	2.26	4.98	2.38	5.25	2.64	5.82	2.33	5.14	2
139.70	4	¾	⅝	75.00	90.00	100.00	4.28	9.44	3.43	7.56	3.60	7.94	4.06	8.95	3.55	7.83	2 ½
152.40	4	¾	⅝	75.00	90.00	100.00	5.18	11.42	3.87	8.53	4.04	8.91	4.90	10.80	4.02	8.86	3
177.80	8	¾	⅝	75.00	90.00	100.00	5.45	12.02	4.99	11.00	4.99	11.00	5.90	13.01			3 ½
190.50	8	¾	⅝	75.00	90.00	100.00	7.32	16.14	5.75	12.68	5.96	13.14	7.41	16.34			4
215.90	8	⅞	¾	85.00	95.00	100.00	8.91	19.64	6.22	13.71	6.44	14.20	8.76	19.31			5
241.30	8	⅞	¾	85.00	100.00	110.00	11.26	24.82	7.38	16.27	7.59	16.73	11.31	24.93			6
298.50	8	⅞	¾	90.00	110.00	115.00	17.68	38.98	12.36	27.25	12.66	27.91	19.92	43.92			8
362.00	12	1	⅞	100.00	115.00	120.00	24.79	54.65	17.10	37.70	16.78	36.99	29.39	64.79			10
431.80	12	1	⅞	100.00	120.00	125.00	38.98	85.94	27.68	61.02	28.30	62.39	43.70	96.34			12
476.30	12	1 ⅛	1	115.00	135.00	135.00	51.71	114.00	35.20	77.60	41.50	91.49	59.42	131.00			14
539.80	16	1 ⅛	1	115.00	135.00	145.00	64.41	142.00	42.18	92.99	52.98	116.80	77.11	170.00			16
577.90	16	1 ¼	1 ⅛	125.00	145.00	145.00	74.84	164.99	49.71	109.59	59.00	130.07	94.80	209.00			18
635.00	20	1 ¼	1 ⅛	140.00	160.00	160.00	89.36	197.01	65.50	144.40	72.12	159.00	123.38	272.01			20
749.30	20	1 ⅜	1 ¼	150.00	170.00	185.00	119.66	263.81	90.50	199.52	99.02	218.30	188.24	415.00			24

(4) The flange dimension illustrated is for regularly furnished 2 mm raised face (except lapped); for requirements of other facings, see page 59~60.
(5) For welding end bevel. See page 62.
(6) Dimensions in bore of welding neck, socket welding correspond to the inside diameters of pipe as given in ASME B36.10M for standard Wall pipe. Thickness of Standard Wall is the same as Schedule 40 in sizes NPS 10 and smaller.
Tolerances in page 61 apply. These bore sizes are furnished unless otherwise specified by the purchaser.

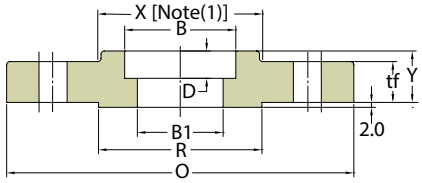
CLASS 300 FLANGES



Slip-on welding



Welding Neck



Socket Welding
(NPS ½ to 3 Only)

ASME B16.5 FORGED FLANGES

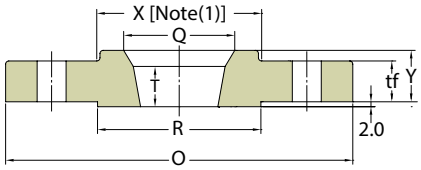
Nominal Pipe Size NPS	Outside Diameter of Flange	Thick-ness of Flange, Min.	Thick-ness Lap Joint Min.	O.D. of Raised Face	Diameter of Hub	Hub Diameter Begin-ning of Chamfer Welding Neck	Length thru hub			Thread Length Threaded Min	Bore			Corner Radius of bore of Lapped Flange and pipe	Counter bore Threaded Flange Min.	Depth of Socket
							Thread-ed Slip-on/ Socket Welding	Lapped	Welding Neck		Slip-on/ Socket Welding, Min.	Lapped Min.	Welding Neck/ Socket Welding.			
	O	tf [Notes (2)(3)]	tf	R	X	A [Note(4)]	Y			T	B		B1 [Note(5)]	r	Q	D
½	95.00	12.70	14.30	34.90	38.00	21.30	21.00	22.00	51.00	16.00	22.20	22.90	15.8	3.00	23.6	10.00
¾	115.00	14.30	15.90	42.90	48.00	26.70	24.00	25.00	56.00	16.00	27.70	28.20	20.9	3.00	29.0	11.00
1	125.00	15.90	17.50	50.80	54.00	33.40	25.00	27.00	60.00	18.00	34.50	34.90	26.6	3.00	35.8	13.00
1 ¼	135.00	17.50	19.10	63.50	64.00	42.20	25.00	27.00	64.00	21.00	43.20	43.70	35.1	5.00	44.4	14.00
1 ½	155.00	19.10	20.70	73.00	70.00	48.30	29.00	30.00	67.00	23.00	49.50	50.00	40.9	6.00	50.3	16.00
2	165.00	20.70	22.30	92.10	84.00	60.30	32.00	33.00	68.00	29.00	61.90	62.50	52.5	8.00	63.5	17.00
2 ½	190.00	23.90	25.40	104.80	100.00	73.00	37.00	38.00	75.00	32.00	74.60	75.40	62.7	8.00	76.2	19.00
3	210.00	27.00	28.60	127.00	117.00	88.90	41.00	43.00	78.00	32.00	90.70	91.40	77.9	10.00	92.2	21.00
3 ½	230.00	28.60	30.20	139.70	133.00	101.60	43.00	44.00	79.00	37.00	103.40	104.10	90.1	10.00	104.9	
4	255.00	30.20	31.80	157.20	146.00	114.30	46.00	48.00	84.00	37.00	116.10	116.80	102.3	11.00	117.6	
5	280.00	33.40	35.00	185.70	178.00	141.30	49.00	51.00	97.00	43.00	143.80	144.40	128.2	11.00	144.4	
6	320.00	35.00	36.60	215.90	206.00	168.30	51.00	52.00	97.00	47.00	170.70	171.40	154.1	13.00	171.4	
8	380.00	39.70	41.30	269.90	260.00	219.10	60.00	62.00	110.00	51.00	221.50	222.20	202.7	13.00	222.2	
10	445.00	46.10	47.70	323.80	321.00	273.00	65.00	95.00	116.00	56.00	276.20	277.40	254.6	13.00	276.2	
12	520.00	49.30	50.80	381.00	375.00	323.80	71.00	102.00	129.00	61.00	327.00	328.20	304.8	13.00	328.6	
14	585.00	52.40	54.00	412.80	425.00	355.60	75.00	111.00	141.00	64.00	359.20	360.20	To be Speci fied by pur-chaser	13.00	360.4	
16	650.00	55.60	57.20	469.90	483.00	406.40	81.00	121.00	144.00	69.00	410.50	411.20		13.00	411.2	
18	710.00	58.80	60.40	533.40	533.00	457.00	87.00	130.00	157.00	70.00	461.80	462.30		13.00	462.0	
20	775.00	62.00	63.50	584.20	587.00	508.00	94.00	140.00	160.00	74.00	513.10	514.40		13.00	512.8	
24	915.00	68.30	69.90	692.20	702.00	610.00	105.00	152.00	167.00	83.00	616.00	616.00		13.00	614.4	

Notes:

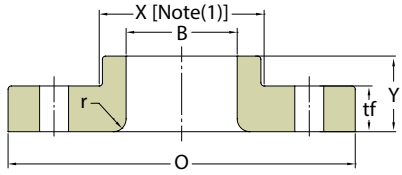
(1) This dimension is for large end of hub, which may be straight or tapered. Taper shall not exceed 7 deg on threaded, slip-on, socket-welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and the back face of the flange.

(2) These flanges may be supplied with a flat face. The flat face may be either the full tf dimension of thickness plus 2mm or the tf dimension thickness without the raised face height.

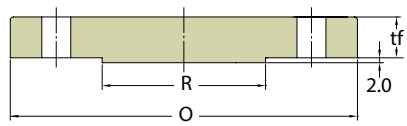
(3) The flange dimension illustrated is for regularly furnished 2 mm raised face (except lapped); for requirements of other facings, see page 59~60.



Threaded



Lapped



Blind

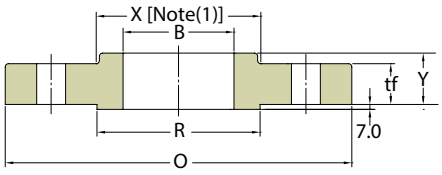
(Dimensions in mm)

Drilling Template				Bolt Length			Approximate Weight										Nominal Pipe Size
Diameter of Bolt Circle	Number of Holes	Diameter of Holes, in.	Diameter of bolts, in.	Machine Bolt Length	Stud Bolt Length		Welding Neck		Slip-on Threaded		Lap Joint		Blind		Socket Welding		
				Raised Face	Raised Face	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb	Kg	lb	
66.70	4	⅝	½	55.00	65.00	75.00	0.78	1.72	0.62	1.37	0.61	1.34	0.62	1.37	0.62	1.37	½
82.60	4	¾	⅝	65.00	75.00	90.00	1.34	2.95	1.15	2.54	1.15	2.54	1.16	2.56	1.19	2.62	¾
88.90	4	¾	⅝	65.00	75.00	90.00	1.64	3.62	1.39	3.06	1.38	3.04	1.42	3.13	1.44	3.17	1
98.40	4	¾	⅝	70.00	85.00	95.00	2.06	4.54	1.67	3.68	1.66	3.66	1.79	3.95	1.73	3.81	1 ¼
114.30	4	⅞	¾	75.00	90.00	100.00	3.06	6.75	2.53	5.58	2.52	5.56	2.68	5.91	2.62	5.78	1 ½
127.00	8	¾	⅝	75.00	90.00	100.00	3.40	7.50	2.80	6.17	2.79	6.15	3.09	6.81	2.94	6.48	2
149.20	8	⅞	¾	85.00	100.00	115.00	5.31	11.71	4.25	9.37	4.22	9.30	4.75	10.47	4.49	9.90	2 ½
168.30	8	⅞	¾	90.00	110.00	120.00	7.32	16.14	5.81	12.81	5.78	12.74	6.79	14.97	6.20	13.67	3
184.20	8	⅞	¾	95.00	110.00	125.00	8.17	18.01	7.72	17.02	7.72	17.02	9.53	21.01			3 ½
200.00	8	⅞	¾	95.00	115.00	125.00	11.30	24.91	10.13	22.33	10.07	22.20	12.00	26.46			4
235.00	8	⅞	¾	110.00	120.00	135.00	15.12	33.33	12.58	27.73	12.52	27.60	15.96	35.19			5
269.90	12	⅞	¾	110.00	120.00	140.00	19.68	43.39	16.04	35.36	15.95	35.16	21.20	46.74			6
330.20	12	1	⅞	120.00	140.00	150.00	30.48	67.20	24.50	54.01	24.37	53.73	34.60	76.28			8
387.40	16	1 ⅛	1	140.00	160.00	170.00	43.74	96.43	34.16	75.31	39.92	88.01	55.34	122.00			10
450.80	16	1 ¼	1 ⅛	145.00	170.00	185.00	64.41	142.00	51.26	113.01	58.70	129.41	78.90	173.94			12
514.40	20	1 ¼	1 ⅛	160.00	180.00	190.00	88.30	194.67	72.12	159.00	83.46	184.00	107.05	236.00			14
571.50	20	1 ⅜	1 ¼	165.00	190.00	205.00	112.94	248.99	90.40	199.30	106.14	234.00	139.25	306.99			16
628.60	24	1 ⅜	1 ¼	170.00	195.00	210.00	138.34	304.99	109.00	240.30	133.95	295.31	176.90	390.00			18
685.80	24	1 ⅜	1 ¼	185.00	205.00	220.00	167.37	368.99	136.00	299.83	157.65	347.56	223.17	492.01			20
812.80	24	1 ⅝	1 ½	205.00	230.00	255.00	235.41	518.99	204.00	449.74	240.40	529.99	342.00	753.98			24

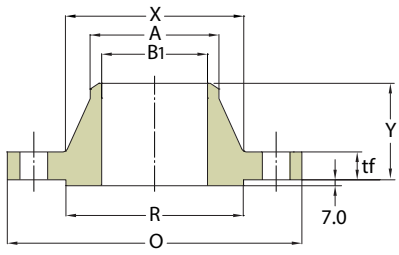
(4) For welding end bevel. See page 62.

(5) Dimensions in bore of welding neck, socket welding correspond to the inside diameters of pipe as given in ASME B36.10M for standard Wall pipe. Standard Wall dimensions are the same as Schedule 40 in sizes NPS 10 and smaller.
Tolerances in page 61 apply. These bore sizes are furnished unless otherwise specified by the purchaser.

CLASS 400 FLANGES



Slip-on Welding



Welding Neck

ASME B16.5 FORGED FLANGES

Nominal Pipe Size NPS	Outside Diameter of Flange	Thickness of Flange, Min.	O.D. of Raised Face	Diameter of Hub	Hub Diameter Beginning of Chamfer Welding Neck	Length thru hub			Thread Length Threaded Min	Bore			Corner Radius of bore of Lapped Flange and pipe	Counter bore Threaded Flange Min.
						Threaded Slip-on	Lapped	Welding Neck		Slip-on, Min.	Lapped Min.	Welding Neck		
	O	tf	R	X	A [Note(2)]	Y			T	B		B_1 [Note(4)]	r	Q
½	Use Class 600 Dimensions in these sizes [Note (3)]													
¾														
1														
1 ¼														
1 ½														
2														
2 ½														
3														
3 ½														
4	255.00	35.00	157.20	146.00	114.30	51.00	51.00	89.00	37.00	116.10	116.80	To be specified by purchaser.	11.00	117.6
5	280.00	38.10	185.70	178.00	141.30	54.00	54.00	102.00	43.00	143.80	144.50		11.00	144.4
6	320.00	41.30	215.90	206.00	168.30	57.00	57.00	103.00	46.00	170.70	171.40		13.00	171.4
8	380.00	47.70	269.90	260.00	219.10	68.00	68.00	117.00	51.00	221.50	222.20		13.00	222.2
10	445.00	54.00	323.80	321.00	273.00	73.00	102.00	124.00	56.00	276.20	277.40		13.00	276.2
12	520.00	57.20	381.00	375.00	323.80	79.00	108.00	137.00	61.00	327.00	328.20		13.00	328.6
14	585.00	60.40	412.80	425.00	355.60	84.00	117.00	149.00	64.00	359.20	360.20		13.00	360.4
16	650.00	63.50	469.90	483.00	406.40	94.00	127.00	152.00	69.00	410.50	411.20		13.00	411.2
18	710.00	66.70	533.40	533.00	457.00	98.00	137.00	165.00	70.00	461.80	462.30		13.00	462.0
20	775.00	69.90	584.20	587.00	508.00	102.00	146.00	168.00	74.00	513.10	514.40		13.00	512.8
24	915.00	76.20	692.20	702.00	610.00	114.00	159.00	175.00	83.00	616.00	616.00		13.00	614.4

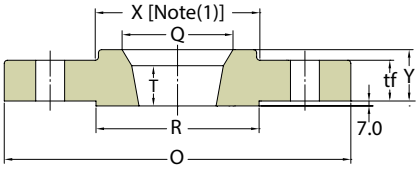
Notes:

(1) This dimension is for large end of hub, which may be straight or tapered. Taper shall not exceed 7 deg on threaded, slip-on, socket-welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and the back face of the flange.

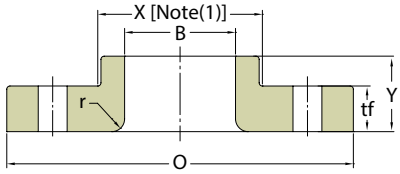
(2) For welding end bevel. See page 62.

(3) Socket welding flanges may be provided in NPS ½ through NPS 2½, using Class 600 dimensions.

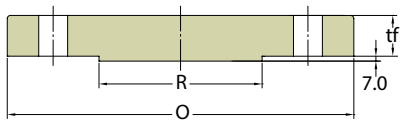
(4) Dimensions in bore of welding neck, socket welding correspond to the inside diameters of pipe as given in ASME B36.10M for standard Wall pipe. Standard Wall dimensions are the same as Schedule 40 in sizes NPS 10 and smaller.
Tolerances in page 61 apply. These bore sizes are furnished unless otherwise specified by the purchaser.



Threaded



Lapped

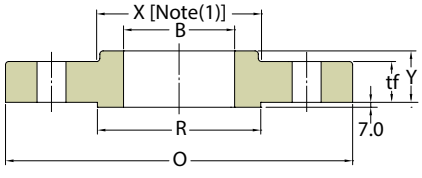


Blind

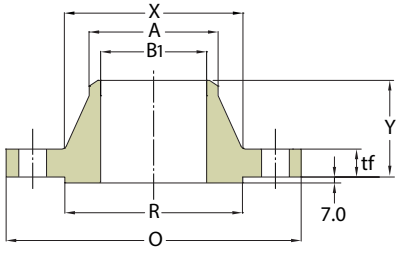
(Dimensions in mm)

Drilling Template				Bolt Length			Approximate Weight								Nominal Pipe Size
Diameter of Bolt Circle	Number of Holes	Diameter of Holes, in.	Diameter of bolts, in.	Machine Bolt Length	Stud Bolt Length		Welding Neck		Slip-on Threaded		Lap Joint		Blind		
				Raised Face	Raised Face	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb	
Use Class 600 Dimensions in these sizes [Note (3)]															
200.00	8	1	⅞	140.00	135.00	140.00	13.61	30.00	10.89	24.01	9.98	22.00	14.40	31.75	4
235.00	8	1	⅞	145.00	135.00	145.00	17.69	39.00	14.07	31.02	13.15	28.99	19.50	42.99	5
269.90	12	1	⅞	150.00	145.00	150.00	22.23	49.01	19.98	44.05	16.78	37.00	27.67	61.00	6
330.00	12	1 ⅛	1	170.00	165.00	170.00	35.38	78.00	30.40	67.02	26.16	57.67	45.36	100.00	8
387.40	16	1 ¼	1 ⅛	190.00	185.00	190.00	49.89	109.99	41.28	91.01	43.09	95.00	68.00	149.91	10
450.80	16	1 ⅜	1 ¼	205.00	195.00	205.00	72.57	159.99	59.02	130.12	68.95	152.01	98.00	216.05	12
514.40	20	1 ⅜	1 ¼	210.00	205.00	210.00	105.69	233.01	81.72	180.16	95.25	209.99	131.66	290.26	14
571.50	20	1 ½	1 ⅜	220.00	215.00	220.00	133.36	294.01	106.69	235.21	127.00	279.99	167.00	368.17	16
628.60	24	1 ½	1 ⅜	230.00	220.00	230.00	158.90	350.31	129.39	285.26	156.49	345.00	206.57	455.41	18
685.80	24	1 ⅝	1 ½	240.00	235.00	250.00	193.00	425.49	152.00	335.10	190.51	420.00	261.00	575.41	20
812.80	24	1 ⅞	1 ¾	265.00	260.00	280.00	281.48	620.56	231.54	510.46	278.96	615.00	395.00	870.83	24

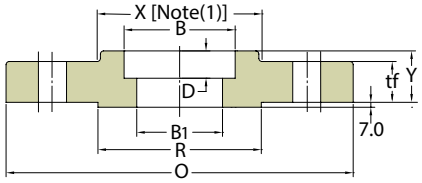
CLASS 600 FLANGES



Slip-on Welding



Welding Neck



Socket Welding
(NPS ½ to 3 Only)

ASME B16.5 FORGED FLANGES

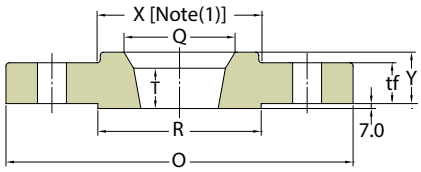
Nominal Pipe Size NPS	Outside Diameter of Flange	Thickness of Flange, Min.	O.D. of Raised Face	Diameter of Hub	Hub Diameter Beginning of Chamfer Welding Neck	Length thru hub			Thread Length Threaded Min	Bore			Corner Radius of bore of Lapped Flange and pipe	Counter bore Threaded Flange Min.	Depth of Socket
						Threaded Slip-on/ Socket Welding	Lapped	Welding Neck		Slip-on/ Socket Welding, Min.	Lapped Min.	Welding Neck/ Soket Welding			
	O	tf	R	X	A [Note(2)]	Y			T	B		B1 [Note(3)]	r	Q	D
½	95.00	14.30	34.90	38.00	21.30	22.00	22.00	52.00	16.00	22.20	22.90	To be specified by purchaser.	3.00	23.6	10.00
¾	115.00	15.90	42.90	48.00	26.70	25.00	25.00	57.00	16.00	27.70	28.20		3.00	29.0	11.00
1	125.00	17.50	50.80	54.00	33.40	27.00	27.00	62.00	18.00	34.50	34.90		3.00	35.8	13.00
1 ¼	135.00	20.70	63.50	64.00	42.20	29.00	29.00	67.00	21.00	43.20	43.70		5.00	44.4	14.00
1 ½	155.00	22.30	73.00	70.00	48.30	32.00	32.00	70.00	23.00	49.50	50.00		6.00	50.6	16.00
2	165.00	25.40	92.10	84.00	60.30	37.00	37.00	73.00	29.00	61.90	62.50		8.00	63.5	17.00
2 ½	190.00	28.60	104.80	100.00	73.00	41.00	41.00	79.00	32.00	74.60	75.40		8.00	76.2	19.00
3	210.00	31.80	127.00	117.00	88.90	46.00	46.00	83.00	35.00	90.70	91.40		10.00	92.2	21.00
3 ½	230.00	35.00	139.70	133.00	101.60	49.00	49.00	86.00	40.00	103.40	104.10		10.00	104.9	
4	275.00	38.10	157.20	152.00	114.30	54.00	54.00	102.00	42.00	116.10	116.80		11.00	117.6	
5	330.00	44.50	185.70	189.00	141.30	60.00	60.00	114.00	48.00	143.80	144.40		11.00	144.4	
6	355.00	47.70	215.90	222.00	168.30	67.00	67.00	117.00	51.00	170.70	171.40		13.00	171.4	
8	420.00	55.60	269.90	273.00	219.10	76.00	76.00	133.00	58.00	221.50	222.20		13.00	222.2	
10	510.00	63.50	323.80	343.00	273.00	86.00	111.00	152.00	66.00	276.20	277.40		13.00	276.2	
12	560.00	66.70	381.00	400.00	323.80	92.00	117.00	156.00	70.00	327.00	328.20		13.00	328.6	
14	605.00	69.90	412.80	432.00	355.60	94.00	127.00	165.00	74.00	359.20	360.20		13.00	360.4	
16	685.00	76.20	469.90	495.00	406.40	106.00	140.00	178.00	78.00	410.50	411.20		13.00	411.2	
18	745.00	82.60	533.40	546.00	457.00	117.00	152.00	184.00	80.00	461.80	462.30		13.00	462.0	
20	815.00	88.90	584.20	610.00	508.00	127.00	165.00	190.00	83.00	513.10	514.40		13.00	512.8	
24	940.00	101.60	692.20	718.00	610.00	140.00	184.00	203.00	93.00	616.00	616.00		13.00	614.4	

Notes:

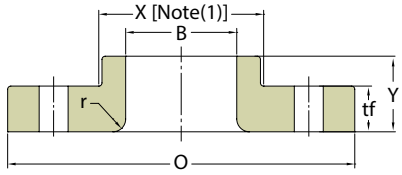
(1) This dimension is for large end of hub, which may be straight or tapered. Taper shall not exceed 7 deg on threaded, slip-on, socket-welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and the back face of the flange.

(2) For welding end bevel. See page 62.

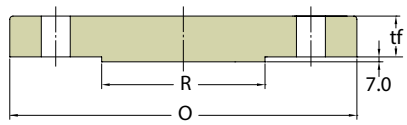
(3) Dimensions in bore of welding neck, socket welding correspond to the inside diameters of pipe as given in ASME B36.10M for standard Wall pipe. Standard Wall dimensions are the same as Schedule 40 in sizes NPS 10 and smaller.
Tolerances in page 61 apply. These bore sizes are furnished unless otherwise specified by the purchaser.



Threaded



Lapped

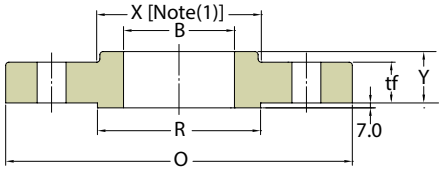


Blind

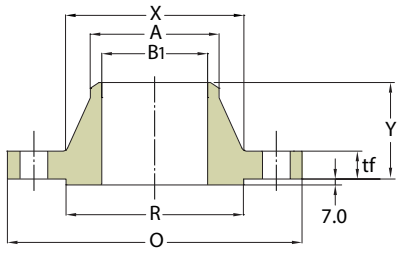
(Dimensions in mm)

Drilling Template				Bolt Length			Approximate Weight										Nominal Pipe Size
Diameter of Bolt Circle	Number of Holes	Diameter of Holes, in.	Diameter of bolts, in.	Machine Bolt Length	Stud Bolt Length		Welding Neck		Slip-on Threaded		Lap Joint		Blind		Socket Welding		
				Raised Face	Raised Face	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb	Kg	lb	
66.70	4	⅝	½	75.00	70.00	75.00	0.90	1.98	0.91	2.01	0.80	1.76	0.91	2.01	0.91	2.01	½
82.60	4	¾	⅝	90.00	85.00	90.00	1.59	3.51	1.40	3.09	1.36	3.00	1.40	3.09	1.36	3.00	¾
88.90	4	¾	⅝	90.00	85.00	90.00	1.90	4.19	1.70	3.75	1.59	3.51	1.81	3.99	1.81	3.99	1
98.40	4	¾	⅝	95.00	90.00	95.00	2.49	5.49	2.27	5.00	2.04	4.50	2.40	5.29	2.60	5.73	1 ¼
114.30	4	⅞	¾	110.00	100.00	110.00	3.63	8.00	3.10	6.83	2.95	6.50	3.40	7.50	3.18	7.01	1 ½
127.00	8	¾	⅝	110.00	100.00	110.00	4.54	10.01	3.63	8.00	3.63	8.00	4.40	9.70	3.90	8.60	2
149.20	8	⅞	¾	120.00	115.00	120.00	6.35	14.00	5.44	11.99	4.99	11.00	6.80	14.99	5.90	13.01	2 ½
168.30	8	⅞	¾	125.00	120.00	125.00	8.16	17.99	7.26	16.01	6.35	14.00	8.90	19.62	7.40	16.31	3
184.20	8	1	⅞	140.00	135.00	140.00	11.80	26.01	9.53	21.01	9.08	20.02	13.17	29.03			3 ½
215.90	8	1	⅞	145.00	140.00	145.00	16.78	36.99	14.97	33.00	14.06	31.00	18.60	41.01			4
266.70	8	1 ⅛	1	165.00	160.00	165.00	30.87	68.06	28.50	62.83	27.50	60.63	30.84	67.99			5
292.10	12	1 ⅛	1	170.00	165.00	170.00	36.77	81.06	36.32	80.07	35.38	78.00	38.00	83.78			6
349.20	12	1 ¼	1 ⅛	190.00	185.00	195.00	50.80	111.99	44.00	97.00	50.80	111.99	62.20	137.13			8
431.80	16	1 ⅜	1 ¼	215.00	210.00	215.00	86.26	190.17	76.20	167.99	74.00	163.14	102.00	224.87			10
489.00	20	1 ⅜	1 ¼	220.00	215.00	220.00	102.51	226.00	97.52	214.99	108.86	240.00	132.00	291.01			12
527.00	20	1 ½	1 ⅜	235.00	230.00	235.00	121.56	267.99	102.00	224.87	111.00	244.71	158.00	348.33			14
603.20	20	1 ⅝	1 ½	255.00	250.00	255.00	177.06	390.35	149.82	330.30	165.71	365.33	224.73	495.44			16
654.00	20	1 ¾	1 ⅝	275.00	265.00	275.00	215.65	475.43	180.10	397.05	194.00	427.70	285.00	628.32			18
723.90	24	1 ¾	1 ⅝	285.00	280.00	290.00	267.86	590.53	231.54	510.46	258.78	570.51	365.00	804.69			20
838.20	24	2	1 ⅞	330.00	325.00	335.00	372.00	820.12	330.00	727.53	362.00	798.07	533.45	1176.06			24

CLASS 900 FLANGES



Slip-on Welding



Welding Neck

ASME B16.5 FORGED FLANGES

Nominal Pipe Size NPS	Outside Diameter of Flange	Thickness of Flange, Min.	O.D. of Raised Face	Diameter of Hub	Hub Diameter Beginning of Chamfer Welding Neck	Length thru hub			Thread Length Threaded Min	Bore			Corner Radius of bore of Lapped Flange and pipe	Counte bore Threaded Flange Min.,
						Threaded Slip-on	Lapped	Welding Neck		Slip-on, Min.	Lapped Min.	Welding Neck		
	O	tf	R	X	A [Note(2)]	Y			T	B		B1 [Note(4)]	r	Q
½	Use Class 1500 Dimensions in these sizes [Note (3)]													
¾														
1														
1 ¼														
1 ½														
2														
2 ½														
3	240.00	38.10	127.00	127.00	88.90	54.00	54.00	102.00	42.00	90.70	91.40	To be specified by purchaser.	10.00	92.2
4	290.00	44.50	157.20	159.00	114.30	70.00	70.00	114.00	48.00	116.10	116.80		11.00	117.6
5	350.00	50.80	185.70	190.00	141.30	79.00	79.00	127.00	54.00	143.80	144.40		11.00	144.4
6	380.00	55.60	215.90	235.00	168.30	86.00	86.00	140.00	58.00	170.70	171.40		13.00	171.4
8	470.00	63.50	269.90	298.00	219.10	102.00	114.00	162.00	64.00	221.50	222.20		13.00	222.2
10	545.00	69.90	323.80	368.00	273.00	108.00	127.00	184.00	72.00	276.20	277.40		13.00	276.2
12	610.00	79.40	381.00	419.00	323.80	117.00	143.00	200.00	77.00	327.00	328.20		13.00	328.6
14	640.00	85.80	412.80	451.00	355.60	130.00	156.00	213.00	83.00	359.20	360.20		13.00	360.4
16	705.00	88.90	469.90	508.00	406.40	133.00	165.00	216.00	86.00	410.50	411.20		13.00	411.2
18	785.00	101.60	533.40	565.00	457.00	152.00	190.00	229.00	89.00	461.80	462.30		13.00	462.0
20	855.00	108.00	584.20	622.00	508.00	159.00	210.00	248.00	93.00	513.10	514.40		13.00	512.8
24	1040.00	139.70	692.20	749.00	610.00	203.00	267.00	292.00	102.00	616.00	616.00		13.00	614.4

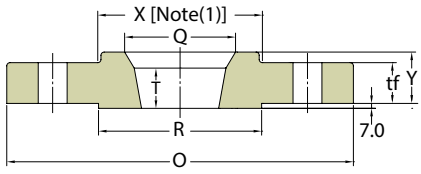
Notes:

(1) This dimension is for large end of hub, which may be straight or tapered. Taper shall not exceed 7 deg on threaded, slip-on, socket-welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and the back face of the flange.

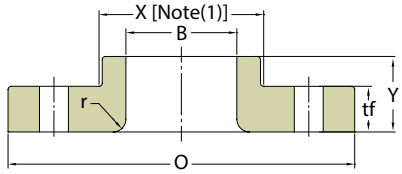
(2) For welding end bevel. See page 62.

(3) Socket welding flanges may be provided in NPS ½ through NPS 2 ½, using Class 1500 dimensions.

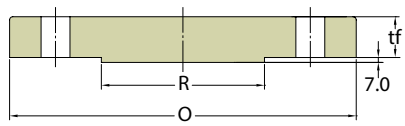
(4) Dimensions in bore of welding neck, socket welding correspond to the inside diameters of pipe as given in ASME B36.10M for standard Wall pipe. Standard Wall dimensions are the same as Schedule 40 in sizes NPS 10 and smaller.
Tolerances in page 61 apply. These bore sizes are furnished unless otherwise specified by the purchaser.



Threaded



Lapped

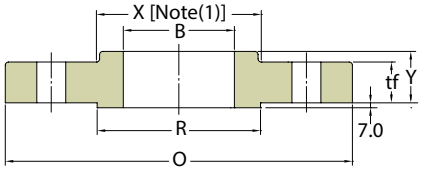


Blind

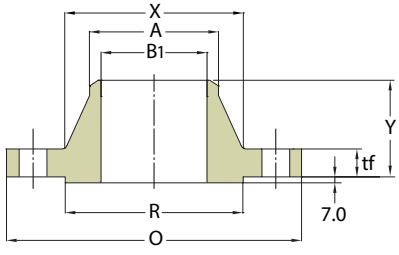
(Dimensions in mm)

Drilling Template				Bolt Length			Approximate Weight								Nominal Pipe Size
Diameter of Bolt Circle	Number of Holes	Diameter of Holes, in.	Diameter of bolts, in.	Machine Bolt Length	Stud Bolt Length		Welding Neck		Slip-on Threaded		Lap Joint		Blind		
				Raised Face	Raised Face	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb	
Use Class 1500 Dimensions in these sizes [Note (3)]															
190.50	8	1	⅞	145.00	140.00	145.00	15.00	33.07	11.80	26.01	11.34	25.00	13.17	29.03	3
235.00	8	1 ¼	1 ⅛	170.00	165.00	170.00	23.13	50.99	23.20	51.15	22.60	49.82	24.50	54.01	4
279.40	8	1 ⅜	1 ¼	190.00	185.00	190.00	38.50	84.88	37.65	83.00	36.74	81.00	39.46	86.99	5
317.50	12	1 ¼	1 ⅛	190.00	185.00	195.00	49.89	109.99	48.30	106.48	47.50	104.72	51.50	113.54	6
393.70	12	1 ½	1 ⅜	220.00	215.00	220.00	79.45	175.16	75.00	165.35	86.00	189.60	89.00	196.21	8
469.90	16	1 ½	1 ⅜	235.00	230.00	235.00	118.04	260.23	111.13	245.00	125.64	276.99	131.54	290.00	10
533.40	20	1 ½	1 ⅜	255.00	250.00	255.00	157.00	346.13	146.00	321.87	167.00	368.17	187.00	412.26	12
558.80	20	1 ⅝	1 ½	275.00	265.00	280.00	181.60	400.36	172.36	379.99	180.07	396.99	224.07	493.99	14
616.00	20	1 ¾	1 ⅝	285.00	280.00	290.00	224.73	495.44	192.95	425.38	211.11	465.42	272.40	600.54	16
685.80	20	2	1 ⅞	325.00	320.00	335.00	308.72	680.61	272.40	600.54	295.10	650.58	385.90	850.76	18
749.30	20	2 ⅛	2	350.00	345.00	360.00	376.82	830.75	331.42	730.66	367.74	810.73	488.00	1075.86	20
901.70	20	2 ⅝	2 ½	440.00	430.00	455.00	685.00	1510.17	632.00	1393.32	700.00	1543.24	905.00	1995.18	24

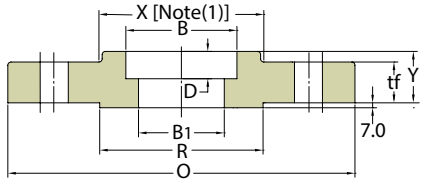
CLASS 1500 FLANGES



Slip-on Welding



Welding Neck



Socket Welding
(NPS ½ to 2 ½ Only)

ASME B16.5 FORGED FLANGES

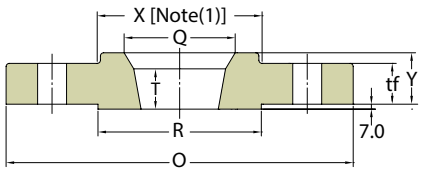
Nominal Pipe Size NPS	Outside Diameter of Flange	Thickness of Flange, Min.	O.D. of Raised Face	Diameter of Hub	Hub Diameter Begin-ning of Chamfer Welding Neck	Length thru hub			Thread Length Threaded Min	Bore			Corner Radius of bore of Lapped Flange and pipe	Counter bore Threaded Flange Min.	Depth of Socket
						Threaded Slip-on/ Socket Welding	Lapped	Welding Neck		Slip-on/ Socket Welding, Min.	Lapped Min.	Welding Neck/ Soket Welding			
	O	tf	R	X	A [Note(2)]	Y			T	B		B1 [Note(3)]	r	Q	D
½	120.00	22.30	34.90	38.00	21.30	32.00	32.00	60.00	23.00	22.20	22.90	To be specified by purchaser.	3.00	23.6	10.00
¾	130.00	25.40	42.90	44.00	26.70	35.00	35.00	70.00	26.00	27.70	28.20		3.00	29.0	11.00
1	150.00	28.60	50.80	52.00	33.40	41.00	41.00	73.00	29.00	34.50	34.90		3.00	35.8	13.00
1 ¼	160.00	28.60	63.50	64.00	42.20	41.00	41.00	73.00	31.00	43.20	43.70		5.00	44.4	14.00
1 ½	180.00	31.80	73.00	70.00	48.30	44.00	44.00	83.00	32.00	49.50	50.00		6.00	50.6	16.00
2	215.00	38.10	92.10	105.00	60.30	57.00	57.00	102.00	39.00	61.90	62.50		8.00	63.5	17.00
2 ½	245.00	41.30	104.80	124.00	73.00	64.00	64.00	105.00	48.00	74.60	75.40		8.00	76.2	19.00
3	265.00	47.70	127.00	133.00	88.90		73.00	117.00			91.40		10.00		
4	310.00	54.00	157.20	162.00	114.30		90.00	124.00			116.80		11.00		
5	375.00	73.10	185.70	197.00	141.30		105.00	156.00			144.40		11.00		
6	395.00	82.60	215.90	229.00	168.30		119.00	171.00			171.40		13.00		
8	485.00	92.10	269.90	292.00	219.10		143.00	213.00			222.20		13.00		
10	585.00	108.00	323.80	368.00	273.00		178.00	254.00			277.40		13.00		
12	675.00	123.90	381.00	451.00	323.80		219.00	283.00			328.20		13.00		
14	750.00	133.40	412.80	495.00	355.60		241.00	298.00			360.20		13.00		
16	825.00	146.10	469.90	552.00	406.40		260.00	311.00			411.20		13.00		
18	915.00	162.00	533.40	597.00	457.00		276.00	327.00			462.30		13.00		
20	985.00	177.80	584.20	641.00	508.00		292.00	356.00			514.40		13.00		
24	1170.00	203.20	692.20	762.00	610.00		330.00	406.00			616.00		13.00		

Notes:

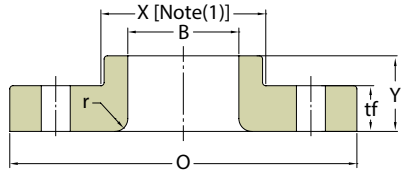
(1) This dimension is for large end of hub, which may be straight or tapered. Taper shall not exceed 7 deg on threaded, slip-on, socket-welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and the back face of the flange.

(2) For welding end bevel. See page 62.

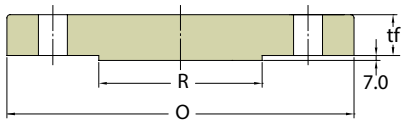
(3) Dimensions in bore of welding neck, socket welding correspond to the inside diameters of pipe as given in ASME B36.10M for standard Wall pipe. Standard Wall dimensions are the same as Schedule 40 in sizes NPS 10 and smaller.
Tolerances in page 61 apply. These bore sizes are furnished unless otherwise specified by the purchaser.



Threaded
(NPS ½ to 2 ½ Only)



Lapped

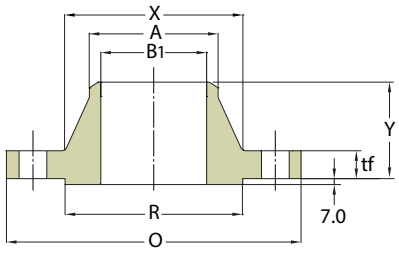


Blind

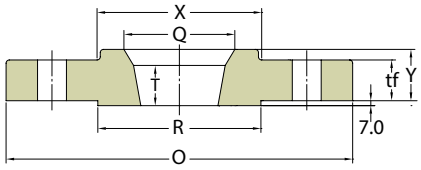
(Dimensions in mm)

Drilling Template				Bolt Length			Approximate Weight										Nominal Pipe Size
Diameter of Bolt Circle	Number of Holes	Diam-eter of Holes, in.	Diam-eter of bolts, in.	Machine Bolt Length	Stud Bolt Length		Welding Neck		Slip-on Threaded		Lap Joint		Blind		Socket Welding		
				Raised Face	Raised Face	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb	Kg	lb	
82.60	4	⅞	¾	110.00	100.00	110.00	2.10	4.63	1.81	3.99	1.81	3.99	1.90	4.19	1.81	3.99	½
88.90	4	⅞	¾	115.00	110.00	115.00	2.72	6.00	2.40	5.29	2.30	5.07	2.70	5.95	2.81	6.19	¾
101.60	4	1	⅞	125.00	120.00	125.00	3.86	8.51	3.41	7.52	3.40	7.50	4.09	9.02	3.61	7.96	1
111.10	4	1	⅞	125.00	120.00	125.00	4.54	10.01	4.10	9.04	4.09	9.02	4.54	10.01	4.99	11.00	1 ¼
123.80	4	1 ⅛	1	140.00	135.00	140.00	5.90	13.01	5.45	12.02	5.40	11.90	5.90	13.01	6.76	14.90	1 ½
165.10	8	1	⅞	145.00	140.00	145.00	10.89	24.01	9.98	22.00	9.53	21.01	11.34	25.00	10.89	24.01	2
190.50	8	1 ⅛	1	160.00	150.00	160.00	16.33	36.00	15.80	34.83	13.15	28.99	16.00	35.27	16.34	36.02	2 ½
203.20	8	1 ¼	1 ⅛	180.00	170.00	180.00	21.79	48.04	21.77	47.99	17.24	38.01	21.79	48.04			3
241.30	8	1 ⅜	1 ¼	195.00	190.00	195.00	31.30	69.00	31.00	68.34	29.00	63.93	33.11	73.00			4
292.10	8	1 ⅝	1 ½	250.00	240.00	250.00	59.02	130.12	58.80	129.63	54.00	119.05	60.00	132.28			5
317.50	12	1 ½	1 ⅜	260.00	255.00	265.00	74.91	165.15	74.00	163.14	62.00	136.69	75.00	165.35			6
393.70	12	1 ¾	1 ⅝	290.00	285.00	325.00	123.83	273.00	117.73	259.55	129.73	286.01	136.98	301.99			8
482.60	12	2	1 ⅞	335.00	330.00	345.00	205.93	454.00	197.49	435.39	220.19	485.44	229.97	507.00			10
571.50	16	2 ⅛	2	375.00	370.00	385.00	306.00	674.61	264.00	582.02	286.02	630.57	316.00	696.66			12
635.00	16	2 ⅜	2 ¼	405.00	400.00	425.00	416.00	917.12			404.06	890.80	421.00	928.15			14
704.80	16	2 ⅝	2 ½	445.00	440.00	470.00	567.50	1251.12			522.10	1151.03	559.00	1232.38			16
774.70	16	2 ⅞	2 ¾	495.00	490.00	525.00	736.00	1622.60			669.65	1476.33	761.00	1677.72			18
831.80	16	3 ⅛	3	540.00	535.00	565.00	929.00	2048.09			805.85	1776.60	967.00	2131.87			20
990.60	16	3 ⅝	3 ½	615.00	610.00	650.00	1504.00	3315.75			1285.55	2834.15	1568.00	3456.85			24

CLASS 2500 FLANGES



Welding Neck



Threaded
(NPS ½ to 2 ½ Only)

ASME B16.5 FORGED FLANGES

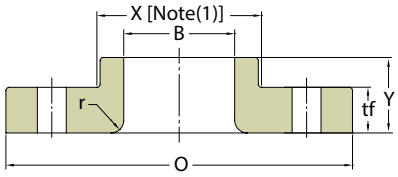
Nominal Pipe Size NPS	Outside Diameter of Flange	Thickness of Flange, Min.	O.D. of Raised Face	Diameter of Hub	Hub Diameter Beginning of Chamfer Welding Neck	Length thru hub			Thread Length Threaded Min	Bore		Corner Radius of bore of Lapped Flange and pipe	Counter bore Threaded Flange Min.
						Threaded	Lapped	Welding Neck		Lapped Min.	Welding Neck		
	O	tf	R	X	A [Note(2)]	Y			T	B	B_1 [Note(3)]	r	Q
½	135.00	30.20	34.90	43.00	21.30	40.00	40.00	73.00	29.00	22.90	To be specified by purchaser.	3.00	23.6
¾	140.00	31.80	42.90	51.00	26.70	43.00	43.00	79.00	32.00	28.20		3.00	29.0
1	160.00	35.00	50.80	57.00	33.40	48.00	48.00	89.00	35.00	34.90		3.00	35.8
1¼	185.00	38.10	63.50	73.00	42.20	52.00	52.00	95.00	39.00	43.70		5.00	44.4
1½	205.00	44.50	73.00	79.00	48.30	60.00	60.00	111.00	45.00	50.00		6.00	50.6
2	235.00	50.90	92.10	95.00	60.30	70.00	70.00	127.00	51.00	62.50		8.00	63.5
2½	265.00	57.20	104.80	114.00	73.00	79.00	79.00	143.00	58.00	75.40		8.00	76.2
3	305.00	66.70	127.00	133.00	88.90		92.00	168.00		91.40		10.00	
4	355.00	76.20	157.20	165.00	114.30		108.00	190.00		116.80		11.00	
5	420.00	92.10	185.70	203.00	141.30		130.00	229.00		144.40		11.00	
6	485.00	108.00	215.90	235.00	168.30		152.00	273.00		171.40		13.00	
8	550.00	127.00	269.90	305.00	219.10		178.00	318.00		222.20		13.00	
10	675.00	165.10	323.80	375.00	273.00		229.00	419.00		277.40		13.00	
12	760.00	184.20	381.00	441.00	323.80		254.00	464.00		328.20		13.00	

Notes:

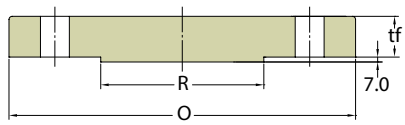
(1) This dimension is for large end of hub, which may be straight or tapered. Taper shall not exceed 7 deg on threaded, slip-on, socket-welding, and lapped flanges. This dimension is defined as the diameter at the intersection between the hub taper and the back face of the flange.

(2) For welding end bevel. See page 62.

(3) Dimensions in bore of welding neck, socket welding correspond to the inside diameters of pipe as given in ASME B36.10M for standard Wall pipe. Standard Wall dimensions are the same as Schedule 40 in sizes NPS 10 and smaller.
Tolerances in page 61 apply. These bore sizes are furnished unless otherwise specified by the purchaser.



Lapped

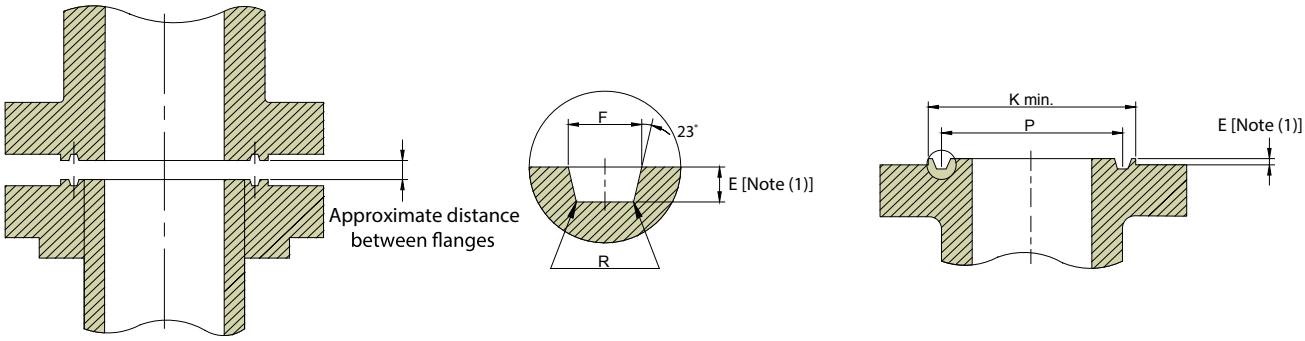


Blind

(Dimensions in mm)

Drilling Template				Bolt Length			Approximate Weight								Nominal Pipe Size
Diameter of Bolt Circle	Number of Holes	Diam-eter of Holes, in.	Diam-eter of bolts, in.	Machine Bolt Length	Stud Bolt Length		Welding Neck		Slip-on Threaded		Lap Joint		Blind		
				Raised Face	Raised Face	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb	
88.90	4	⅞	¾	120.00	115.00	120.00	3.18	7.01	3.18	7.01	3.00	6.61	3.18	7.01	½
95.20	4	⅞	¾	125.00	120.00	125.00	4.08	8.99	4.08	8.99	3.63	8.00	4.54	10.01	¾
108.00	4	1	⅞	140.00	135.00	140.00	5.45	12.02	5.44	11.99	4.99	11.00	5.44	11.99	1
130.20	4	1 ⅛	1	150.00	145.00	150.00	9.07	20.00	8.16	17.99	7.26	16.01	8.16	17.99	1 ¼
146.00	4	1 ¼	1 ⅛	170.00	165.00	170.00	11.35	25.02	11.00	24.25	9.99	22.02	10.44	23.02	1 ½
171.40	8	1 ⅛	1	180.00	170.00	180.00	19.07	42.04	17.25	38.03	16.80	37.04	17.71	39.04	2
196.80	8	1 ¼	1 ⅛	195.00	190.00	205.00	23.61	52.05	24.97	55.05	24.06	53.04	25.42	56.04	2 ½
228.60	8	1 ⅜	1 ¼	220.00	215.00	230.00	42.68	94.09	37.68	83.07	36.32	80.07	39.04	86.07	3
273.00	8	1 ⅝	1 ½	255.00	250.00	260.00	64.00	141.10	58.00	127.87	54.48	120.11	60.38	133.12	4
323.80	8	1 ⅞	1 ¾	300.00	290.00	310.00	110.68	244.01	95.25	209.99	92.53	203.99	101.15	223.00	5
368.30	8	2 ⅛	2	345.00	335.00	355.00	176.46	389.03	146.51	323.00	143.01	315.28	156.63	345.31	6
438.20	12	2 ⅛	2	380.00	375.00	395.00	261.27	576.00	219.99	485.00	213.38	470.42	240.62	530.48	8
539.80	12	2 ⅝	2 ½	490.00	485.00	510.00	484.43	1067.99	419.57	924.99	408.60	900.81	465.36	1025.94	10
619.10	12	2 ⅞	2 ¾	540.00	535.00	560.00	692.35	1526.37	590.20	1301.17	572.95	1263.14	664.06	1464.00	12

Dimensions of Ring Joint Facings (All Pressure Rating Classes)



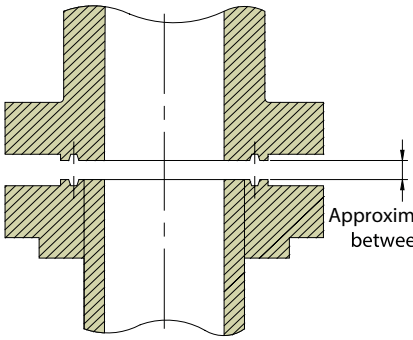
1	2	3	4	5	6	7	8	9	10	11	12
Nominal Size								Groove Dimensions			
Class 150 NPS	Class 300 NPS	Class 400 NPS	Class 600 NPS	Class 900 NPS	Class 1500 NPS	Class 2500 NPS	Groove Number	Pitch Dimeter, P	Depth, E [Note(1)]	Width, F	Radius at Bottom, R
…	½	…	½	…	…	…	R11	34.14	5.54	7.14	0.8
…	…	…	…	…	½	…	12	39.67	6.35	8.74	0.8
…	¾	…	¾	…	…	½	13	42.88	6.35	8.74	0.8
…	…	…	…	…	¾	…	14	44.45	6.35	8.74	0.8
1	…	…	…	…	…	…	15	47.63	6.35	8.74	0.8
…	1	…	1	…	1	¾	16	50.80	6.35	8.74	0.8
1¼	…	…	…	…	…	…	17	57.15	6.35	8.74	0.8
…	1¼	…	…	…	1¼	1	18	60.33	6.35	8.74	0.8
1½	…	…	…	…	…	…	19	65.07	6.35	8.74	0.8
…	1½	…	1½	…	1½	…	20	68.27	6.35	8.74	0.8
…	…	…	…	…	…	1¼	21	72.23	7.92	11.91	0.8
2	…	…	…	…	…	…	22	82.55	6.35	8.74	0.8
…	2	…	2	…	…	1½	23	82.55	7.92	11.91	0.8
…	…	…	…	…	2	…	24	95.25	7.92	11.91	0.8
2½	…	…	…	…	…	…	25	101.60	6.35	8.74	0.8
…	2½	…	2½	…	…	2	26	101.60	7.92	11.91	0.8
…	…	…	…	…	2½	…	27	107.95	7.92	11.91	0.8
…	…	…	…	…	…	2½	28	111.13	9.52	13.49	0.8
3	…	…	…	…	…	…	29	114.30	6.35	8.74	0.8
…	Note(2)	…	Note(2)	…	…	…	30	117.48	7.92	11.91	0.8
…	3[Note(2)]	…	3[Note(2)]	3	…	…	31	123.83	7.92	11.91	0.8
…	…	…	…	…	…	3	32	127.00	9.53	13.49	1.5
3½	…	…	…	…	…	…	33	131.78	6.35	8.74	0.8
…	3½	…	3½	…	…	…	34	131.78	7.92	11.91	0.8
…	…	…	…	…	3	…	35	136.53	7.92	11.91	0.8
4	…	…	…	…	…	…	36	149.23	6.35	8.74	0.8
…	4	4	4	4	…	…	37	149.23	7.92	11.91	0.8
…	…	…	…	…	…	4	38	157.18	11.13	16.66	1.5
…	…	…	…	…	4	…	39	161.93	7.92	11.91	0.8
5	…	…	…	…	…	…	40	171.45	6.35	8.74	0.8
…	5	5	5	5	…	…	41	180.98	7.92	11.91	0.8
…	…	…	…	…	…	5	42	190.50	12.70	19.84	1.5
6	…	…	…	…	…	…	43	193.68	6.35	8.74	0.8
…	…	…	…	…	5	…	44	193.68	7.92	11.91	0.8
…	6	6	6	6	…	…	45	211.12	7.92	11.91	0.8

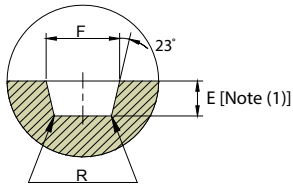
Notes:

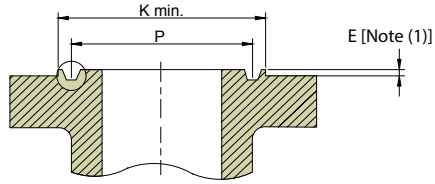
(1) Height of raised portion is equal to the depth of groove dimension E, but is not subjected to the tolerances for E. Former full-face contour may be used.

(2) For ring joints with lapped flanges in Classes 300 and 600, ring and groove number R30 is used in instead of R31.

Dimensions of Ring Joint Facings (All Pressure Rating Classes)

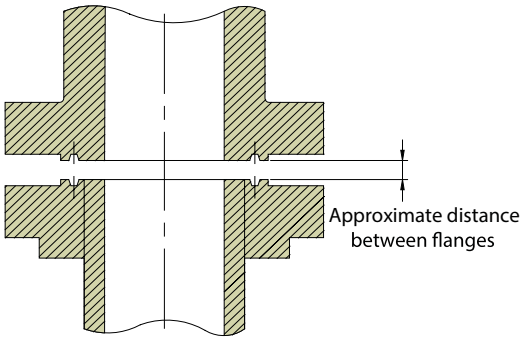


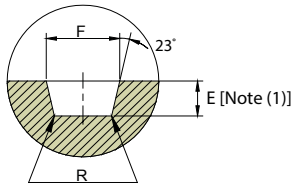


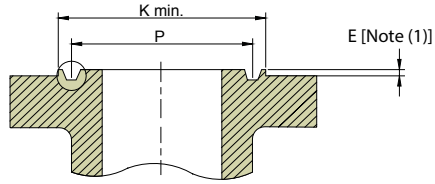


13	14	15	16	17	18	19	20	21	22	23	24
Diameter of Raised portion, K					Approximate Distance Between Flanges						
Class 150	Class 300,400, 600	Class 900	Class 1500	Class 2500	Class 150	Class 300	Class 400	Class 600	Class 900	Class 1500	Class 2500
…	51.0	…	…	…	…	3	…	3	…	…	…
…	…	…	60.5	…	…	…	…	…	…	4	…
…	63.5	…	…	65.0	…	4	…	4	…	…	4
…	…	…	66.5	…	…	…	…	…	…	4	…
63.5	…	…	…	…	4	…	…	…	…	…	…
…	70.0	…	71.5	73.0	…	4	…	4	…	4	4
73.0	…	…	…	…	4	…	…	…	…	…	…
…	79.5	…	81.0	82.5	…	4	…	4	…	4	4
82.5	…	…	…	…	4	…	…	…	…	…	…
…	90.5	…	92.0	…	…	4	…	4	…	4	…
…	…	…	…	102	…	…	…	…	…	…	3
102	…	…	…	…	4	…	…	…	…	…	…
…	108	…	…	114	…	6	…	5	…	…	3
…	…	…	124	…	…	…	…	…	…	3	…
121	…	…	…	…	4	…	…	…	…	…	…
…	127	…	…	133	…	6	…	5	…	…	3
…	…	…	137	…	…	…	…	…	…	3	…
…	…	…	…	149	…	…	…	…	…	…	3
133	…	…	…	…	4	…	…	…	…	…	…
…	…	…	…	…	…	…	…	…	…	…	…
…	146	156	…	…	…	6	…	5	4	…	…
…	…	…	…	168	…	…	…	…	…	…	3
154	…	…	…	…	4	…	…	…	…	…	…
…	159	…	…	…	…	6	…	5	…	…	…
…	…	…	168	…	…	…	…	…	…	3	…
171	…	…	…	…	4	…	…	…	…	…	…
…	175	181	…	…	…	6	6	5	4	…	…
…	…	…	…	203	…	…	…	…	…	…	4
…	…	…	194	…	…	…	…	…	…	3	…
194	…	…	…	…	4	…	…	…	…	…	…
…	210	216	…	…	…	6	6	5	4	…	…
…	…	…	…	241	…	…	…	…	…	…	4
219	…	…	…	…	4	…	…	…	…	…	…
…	…	…	229	…	…	…	…	…	…	3	…
…	241	241	…	…	…	6	6	5	4	…	…

Dimensions of Ring Joint Facings (All Pressure Rating Classes)





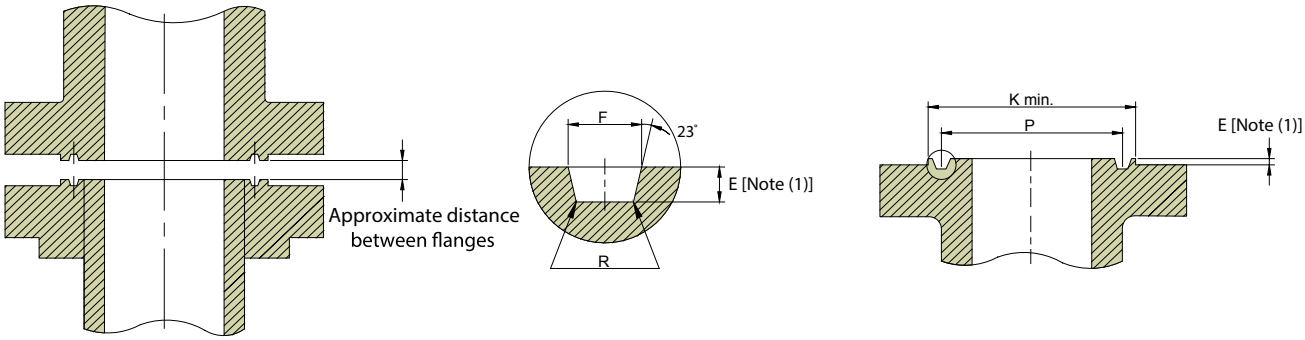


1	2	3	4	5	6	7	8	9	10	11	12
Nominal Size								Groove Dimensions			
Class 150 NPS	Class 300 NPS	Class 400 NPS	Class 600 NPS	Class 900 NPS	Class 1500 NPS	Class 2500 NPS	Groove Number	Pitch Dimeter, P	Depth, E [Note(1)]	Width, F	Radius at Bottom, R
…	…	…	…	…	6	…	46	211.14	9.53	13.49	1.5
…	…	…	…	…	…	6	47	228.60	12.70	19.84	1.5
8	…	…	…	…	…	…	48	247.65	6.35	8.74	0.8
…	8	8	8	8	…	…	49	269.88	7.92	11.91	0.8
…	…	…	…	…	8	…	50	269.88	11.13	16.66	1.5
…	…	…	…	…	…	8	51	279.40	14.27	23.01	1.5
10	…	…	…	…	…	…	52	304.80	6.35	8.74	0.8
…	10	10	10	10	…	…	53	323.85	7.92	11.91	0.8
…	…	…	…	…	10	…	54	323.85	11.13	16.66	1.5
…	…	…	…	…	…	10	55	342.90	17.48	30.18	2.4
12	…	…	…	…	…	…	56	381.00	6.35	8.74	0.8
…	12	12	12	12	…	…	57	381.00	7.92	11.91	0.8
…	…	…	…	…	12	…	58	381.00	14.27	23.01	1.5
14	…	…	…	…	…	…	59	396.88	6.35	8.74	0.8
…	…	…	…	…	…	12	60	406.40	17.48	33.32	2.4
…	14	14	14	…	…	…	61	419.10	7.92	11.91	0.8
…	…	…	…	14	…	…	62	419.10	11.13	16.66	1.5
…	…	…	…	…	14	…	63	419.10	15.88	26.97	2.4
16	…	…	…	…	…	…	64	454.03	6.35	8.74	0.8
…	16	16	16	…	…	…	65	469.90	7.92	11.91	0.8
…	…	…	…	16	…	…	66	469.90	11.13	16.66	1.5
…	…	…	…	…	16	…	67	469.90	17.48	30.18	2.4
18	…	…	…	…	…	…	68	517.53	6.35	8.74	0.8
…	18	18	18	…	…	…	69	533.40	7.92	11.91	0.8
…	…	…	…	18	…	…	70	533.40	12.70	19.84	1.5
…	…	…	…	…	18	…	71	533.40	17.48	30.18	2.4
20	…	…	…	…	…	…	72	558.80	6.35	8.74	0.8
…	20	20	20	…	…	…	73	584.20	9.53	13.49	1.5
…	…	…	…	20	…	…	74	584.20	12.70	19.84	1.5
…	…	…	…	…	20	…	75	584.20	17.48	33.32	2.4
24	…	…	…	…	…	…	76	673.10	6.35	8.74	0.8
…	24	24	24	…	…	…	77	692.15	11.13	16.66	1.5
…	…	…	…	24	…	…	78	692.15	15.88	26.97	2.4
…	…	…	…	…	24	…	79	692.15	20.62	36.53	2.4

Notes:

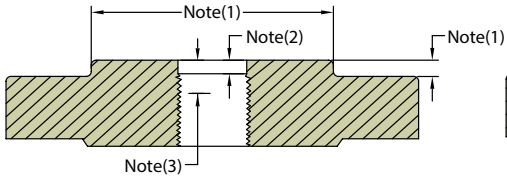
(1) Height of raised portion is equal to the depth of groove dimension E, but is not subjected to the tolerances for E. Former full-face contour may be used.

Dimensions of Ring Joint Facings (All Pressure Rating Classes)

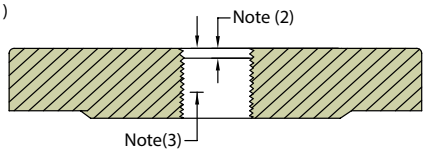


13	14	15	16	17	18	19	20	21	22	23	24
Diameter of Raised portion, K					Approximate Distance Between Flanges						
Class 150	Class 300,400, 600	Class 900	Class 1500	Class 2500	Class 150	Class 300	Class 400	Class 600	Class 900	Class 1500	Class 2500
…	…	…	248	…	…	…	…	…	…	3	…
…	…	…	…	279	…	…	…	…	…	…	4
273	…	…	…	…	4	…	…	…	…	…	…
…	302	308	…	…	…	6	6	5	4	…	…
…	…	…	318	…	…	…	…	…	…	4	…
…	…	…	…	340	…	…	…	…	…	…	5
330	…	…	…	…	4	…	…	…	…	…	…
…	356	362	…	…	…	6	6	5	4	…	…
…	…	…	371	…	…	…	…	…	…	4	…
…	…	…	…	425	…	…	…	…	…	…	6
406	…	…	…	…	4	…	…	…	…	…	…
…	413	419	…	…	…	6	6	5	4	…	…
…	…	…	438	…	…	…	…	…	…	5	…
425	…	…	…	…	3	…	…	…	…	…	…
…	…	…	…	495	…	…	…	…	…	…	8
…	457	…	…	…	…	6	6	5	…	…	…
…	…	467	…	…	…	…	…	…	4	…	…
…	…	…	489	…	…	…	…	…	…	6	…
483	…	…	…	…	3	…	…	…	…	…	…
…	508	…	…	…	…	6	6	5	…	…	…
…	…	524	…	…	…	…	…	…	4	…	…
…	…	…	546	…	…	…	…	…	…	8	…
546	…	…	…	…	3	…	…	…	…	…	…
…	575	…	…	…	…	6	6	5	…	…	…
…	…	594	…	…	…	…	…	…	5	…	…
…	…	…	613	…	…	…	…	…	…	8	…
597	…	…	…	…	3	…	…	…	…	…	…
…	635	…	…	…	…	6	6	5	…	…	…
…	…	648	…	…	…	…	…	…	5	…	…
…	…	…	673	…	…	…	…	…	…	10	…
711	…	…	…	…	3	…	…	…	…	…	…
…	749	…	…	…	…	6	6	6	…	…	…
…	…	772	…	…	…	…	…	…	6	…	…
…	…	…	794	…	…	…	…	…	…	11	…

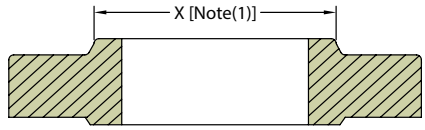
REDUCING THREADED AND SLIP-ON PIPE FLANGES



Threaded



Blind Flange



Slip-on Welding

1	2	3	4	5	6
Nominal Pipe Size [Note (4)]	Smallest Size of Reducing Outlet Requiring Hub Flanges [Note (1)]	Nominal Pipe Size [Note (4)]	Smallest Size of Reducing Outlet Requiring Hub Flanges [Note (1)]	Nominal Pipe Size [Note (4)]	Smallest Size of Reducing Outlet Requiring Hub Flanges [Note (1)]
NPS	NPS	NPS	NPS	NPS	NPS
1	½	3 ½	1 ½	12	3 ½
1 ¼	½	4	1 ½	14	3 ½
1 ½	½	5	1 ½	16	4
2	1	6	2 ½	18	4
2 ½	1 ¼	8	3	20	4
3	1 ¼	10	3 ½	24	4

Reducing Threaded and Slip-On Flanges for Class 150 Through 2500

Notes:

(1) The hub dimensions shall be at least as large as those of the standard flanges of the size to which the reduction is being machined, except flanges reducing to a size smaller than those of Columns 2, 4 and 6 may be made from blind flanges. See Example.

(2) Class 150 flanges do not have a counter bore. Class 300 and higher pressure flanges will have depth of counter bore Q of 7 mm for NPS 2 and smaller tapping and 9.50 mm for NPS 2 ½ and larger. The diameter Q of counter bore is the same as that given in the tables of threaded flanges for the corresponding tapping.

(3) Minimum length of effective threads shall be at least equal dimension T of the corresponding pressure class threaded flange as shown in tables but does not necessarily extend for the face of the flange.

(4) For method of designating reducing threaded and reducing slip-on flanges.
- Reducing flanges shall be designated by the NPS for each opening.

Example:

A. The size designating is NPS 6 x 2 ½ - Class 300 reducing threaded flange. This flange has the following dimensions:
NPS 2 ½ = taper pipe thread tapping (ASME B1.20.1).
320 mm = diameter of regular NPS 6 Class 300 threaded flange.
35 mm = thickness of regular NPS 6 Class 300 threaded flange.
178 mm = diameter of hub for regular NPS 5 Class 300 threaded flange. Hub diameter may be one size small to reduce machining. In this example a hub diameter of NPS 2 ½ would be the smallest acceptable.
15.5 mm = height of hub for regular NPS 5 Class 300 threaded flange.

B. The size designation is NPS 6 x 2 ½ - Class 300 reducing threaded flange. Use regular NPS 6 Class 300 blind flange tapped with NPS 2 taper pipe thread (ASME B1.20.1).

ORIFICE FLANGES

ASME ORIFICE FLANGES
CLASS 300 ORIFICE FLANGES
CLASS 600 ORIFICE FLANGES
CLASS 900 ORIFICE FLANGES
CLASS 1500 ORIFICE FLANGES
CLASS 2500 ORIFICE FLANGES

ORIFICE FLANGES (ASME B16.36)

1. SCOPE

This standard covers flanges (similar to those covered in ASME B16.5) that have orifice pressure differential connections. Coverage is limited to the following:

(a) Welding Neck flanges Class 300, 600, 900, 1500 and 2500 in U.S.

(b) Slip-on and threaded Class 300.

(c) Welding Neck flanges Class 400 in U.S.

2. GENERAL

2.1 References

Codes, standards, and specifications containing provisions to the extended reference herein constitute requirements of this Standard.

2.2 Relevant Units

This standard states values in both metric and U.S. Customary units. As an exception, diameter of bolts and flange bolt holes are expressed in inch units only. These systems of units are to be regarded separately as standard. Within the text, the U.S. Customary units are shown in parentheses or in separate tables. The values stated in each system are not exact equivalents; therefore, it is required that each system of units is used independently of the other. Except for diameter of bolts and flange bolt holes, combining values from the two systems constitutes nonconformance with the standard. Except for Class 400, the values in U.S.

2.3 Convention

For the purposes of determining conformance with this standard, the convention for fixing significant digits where limits, maximum and minimum values are specified, shall be rounded as defined in ASTM practice E 29. This requires that an observed or calculated value shall be rounded off to the nearest unit in the last righthand digit used for expressing the limit. Decimal values do not imply a particular method of measurement.

2.4 Denotation

2.4.1 Pressure Rating Designation

(a) Class, followed by a dimensionless number, is the designation for pressure-temperature ratings as follows: Class 300, 600, 900, 1500 and 2500.

(b) Class 400 is retained in the U.S. Customary tables.

2.4.2 Sizes

NPS, followed by a dimensionless number, is the designation for nominal flange size. NPS is related to the reference nominal diameter, DN, used in international standards. The relationship is, typically, as follows:

NPS	DN
1	25
1 ½	40
2	50
2 ½	65
3	80
4	100

GENERAL NOTE: For NPS≥4, the related DN = 25 (NPS).

2.5 Service Conditions

Criteria for selection of materials suitable for the particular fluid service are not within the scope of this Standard.

3. PRESSURE - TEMPERATURE RATINGS

The pressure-temperature ratings, including all used recommendations, limitations and the method of rating given in ASME B16.5 apply to these flanges.

4. MATERIAL

4.1 General

Flange materials shall be in accordance with the requirements of ASME B16.5. For materials manufactured to editions of the material specification other than those listed in Appendix III of ASME B16.5, refer to para.4.33.

4.2 Bolting

Bolting material recommendations are given in ASME B16.5.

4.3 Plugs

Pressure-retaining plugs shall conform to ASME B16.11, unless otherwise agreed between purchaser and manufacturer. Plug material shall be at least as corrosion resistant as the corresponding flange material.

5. SIZE

Orifice flange sizes are indicated by the nominal pipe size to which they are attached. Only those listed in Class 300 through 2500.

6. MARKING

Flanges shall be marked as required in ASME B16.5. For Welding Neck flanges only, the bore diameter shall be marked.

7. FLANGE FACING FINISH

The finish of contact faces shall conform to the requirements of ASME B16.5.

8. GASKET FOR RAISED FACE FLANGES

8.1 Gasket Thickness

Flange dimensions are based on the use of 1.5 mm (0.06 in.) thick gaskets.

8.2 Flange Gaskets Requiring Dimensional Changes

When the location of the pressure tap with respect to the orifice plate is critical to the service and metering conditions, its location may be altered to accommodate other than 2mm (0.06 in) thick gaskets or ring-type joint gaskets whose thickness may vary from that listed in Class 600 through 2500.

The alteration of location may also be accomplished by the removal of 2 mm (0.06 in) high raised face is removed, the user is cautioned to limit the outside diameter of the gasket or orifice plate to the tabulated R dimension.

ORIFICE FLANGES (ASME B16.36)

9. PRESSURE TAPS

9.1 General

Each orifice flange shall be provided with two pressure tap holes extending radially from the outside diameter of the flange to the inside diameter of the flange. Corner taps may be used on NPS 1 ½ and smaller if space permits. See Fig. 1.

For ring joint flanges listed in Class 600 through 2500, where radial taps will interfere with the ring groove, angular meter taps, as illustrated in Fig. 2, will be required. Each pressure tap hole shall be equipped with a pipe plug.

9.2 Location

9.2.1 Measurement.

The 24 mm (0.094 in) dimension for raised face and 19 mm (0.75 in) for ring joint shall be measured at the bore.

9.2.2 Identification.

For ring joint flanges requiring alteration of pressure tap location due to interference with the ring groove other than methods provided in this Standard, such alteration shall be identified per agreement between purchaser and manufacturer.

9.3 Pipe Connection

Unless otherwise specified, pressure tap holes may be either tapped ½ NPT in accordance with ASME B1.20.1 or ½ NPS socket connection in accordance with ASME B16.11.

10. JACK SCREW PROVISION

10.1 Location

Each flange shall have a machine bolt mounted in a hole drilled on the flange bolt circle center line at 90 deg from the pressure taps, for use as a jack screw. The machine bolt shall be regular with one heavy hex nut. See Fig. 3.

10.2 Slot for Nut

A slot shall be provided in the flange 2 mm (0.06 in) wider than the width across flats of the nut. The depth of the slot shall admit the nut a lot so that there is no interference with joining the flanges when bolted together without orifice plate.

10.3 Tapped Hole

As an alternative to para. 10.2, tapped hole may be provided and the hex nut omitted when agreed on between the purchaser and the manufacturer.

11. FLANGE DIMENSIONS

Dimensions are listed in Class 300 through 2500.

12. FLANGE THREADS

Threaded flange shall have an American National Standard taper pipe thread conforming to ASME B1.20.1.

(a) The thread shall be concentric with the axis of the flange. Variations in alignment shall not exceed 5 mm/m (0.06 in/ft).

(b) The flanges are made with counter bores at the back of the flange and the threads shall be chamfered to the diameter of the counter bore at an angle of approximately 45 deg with the axis of the thread to afford easy entrance in mating a joint. The counter bore and chamfer shall be concentric with the thread.

(c) In order to permit the pipe to be inserted to the face of the flange, the threads should have full root diameters through to the face of the flange, or shall have a counter bore at the face of the flange.

(d) The gaging notch of the working gage shall come flush with the bottom of the chamfer in all threaded flanges and shall be considered as being the intersection of the chamfer cone and the pitch cone of the thread. This depth of chamfer is approximately equal to one-half the pitch of the thread.

(e) The maximum allowable thread variation is one turn large or small from the gaging notch.

13. TOLERANCES

Tolerances on all dimensions shall be as shown in ASME B16.5 except for those shown below.

13.1 Pressure Tap Location

Tolerance on location of center of pressure tap hole from flange face shall be

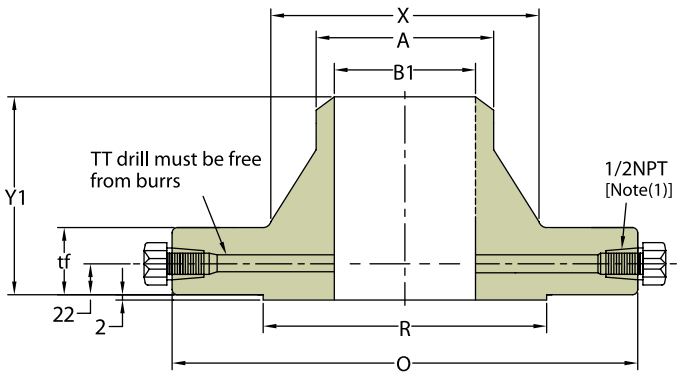
(a) ±0.5 mm (±0.02 in) for flanges smaller than NPS 4

(b) ±0.8 mm (±0.03 in) for flanges NPS 4 and larger

13.2 Bore Diameter

Bore diameter tolerance (welding neck flanges only) is ±0.5 % of nominal value.

CLASS 300 ORIFICE FLANGES

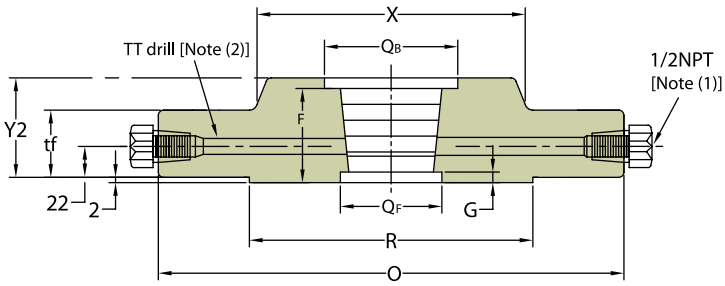


Weld Neck

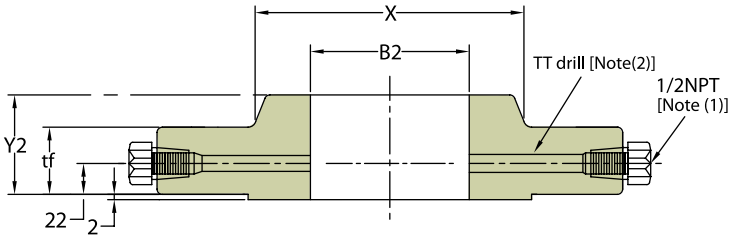
ASME B16.36 FORGED FLANGES

Nominal Pipe Size	Outside Diameter. of Raised Face	Outside Diameter. of Flange	Minimum Thickness of Flange	Length Thru Hub		Diameter of Hub	Hub Diameter Beginning of Chamfer (W.N.)	Diameter of Counter bore	
				Slip-on & Threaded	Welding Neck			Back	Face
	R	O	tf	Y2	Y1	X	A	Q_B	Q_F
1	50.8	125	36.6	46	81	54	33.4	35.8	33.0
1 ½	73.0	155	36.6	46	84	70	48.3	50.5	48.0
2	92.1	165	36.6	48	84	84	60.3	63.5	59.9
2 ½	104.8	190	36.6	49	87	100	73.0	76.2	72.1
3	127.0	210	36.6	51	87	117	88.9	92.2	87.9
4	157.2	255	36.6	52	90	146	114.3	117.6	113.0
6	215.9	320	36.6	52	98	206	168.3	171.4	166.9
8	269.9	380	39.7	60	110	260	219.1	222.2	217.2
10	323.8	445	46.1	65	116	321	273.0	See Note (6)	
12	381.0	520	49.3	71	129	375	323.8		
14	412.8	585	52.4	75	141	425	355.6		
16	469.9	650	55.6	81	144	483	406.4		
18	533.4	710	58.8	87	157	533	457.0		
20	584.2	775	62.0	94	160	587	508.0		
24	692.2	915	68.3	105	167	702	610.0		

GENERAL NOTES:
(a) Dimensions are in millimeters, except for bolts and bolt holes. Reference Mandatory Appendix I for U.S. Customary.
(b) Weld neck flanges NPS 3 and smaller are identical to Class 600 flanges and may be so marked.
(c) All other dimensions are in accordance with ASME B16.5.



Threaded



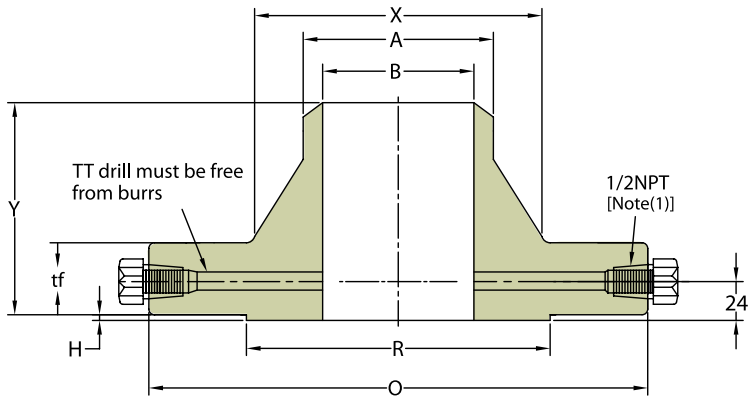
Slip-On

(Dimensions in mm)

Counter bore Depth (From Face)		Bore		Diameter of Pressure Connection	Drilling template		
		Slip-on	Welding Neck		Bolt Circle	Number of Holes	Diameter of Holes
F	G	B2	B1	TT			
36.5	19.0	34.5	(5)	6.4	88.9	4	11⁄16
37.3	18.3	49.5	(5)	6.4	114.3	4	13⁄16
38.1	17.5	61.9	(5)	6.4	127.0	8	11⁄16
44.4	14.3	74.6	(5)	6.4	149.2	8	13⁄16
46.0	14.3	90.7	(5)	9.5	168.3	8	13⁄16
47.6	14.3	116.1	(5)	12.7	200.0	8	13⁄16
47.6	7.9	170.7	(5)	12.7	269.9	12	7⁄8
55.6	11.1	221.5	(5)	12.7	330.2	12	1
See Note (6)		276.2	(5)	12.7	387.4	16	1 1⁄8
		327.0	(5)	12.7	450.8	16	1 1⁄4
		359.2	(5)	12.7	514.4	20	1 1⁄4
		410.5	(5)	12.7	571.5	20	1 3⁄8
		461.8	(5)	12.7	628.6	24	1 3⁄8
		513.1	(5)	12.7	685.8	24	1 3⁄8
		616.0	(5)	12.7	812.8	24	1 5⁄8

NOTE:
(1) Other NPT sizes may be furnished if required.
(2) For slip-on and threaded flanges, verify that TT drilling extends to inside diameter of pipe after assembly and is free from burrs.
(3) Bolt lengths include allowance for orifice and gasket thickness of 6 mm (0.25 in) for NPS 1-12 and 10 mm (0.38 in) for NPS 14-24.
(4) in conformance with ASME B16.5, stud bolt lengths do not include point heights.
(5) Bore diameter of weld neck flanges is to be specified by the purchaser.
(6) Threaded flanges are furnished in NPS 1 to NPS 8 only.

CLASS 600 ORIFICE FLANGES

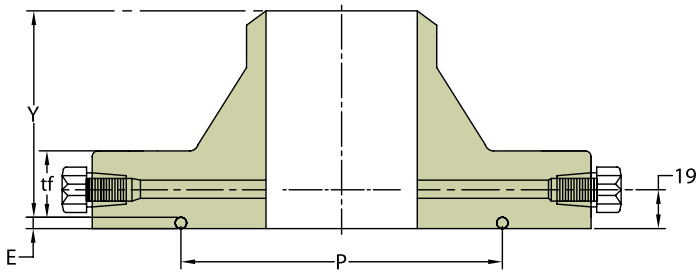


Raised Face

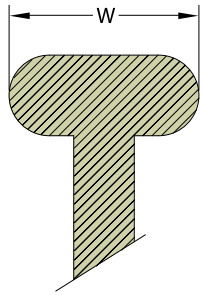
ASME B16.36 FORGED FLANGES

Nominal Pipe Size	Outside Diameter of Raised Face	Outside Diameter of Flange	Minimum Thickness of Flange	Length Through Hub	Height of Raised Face	Ring Type Joint					
						Groove Number	Pitch Diameter	Groove Depth	Groove Width	Radius at Bottom	Special Oval Ring Height
	R	O	tf	Y	H		P	E	F	r	W
1	50.8	125	36.6	81	2	R16	50.8	6.35	8.74	0.8	25.4
1 ½	73.0	155	36.6	84	2	R20	68.27	6.35	8.74	0.8	25.4
2	92.1	165	36.6	84	2	R23	82.55	7.92	11.91	0.8	27.0
2 ½	104.8	190	36.6	87	2	R26	101.6	7.92	11.91	0.8	27.0
3	127.0	210	36.6	87	2	R31	123.83	7.92	11.91	0.8	27.0
4	157.2	275	38.1	102	7	R37	149.23	7.92	11.91	0.8	27.0
6	215.9	355	47.7	117	7	R45	211.12	7.92	11.91	0.8	27.0
8	269.9	420	55.6	133	7	R49	269.88	7.92	11.91	0.8	27.0
10	323.8	510	63.5	152	7	R53	323.85	7.92	11.91	0.8	27.0
12	381.0	560	66.7	156	7	R57	381	7.92	11.91	0.8	27.0
14	412.8	605	69.9	165	7	R61	419.1	7.92	11.91	0.8	27.0
16	469.9	685	76.2	178	7	R65	469.9	7.92	11.91	0.8	30.2
18	533.4	745	82.6	184	7	R69	533.4	7.92	11.91	0.8	30.2
20	584.2	815	88.9	190	7	R73	584.2	9.53	13.49	1.5	31.8
24	692.2	940	101.6	203	7	R77	692.15	11.13	16.66	1.5	36.5

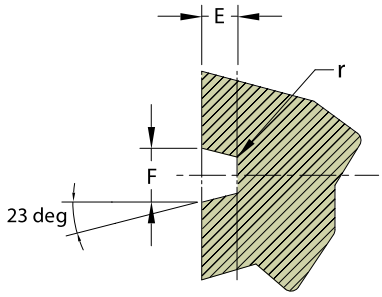
GENERAL NOTES:
(a) Dimensions are in millimeters, except for bolts and bolt holes. Reference Mandatory Appendix I for U.S. Customary.
(b) Weld neck flanges NPS 3 and smaller are identical to Class 300 flanges except for bolting and may be used for such services.
(c) All other dimensions are in accordance with ASME B16.5.
(d) Ring joint flange in NPS 24 will require an angular meter tap as shown in Fig. 2.



Ring Type Joint



Special One-or Two-Piece Ring and Orifice Plate Assembly



Groove Detail

(Dimensions in mm)

Diameter of Hub	Hub Diameter Beginning of chamfer	Bore	Diameter of Pressure Connection	Drilling Template			
				Diameter of Bolt Circle	Number of Holes	Diameter of Holes	
						Raised Face	Ring Joint
X	A	B	TT				
54	33.5	(4)	6.4	88.9	4	11/16	3/4
70	48.3	(4)	6.4	114.3	4	13/16	7/8
84	60.3	(4)	6.4	127.0	8	11/16	3/4
100	73.0	(4)	6.4	149.2	8	13/16	7/8
117	88.9	(4)	9.5	168.3	8	13/16	7/8
152	114.3	(4)	12.7	215.9	8	1	1
222	168.3	(4)	12.7	292.1	12	1 1/8	1 1/8
273	219.1	(4)	12.7	349.2	12	1 1/4	1 1/4
343	273.0	(4)	12.7	431.8	16	1 3/8	1 3/8
400	323.8	(4)	12.7	489.0	20	1 3/8	1 3/8
432	355.6	(4)	12.7	527.0	20	1 1/2	1 1/2
495	406.4	(4)	12.7	603.2	20	1 5/8	1 5/8
546	457.2	(4)	12.7	654.0	20	1 3/4	1 3/4
610	508.0	(4)	12.7	723.9	24	1 3/4	1 3/4
718	609.6	(4)	12.7	838.2	24	2	2

NOTE:

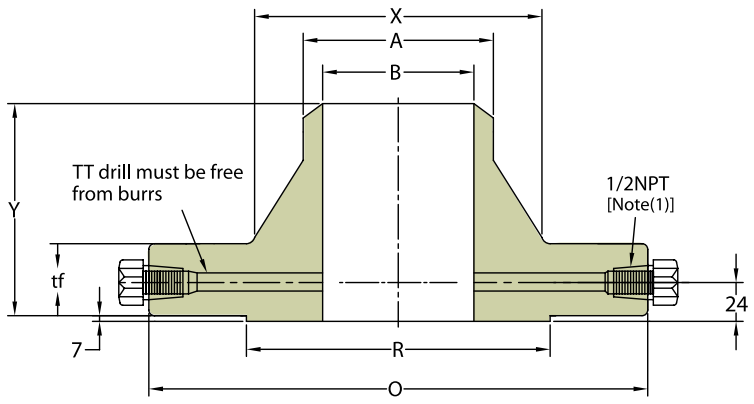
(1) Other NPT sizes may be furnished if required.

(2) In conformance with ASME B16.5. stud bolt lengths do not include point heights.

(3) Bolt lengths for raised face flanges include allowance for orifice and gasket thickness of 6 mm (0.25 in) for NPS 1-12 and 10 mm (0.38 in) for NPS 14-24. Bolt lengths for ring type joint flanges include allowance for NPS 1-10 19 mm (0.75 in) for NPS 12-18, and 22 mm (0.88 in) for NPS 20.

(4) Bore is to be specified by the purchaser.

CLASS 900 ORIFICE FLANGES

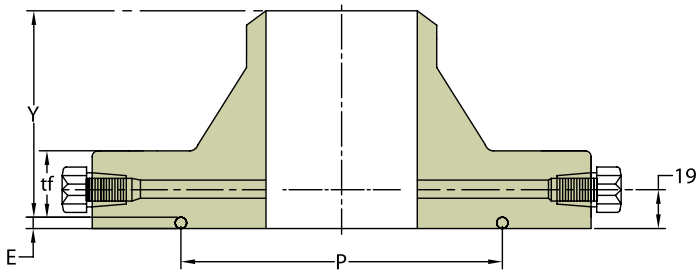


Raised Face

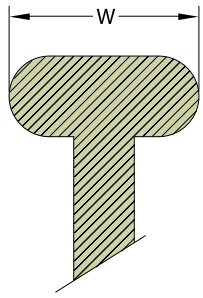
ASME B16.36 FORGED FLANGES

Nominal Pipe Size	Outside Diameter of Raised Face	Outside Diameter of Flange	Minimum Thickness of Flange	Length Through Hub	Ring Type Joint					
					Groove Number	Pitch Diameter	Groove Depth	Groove Width	Radius at Bottom	Special Oval Ring Height
	R	O	tf	Y		P	E	F	r	W
1	For NPS 2 ½ and smaller, use Class 1500.									
1 ½										
2										
2 ½										
3	127.0	240	38.1	102	R31	123.83	7.92	11.91	0.8	27.0
4	157.2	290	44.5	114	R37	149.23	7.92	11.91	0.8	27.0
6	215.9	380	55.6	140	R45	211.12	7.92	11.91	0.8	27.0
8	269.9	470	63.5	162	R49	269.88	7.92	11.91	0.8	27.0
10	323.8	545	69.9	184	R53	323.85	7.92	11.91	0.8	27.0
12	381.0	610	79.4	200	R57	381	7.92	11.91	0.8	27.0
14	412.8	640	85.8	213	R62	419.1	11.13	16.66	1.5	33.3
16	469.9	705	88.9	216	R66	469.9	11.13	16.66	1.5	36.5
18	533.4	785	101.6	229	R70	533.4	12.7	19.84	1.5	39.7
20	584.2	855	108	248	R74	584.2	12.7	19.84	1.5	39.7
24	692.2	1040	139.7	292	R78	692.15	15.88	26.97	2.4	47.6

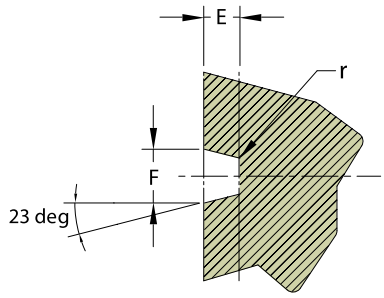
GENERAL NOTES:
(a) Dimensions are in millimeters, except for bolts and bolt holes. Reference Mandatory Appendix I for U.S. Customary.
(b) Weld neck flanges NPS 3 and smaller are identical to Class 300 flanges except for bolting and may be used for such services.
(c) Ring joint flange in NPS 24 will require an angular meter tap as shown in Fig. 2.



Ring Type Joint



Special One-or Two-Piece Ring and Orifice Plate Assembly



Groove Detail

(Dimensions in mm)

Diameter of Hub	Hub Diameter Beginning of chamfer	Bore	Diameter of Pressure Connection	Drilling Template		
				Diameter of Bolt Circle	Number of Holes	Diameter of Holes
X	A	B	TT			
For NPS 2½ and smaller, use Class 1500.						
127	88.9	(4)	9.5	190.5	8	1
159	114.3	(4)	12.7	235.0	8	1 ¼
235	168.3	(4)	12.7	317.5	12	1 ¼
298	219.1	(4)	12.7	393.7	12	1 ½
368	273.0	(4)	12.7	469.9	16	1 ½
419	323.8	(4)	12.7	533.4	20	1 ½
451	355.6	(4)	12.7	558.8	20	1 ⅝
508	406.4	(4)	12.7	616.0	20	1 ¾
565	457.2	(4)	12.7	685.8	20	2
622	508.0	(4)	12.7	749.3	20	2 ⅛
749	609.6	(4)	12.7	901.7	20	2 ⅝

NOTE:

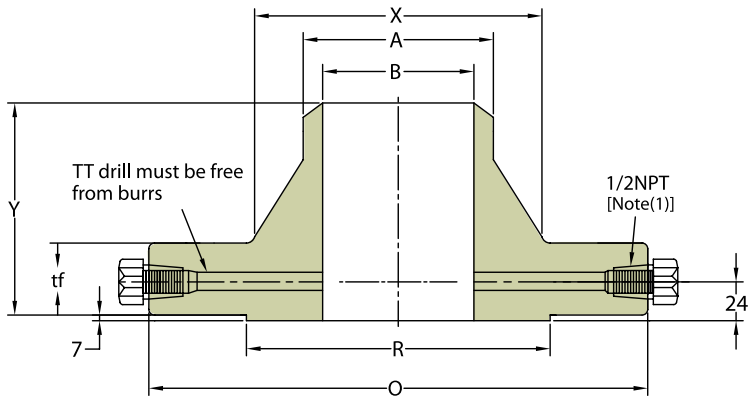
(1) Other NPT sizes may be furnished if required.

(2) In conformance with ASME B16.5. stud bolt lengths do not include point heights.

(3) Bolt lengths for raised face flanges include allowance for orifice and gasket thickness of 6 mm (0.25 in) for NPS 1-12 and 10mm (0.38 in) for NPS 14-24. Bolt lengths for ring type joint flanges include allowance of 15 mm (0.62 in) for NPS 1-10 19 mm (0.75 in) for NPS 12-18, and 22 mm (0.88 in) for NPS 20.

(4) Bore is to be specified by the purchaser.

CLASS 1500 ORIFICE FLANGES

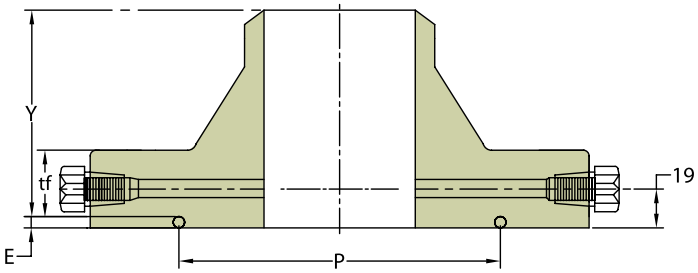


Raised Face

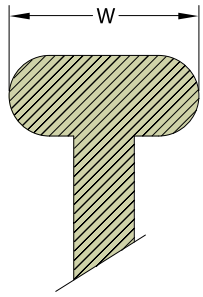
ASME B16.36 FORGED FLANGES

Nominal Pipe Size	Outside Diameter of Raised Face	Outside Diameter of Flange	Minimum Thickness of Flange	Length Through Hub	Ring Type Joint					
					Groove Number	Pitch Diameter	Groove Depth	Groove Width	Radius at Bottom	Special Oval Ring Height
	R	O	tf	Y		P	E	F	r	W
1	50.8	150	38.1	83	R16	50.80	6.35	8.74	0.8	25.4
1 ½	73.0	180	38.1	89	R20	68.27	6.35	8.74	0.8	25.4
2	92.1	215	38.1	102	R24	95.25	7.92	11.91	0.8	27.0
2 ½	104.8	245	41.3	105	R27	107.95	7.92	11.91	0.8	27.0
3	127.0	265	47.7	117	R35	136.53	7.92	11.91	0.8	27.0
4	157.2	310	54.0	124	R39	161.93	7.92	11.91	0.8	27.0
6	215.9	395	82.6	171	R46	211.14	9.52	13.49	1.5	28.6
8	269.9	485	92.1	213	R50	269.88	11.13	16.66	1.5	33.3
10	323.8	585	108.0	254	R54	323.85	11.13	16.66	1.5	33.3
12	381.0	675	123.9	283	R58	381.00	14.27	23.01	1.5	39.7
14	412.8	750	133.4	298	R63	419.10	15.88	26.97	2.4	44.4
16	469.9	825	146.1	311	R67	469.90	17.48	30.18	2.4	50.8
18	533.4	915	162.0	327	R71	533.40	17.48	30.18	2.4	50.8
20	584.2	985	177.8	356	R75	584.20	17.48	33.32	2.4	54.0
24	692.2	1170	203.2	406	R79	692.15	20.62	36.53	2.4	58.7

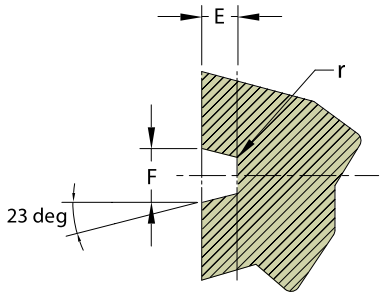
GENERAL NOTES:
(a) Dimensions are in millimeters, except for bolts and bolt holes.
(b) All other dimensions are in accordance with ASME B16.5.
(c) Ring joint flanges larger than NPS 6 will require angular meter taps shown in Fig. 2.



Ring Type Joint



Special One-or Two-Piece Ring and Orifice Plate Assembly



Groove Detail

(Dimensions in mm)

Diameter of Hub	Hub Diameter Beginning of chamfer	Bore	Diameter of Pressure Connection	Drilling Template		
				Diameter of Bolt Circle	Number of Holes	Diameter of Holes
X	A	B	TT			
52	33.5	(4)	6.4	101.6	4	1
70	48.3	(4)	6.4	123.8	4	1 ⅛
105	60.3	(4)	6.4	165.1	8	1
124	73.0	(4)	6.4	190.5	8	1 ⅛
133	88.9	(4)	9.5	203.2	8	1 ¼
162	114.3	(4)	12.7	241.3	8	1 ⅜
229	168.3	(4)	12.7	317.5	12	1 ½
292	219.1	(4)	12.7	393.7	12	1 ¾
368	273.0	(4)	12.7	482.6	12	2
451	323.8	(4)	12.7	571.6	16	2 ⅛
495	355.6	(4)	12.7	635.0	16	2 ⅜
552	406.4	(4)	12.7	704.8	16	2 ⅝
597	457.2	(4)	12.7	774.7	16	2 ⅞
641	508.0	(4)	12.7	831.8	16	3 ⅛
762	609.6	(4)	12.7	990.6	16	3 ⅝

NOTE:

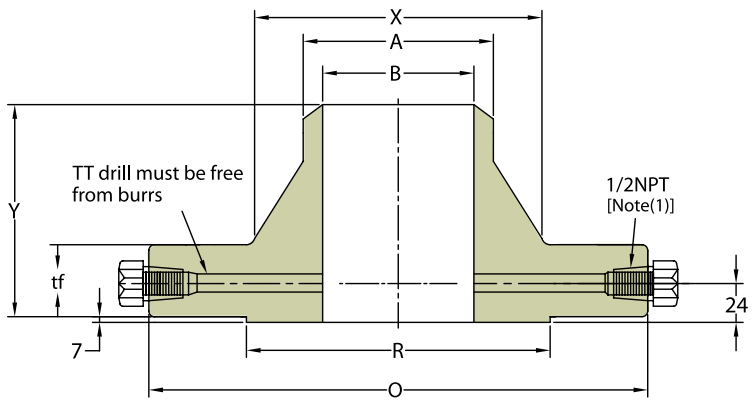
(1) Other NPT sizes may be furnished if required.

(2) In conformance with ASME B16.5. stud bolt lengths do not include point heights.

(3) Bolt lengths for raised face flanges include allowance for orifice and gasket thickness of 6 mm (0.25 in) for NPS 1-12 and 10 mm (0.38 in) for NPS 14-24. Bolt lengths for ring type joint flanges include allowance of 15 mm (0.62 in) for NPS 1-6.

(4) Bore is to be specified by the purchaser.

CLASS 2500 ORIFICE FLANGES

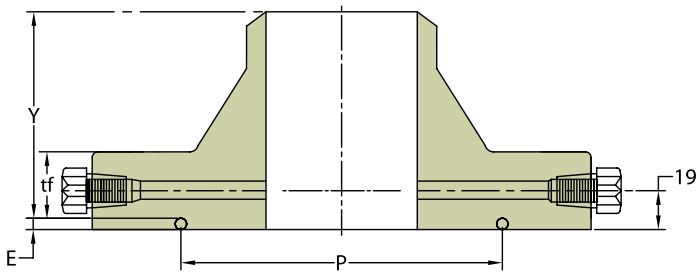


Raised Face

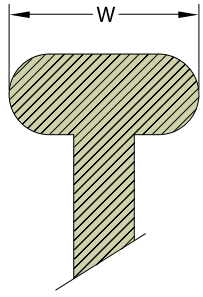
ASME B16.36 FORGED FLANGES

Nominal Pipe Size	Outside Diameter of Raised Face	Outside Diameter of Flange	Minimum Thickness of Flange	Length Through Hub	Ring Type Joint					
					Groove Number	Pitch Diameter	Groove Depth	Groove Width	Radius at Bottom	Special Oval Ring Height
	R	O	tf	Y		P	E	F	r	W
1	50.8	160	38.1	92	R18	60.33	6.35	8.74	0.8	25.4
1 ½	73.0	205	44.5	111	R23	82.55	7.92	11.91	0.8	27.0
2	92.1	235	50.8	127	R26	101.60	7.92	11.91	0.8	27.0
2 ½	104.8	265	57.2	143	R28	111.13	9.53	13.49	1.5	30.2
3	127.0	305	66.7	168	R32	127.00	9.53	13.49	1.5	30.2
4	157.2	355	76.2	190	R38	157.18	11.13	16.66	1.5	33.3
6	215.9	485	108	273	R47	228.60	12.70	19.84	1.5	36.5
8	269.9	550	127	318	R51	279.40	14.27	23.01	1.5	39.7
10	323.8	675	165.1	419	R55	342.90	17.48	30.18	2.4	47.6
12	381.0	760	184.2	464	R60	406.40	17.48	33.32	2.4	50.8

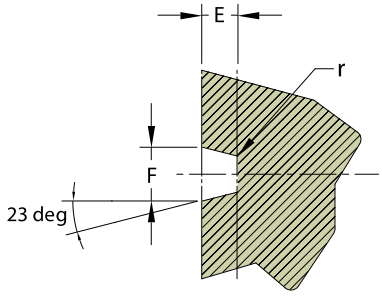
GENERAL NOTES:
(a) Dimensions are in millimeters, except for bolts and bolt holes.
(b) All other dimensions are in accordance with ASME B16.5.
(c) Ring joint flanges larger than NPS 3 will require angular meter taps shown in Fig. 2.



Ring Type Joint



Special One-or Two-Piece Ring and Orifice Plate Assembly



Groove Detail

(Dimensions in mm)

Diameter of Hub	Hub Diameter Beginning of chamfer	Bore	Diameter of Pressure Connection	Drilling Template			
				Diameter of Bolt Circle	Number of Holes	Diameter of Holes	Diam-eter of Bolts
X	A	B	TT				
57	33.5	(4)	6.4	108.0	4	1	⅞
79	48.3	(4)	6.4	146.0	4	1 ¼	1 ⅛
95	60.3	(4)	6.4	171.4	8	1 ⅛	1
114	73.0	(4)	6.4	196.8	8	1 ¼	1 ⅛
133	88.9	(4)	9.5	228.6	8	1 ⅜	1 ¼
165	114.3	(4)	12.7	273.0	8	1 ⅝	1 ½
235	168.3	(4)	12.7	368.3	8	2 ⅛	2
305	219.1	(4)	12.7	438.2	12	2 ⅛	2
375	273.0	(4)	12.7	539.8	12	2 ⅝	2 ½
441	323.8	(4)	12.7	619.1	12	2 ⅞	2 ¾

NOTE:

(1) Other NPT sizes may be furnished if required.

(2) In conformance with ASME B16.5. stud bolt lengths do not include point heights.

(3) Bolt lengths for raised face flanges include allowance for orifice and gasket thickness of 6mm (0.25 in) for NPS 1-12. Bolt lengths for ring type joint flanges include allowance of 15 mm (0.62 in) for NPS 1 to NPS 3.

(4) Bore is to be specified by the purchaser.

Fig. 1 Corner Taps

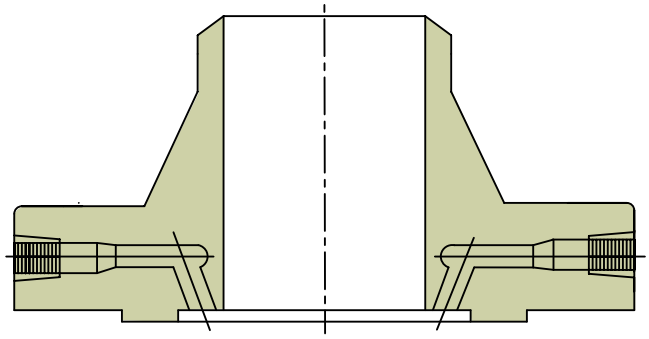


Fig. 2 Angular Meter Tap for RTJ Flanges

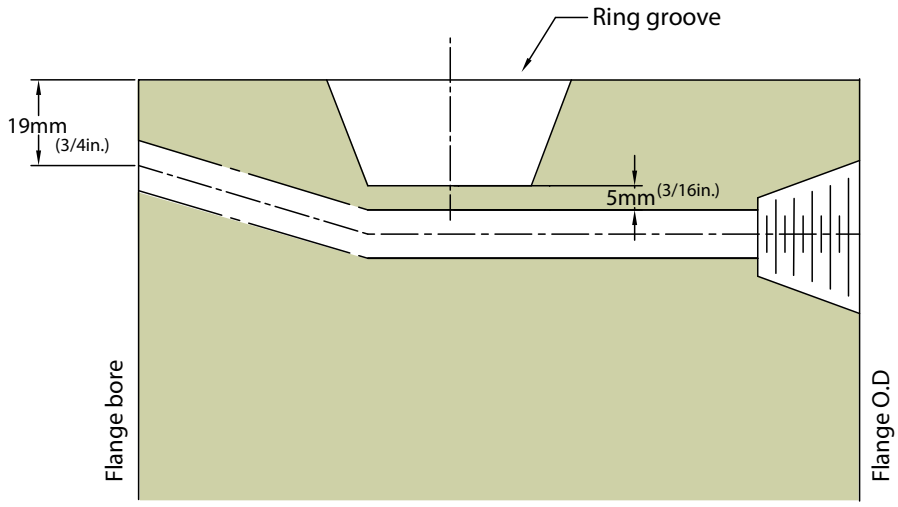
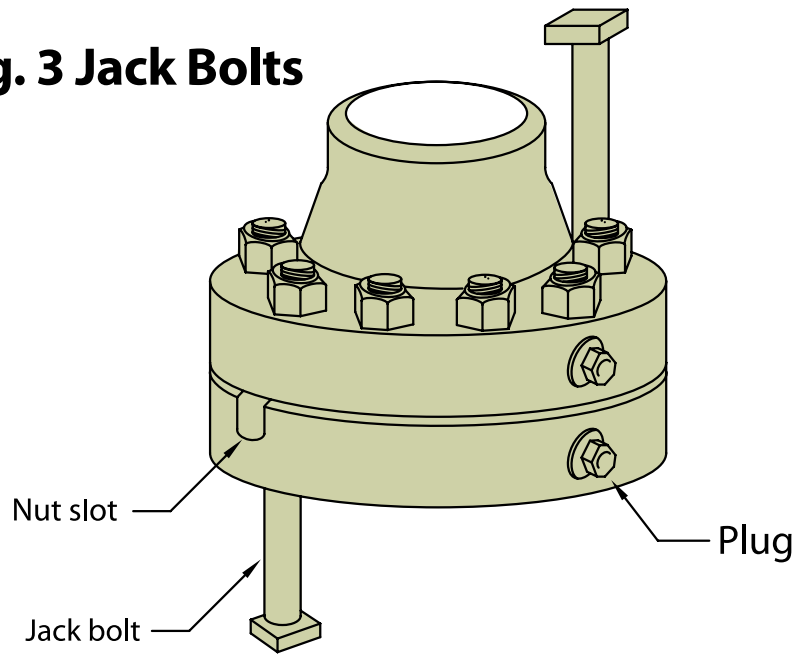


Fig. 3 Jack Bolts

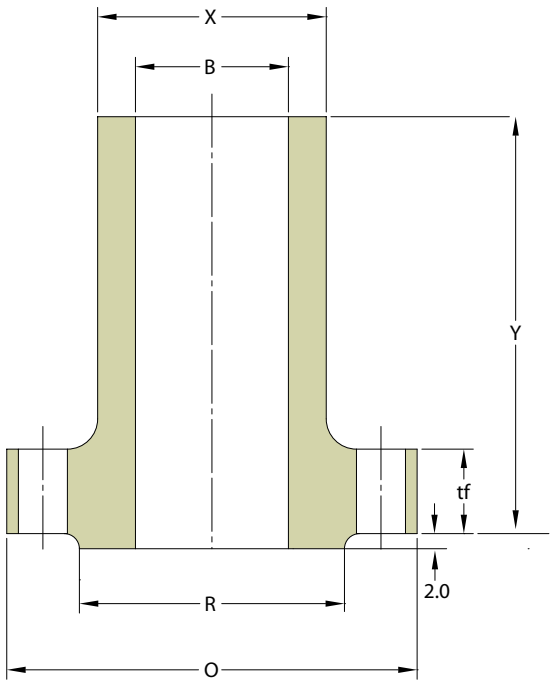


LONG WELDING NECK FLANGES

CLASS 150 FLANGES
CLASS 300 FLANGES
CLASS 400 FLANGES
CLASS 600 FLANGES
CLASS 900 FLANGES
CLASS 1500 FLANGES
CLASS 2500 FLANGES

CLASS 150 FLANGES

LONG WELDING NECK
(Straight Hub Welding Flange)



(Dimensions in mm)

Nominal Pipe Size NPS	Outside Diameter of Flange	Thickness of Flange, Min..	Outside Diameter of Raised Face	HUB Diameter at Bevel	Diameter of Bore	Length Through Hub	Drilling Template		
							Diameter of Bolts Circle	Number of Holes	Diameter of Holes (in.)
	O	tf	R	X	B	Y			
½	90	9.6	34.9	30	To be specified by purchaser	229	60.30	4	⅝
¾	100	11.2	42.9	38		229	69.90	4	⅝
1	110	12.7	50.8	49		229	79.40	4	⅝
1 ¼	115	14.3	63.5	59		229	88.90	4	⅝
1 ½	125	15.9	73.0	65		229	98.40	4	⅝
2	150	17.5	92.1	78		229	120.70	4	¾
2 ½	180	20.7	104.8	90		229	139.70	4	¾
3	190	22.3	127.0	108		229	152.40	4	¾
3 ½	215	22.3	139.7	122		229	177.80	8	¾
4	230	22.3	157.2	135		229	190.50	8	¾
5	255	22.3	185.7	164		305	215.90	8	⅞
6	280	23.9	215.9	192		305	241.30	8	⅞
8	345	27	269.9	246		305	298.50	8	⅞
10	405	28.6	323.8	305		305	362.00	12	1
12	485	30.2	381.0	365		305	431.80	12	1
14	535	33.4	412.8	400		305	476.30	12	1 ⅛
16	595	35	469.9	457		305	539.80	16	1 ⅛
18	635	38.1	533.4	505		305	577.90	16	1 ¼
20	700	41.3	584.2	559		305	635.00	20	1 ¼
24	815	46.1	692.2	663		305	749.30	20	1 ⅜

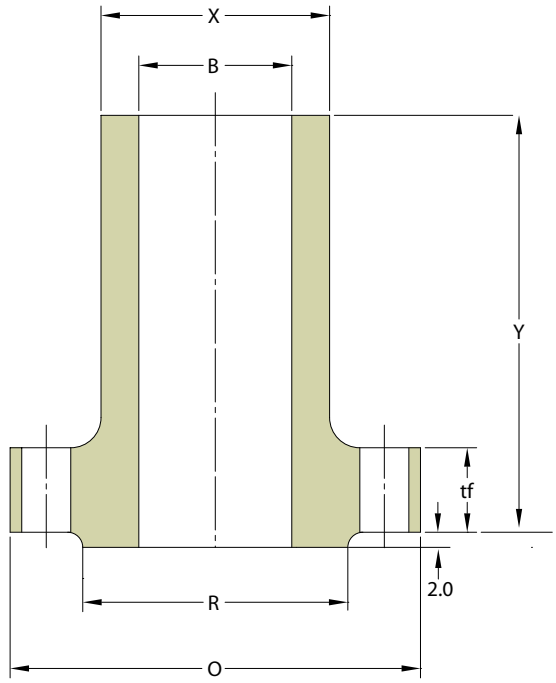
Notes:

(1) Other lengths may be furnished by agreement between the end user and the manufacturer.

(2) The bore diameter shall be equal to B dimension of the welding neck flange. Other bores may be furnished by agreement between the end user and the manufacturer. In no case shall the bore diameter exceed the bore of the same size and class lapped flange.

CLASS 300 FLANGES

LONG WELDING NECK
(Straight Hub Welding Flange)



(Dimensions in mm)

Nominal Pipe Size NPS	Outside Diameter of Flange	Thickness of Flange, Min.	Outside Diameter of Raised Face	HUB Diameter at Bevel	Diameter of Bore	Length Through Hub	Drilling Template		
							Diameter of Bolts Circle	Number of Holes	Diameter of Holes (in.)
	O	tf	R	X	B	Y			
½	95	12.7	34.9	38	To be specified by purchaser	229	66.7	4	⅝
¾	115	14.3	42.9	48		229	82.6	4	¾
1	125	15.9	50.8	54		229	88.9	4	¾
1 ¼	135	17.5	63.5	64		229	98.4	4	¾
1 ½	155	19.1	73.0	70		229	114.3	4	⅞
2	165	20.7	92.1	84		229	127.0	8	¾
2 ½	190	23.9	104.8	100		229	149.2	8	⅞
3	210	27	127.0	117		229	168.3	8	⅞
3 ½	230	28.6	139.7	133		229	184.2	8	⅞
4	255	30.2	157.2	146		229	200.0	8	⅞
5	280	33.4	185.7	178		305	235.0	8	⅞
6	320	35	215.9	206		305	269.9	12	⅞
8	380	39.7	269.9	260		305	330.2	12	1
10	445	46.1	323.8	321		305	387.4	16	1 ⅛
12	520	49.3	381.0	375		305	450.8	16	1 ¼
14	585	52.4	412.8	425		305	514.4	20	1 ¼
16	650	55.6	469.9	483		305	571.5	20	1 ⅜
18	710	58.8	533.4	533		305	628.6	24	1 ⅜
20	775	62	584.2	587		305	685.8	24	1 ⅜
24	915	68.3	692.2	702		305	812.8	24	1 ⅝

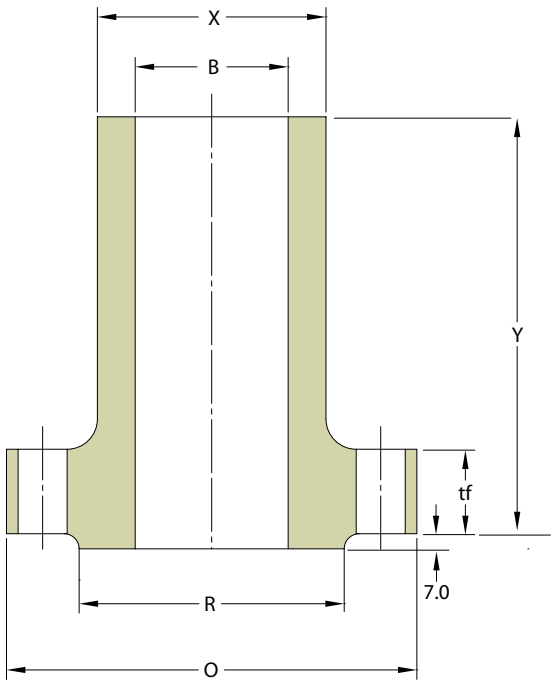
Notes:

(1) Other lengths may be furnished by agreement between the end user and the manufacturer.

(2) The bore diameter shall be equal to B dimension of the welding neck flange. Other bores may be furnished by agreement between the end user and the manufacturer. In no case shall the bore diameter exceed the bore of the same size and class lapped flange.

CLASS 400 FLANGES

LONG WELDING NECK
(Straight Hub Welding Flange)



(Dimensions in mm)

Nominal Pipe Size NPS	Outside Diameter of Flange	Thickness of Flange, Min.	Outside Diameter of Raised Face	HUB Diameter at Bevel	Diameter of Bore	Length Through Hub	Drilling Template		
							Diameter of Bolts Circle	Number of Holes	Diameter of Holes (in.)
	O	tf	R	X	B	Y			
½	Use Class 600 Dimensions in these sizes.								
¾									
1									
1 ¼									
1 ½									
2									
2 ½									
3									
3 ½									
4	255	35.0	157.2	146	To be Specified by Purchaser	229	200.0	8	1
5	280	38.1	185.7	178		305	235.0	8	1
6	320	41.3	215.9	206		305	269.9	12	1
8	380	47.7	269.9	260		305	330.0	12	1 ⅛
10	445	54.0	323.8	321		305	387.4	16	1 ¼
12	520	57.2	381.0	375		305	450.8	16	1 ⅜
14	585	60.4	412.8	425		305	514.4	20	1 ⅜
16	650	63.5	469.9	483		305	571.5	20	1 ½
18	710	66.7	533.4	533		305	628.6	24	1 ½
20	775	69.9	584.2	587		305	685.8	24	1 ⅝
24	915	76.2	692.2	702		305	812.8	24	1 ⅞

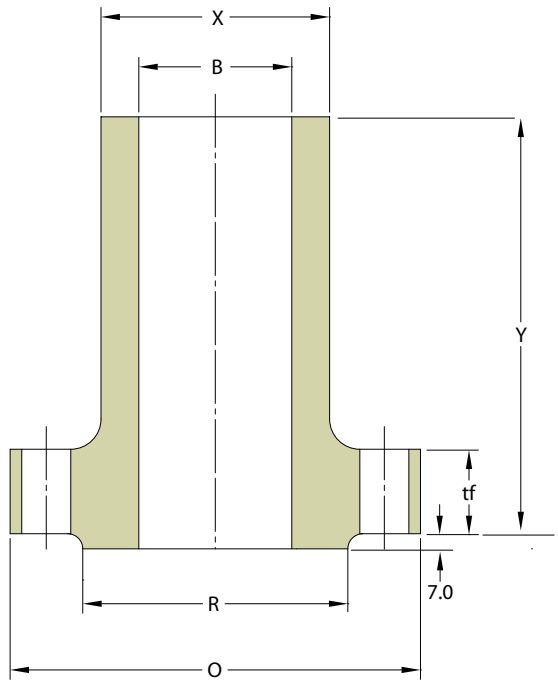
Notes:

(1) Other lengths may be furnished by agreement between the end user and the manufacturer.

(2) The bore diameter shall be equal to B dimension of the welding neck flange. Other bores may be furnished by agreement between the end user and the manufacturer. In no case shall the bore diameter exceed the bore of the same size and class lapped flange.

CLASS 600 FLANGES

LONG WELDING NECK
(Straight Hub Welding Flange)



(Dimensions in mm)

Nominal Pipe Size NPS	Outside Diameter of Flange	Thickness of Flange, Min.	Outside Diameter of Raised Face	HUB Diameter at Bevel	Diameter of Bore	Length Through Hub	Drilling Template		
							Diameter of Bolts Circle	Number of Holes	Diameter of Holes (in.)
	O	tf	R	X	B	Y			
½	95	14.3	34.9	38	To be Specified by Purchaser	229	66.7	4	⅝
¾	115	15.9	42.9	48		229	82.6	4	¾
1	125	17.5	50.8	54		229	88.9	4	¾
1 ¼	135	20.7	63.5	64		229	98.4	4	¾
1 ½	155	22.3	73.0	70		229	114.3	4	⅞
2	165	25.4	92.1	84		229	127.0	8	¾
2 ½	190	28.6	104.8	100		229	149.2	8	⅞
3	210	31.8	127.0	117		229	168.3	8	⅞
3 ½	230	35.0	139.7	133		229	184.2	8	1
4	275	38.1	157.2	152		229	215.9	8	1
5	330	44.5	185.7	189		305	266.7	8	1 ⅛
6	355	47.7	215.9	222		305	292.1	12	1 ⅛
8	420	55.6	269.9	273		305	349.2	12	1 ¼
10	510	63.5	323.8	343		305	431.8	16	1 ⅜
12	560	66.7	381.0	400		305	489.0	20	1 ⅜
14	605	69.9	412.8	432		305	527.0	20	1 ½
16	685	76.2	469.9	495		305	603.2	20	1 ⅝
18	745	82.6	533.4	546		305	654.0	20	1 ¾
20	815	88.9	584.2	610		305	723.9	24	1 ¾
24	940	101.6	692.2	718		305	838.2	24	2

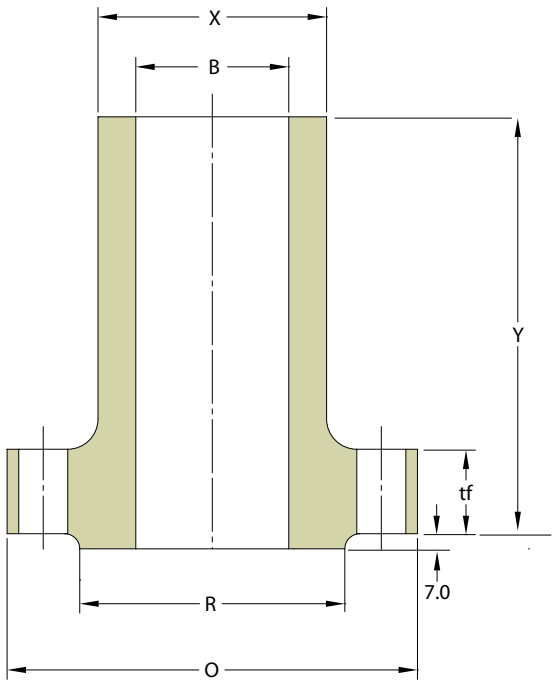
Notes:

(1) Other lengths may be furnished by agreement between the end user and the manufacturer.

(2) The bore diameter shall be equal to B dimension of the welding neck flange. Other bores may be furnished by agreement between the end user and the manufacturer. In no case shall the bore diameter exceed the bore of the same size and class lapped flange.

CLASS 900 FLANGES

LONG WELDING NECK
(Straight Hub Welding Flange)



(Dimensions in mm)

Nominal Pipe Size NPS	Outside Diameter of Flange	Thickness of Flange, Min.	Outside Diameter of Raised Face	HUB Diameter at Bevel	Diameter of Bore	Length Through Hub	Drilling Template		
							Diameter of Bolts Circle	Number of Holes	Diameter of Holes (in.)
	O	tf	R	X	B	Y			
½	Use Class 1500 Dimensions in these sizes.								
¾									
1									
1 ¼									
1 ½									
2									
2 ½									
3	240	38.1	127.0	127	To be Specified by Purchaser	229	190.5	8	1
4	290	44.5	157.2	159		229	235.0	8	1 ¼
5	350	50.8	185.7	190		305	279.4	8	1 ⅜
6	380	55.6	215.9	235		305	317.5	12	1 ¼
8	470	63.5	269.9	298		305	393.7	12	1 ½
10	545	69.9	323.8	368		305	469.9	16	1 ½
12	610	79.4	381.0	419		305	533.4	20	1 ½
14	640	85.8	412.8	451		305	558.8	20	1 ⅝
16	705	88.9	469.9	508		305	616.0	20	1 ¾
18	785	101.6	533.4	565		305	685.8	20	2
20	855	108.0	584.2	622		305	749.3	20	2 ⅛
24	1,040	139.7	692.2	749		305	901.7	20	2 ⅝

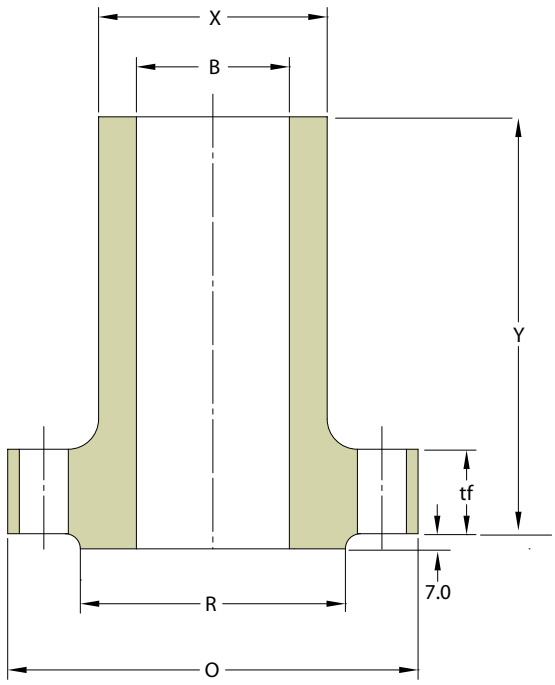
Notes:

(1) Other lengths may be furnished by agreement between the end user and the manufacturer.

(2) The bore diameter shall be equal to B dimension of the welding neck flange. Other bores may be furnished by agreement between the end user and the manufacturer. In no case shall the bore diameter exceed the bore of the same size and class lapped flange.

CLASS 1500 FLANGES

LONG WELDING NECK
(Straight Hub Welding Flange)



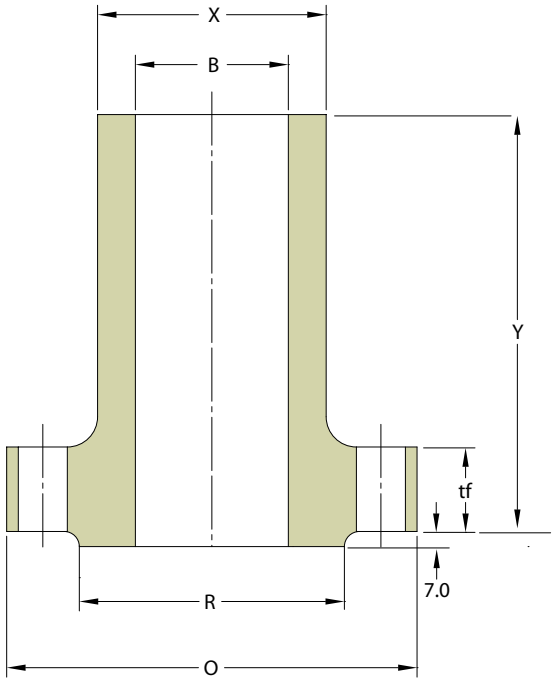
(Dimensions in mm)

Nominal Pipe Size NPS	Outside Diameter of Flange	Thickness of Flange, Min.	Outside Diameter of Raised Face	HUB Diameter at Bevel	Diameter of Bore	Length Through Hub	Drilling Template		
							Diameter of Bolts Circle	Number of Holes	Diameter of Holes (in.)
	O	tf	R	X	B	Y			
½	120	22.3	34.9	38	To be Specified by Purchaser	229	82.6	4	⅞
¾	130	25.4	42.9	44		229	88.9	4	⅞
1	150	28.6	50.8	52		229	101.6	4	1
1 ¼	160	28.6	63.5	64		229	111.1	4	1
1 ½	180	31.8	73.0	70		229	123.8	4	1 ⅛
2	215	38.1	92.1	105		229	165.1	8	1
2 ½	245	41.3	104.8	124		229	190.5	8	1 ⅛
3	265	47.7	127.0	133		229	203.2	8	1 ¼
4	310	54.0	157.2	162		229	241.3	8	1 ⅜
5	375	73.1	185.7	197		305	292.1	8	1 ⅝
6	395	82.6	215.9	229		305	317.5	12	1 ½
8	485	92.1	269.9	292		305	393.7	12	1 ¾
10	585	108.0	323.8	368		305	482.6	12	2
12	675	123.9	381.0	451		305	571.5	16	2 ⅛
14	750	133.4	412.8	495		305	635.0	16	2 ⅜
16	825	146.1	469.9	552		305	704.8	16	2 ⅝
18	915	162.0	533.4	597		305	774.7	16	2 ⅞
20	985	177.8	584.2	641		305	831.8	16	3 ⅛
24	1,170	203.2	692.2	762		305	990.6	16	3 ⅝

Notes:
(1) Other lengths may be furnished by agreement between the end user and the manufacturer.
(2) The bore diameter shall be equal to B dimension of the welding neck flange. Other bores may be furnished by agreement between the end user and the manufacturer. In no case shall the bore diameter exceed the bore of the same size and class lapped flange.

CLASS 2500 FLANGES

LONG WELDING NECK
(Straight Hub Welding Flange)



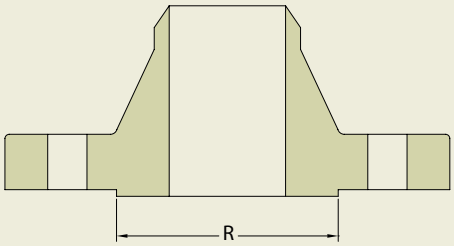
(Dimensions in mm)

Nominal Pipe Size NPS	Outside Diameter of Flange	Thickness of Flange, Min.	Outside Diameter of Raised Face	HUB Diameter at Bevel	Diameter of Bore	Length Through Hub	Drilling Template		
							Diameter of Bolts Circle	Number of Holes	Diameter of Holes (in.)
	O	tf	R	X	B	Y			
½	135	30.2	34.9	43	To be Specified by Purchaser	229	88.9	4	⅞
¾	140	31.8	42.9	51		229	95.2	4	⅞
1	160	35.0	50.8	57		229	108.0	4	1
1 ¼	185	38.1	63.5	73		229	130.2	4	1 ⅛
1 ½	205	44.5	73.0	79		229	146.0	4	1 ¼
2	235	50.9	92.1	95		229	171.4	8	1 ⅛
2 ½	265	57.2	104.8	114		229	196.8	8	1 ¼
3	305	66.7	127.0	133		229	228.6	8	1 ⅜
4	355	76.2	157.2	165		229	273.0	8	1 ⅝
5	420	92.1	185.7	203		305	323.8	8	1 ⅞
6	485	108.0	215.9	235		305	368.3	8	2 ⅛
8	550	127.0	269.9	305		305	438.2	12	2 ⅛
10	675	165.1	323.8	375		305	539.8	12	2 ⅝
12	760	184.2	381.0	441		305	619.1	12	2 ⅞

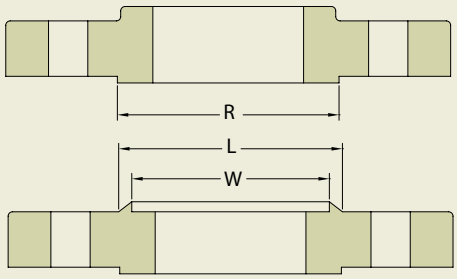
Notes:
(1) Other lengths may be furnished by agreement between the end user and the manufacturer.
(2) The bore diameter shall be equal to B dimension of the welding neck flange. Other bores may be furnished by agreement between the end user and the manufacturer. In no case shall the bore diameter exceed the bore of the same size and class lapped flange.

FLANGES FACINGS

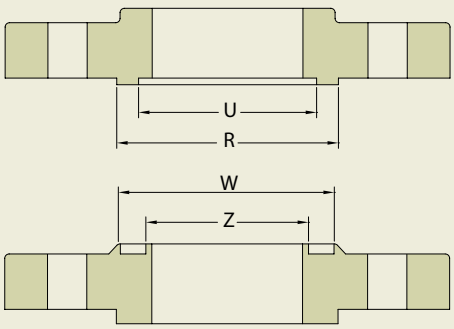
DIMENSIONS OF FLANGE FACINGS



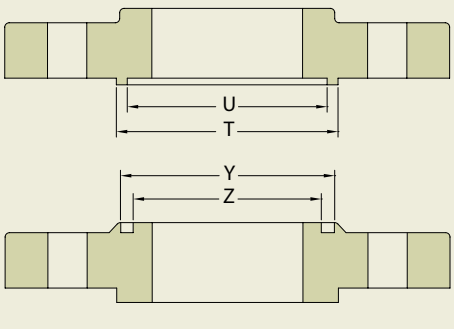
RAISED FACE



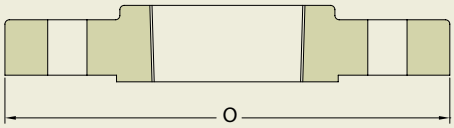
LARGE MALE AND FEMALE



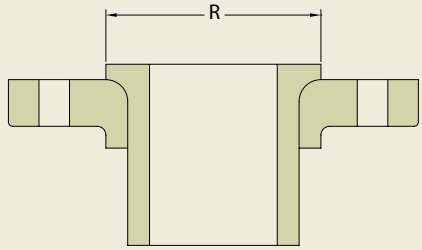
LARGE TONGUE AND GROOVE



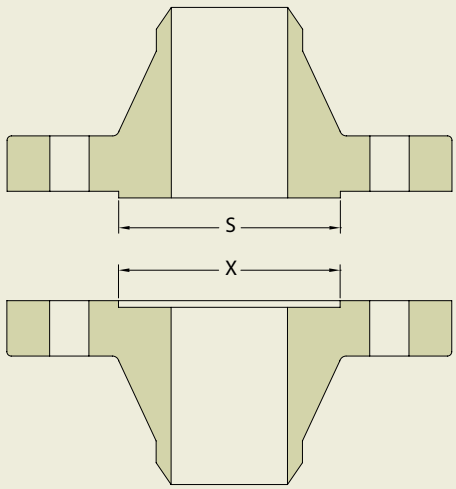
SMALL TONGUE AND GROOVE



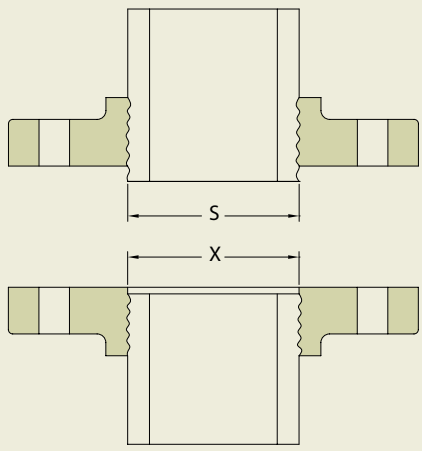
FLAT FACE



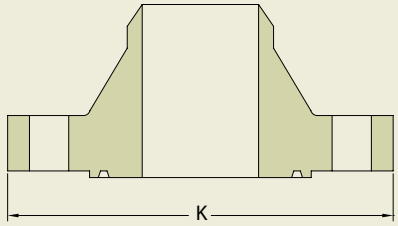
LAPPED JOINT



SMALL MALE AND FEMALE



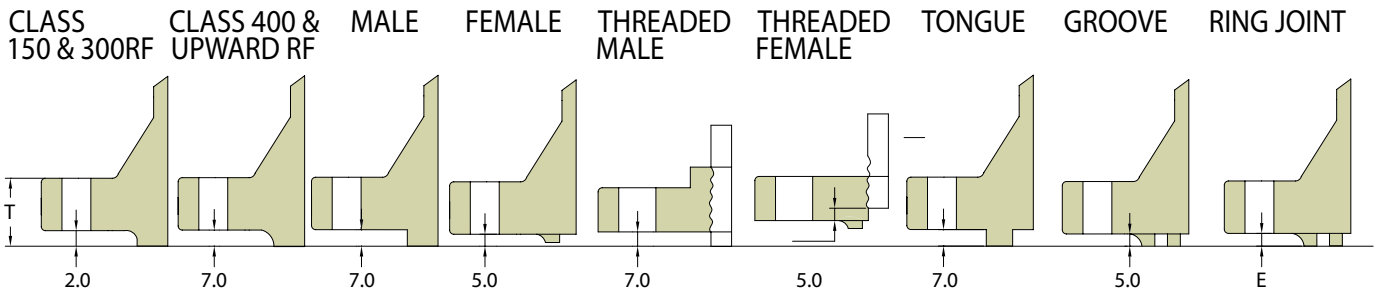
SMALL MALE AND FEMALE



RING JOINT

FLANGES FACINGS

DIMENSIONS OF FLANGE FACINGS



ASME B16.5 FORGED FLANGES

(Dimensions in mm)

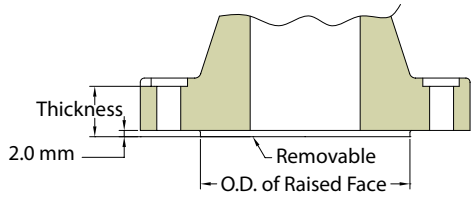
Nominal Pipe Size	Outside Diameter			I.D. of Large and Tongue	Outside Diameter			I.D. of Large and Groove	Height		Depth of Groove or Female
	Raised Face, Lapped, Large Male and Large Tongue	Small Male	Small Tongue		Large Female and Large Groove	Small Female	Small Groove		Raised Face and 300 ST' DS	Raised Face, Large and Small Male and Tongue Classes 400 2500 crane	
	R	S	T	U	W	X	Y	Z			
½	34.9	18.3	35.1	25.4	36.5	19.9	36.5	23.8	2	7	5
¾	42.9	23.8	42.9	33.3	44.4	25.4	44.4	31.8	2	7	5
1	50.8	30.2	47.8	38.1	52.4	31.8	49.2	36.5	2	7	5
1 ¼	63.5	38.1	57.2	47.6	65.1	39.7	58.7	46.0	2	7	5
1 ½	73.0	44.4	63.5	54.0	74.6	46.0	65.1	52.4	2	7	5
2	92.1	57.2	82.6	73.0	93.7	58.8	84.1	71.4	2	7	5
2 ½	104.8	68.3	95.2	85.7	106.4	69.8	96.8	84.1	2	7	5
3	127.0	84.1	117.5	108.0	128.6	85.7	119.1	106.4	2	7	5
3 ½	139.7	96.8	130.2	120.6	141.3	98.4	131.8	119.1	2	7	5
4	157.2	109.5	144.5	131.8	158.8	111.1	146.0	130.2	2	7	5
5	185.7	136.5	173.0	160.3	187.3	138.1	174.6	158.8	2	7	5
6	215.9	161.9	203.2	190.5	217.5	163.5	204.8	188.9	2	7	5
8	269.9	212.7	254.0	238.1	271.5	214.3	255.6	236.5	2	7	5
10	323.8	266.7	304.8	285.8	325.4	268.3	306.4	284.2	2	7	5
12	381.0	317.5	362.0	342.9	382.6	319.1	363.5	341.3	2	7	5
14	412.8	349.2	393.7	374.6	414.3	350.8	395.3	373.1	2	7	5
16	469.9	400.0	447.5	425.4	471.5	401.6	449.3	423.9	2	7	5
18	533.4	450.8	511.2	489.0	535.0	452.4	512.8	487.4	2	7	5
20	584.2	501.6	558.8	533.4	585.8	503.2	560.4	531.8	2	7	5
24	692.2	603.2	666.8	641.4	693.7	604.8	668.3	639.8	2	7	5

Notes:

(1) Small male and female faces are not applicable to Slip-on Flange.

(2) Large male and female faces are not applicable to Class 150 Flange.

(3) For flanges of Class 150 and 300 where they are to be bolted to ASME Class 125 and 250 Cast-Iron Flanges or required with flat face, flat face can be made by removing raised face.



*Tolerance are ±1.0 mm for 2.0 mm RF and ±0.5 mm for 7.0 mm RF Large Male and Large Tongue.

TOLERANCE

ASME B16.5 FORGED FLANGES

THREAD, SOCKET-WELDING, SLIP-ON, LAP JOINT AND BLIND

Outside Diameter	**(O)**	24" and Smaller	± 2.0 (*)
Bore	**(B)**	10" and Smaller	+ 1.0, - 0
		12" and Larger	+ 1.5, -0
Diameter of Counterbore		10" and Smaller	+ 1.0,- 0"
		12" and Larger	- 1.5, - 0
Diameter of Hub	**(X)**	24" and Smaller	± 2.0 (*)
		Slope	7deg max
Outside of Raised Face	**(G)**	2.0 Raised Face	± 1.0
		7.0 Raised Face	± 0.5
		Tongue & Groove	
		Male, Female	
Raised Face	**2.0**	Height	± 0.5
	7.0		± 2.0
Drilling		Bolt Circle	± 1.5
		Bolt Hole Spacing	± 0.8
		Eccentricity of Bolt Circle with Respect to Facing	2.1/2" and Small 0.8 max 3" and Larger 1.5 max
Thickness	**(tf)**	18" and Smaller	+ 3.0 ,- 0
		20" and Larger	+ 5.0, - 0
Length thru Hub	**(Y)**	10" and Smaller	± 1.5 (*)
		12" and Larger	± 3.0 (*)
Ring joint facing		P (Pitch)	± 0.13
		F (Width)	± 0.2
		E (Depth)	+ 0.4, - 0
		R (radius at bottom)	R≤2 : + 0.8, -0.0
			R>2 : ± 0.8
		23 deg (angle)	± 0.5°

WELDING NECK

(Unit in mm)

Outside Diameter	**(O)**	24" and Smaller	± 2.0 (*)
Bore	**(B)**	10" and Smaller	± 1.0
		12" thru 18"	± 1.5
		20" and Larger	+ 3.0, - 1.5
Outside of Raised Face	**(G)**	2.0 Raised Face	± 1.0
		7.0 Raised Face	± 0.5
		Tongue & Groove	
		Male, Female	
Raised Face	**2.0**	Height	± 0.5
	7.0		± 2.0
Diameter of Hub	**(X)**	24" and Smaller Slope	± 2.0 (*) 1:3 max (45deg max)
Hub Thickness		24" and Smaller	87.5%(min), 12.5%
Diameter of Hub at Point of Welding	**(A)**	5" and Smaller	+ 2.0 ,- 1.0
		6" and Larger	+ 4.0, -1.0
Drilling		Bolt Circle	± 1.5
		Bolt Hole Spacing	± 0.8
		Eccentricity of Bolt Circle with Respect to Facing	2.1/2" and Small 0.8 max 3" and Larger 1.5 max
Thickness	**(tf)**	18" and Smaller	+ 3.0 ,- 0
		20" and Larger	+ 5.0, - 0
Length thru Hub	**(Y)**	4" and Smaller	± 1.5
		5" thru 10"	+ 1.5, -3.0
		12" and Larger	+ 3.0, -5.0

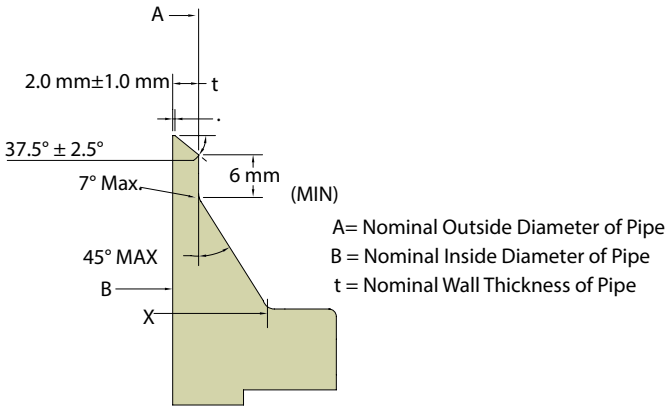
Notes:

*: Tolerances shall be in accordance with Kofco STD

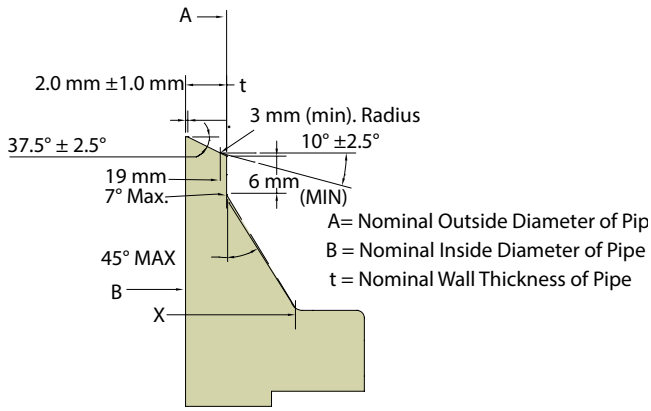
WELDING ENDS

ASME B16.5 FORGED FLANGES

Bevel For Wall Thicknesses(t)
From 5 mm to 22 mm Inclusive



Bevel for Wall Thicknesses(t)
Greater than 22 mm



Notes:

(a) Dimensions are in inches. For dimensions in millimeters, refer to Figs. 8 and 9.

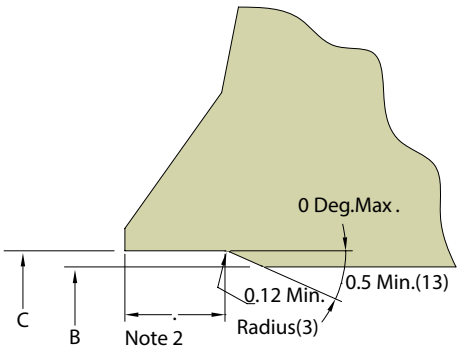
(b) See para. 6.7, 6.8 and 7.4 for details and tolerances.

(c) See Figs. F10 and F11 for additional details of welding ends.

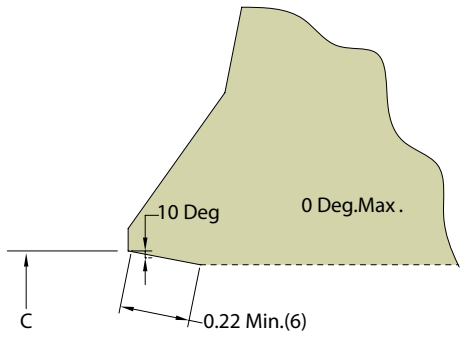
(d) When the thickness of the hub at the bevel is greater than that of the pipe to which the flange is joined and the additional thickness is provided on the outside diameter, a taper weld having a slope not exceeding 1 to 3 may be employed or, alternatively , the greater outside diameter may be tapered at the same maximum slope or less, from a point on the welding bevel equal to the outside diameter of the mating pipe. Similarly, when the greater thickness is provided on the inside of the flange, it shall be taper-bored from the welding end at a slope not exceeding 1 to 3. When flanges covered by this standard are intended for services with light wall, higher strength pipe, the thickness of the hub at the bevel may be greater than that of the pipe to which the flange is joined. Under these conditions, a single taper hub may be provided, and the outside diameter of the hub at the base (dimension X) may also be modified. The additional thickness may be provided on either inside or outside or partially on each side, but the total additional thickness of intended mating pipe. See Figs. 12,13, and 14.

(e) The hub transition from the A diameter to the X diameter shall fall within the maximum and minimum envelope outside by the 1:3 max. slope and the dashed line.

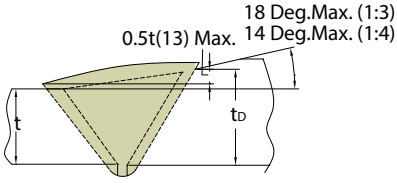
(f) For welding end dimensions, refer to ASME B16.25



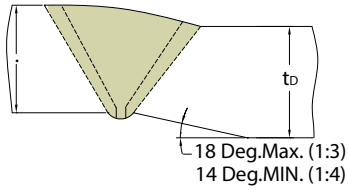
INSIDE CONTOUR FOR USE WITH
RECTANGULAR BACKING RING



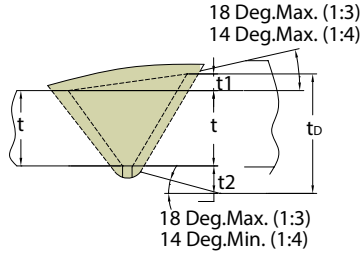
INSIDE CONTOUR FOR USE WITH
TAPER BACKING RING



BEVEL FOR OUTSIDE THICKNESS



BEVEL FOR INSIDE THICKNESS



BEVEL FOR COMBINED THICKNESS

ASME B36.10

(Dimensions in mm)

Nominal Pipe Size	Outside Diameter	WALL I.D	SCH 5S	SCH 10S	SCH 10	SCH 20	SCH 30	SCH 40S	SCH STD	SCH 40	SCH 60	SCH 80S	SCH XS	SCH 80	SCH 100	SCH 120	SCH 140	SCH 160	SCH XXS
⅛	10.29	WALL		1.24				1.73	1.73	1.73		2.41	2.41	2.41					
		I.D		7.8				6.8	6.8	6.8		5.5	5.5	5.5					
¼	13.72	WALL		1.65				2.24	2.24	2.24		3.02	3.02	3.02					
		I.D		10.4				9.2	9.2	9.2		7.7	7.7	7.7					
⅜	17.15	WALL		1.65				2.31	2.31	2.31		3.20	3.20	3.20					
		I.D		13.9				12.5	12.5	12.5		10.8	10.8	10.8					
½	21.34	WALL	1.65	2.11				2.77	2.77	2.77		3.73	3.73	3.73				4.78	7.47
		I.D	18.0	17.1				15.8	15.8	15.8		13.9	13.9	13.9				11.8	6.4
¾	26.67	WALL	1.65	2.11				2.87	2.87	2.87		3.91	3.91	3.91				5.56	7.82
		I.D	23.4	22.5				20.9	20.9	20.9		18.9	18.9	18.9				15.6	11.0
1	33.40	WALL	1.65	2.77				3.38	3.38	3.38		4.55	4.55	4.55				6.35	9.09
		I.D	30.1	27.9				26.6	26.6	26.6		24.3	24.3	24.3				20.7	15.2
1¼	42.16	WALL	1.65	2.77				3.56	3.56	3.56		4.85	4.85	4.85				6.35	9.70
		I.D	38.9	36.6				35.0	35.0	35.0		32.5	32.5	32.5				29.5	22.8
1½	48.26	WALL	1.65	2.77				3.68	3.68	3.68		5.08	5.08	5.08				7.14	10.16
		I.D	45.0	42.7				40.9	40.9	40.9		38.1	38.1	38.1				34.0	27.9
2	60.32	WALL	1.65	2.77			3.18	3.91	3.91	3.91		5.54	5.54	5.54				8.74	11.07
		I.D	57.0	54.8			53.94	52.5	52.5	52.5		49.2	49.2	49.2				42.8	38.2
2½	73.02	WALL	2.11	3.05			4.78	5.16	5.16	5.16		7.01	7.01	7.01				9.52	14.02
		I.D	68.8	66.9			63.44	62.7	62.7	62.7		59.0	59.0	59.0				54.0	45.0
3	88.90	WALL	2.11	3.05			4.78	5.49	5.49	5.49		7.62	7.62	7.62				11.12	15.24
		I.D	84.7	82.8			79.34	77.9	77.9	77.9		73.7	73.7	73.7				66.7	58.4
3½	101.60	WALL	2.11	3.05				5.74	5.74	5.74		8.08	8.08	8.08					
		I.D	97.4	95.5				90.1	90.1	90.1		85.4	85.4	85.4					
4	114.30	WALL	2.11	3.05				6.02	6.02	6.02		8.56	8.56	8.56		11.12		13.49	17.12
		I.D	110.1	108.2				102.3	102.3	102.3		97.2	97.2	97.2		92.1		87.3	80.1
5	141.30	WALL	2.77	3.40				6.55	6.55	6.55		9.53	9.53	9.53		12.70		15.88	19.05
		I.D	135.8	134.5				128.2	128.2	128.2		122.2	122.2	122.2		115.9		109.5	103.2
6	168.30	WALL	2.77	3.40				7.11	7.11	7.11		10.97	10.97	10.97		14.27		18.26	21.94
		I.D	162.8	161.5				154.1	154.1	154.1		146.4	146.4	146.4		139.8		131.8	124.4
8	219.08	WALL	2.77	3.76		6.35	7.04	8.18	8.18	8.18	10.31	12.70	12.70	12.70	15.09	18.26	20.62	23.01	22.22
		I.D	213.5	211.6		206.4	205.0	202.7	202.7	202.7	198.5	193.7	193.7	193.7	188.9	182.6	177.8	173.1	174.6
10	273.05	WALL	3.40	4.19		6.35	7.80	9.27	9.27	9.27	12.70	12.70	12.70	15.09	18.26	21.44	25.40	28.58	25.40
		I.D	266.3	264.7		260.4	257.5	254.5	254.5	254.5	247.7	247.7	247.7	242.9	236.5	230.2	222.3	215.9	222.3
12	323.85	WALL	3.96	4.57		6.35	8.38	9.52	9.52	10.31	14.27	12.70	12.70	17.48	21.44	25.40	28.58	33.32	25.40
		I.D	315.9	314.7		311.2	307.1	304.8	304.8	303.2	295.3	298.5	298.5	288.9	281.0	273.1	266.7	257.2	273.1
14	355.60	WALL	3.96	4.78	6.35	7.92	9.52		9.52	11.13	15.09		12.70	19.05	23.83	27.79	31.75	35.71	
		I.D	347.7	346.0	342.9	339.8	336.6		336.6	333.3	325.4		330.2	317.5	307.9	300.0	292.1	284.2	
16	406.40	WALL	4.19	4.78	6.35	7.92	9.52		9.52	12.70	16.66		12.70	21.44	26.19	30.96	36.52	40.49	
		I.D	398.0	396.8	393.7	390.6	387.4		387.4	381.0	373.1		381.0	363.5	354.0	344.5	333.4	325.4	
18	457.20	WALL	4.19	4.78	6.35	7.92	11.12		9.52	14.27	19.05		12.70	23.82	29.36	34.92	39.67	45.24	
		I.D	448.8	447.6	444.5	441.4	435.0		438.2	428.7	419.1		431.8	409.6	398.5	387.4	377.9	366.7	
20	508.00	WALL	4.78	5.54	6.35	9.52	12.70		9.52	15.09	20.62		12.70	26.19	32.54	38.10	44.45	50.01	
		I.D	498.4	496.9	495.3	489.0	482.6		489.0	477.8	466.8		482.6	455.6	442.9	431.8	419.1	408.0	
22	558.80	WALL	4.78	5.54	6.35	9.52	12.70		9.52		22.22		12.70	28.58	34.92	41.28	47.62	53.98	
		I.D	549.2	547.7	546.1	539.8	533.4		539.8		514.4		533.4	501.6	489.0	476.2	463.6	450.8	
24	609.60	WALL	5.54	6.35	6.35	9.52	14.27		9.52	17.48	24.61		12.70	30.96	38.89	46.02	52.37	59.54	
		I.D	598.5	596.9	596.9	590.6	581.1		590.6	574.6	560.4		584.2	547.7	531.8	517.6	504.9	490.5	

▸ Not included in B36.10

The wall thickness shown represent nominal or average wall dimensions which are subject to a 12 - ½% mill tolerance.

Note that schedule 40 of size 12" and larger, schedule 80 of size 10" and larger do not equal schedule 40S and 80S of ASME B36.19 nor standard weight and extra strong respectively.

MATERIAL SPECIFICATIONS

ASTM STANDARD

ASTM	Grade	Classification	Chemical Composition								Mechanical Properties				
			C %	Mn. %	P Max. %	S Max. %	Si %	Ni %	Cr %	Mo %	T.S. Min. psi (kg/mm²)	Y.S. Min. psi (kg/mm²)	EL. Min. %	RA. Min. %	HB
A-105*		Carbon Steel	MAX. 0.35	0.60 ~ 1.05	0.035	0.040	0.10 ~ 0.35	MAX. 0.40	MAX. 0.30	MAX. 0.12	70,000 (49.5)	36,000 (25.2)	22	30	MAX. 187
A-182	F1	½ Mo	MAX. 0.28	0.6 ~ 0.90	0.045	0.045	0.15 ~ 0.35			0.44 ~ 0.65	70,000 (49.5)	40,000 (28.1)	20	30	143 ~ 192
A-182	F5	5cr- ½ Mo	MAX. 0.15	0.30 ~ 0.60	0.030	0.030	MAX. 0.50	MAX. 0.50	4.00 ~ 6.00	0.44 ~ 0.65	70,000 (49.5)	40,000 (28.1)	20	35	143 ~ 217
A-182	F5a	5cr- ½ Mo	MAX. 0.25	MAX. 0.6	0.040	0.030	MAX. 0.50	MAX. 0.50	4.00 ~ 6.00	0.44 ~ 0.65	90,000 (63.3)	65,000 (45.7)	22	50	187 ~ 248
A-182	F11-1	1 ¼ Cr-½ Mo	0.05 ~ 0.15	0.30 ~ 0.60	0.030	0.030	0.50 ~ 1.00		1.00 ~ 1.50	0.44 ~ 0.65	60,000 (42.2)	30,000 (21.1)	20	45	121 ~ 174
A-182	F11-2	1 ¼ Cr-½ Mo	0.10 ~ 0.20	0.30 ~ 0.80	0.040	0.040	0.50 ~ 1.00		1.00 ~ 1.50	0.44 ~ 0.65	70,000 (49.5)	40,000 (28.1)	20	30	143 ~ 207
A-182	F11-3	1 ¼ Cr-½ Mo	0.10 ~ 0.20	0.30 ~ 0.80	0.040	0.040	0.50 ~ 1.00		1.00 ~ 1.50	0.44 ~ 0.65	75,000 (52.7)	45,000 (31.6)	20	30	156 ~ 207
A-182	F12-1	1Cr- ½ Mo	0.05 ~ 0.15	0.30 - 0.60	0.045	0.045	MAX. 0.5		0.80 ~ 1.25	0.44 ~ 0.65	60,000 (42.2)	32,000 (22.4)	20	45	121 ~ 174
A-182	F12-2	1Cr- ½ Mo	0.10 ~ 0.20	0.30 ~ 0.80	0.040	0.040	0.10 ~ 0.60		0.80 ~ 1.25	0.44 ~ 0.65	70,000 (49.5)	40,000 (28.1)	20	30	143 ~ 207
A-182	F22-1	2 ¼ Cr-1 Mo	0.05 ~ 0.15	0.30 ~ 0.60	0.040	0.040	MAX. 0.50		2.00 ~ 2.50	0.87 ~ 1.13	60,000 (42.21)	30,000 (21.1)	20	35	MAX 170
A-182	F22-3	2 ¼ Cr-1 Mo	0.05 ~ 0.15	0.30 ~ 0.60	0.040	0.040	MAX. 0.50		2.00 ~ 2.50	0.87 ~ 1.13	75,000 (52.7)	45,000 (31.6)	20	30	156 ~ 207
A-182	F304	18Cr-8 Ni	MAX. 0.08	MAX. 2.00	0.045	0.030	MAX. 1.00	8.00 ~ 11.00	18.00 ~ 20.00		75,000 (52.7)	30,000 (21.1)	30	50	
A-182	F304L	18Cr-8 Ni	MAX. 0.03	MAX. 2.00	0.045	0.030	MAX. 1.00	8.00 ~ 13.00	18.00 ~ 20.00		70,000 (49.5)	25,000 (17.6)	30	50	
A-182	F316	18Cr-8 Ni Mo	MAX. 0.08	MAX. 2.00	0.045	0.030	MAX. 1.00	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	75,000 (52.7)	30,000 (21.7)	30	50	
A-182	F316L	18Cr-8 Ni Mo-Low	MAX. 0.03	MAX. 2.00	0.045	0.030	MAX. 1.00	10.00 ~ 15.00	16.00 ~ 18.00	2.00 ~ 3.00	70,000 (49.5)	25,000 (17.6)	30	50	
A-182	F321	18Cr-8 Ni Ti	MAX. 0.08	MAX. 2.00	0.045	0.030	MAX. 1.00	9.00 ~ 12.00	17.00 ~ 19.00		75,000 (52.7)	30,000 (21.1)	30	50	
A-182	F347	18Cr-8 Ni Cb	MAX. 0.08	MAX. 2.00	0.045	0.030	MAX. 1.00	9.00 ~ 13.00	17.00 ~ 20.00		75,000 (52.7)	30,000 (21.1)	30	50	
A-350*	LF1	Carbon Steel	MAX. 0.30	0.60 ~ 1.35	0.035	0.040	0.15 ~ 0.30	MAX. 0.40	MAX. 0.30	MAX. 0.12	60,000 ~ 85,000 (42.2~59.7)	30,000 (21.1)	25	38	
A-350*	LF2	Carbon Steel	MAX. 0.30	0.60 ~ 1.35	0.035	0.040	0.15 ~ 0.30	MAX. 0.40	MAX. 0.30	MAX. 0.12	70,000 ~ 95,000 (49.2~66.8)	36,000 (25.3)	22	30	
A-350*	LF3	3 ½ Ni	MAX. 0.20	0.60 ~ 1.35	0.035	0.040	0.20 ~ 0.35	1.00 ~ 2.00	MAX. 0.30	MAX. 0.12	70,000 ~ 95,000 (49.2~66.8)	37,500 (26.4)	22	35	

* Other Elements: Cu (0.40 % max.), V (0.08 % max.).
* The sum of Cu, Ni, Cr and Mo and V shall not exceed 1.00 %.
* The sum of Cr and Mo shall not be exceed 0.32 %.

The Kofco's American Standard Flanges are manufactured by conforming to the ASME B16.5 (Table 1A "List of Material Specifications") and satisfying the above requirements.

LIST OF MATERIAL SPECIFICATIONS

Material Group	Nominal Designation	Applicable ASTM Specifications [Note (1)]		
		Forgings	Castings	Plates
1.1	C-Si	A105	A216 Gr. WCB	A515 Gr. 70
	C-Mn-Si	A350 Gr. LF2		A516 Gr. 70 A537 Cl. 1
	C-Mn-Si-V	A350 Gr. LF6 Cl.1		
	3½Ni	A350 Gr. LF3		
1.2	C-Mn-Si-V	A350 Gr. LF6 Cl.2		
1.4	C-Mn-Si	A350 Gr. LF1 Cl.1		A516 Gr. 60
1.5	C-½Mo	A182 Gr. F1		A204 Gr. A A204 Gr. B
1.7	½Cr-½Mo	A182 Gr. F2		
1.9	1¼Cr-½Mo-Si	A182 Gr. F11 Cl.2		A387 Gr. 11 Cl.2
1.10	2¼Cr-1Mo	A182 Gr. F22 Cl.3	A217 Gr. WC9	A387 Gr. 22 Cl.2
1.13	5Cr-½Mo	A182 Gr. F5a	A217 Gr. C5	
1.14	9Cr-1Mo	A182 Gr. F9	A217 Gr. C12	
1.15	9Cr-1Mo-V	A182 Gr. F91	A217 Gr. C12A	A387 Gr. 91 Cl.2
1.17	1Cr-½Mo	A182 Gr. F12 Cl.2		
	5Cr-½Mo	A182 Gr. F5		
2.1	18Cr-8Ni	A182 Gr. F304 A182 Gr. F304H	A351 Gr. CF3 A351 Gr. CF8	A240 Gr. 304 A240 Gr. 304H
2.2	16Cr-12Ni-2Mo	A182 Gr. F316 A182 Gr. F316H	A351 Gr. CF3M A351 Gr. CF8M	A240 Gr. 316 A240 Gr. 316H
	18Cr-13Ni-3Mo	A182 Gr. F317		A240 Gr. 317
2.3	18Cr-8Ni	A182 Gr. F304L		A240 Gr. 304L
	16Cr-12Ni-2Mo	A182 Gr. F316L		A240 Gr. 316L
2.4	18Cr-10Ni-Ti	A182 Gr. F321 A182 Gr. F321H		A240 Gr. 321 A240 Gr. 321H
2.5	18Cr-10Ni-Cb	A182 Gr. F347 A182 Gr. F347H A182 Gr. F348 A182 Gr. F348H		A240 Gr. 347 A240 Gr. 347H A240 Gr. 348 A240 Gr. 348H
2.7	25Cr-20Ni	A182 Gr. F310		A240 Gr. 310H
2.8	20Cr-18Ni-6Mo	A182 Gr. F44	A351 Gr. CK3MCuN	A240 Gr. S31254
	22Cr-5Ni-3Mo-N	A182 Gr. F51		A240 Gr. S31803
	25Cr-7Ni-4Mo-N	A182 Gr. F53		A240 Gr. S32750
	25Cr-7Ni-3.5Mo-N-Cu-W	A182 Gr. F55		A240 Gr. S32760
3.1	35Ni-35Fe-10Cr-Cb	B462 Gr. N08020		B463 Gr. N08020
3.2	99.0Ni	B160 Gr. N02200		B162 Gr. N02200
3.3	99.0Ni-Low C	B160 Gr. N02201		B162 Gr. N02201
3.4	67Ni-30Cu	B564 Gr. N04400		B127 Gr. N04400
	67Ni-30Cu-S	B164 Gr. N04405		
3.5	72Ni-15Cr-8Fe	B564 Gr. N06600		B168 Gr. N06600
3.6	33Ni-42Fe-21Cr	B564 Gr. N08800		B409 Gr. N08800
3.7	65Ni-28Mo-2Fe	B462 Gr. N10665		B333 Gr. N10665
	64Ni-29.5Mo-2Cr-2Fe-Mn-W	B462 Gr. N10675		B333 Gr. N10675
3.8	54Ni-16Mo-15Cr	B462 Gr. N10276		B575 Gr. N10276
	60Ni-22Cr-9Mo-3.5Cb	B564 Gr. N06625		B443 Gr. N06625
	62Ni-28Mo-5Fe	B335 Gr. N10001		B333 Gr. N10001
	70Ni-16Mo-7Cr-5Fe	B573 Gr. N10003		B434 Gr. N10003
	61Ni-16Mo-16Cr	B574 Gr. N06455		B575 Gr. N06455
	42Ni-21.5Cr-3Mo-2.3Cu	B564 Gr. N08825		B424 Gr. N08825
	55Ni-21Cr-13.5Mo	B462 Gr. N06022		B575 Gr. N06022
	55Ni-23Cr-16Mo-1.6Cu	B462 Gr. N06200		B575 Gr. N06200
3.9	47Ni-22Cr-9Mo-18Fe	B572 Gr. N06002		B435 Gr. N06002
3.10	25Ni-46Fe-21Cr-5Mo	B672 Gr. N08700		B599 Gr. N08700
3.11	44Fe-25Ni-21Cr-Mo	B649 Gr. N08904		B625 Gr. N08904
3.12	26Ni-43Fe-22Cr-5Mo	B621 Gr. N08320		B620 Gr. N08320
	47Ni-22Cr-20Fe-7Mo	B581 Gr. N06985		B582 Gr. N06985
	46Fe-24Ni-21Cr-6Mo-Cu-N	B462 Gr. N08367	A351 Gr. CN3MN	B688 Gr. N08367
3.13	49Ni-25Cr-18Fe-6Mo	B581 Gr. N06975		B582 Gr. N06975
	Ni-Fe-Cr-Mo-Cu-Low C	B564 Gr. N08031		B625 Gr. N08031
3.14	47Ni-22Cr-19Fe-6Mo	B581 Gr. N06007		B582 Gr. N06007
	40Ni-29Cr-15Fe-5Mo	B462 Gr. N06030		B582 Gr. N06030
3.15	33Ni-42Fe-21Cr	B564 Gr. N08810		B409 Gr. N08810
3.16	35Ni-19Cr-1¼Si	B511 Gr. N08330		B536 Gr. N08330

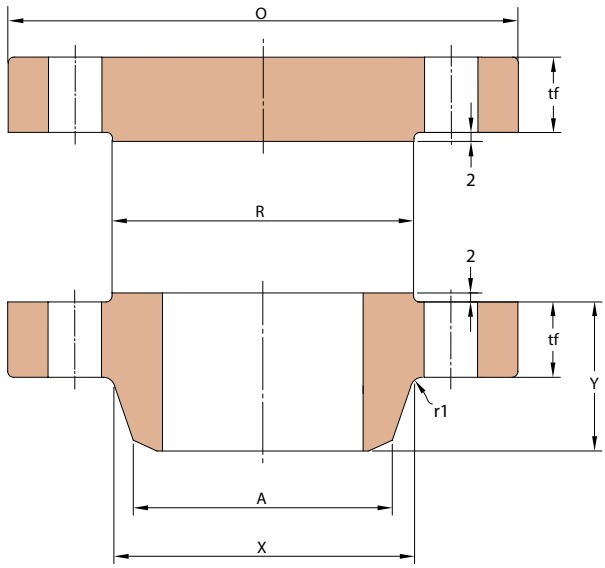
Notes:

(1) ASME Boiler and Pressure Vessel Code, Section II materials may also be used provided the requirements of the ASME specification are identical to or more stringent than the corresponding ASTM specification for the Grade, Class, or Typelisted.

ASME B16.47 Ser.A FLANGES

CLASS 150 FLANGES
CLASS 300 FLANGES
CLASS 400 FLANGES
CLASS 600 FLANGES
CLASS 900 FLANGES
RING JOINT FACINGS

CLASS 150 FLANGES



Raised Face

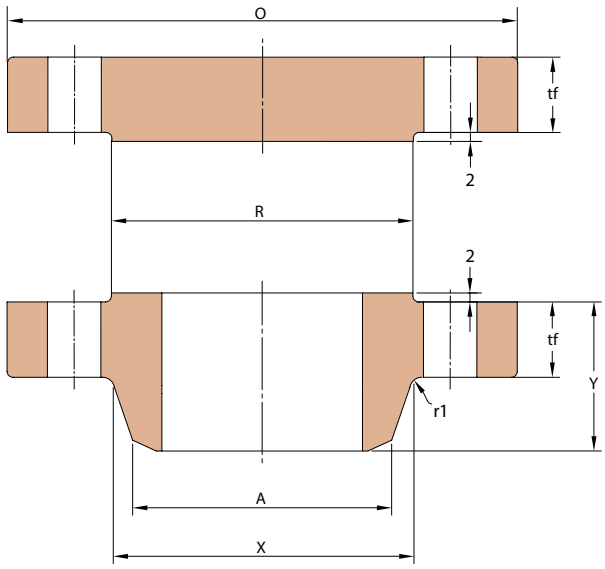
ASME B16.47 Ser.A FORGED FLANGES

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange, O	Minimum Thickness of Flange, tf [Note (1)]		Length Through Hub, Y	Diam. Of Hub, X [Note (2)]	Hub Diam. Top, A [Note (3)]	Raised Face Diam, R	Drilling			Minimum Fillet Radius, r1
		WNF	Blind					Diam. Of Bolt Circle	No. of Bolt Holes	Diam. Of Bolt Hole, in.	
26	870	66.7	66.7	119	676	660.4	749	806.4	24	1 3/8	10
28	925	69.9	69.9	124	727	711.2	800	863.6	28	1 3/8	11
30	985	73.1	73.1	135	781	762.0	857	914.4	28	1 3/8	11
32	1060	79.4	79.4	143	832	812.8	914	977.9	28	1 5/8	11
34	1110	81.0	81.0	148	883	863.6	965	1028.7	32	1 5/8	13
36	1170	88.9	88.9	156	933	914.4	1022	1085.8	32	1 5/8	13
38	1240	85.8	85.8	156	991	965.2	1073	1149.4	32	1 5/8	13
40	1290	88.9	88.9	162	1041	1016.0	1124	1200.2	36	1 5/8	13
42	1345	95.3	95.3	170	1092	1066.8	1194	1257.3	36	1 5/8	13
44	1405	100.1	100.1	176	1143	1117.6	1245	1314.4	40	1 5/8	13
46	1455	101.6	101.6	184	1197	1168.4	1295	1365.2	40	1 5/8	13
48	1510	106.4	106.4	191	1248	1219.2	1359	1422.4	44	1 5/8	13
50	1570	109.6	109.6	202	1302	1270.0	1410	1479.6	44	1 7/8	13
52	1625	114.3	114.3	208	1353	1320.8	1461	1536.7	44	1 7/8	13
54	1685	119.1	119.1	214	1403	1371.6	1511	1593.8	44	1 7/8	13
56	1745	122.3	122.3	227	1457	1422.4	1575	1651.0	48	1 7/8	13
58	1805	127.0	127.0	233	1508	1473.2	1626	1708.2	48	1 7/8	13
60	1855	130.2	130.2	238	1559	1524.0	1676	1759.0	52	1 7/8	13

Notes:
(1) The minimum flange thickness does not include the raised face thickness.
(2) This dimension is for the large end of hub, which may be straight or tapered.
(3) For welding and bevel, see page 80.

CLASS 300 FLANGES



Raised Face

ASME B16.47 Ser.A FORGED FLANGES

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange, O	Minimum Thickness of Flange, tf [Note (1)]		Length Through Hub, Y	Diam. Of Hub, X [Note (2)]	Hub Diam. Top, A [Note (3)]	Raised Face Diam, R	Drilling			Minimum Fillet Radius, r1
		WNF	Blind					Diam. Of Bolt Circle	No. of Bolt Holes	Diam. Of Bolt Hole, in.	
26	970	77.8	82.6	183	721	660.4	749	876.3	28	1¾	10
28	1035	84.2	88.9	195	775	711.2	800	939.8	28	1¾	11
30	1090	90.5	93.7	208	827	762.0	857	997.0	28	1⅞	11
32	1150	96.9	98.5	221	881	812.8	914	1054.1	28	2	11
34	1205	100.1	103.2	230	937	863.6	965	1104.9	28	2	13
36	1270	103.2	109.6	240	991	914.4	1022	1168.4	32	2⅛	13
38	1170	106.4	106.4	179	994	965.2	1029	1092.2	32	1⅝	13
40	1240	112.8	112.8	192	1048	1016.0	1086	1155.7	32	1¾	13
42	1290	117.5	117.5	198	1099	1066.8	1137	1206.5	32	1¾	13
44	1355	122.3	122.3	205	1149	1117.6	1194	1263.6	32	1⅞	13
46	1415	127.0	127.0	214	1203	1168.4	1245	1320.8	28	2	13
48	1465	131.8	131.8	222	1254	1219.2	1302	1371.6	32	2	13
50	1530	138.2	138.2	230	1305	1270.0	1359	1428.8	32	2⅛	13
52	1580	142.9	142.9	237	1356	1320.8	1410	1479.6	32	2⅛	13
54	1660	150.9	150.9	251	1410	1371.6	1467	1549.4	28	2⅜	13
56	1710	152.4	152.4	259	1464	1422.4	1518	1600.2	28	2⅜	13
58	1760	157.2	157.2	265	1514	1473.2	1575	1651.0	32	2⅜	13
60	1810	162.0	162.0	271	1565	1524.0	1626	1701.8	32	2⅜	13

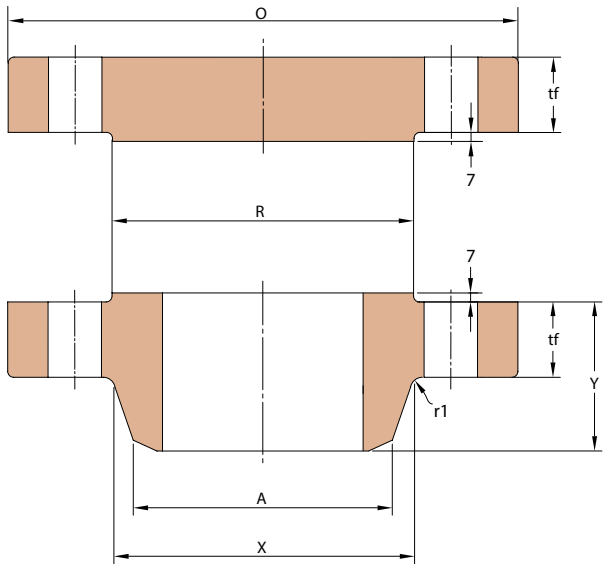
Notes:

(1) The minimum flange thickness does not include the raised face thickness.

(2) This dimension is for the large end of hub, which may be straight or tapered.

(3) For welding and bevel, see page 80.

CLASS 400 FLANGES



Raised Face

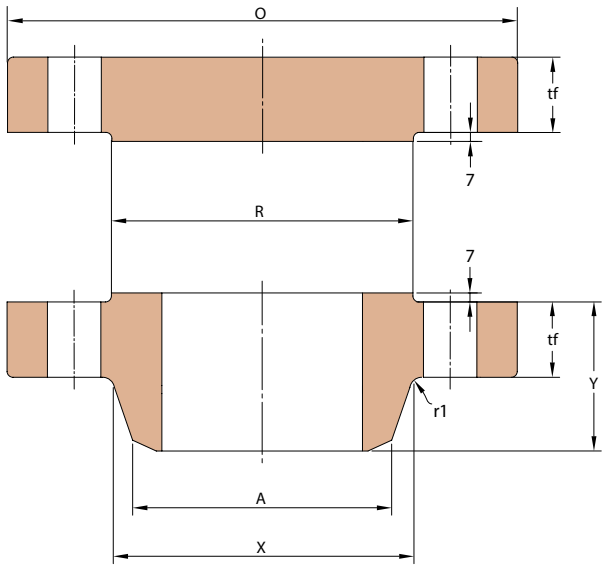
ASME B16.47 Ser.A FORGED FLANGES

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange, O	Minimum Thickness of Flange, tf [Note (1)]		Length Through Hub, Y	Diam. Of Hub, X [Note (2)]	Hub Diam. Top, A [Note (3)]	Raised Face Diam, R	Drilling			Minimum Fillet Radius, r1
		WNF	Blind					Diam. Of Bolt Circle	No. of Bolt Holes	Diam. Of Bolt Hole, in.	
26	970	88.9	98.5	194	727	660.4	749	876.3	28	1⅞	11
28	1035	95.3	104.8	206	783	711.2	800	939.8	28	2	13
30	1090	101.6	111.2	219	837	762.0	857	997.0	28	2⅛	13
32	1150	108.0	115.9	232	889	812.8	914	1054.1	28	2⅛	13
34	1205	111.2	122.3	241	945	863.6	965	1104.9	28	2⅛	14
36	1270	114.3	128.6	251	1000	914.4	1022	1168.4	32	2⅛	14
38	1205	123.9	123.9	206	1003	965.2	1035	1117.6	32	1⅞	14
40	1270	130.2	130.2	216	1054	1016.0	1092	1174.8	32	2	14
42	1320	133.4	133.4	224	1108	1066.8	1143	1225.6	32	2	14
44	1385	139.7	139.7	233	1159	1117.6	1200	1282.7	32	2⅛	14
46	1440	146.1	146.1	244	1213	1168.4	1257	1339.8	36	2⅛	14
48	1510	152.4	152.4	257	1267	1219.2	1308	1403.4	28	2⅜	14
50	1570	157.2	158.8	268	1321	1270.0	1362	1460.5	32	2⅜	14
52	1620	162.0	163.6	276	1372	1320.8	1413	1511.3	32	2⅜	14
54	1700	169.9	171.5	289	1426	1371.6	1470	1581.2	28	2⅝	14
56	1755	174.7	176.3	298	1480	1422.4	1527	1632.0	32	2⅝	14
58	1805	177.8	181.0	306	1530	1473.2	1578	1682.8	32	2⅝	14
60	1885	185.8	189.0	319	1584	1524.0	1635	1752.6	32	2⅞	14

Notes:
(1) The minimum flange thickness does not include the raised face thickness.
(2) This dimension is for the large end of hub, which may be straight or tapered.
(3) For welding and bevel, see page 80.

CLASS 600 FLANGES



Raised Face

ASME B16.47 Ser.A FORGED FLANGES

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange, O	Minimum Thickness of Flange, tf [Note (1)]		Length Through Hub, Y	Diam. Of Hub, X [Note (2)]	Hub Diam. Top, A [Note (3)]	Raised Face Diam, R	Drilling			Minimum Fillet Radius, r1
		WNF	Blind					Diam. Of Bolt Circle	No. of Bolt Holes	Diam. Of Bolt Hole, in.	
26	1015	108.0	125.5	222	748	660.4	749	914.4	28	2	13
28	1075	111.2	131.8	235	803	711.2	800	965.2	28	2⅛	13
30	1130	114.3	139.7	248	862	762.0	857	1022.4	28	2⅛	13
32	1195	117.5	147.7	260	918	812.8	914	1079.5	28	2⅜	13
34	1245	120.7	154.0	270	973	863.6	965	1130.3	28	2⅜	14
36	1315	123.9	162.0	283	1032	914.4	1022	1193.8	28	2⅝	14
38	1270	152.4	155.0	254	1022	965.2	1054	1162.0	28	2⅜	14
40	1320	158.8	162.0	264	1073	1016.0	1111	1212.8	32	2⅜	14
42	1405	168.3	171.5	279	1127	1066.8	1168	1282.7	28	2⅝	14
44	1455	173.1	177.8	289	1181	1117.6	1226	1333.5	32	2⅝	14
46	1510	179.4	185.8	300	1235	1168.4	1276	1390.6	32	2⅝	14
48	1595	189.0	195.3	316	1289	1219.2	1334	1460.5	32	2⅞	14
50	1670	196.9	203.2	329	1343	1270.0	1384	1524.0	28	3⅛	14
52	1720	203.2	209.6	337	1394	1320.8	1435	1574.8	32	3⅛	14
54	1780	209.6	217.5	349	1448	1371.6	1492	1632.0	32	3⅛	14
56	1855	217.5	225.5	362	1502	1422.4	1543	1695.4	32	3⅜	16
58	1905	222.3	231.8	370	1553	1473.2	1600	1746.2	32	3⅜	16
60	1995	233.4	242.9	389	1610	1524.0	1657	1822.4	28	3⅝	17

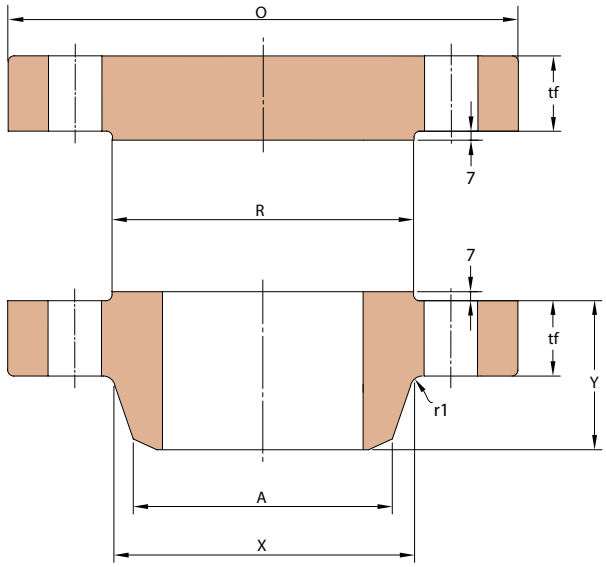
Notes:

(1) The minimum flange thickness does not include the raised face thickness.

(2) This dimension is for the large end of hub, which may be straight or tapered.

(3) For welding and bevel, see page 80.

CLASS 900 FLANGES



Raised Face

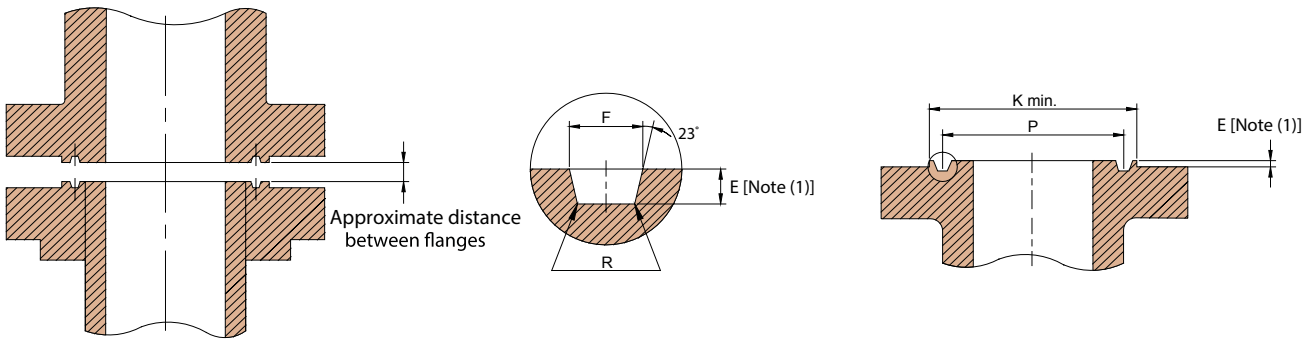
ASME B16.47 Ser.A FORGED FLANGES

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange, O	Minimum Thickness of Flange, tf [Note (1)]		Length Through Hub, Y	Diam. Of Hub, X [Note (2)]	Hub Diam. Top, A [Note (3)]	Raised Face Diam, R	Drilling			Minimum Fillet Radius, r1
		WNF	Blind					Diam. Of Bolt Circle	No. of Bolt Holes	Diam. Of Bolt Hole, in.	
26	1085	139.7	160.4	286	775	660.4	749	952.5	20	2⅞	11
28	1170	142.9	171.5	298	832	711.2	800	1022.4	20	3⅛	13
30	1230	149.3	182.6	311	889	762.0	857	1085.8	20	3⅛	13
32	1315	158.8	193.7	330	946	812.8	914	1155.7	20	3⅜	13
34	1395	165.1	204.8	349	1006	863.6	965	1225.6	20	3⅝	14
36	1460	171.5	214.4	362	1064	914.4	1022	1289.0	20	3⅝	14
38	1460	190.5	215.9	352	1073	965.2	1099	1289.0	20	3⅝	19
40	1510	196.9	223.9	364	1127	1016.0	1162	1339.8	24	3⅝	21
42	1560	206.4	231.8	371	1176	1066.8	1213	1390.6	24	3⅝	21
44	1650	214.4	242.9	391	1235	1117.6	1270	1463.7	24	3⅞	22
46	1735	225.5	255.6	411	1292	1168.4	1334	1536.7	24	4⅛	22
48	1785	233.4	263.6	419	1343	1219.2	1384	1587.5	24	4⅛	24
50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
52	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
54	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
56	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
58	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Notes:
(1) The minimum flange thickness does not include the raised face thickness.
(2) This dimension is for the large end of hub, which may be straight or tapered.
(3) For welding and bevel, see page 80.

Dimensions of Ring Joint Facings (All Pressure Rating Classes)



Dimension of Ring-Joint Facings

(Dimensions in mm)

Nominal Pipe Size for Class				Groove Number	Groove Dimensions				Diameter of Raised Portion, K
300	400	600	900		Pitch Diameter, P	Depth, E	Width, F	Radius at Bottom, R	
26	26	26	…	R93	749.30	12.70	19.84	1.5	810
28	28	28	…	R94	800.10	12.70	19.84	1.5	861
30	30	30	…	R95	857.25	12.70	19.84	1.5	917
32	32	32	…	R96	914.40	14.27	23.01	1.5	984
34	34	34	…	R97	965.20	14.27	23.01	1.5	1035
36	36	36	…	R98	1022.35	14.27	23.01	1.5	1092
…	…	…	26	R100	749.30	17.48	30.18	2.3	832
…	…	…	28	R101	800.10	17.48	33.32	2.3	889
…	…	…	30	R102	857.25	17.48	33.32	2.3	946
…	…	…	32	R103	914.40	17.48	33.32	2.3	1003
…	…	…	34	R104	965.20	20.62	36.53	2.3	1067
…	…	…	36	R105	1022.35	20.62	36.53	2.3	1124

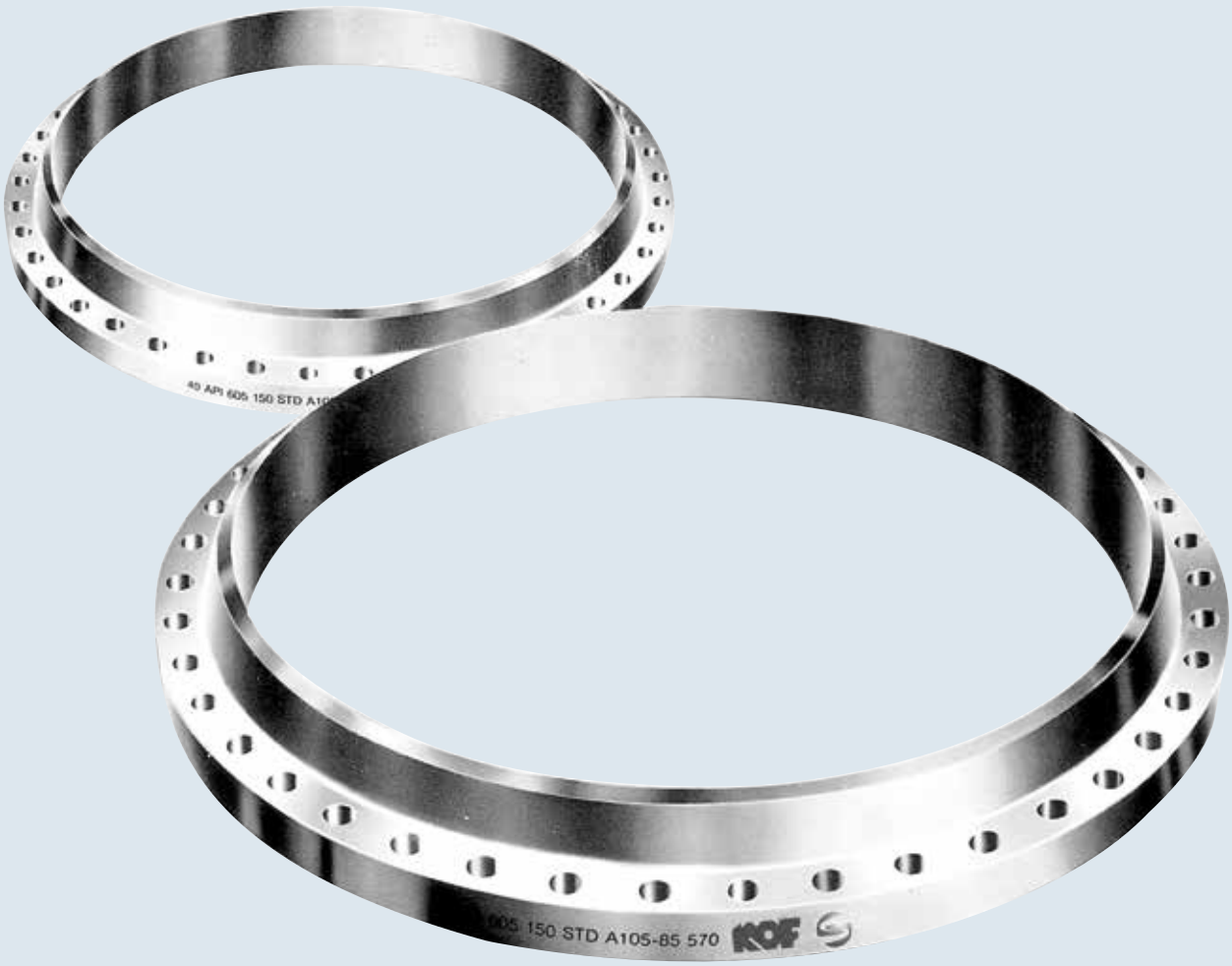
Tolerances	
E (depth)	+0.4, -0.0
F (width)	±0.2
P (pich diameter)	±0.13
R (radius at bottom)	+0.8, -0.0 for R ≤2 +0.8, for R >2
23 deg angle	±½ deg

Notes:

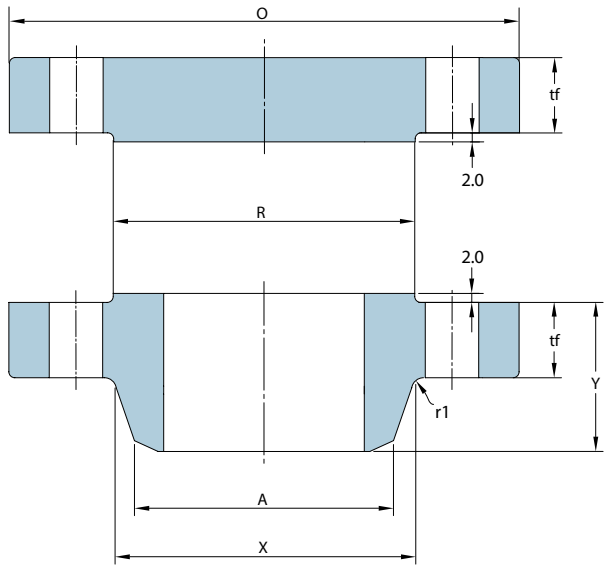
(1) Height of raised portion is equal to the depth of groove dimension E, but is not subjected to the tolerances for E. Full face contour may be used.

ASME B16.47 Ser.B FLANGES

CLASS 75 FLANGES
CLASS 150 FLANGES
CLASS 300 FLANGES
CLASS 400 FLANGES
CLASS 600 FLANGES
CLASS 900 FLANGES
WELDING ENDS



CLASS 75 FLANGES



Raised Face

ASME B16.47 Ser.B FORGED FLANGES

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange, O	Minimum Thickness of Flange, tf [Note (1)]		Length Through Hub, Y	Diam. Of Hub, X [Note (2)]	Hub Diam. Top, A [Note (3)]	Raised Face Diam, R	Drilling			Minimum Fillet Radius, r1
		WNF	Blind					Diam. Of Bolt Circle	No. of Bolt Holes	Diam. Of Bolt Hole, in.	
26	760	31.9	31.9	57	676	661.9	705	723.9	36	¾	8
28	815	31.9	31.9	60	727	712.7	756	774.7	40	¾	8
30	865	31.9	31.9	64	778	763.5	806	825.5	44	¾	8
32	915	33.5	35.0	68	829	814.3	857	876.3	48	¾	8
34	965	33.5	36.6	72	879	865.1	908	927.1	52	¾	8
36	1035	35.0	40.9	84	935	915.9	965	992.2	40	⅞	10
38	1085	36.6	43.0	87	986	966.7	1016	1043.0	40	⅞	10
40	1135	36.6	43.0	91	1037	1017.5	1067	1093.8	44	⅞	10
42	1185	38.2	46.3	94	1087	1068.3	1118	1144.6	48	⅞	10
44	1250	41.4	47.7	103	1140	1119.1	1175	1203.3	36	1	10
46	1300	43.0	49.3	106	1191	1169.9	1226	1254.1	40	1	10
48	1355	44.6	52.5	110	1241	1220.7	1276	1304.9	44	1	10
50	1405	46.2	54.1	114	1294	1271.5	1327	1355.7	44	1	10
52	1455	46.2	55.7	119	1345	1322.3	1378	1409.7	48	1	10
54	1510	47.8	58.9	124	1397	1373.1	1429	1460.5	48	1	10
56	1575	49.3	60.4	133	1451	1423.9	1486	1520.8	40	1⅛	11
58	1625	50.9	62.0	137	1502	1474.7	1537	1571.6	44	1⅛	11
60	1675	54.1	65.2	143	1553	1525.5	1588	1622.4	44	1⅛	11

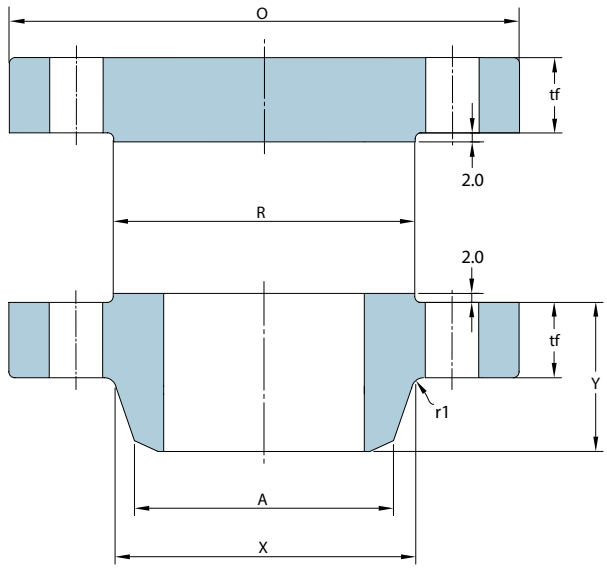
Notes:

(1) The minimum flange thickness does not include the raised face thickness.

(2) This dimension is for the large end of hub, which may be straight or tapered.

(3) For welding and bevel, see page 80.

CLASS 150 FLANGES



Raised Face

ASME B16.47 Ser.B FORGED FLANGES

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange, O	Minimum Thickness of Flange, tf [Note (1)]		Length Through Hub, Y	Diam. Of Hub, X [Note (2)]	Hub Diam. Top, A [Note (3)]	Raised Face Diam, R	Drilling			Minimum Fillet Radius, r1
		WNF	Blind					Diam. Of Bolt Circle	No. of Bolt Holes	Diam. Of Bolt Hole, in.	
26	785	39.8	43.0	87	684	661.9	711	744.5	36	⅞	10
28	835	43.0	46.2	94	735	712.7	762	795.3	40	⅞	10
30	885	43.0	49.3	98	787	763.5	813	846.1	44	⅞	10
32	940	44.6	52.5	106	840	814.3	864	900.1	48	⅞	10
34	1005	47.7	55.7	109	892	865.1	921	957.3	40	1	10
36	1055	50.9	57.3	116	945	915.9	972	1009.6	44	1	10
38	1125	52.5	62.0	122	997	968.2	1022	1070.0	40	1⅛	10
40	1175	54.1	65.2	127	1049	1019.0	1080	1120.8	44	1⅛	10
42	1225	57.3	66.8	132	1102	1069.8	1130	1171.6	48	1⅛	11
44	1275	58.9	70.0	135	1153	1120.6	1181	1222.4	52	1⅛	11
46	1340	60.4	73.1	143	1205	1171.4	1235	1284.3	40	1¼	11
48	1390	63.6	76.3	148	1257	1222.2	1289	1335.1	44	1¼	11
50	1445	66.8	79.5	152	1308	1273.0	1340	1385.9	48	1¼	11
52	1495	68.4	82.7	156	1360	1323.8	1391	1436.7	52	1¼	11
54	1550	70.0	85.8	160	1413	1374.6	1441	1492.2	56	1¼	11
56	1600	71.6	89.0	165	1465	1425.4	1492	1543.0	60	1¼	14
58	1675	73.1	91.9	173	1516	1476.2	1543	1611.3	48	1⅜	14
60	1725	74.7	95.4	178	1570	1527.0	1600	1662.1	52	1⅜	14

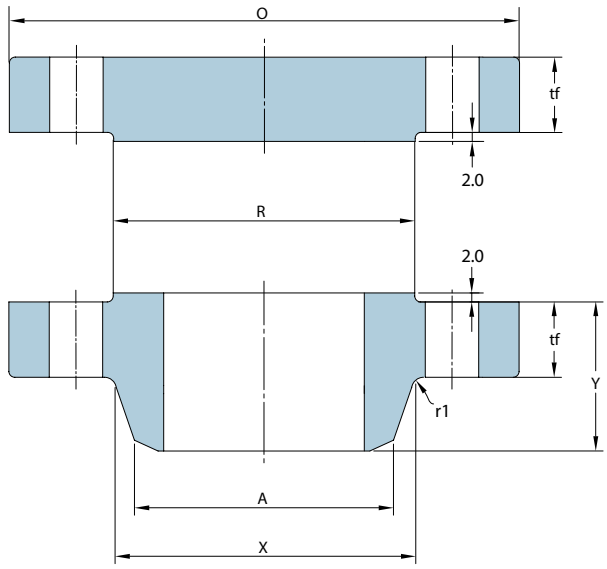
Notes:

(1) The minimum flange thickness does not include the raised face thickness.

(2) This dimension is for the large end of hub, which may be straight or tapered.

(3) For welding and bevel, see page 80.

CLASS 300 FLANGES



Raised Face

ASME B16.47 Ser.B FORGED FLANGES

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange, O	Minimum Thickness of Flange, tf [Note (1)]		Length Through Hub, Y	Diam. Of Hub, X [Note (2)]	Hub Diam. Top, A [Note (3)]	Raised Face Diam, R	Drilling			Minimum Fillet Radius, r1
		WNF	Blind					Diam. Of Bolt Circle	No. of Bolt Holes	Diam. Of Bolt Hole, in.	
26	865	87.4	87.4	143	702	665.2	737	803.3	32	1 3/8	14
28	920	87.4	87.4	148	756	716.0	787	857.2	36	1 3/8	14
30	990	92.1	92.1	156	813	768.4	845	920.8	36	1 1/2	14
32	1055	101.6	101.6	167	864	819.2	902	977.9	32	1 5/8	16
34	1110	101.6	101.6	171	918	870.0	953	1031.9	36	1 5/8	16
36	1170	101.6	101.6	179	965	920.8	1010	1089.0	32	1 3/4	16
38	1220	109.6	109.6	191	1016	971.6	1060	1139.8	36	1 3/4	16
40	1275	114.3	114.3	197	1067	1022.4	1114	1190.6	40	1 3/4	16
42	1335	117.5	117.5	203	1118	1074.7	1168	1244.6	36	1 7/8	16
44	1385	125.5	125.5	213	1173	1125.5	1219	1295.4	40	1 7/8	16
46	1460	127.0	128.6	221	1229	1176.3	1270	1365.2	36	2	16
48	1510	127.0	133.4	222	1278	1227.1	1327	1416.0	40	2	16
50	1560	136.6	138.2	233	1330	1277.9	1378	1466.8	44	2	16
52	1615	141.3	142.6	241	1383	1328.7	1429	1517.6	48	2	16
54	1675	135.0	147.7	238	1435	1379.5	1480	1578.0	48	2	16
56	1765	152.4	155.4	267	1494	1430.3	1537	1651.0	36	2 3/8	17
58	1825	152.4	160.4	273	1548	1481.1	1594	1712.9	40	2 3/8	17
60	1880	149.3	165.1	270	1599	1531.9	1651	1763.7	40	2 3/8	17

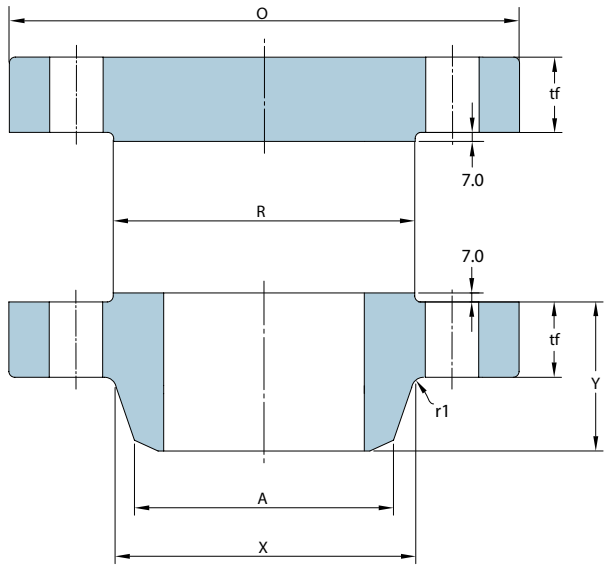
Notes:

(1) The minimum flange thickness does not include the raised face thickness.

(2) This dimension is for the large end of hub, which may be straight or tapered.

(3) For welding and bevel, see page 80.

CLASS 400 FLANGES



Raised Face

ASME B16.47 Ser.B FORGED FLANGES

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange, O	Minimum Thickness of Flange, tf [Note (1)]		Length Through Hub, Y	Diam. Of Hub, X [Note (2)]	Hub Diam. Top, A [Note (3)]	Raised Face Diam, R	Drilling			Minimum Fillet Radius, r1
		WNF	Blind					Diam. Of Bolt Circle	No. of Bolt Holes	Diam. Of Bolt Hole, in.	
26	850	88.9	88.9	149	689	660.4	711	781.0	28	1½	11
28	915	95.3	95.3	159	740	711.2	762	838.2	24	1⅝	13
30	970	101.6	101.6	170	794	762.0	819	895.4	28	1⅝	13
32	1035	108.0	108.0	179	845	812.8	873	952.5	28	1¾	13
34	1085	111.2	111.2	187	899	863.6	927	1003.3	32	1¾	14
36	1155	119.1	119.1	200	952	914.4	981	1066.8	28	1⅞	14
38	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
42	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
44	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
48	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
52	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
54	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
56	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
58	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

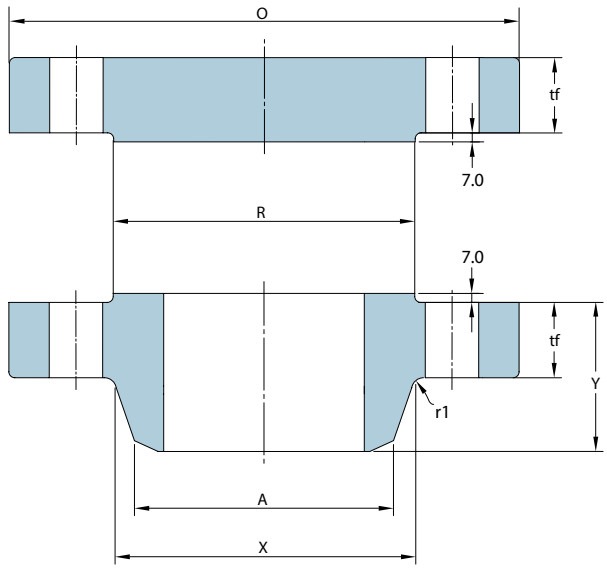
Notes:

(1) The minimum flange thickness does not include the raised face thickness.

(2) This dimension is for the large end of hub, which may be straight or tapered.

(3) For welding and bevel, see page 80.

CLASS 600 FLANGES



Raised Face

ASME B16.47 Ser.B FORGED FLANGES

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange, O	Minimum Thickness of Flange, tf [Note (1)]		Length Through Hub, Y	Diam. of Hub, X [Note (2)]	Hub Diam. Top, A [Note (3)]	Raised Face Diam, R	Drilling			Minimum Fillet Radius, r1
		WNF	Blind					Diam. Of Bolt Circle	No. of Bolt Holes	Diam. Of Bolt Hole, in.	
26	890	111.2	111.3	181	698	660.4	727	806.4	28	1¾	13
28	950	115.9	115.9	190	752	711.2	784	863.6	28	1⅞	13
30	1020	125.5	127.0	205	806	762.0	841	927.1	28	2	13
32	1085	130.2	134.9	216	860	812.8	895	984.2	28	2⅛	13
34	1160	141.3	144.2	233	914	863.6	953	1054.1	24	2⅜	14
36	1215	146.1	150.9	243	968	914.4	1010	1104.9	28	2⅜	14
38	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
42	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
44	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
48	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
52	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
54	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
56	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
58	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

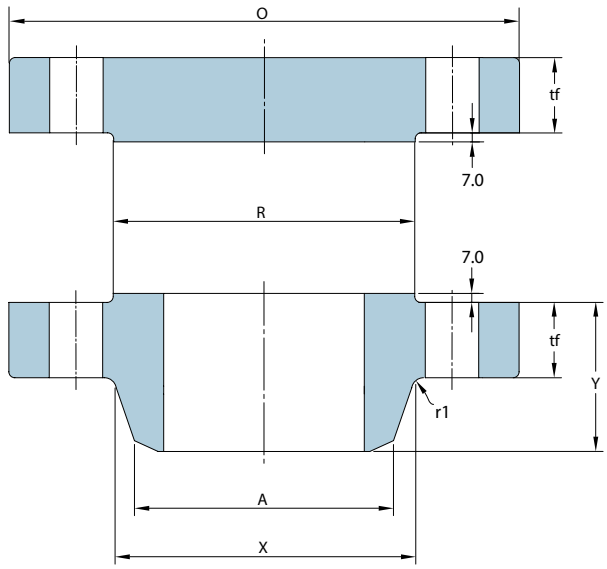
Notes:

(1) The minimum flange thickness does not include the raised face thickness.

(2) This dimension is for the large end of hub, which may be straight or tapered.

(3) For welding and bevel, see page 80.

CLASS 900 FLANGES



Raised Face

ASME B16.47 Ser.B FORGED FLANGES

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange, O	Minimum Thickness of Flange, tf [Note (1)]		Length Through Hub, Y	Diam. Of Hub, X [Note (2)]	Hub Diam. Top, A [Note (3)]	Raised Face Diam, R	Drilling			Minimum Fillet Radius, r1
		WNF	Blind					Diam. Of Bolt Circle	No. of Bolt Holes	Diam. Of Bolt Hole, in.	
26	1020	135.0	154.0	259	743	660.4	762	901.7	20	2⅝	11
28	1105	147.7	166.7	276	797	711.2	819	971.6	20	2⅞	13
30	1180	155.6	176.1	289	851	762.0	876	1035.0	20	3⅛	13
32	1240	160.4	186.0	303	908	812.8	927	1092.2	20	3⅛	13
34	1315	171.5	195.0	319	962	863.6	991	1155.7	20	3⅜	14
36	1345	173.1	201.7	325	1016	914.4	1029	1200.2	24	3⅛	14
38	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
42	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
44	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
48	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
52	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
54	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
56	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
58	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Notes:

(1) The minimum flange thickness does not include the raised face thickness.

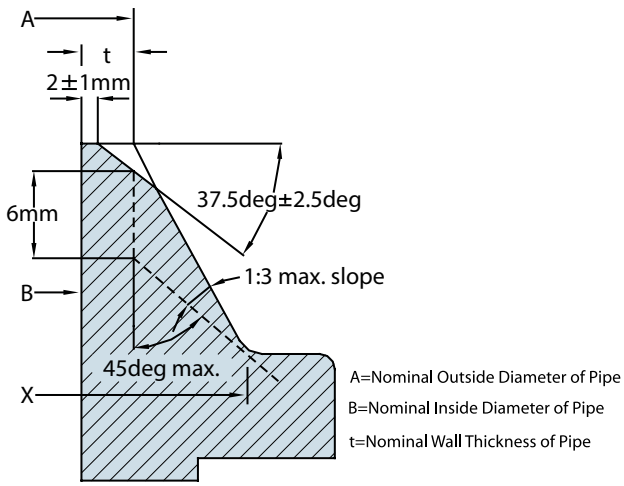
(2) This dimension is for the large end of hub, which may be straight or tapered.

(3) For welding and bevel, see page 80.

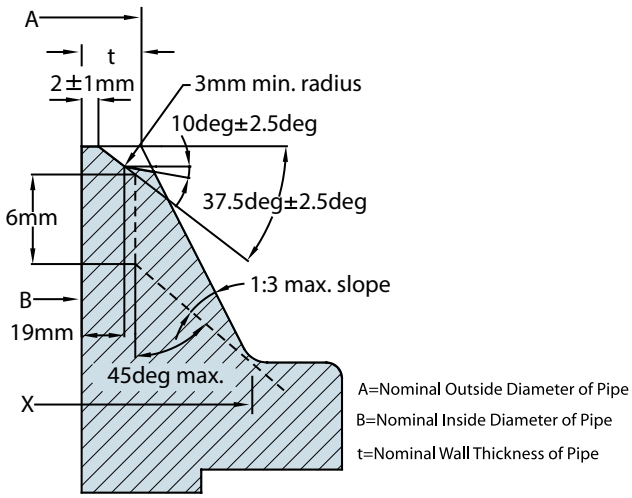
WELDING ENDS

1. ASME B16.47 Ser.A, B FORGED FLANGES

(a) Bevel for Wall Thickness t
From 5mm to 22mm Inclusive



(b) Bevel for Wall Thickness t
Greater than 22mm



2. TOLERANCE

Outside Diameter (O)		± 3.0 mm (*)
Bore (B)	Fig. 1 (No Backing Ring)	+ 3.0 mm, - 2.0 mm
	Fig. 2 (Backing Ring)	+ 0.0 mm, - 2.0 mm
Diameter of Contact Face (R)		± 2.0 mm
(2.0 mm) raised face	Height	± 0.5 mm
(7.0 mm) raised face	Height	± 2.0 mm
Diameter of Hub at base (X)		± 3.0 mm (*)
Hub Thickness		87.5 %(min), 12.5 %
Diameter of Hub at Point of Welding (A)		+ 5.0 mm, - 2.0 mm
Drilling	Bolt Circle	± 1.5 mm
	Bolt Hole Spacing	± 0.8 mm
Thickness (tf)	t ≤ 25 mm	+ 3.0, - 0.0 mm
	25 < t ≤ 50 mm	+ 5.0, - 0.0 mm
	50 < t ≤ 75 mm	+ 8.0, - 0.0 mm
	t >75mm	+ 10.0, - 0.0 mm
Length Thru Hub (Y)		+ 3.0 mm, - 5.0 mm
Ring joint facing	E (Depth)	+ 0.4, - 0.0 mm
	F (Width)	± 0.2 mm
	P (Pitch)	± 0.13 mm
	R (Radius at bottom)	Radius ≤ 2 : + 0.8, -0.0 mm Radius ≥ 2 : ± 0.8 mm
	23deg angle	± 0.5°

Notes:

(1) Flanges shall have bearing surfaces for bolting that are parallel to the flange face within 1 degree. Any back facing or spot facing required to accomplish parallelism between the flange face and nut bearing surface on the back of the flange shall not reduce the flange thickness.

(2) Tolerances for the welding end of a welding neck flange shall be in conformance with ASME B16.25.

(3) Other tolerances than specified the table shall be in accordance with ASME B16.5.

(4) The flange shall be either back-faced on spot-faced at the bolt-holes on the flange back if the nut bearing surface at the back of the flange is not parallel with the flange face within the tolerances listed in Note(1), if the fillet at the hub interferes with the nut bearing surface or if the flange thickness exceeds the minimum required thickness by more than 0.19 inch (4.8 millimeters). The nut bearing surface is the spot-facing diameter at the bolt-holes as given in MSS SP-9. Spot-facing shall be in accordance with MSS SP-9.

(5) Tolerance marked * are not covered in ASME B16.47 Ser.A.

* : Tolerance shall be in accordance with Kofco STD.

AWWA FLANGES

GENERAL SPECIFICATIONS
TABLE 2
TABLE 3
TABLE 4
TABLE 5
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GENERAL SPECIFICATIONS

AWWA C207 FLANGES

1. Standard Finishes for Contact Face of AWWA Flanges

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

2. Dimensional Tolerances for AWWA Flanges

Dimension		Tolerance
Bore		+1.6 -0
Outside diameter		±3.2
Tickness	18 in. and smaller	+3.2 -0
	20 in. and larger	+4.8 -0
Length through hub	18 in. and smaller	+3.2 - 0.79
	20 in. and larger	+4.8 -1.6
Bolt circle diameter		±1.6
Bolt-hole spacing		±0.79

Note: For other dimensional tolerances, see page 61.

3. Bolting

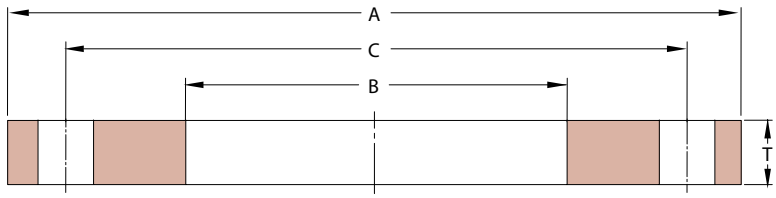
Bolts and nuts shall be carbon steel ASTM A307, Grades A or B. Bolts shall have regular unfinished square or hexagonal heads, and nuts shall have regular square or hexagonal Shapes all in accordance with ASME B18.21 for wrench head bolts and nuts wrench openings. All bolts and nuts shall be threaded in accordance with ASME B1.1 for screwy threads, coarse-thread series, Class 2A and 2B fit.

4. Gaskets

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

TABLE 2

AWWA STANDARD STEEL-RING FLANGES, CLASS B*(86psi) AND CLASS D†(175-150psi)



AWWA C207

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange	I.D. of Flange	Number of Bolts	Diam. of Bolts Circle	Diam of Bolts Hole	Thickness of Flange	
						Class B	Class D
	A	B †		C		T	T
4	228.6	116.1	8	190.5	19.1	15.9	15.9
5	254.0	143.8	8	215.9	22.2	15.9	15.9
6	279.4	170.7	8	241.3	22.2	17.5	17.5
8	342.9	221.5	8	298.5	22.2	17.5	17.5
10	406.4	276.4	12	362.0	25.4	17.5	17.5
12	482.6	327.2	12	431.8	25.4	17.5	20.6
14	533.4	360.4	12	476.3	28.6	17.5	23.8
16	596.9	411.2	16	539.8	28.6	17.5	25.4
18	635.0	462.0	16	577.9	31.8	17.5	27
20	698.5	512.8	20	635.0	31.8	17.5	28.6
22	749.3	563.6	20	692.2	34.9	19.1	30.2
24	812.8	614.4	20	749.3	34.9	19.1	31.8
26	870.0	*665.2	24	806.5	34.9	20.6	33.3
28	927.1	*716.0	28	863.6	34.9	22.2	33.3
30	984.3	*766.8	28	914.4	34.9	22.2	34.9
32	1060.5	*817.6	28	977.9	41.1	23.8	38.1
34	1111.3	*868.4	32	1028.7	41.1	23.8	38.1
36	1168.4	*919.2	32	1085.9	41.1	25.4	41.3
38	1238.3	*970.0	32	1149.4	41.1	25.4	41.3
40	1289.1	*1020.8	36	1200.2	41.1	25.4	41.3
42	1346.2	*1071.6	36	1257.3	41.1	28.6	44.5
44	1403.4	*1122.4	40	1314.5	41.1	28.6	44.5
46	1454.2	*1173.2	40	1365.3	41.1	28.6	44.5
48	1511.3	*1224.0	44	1422.4	41.1	31.8	47.6
50	1568.5	*1274.8	44	1479.6	47.6	31.8	50.8
52	1625.6	*1325.6	44	1536.7	47.6	31.8	50.8
54	1682.8	*1376.4	44	1593.9	47.6	34.9	54
60	1854.2	*1528.8	52	1759.0	47.6	38.1	57.2
66	2032.0	*1681.2	52	1930.4	47.6	41.3	63.5
72	2197.1	*1833.6	60	2095.5	47.6	44.5	66.7
78	2362.2	*1986.0	64	2260.6	54	50.8	69.9
84	2533.7	*2138.4	64	2425.7	54	50.8	73
90	2705.1	*2290.8	68	2590.8	61.9	57.2	76.2
96	2876.6	*2443.2	68	2755.9	61.9	57.2	82.6
102	3048.0	*2595.6	72	2908.3	68.3	63.5	82.6
108	3219.5	*2748.0	72	3067.1	68.3	63.5	85.7
114	3390.9	*2900.4	76	3219.5	74.6	69.9	88.9
120	3562.4	*3052.8	76	3371.9	74.6	69.9	88.9
126	3733.8	*3205.2	80	3537.0	81	76.2	95.3
132	3905.3	*3357.6	80	3702.1	81	76.2	98.4
138	4076.7	*3510.0	84	3860.8	87.3	82.6	101.6
144	4248.2	*3662.4	84	4019.6	87.3	82.6	104.8

Notes:

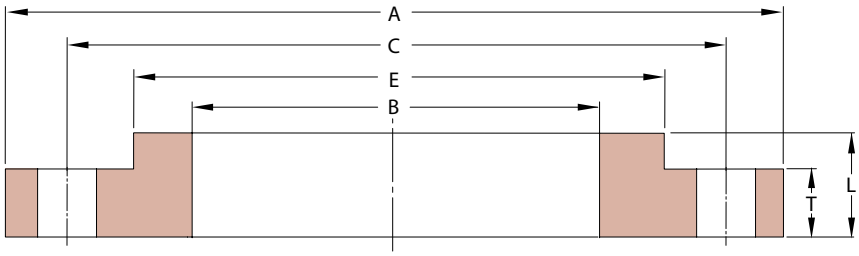
(1) Ring flanges may be over-bored or counter bored to accommodate larger outside-diameter pipe than shown as nominal. This is done to allow a clear inside diameter after cement-mortar lining. Wrench clearance between the pipe O.D. and bolt circle must be maintained as well as sufficient gasket seating area.

(2) Metric conversion: nominal pipe size: in. x 25=mm; dimensions: in. x 25.4=mm; psi x 6.895=kPa

- Pressure rating at atmospheric temperature is 86 psi. These flanges have the same O.D. and drilling as class 125 cast-iron flanges (ANSI/ASME B16.1). In sizes 24 in. and smaller, they also match ANSI/ASME B16.5 150 psi drilling for steel flanges.
- Pressure rating at atmospheric temperature: sizes 4-12 in. inclusive, 175 psi; sizes larger than 12 in., 150 psi. These flanges have the same diameter and drilling as class 125 cast-Iron flanges (ANSI/ASME B16.1). In sizes 24 in. and smaller, they also match ANSI/ASME B16.5 150-psi standard for steel flanges.
- The purchaser shall specify the ID of the flange, dimension B, for nominal pipe sizes 26 in. and larger. The diameter of the flange bore shall not exceed the pipe O.D. by more than 0.19 In.
- Bolt holes shall be drilled in ⅛ in. for larger in diameter than the nominal diameter of the bolt except as stated in Sec. 4.2.3.

TABLE 3

AWWA STANDARD STEEL-HUB FLANGES, CLASS D*(175-150psi)



AWWA C207

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange	I.D. of Flange	Number of Bolts	Diam. of Bolts Circle	Diam of Bolts Hole	Flanges Dimensions		
	A	B		C		T	L	E
4	228.6	116.1	8	190.5	19.1	12.7	22.2	134.9
5	254.0	143.8	8	215.9	22.2	14.3	31.8	160.3
6	279.4	170.7	8	241.3	22.2	14.3	31.8	192.1
8	342.9	221.5	8	298.5	22.2	14.3	31.8	246.1
10	406.4	276.4	12	362.0	25.4	17.5	31.8	304.8
12	482.6	327.2	12	431.8	25.4	17.5	31.8	365.1
14	533.4	360.4	12	476.3	28.6	19.1	31.8	400.1
16	596.9	411.2	16	539.8	28.6	19.1	31.8	457.2
18	635.0	462.0	16	577.9	31.8	19.1	31.8	504.8
20	698.5	512.8	20	635.0	31.8	19.1	31.8	558.8
22	749.3	563.6	20	692.2	34.9	25.4	44.5	616.0
24	812.8	614.4	20	749.3	34.9	25.4	44.5	663.6
26	870.0	665.2	24	806.5	34.9	25.4	44.5	723.9
28	927.1	716.0	28	863.6	34.9	25.4	44.5	774.7
30	984.3	766.8	28	914.4	34.9	25.4	44.5	825.5
32	1060.5	817.6	28	977.9	41.1	28.6	44.5	882.7
34	1111.3	868.4	32	1028.7	41.1	28.6	44.5	933.5
36	1168.4	919.2	32	1085.9	41.1	28.6	44.5	984.3
38	1238.3	970.0	32	1149.4	41.1	28.6	44.5	1035.1
40	1289.1	1020.8	36	1200.2	41.1	28.6	44.5	1092.2
42	1346.2	1071.6	36	1257.3	41.1	31.8	44.5	1143.0
44	1403.4	1122.4	40	1314.5	41.1	31.8	57.2	1193.8
46	1454.2	1173.2	40	1365.3	41.1	31.8	57.2	1244.6
48	1511.3	1224.0	44	1422.4	41.1	34.9	63.5	1295.4
50	1568.5	1274.8	44	1479.6	47.6	34.9	63.5	1346.2
52	1625.6	1325.6	44	1536.7	47.6	34.9	63.5	1397.0
54	1682.8	1376.4	44	1593.9	47.6	34.9	63.5	1447.8
60	1854.2	1528.8	52	1759.0	47.6	38.1	69.9	1600.2
66	2032.0	1681.2	52	1930.4	47.6	38.1	69.9	1752.6
72	2197.1	1833.6	60	2095.5	47.6	38.1	69.9	1905.0
78	2362.2	1986.0	64	2260.6	54	44.5	76.2	2063.8
84	2533.7	2138.4	64	2425.7	54	44.5	76.2	2222.5
90	2705.1	2290.8	68	2590.8	61.9	50.8	82.6	2381.3
96	2876.6	2443.2	68	2755.9	61.9	50.8	82.6	2540.0

Notes:

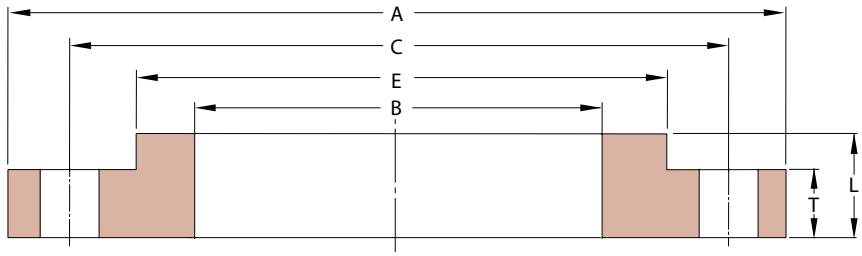
(1) Hub flanges are to be used on pipe that has an O.D. equal to the nominal pipe size in the first column and shall not be over-bored.

(2) Metric conversion: nominal pipe size: in. x 25=mm; dimensions: in. x 25.4=mm; psi x 6.895=kPa

- Pressure rating at atmospheric temperature: sizes 4-12 in. inclusive, 175 psi; sizes larger than 12 in., 150 psi. These flanges have the same diameter and drilling as class 125 cast-Iron flanges (ANSI/ASME B16.1). In sizes 24 in. and smaller, they also match ANSI/ASME B16.5 150-psi standard for steel flanges.
- Bolt holes shall be drilled ⅛-in. larger in diameter than the nominal diameter of the bolt except as stated in Sec. 4.2.3.

TABLE 4

AWWA STANDARD STEEL-HUB FLANGES, CLASS E*(275psi)



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(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange	I.D. of Flange	Number of Bolts	Diam. of Bolts Circle	Diam of Bolts Hole	Flanges Dimensions		
	A	B †		C		T	L	E
4	228.6	116.1	8	190.5	19.1	23.8	33.3	134.9
5	254.0	143.8	8	215.9	22.2	23.8	36.5	163.5
6	279.4	170.7	8	241.3	22.2	25.4	39.7	192.1
8	342.9	221.5	8	298.5	22.2	28.6	44.5	246.1
10	406.4	276.4	12	362.0	25.4	30.2	49.2	304.8
12	482.6	327.2	12	431.8	25.4	31.8	55.6	365.1
14	533.4	360.4	12	476.3	28.6	34.9	57.2	400.1
16	596.9	411.2	16	539.8	28.6	36.5	63.5	457.2
18	635.0	462.0	16	577.9	31.8	39.7	68.3	504.8
20	698.5	512.8	20	635.0	31.8	42.9	73.0	558.8
22	749.3	563.6	20	692.2	34.9	46.0	79.4	609.6
24	812.8	614.4	20	749.3	34.9	47.6	82.6	663.6
26	870.0	665.2	24	806.5	34.9	50.8	85.7	723.9
28	927.1	716.0	28	863.6	34.9	52.4	87.3	781.1
30	984.3	766.8	28	914.4	34.9	54.0	88.9	831.9
32	1060.5	817.6	28	977.9	41.1	57.2	92.1	889.0
34	1111.3	868.4	32	1028.7	41.1	58.7	93.7	939.8
36	1168.4	919.2	32	1085.9	41.1	60.3	95.3	997.0
38	1238.3	970.0	32	1149.4	41.1	60.3	95.3	1060.5
40	1289.1	1020.8	36	1200.2	41.1	63.5	98.4	1111.3
42	1346.2	1071.6	36	1257.3	41.1	66.7	101.6	1168.4
44	1403.4	1122.4	40	1314.5	41.1	66.7	101.6	1219.2
46	1454.2	1173.2	40	1365.3	41.1	68.3	103.2	1270.0
48	1511.3	1224.0	44	1422.4	41.1	69.9	104.8	1327.2
50	1568.5	1274.8	44	1479.6	47.6	69.9	104.8	1378.0
52	1625.6	1325.6	44	1536.7	47.6	73.0	108.0	1435.1
54	1682.8	1376.4	44	1593.9	47.6	76.2	111.1	1492.3
60	1854.2	1528.8	52	1759.0	47.6	79.4	114.3	1657.4
66	2032.0	1681.2	52	1930.4	47.6	85.7	123.8	1816.1
72	2197.1	1833.6	60	2095.5	47.6	88.9	127.0	1993.9
78	2362.2	1986.0	64	2260.6	54	98.4	136.5	2146.3
84	2533.7	2138.4	64	2425.7	54	98.4	136.5	2298.7
90	2705.1	2290.8	68	2590.8	61.9	108.0	146.1	2457.5
96	2876.6	2443.2	68	2755.9	61.9	108.0	146.1	2609.9

Notes:

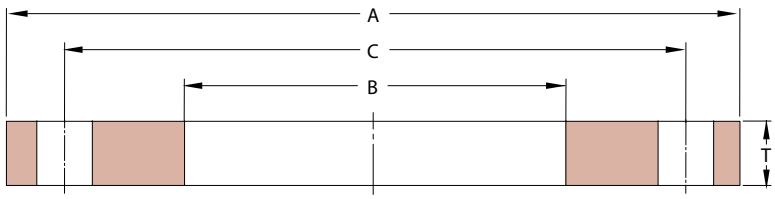
(1) Hub flanges are to be used on pipe that has an O.D. equal to the nominal pipe size in the first column and shall not be over-bored.

(2) Metric conversion: nominal pipe size: in. x 25=mm; dimensions: in. x 25.4=mm; psi x 6.895=kPa

- Pressure rating at atmospheric temperature is 275 psi. These flanges have the same diameter and drilling as ANSI B16.1, class 125 cast-iron flanges. In sizes 24 in. and smaller, they also match ANSI B16.5, 150 psi standard for steel flanges.
- Welding neck flanges may be used if desired, at the purchaser's option.
- Bolt holes shall be drilled in ⅛-in. for larger in diameter than the nominal diameter of the bolt except as stated in Sec. 4.2.3.
- The thickness T of a flange from which the raised face has been removed, shall be no less than Dimension T minus 0.06 in.

TABLE 5

AWWA STANDARD STEEL-RING FLANGES, CLASS E*(275psi)



AWWA C207

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange	I.D. of Flange	Number of Bolts	Diam. of Bolts Circle	Diam of Bolts Hole	Thickness of Flanges
	A	B †		C		T
4	228.6	116.1	8	190.5	19.1	28.6
5	254.0	143.8	8	215.9	22.2	30.2
6	279.4	170.7	8	241.3	22.2	33.4
8	342.9	221.5	8	298.5	22.2	38.1
10	406.4	276.4	12	362.0	25.4	39.7
12	482.6	327.2	12	431.8	25.4	44.5
14	533.4	360.4	12	476.3	28.6	47.6
16	596.9	411.2	16	539.8	28.6	50.8
18	635.0	462.0	16	577.9	31.8	54
20	698.5	512.8	20	635.0	31.8	60.3
22	749.3	563.6	20	692.2	34.9	63.5
24	812.8	614.4	20	749.3	34.9	66.7
26	870.0	*665.2	24	806.5	34.9	69.9
28	927.1	*716.0	28	863.6	34.9	69.9
30	984.3	*766.8	28	914.4	34.9	73
32	1060.5	*817.6	28	977.9	41.1	76.2
34	1111.3	*868.4	32	1028.7	41.1	76.2
36	1168.4	*919.2	32	1085.9	41.1	79.4
38	1238.3	*970.0	32	1149.4	41.1	79.4
40	1289.1	*1020.8	36	1200.2	41.1	82.6
42	1346.2	*1071.6	36	1257.3	41.1	85.7
44	1403.4	*1122.4	40	1314.5	41.1	85.7
46	1454.2	*1173.2	40	1365.3	41.1	87.3
48	1511.3	*1224.0	44	1422.4	41.1	88.9
50	1568.5	*1274.8	44	1479.6	47.6	88.9
52	1625.6	*1325.6	44	1536.7	47.6	92.1
54	1682.8	*1376.4	44	1593.9	47.6	95.3
60	1854.2	*1528.8	52	1759.0	47.6	98.4
66	2032.0	*1681.2	52	1930.4	47.6	108
72	2197.1	*1833.6	60	2095.5	47.6	111.1
78	2362.2	*1986.0	64	2260.6	54	120.7
84	2533.7	*2138.4	64	2425.7	54	120.7
90	2705.1	*2290.8	68	2590.8	61.9	130.2
96	2876.6	*2443.2	68	2755.9	61.9	130.2
102	3048.0	*2595.6	72	2908.3	68.3	139.7
108	3219.5	*2748.0	72	3067.1	68.3	139.7
114	3390.9	*2900.4	76	3219.5	74.6	149.2
120	3562.4	*3052.8	76	3371.9	74.6	149.2
126	3733.8	*3205.2	80	3537.0	81	158.8
132	3905.3	*3357.6	80	3702.1	81	158.8
138	4076.7	*3510.0	84	3860.8	87.3	171.5
144	4248.2	*3662.4	84	4019.6	87.3	171.5

Notes:

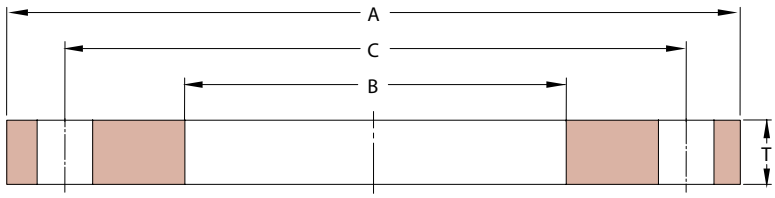
(1) Ring flanges may be over-bored or counter bored to accommodate larger outside-diameter pipe than shown as nominal. This is done to allow a clear inside diameter after cement-mortar lining. Wrench clearance between the pipe O.D. and bolt circle must be maintained as well as sufficient gasket seating area.

(2) Metric conversion: nominal pipe size: in. x 25=mm; dimensions: in. x 25.4=mm; psi x 6.895=kPa

- Pressure rating at atmospheric temperature is 275 psi. These flanges have the same diameter and drilling as ANSI B16.1, class 125 cast-iron flanges. In sizes 24 in. and smaller, they also match ANSI B16.5, 150-psi standard for steel flanges.
- The purchaser shall specify the I.D. of the flange, dimension B, for nominal pipe sizes 26 in. and larger. It is recommended that this dimension be 3⁄16 in. larger in diameter than the nominal O.D. of the pipe.
- Bolt holes shall be drilled in 1⁄8 in. for larger in diameter than the nominal diameter of the bolt except as stated in Sec. 4.2.3.

TABLE 6

AWWA STANDARD STEEL-RING FLANGES, CLASS F*(300psi)



AWWA C207

(Dimensions in mm)

Nominal Pipe Size	O.D. of Flange	I.D. of Flange	Number of Bolts	Diam. of Bolts Circle	Diam of Bolts Hole	Thickness of Flange
	A	B		C		T
4	254.0	115.1	8	200.2	22.2	28.7
5	279.4	143.8	8	235.0	22.2	30.7
6	317.5	170.9	12	269.7	22.2	33.3
8	381.0	221.7	12	330.2	25.4	33.3
10	444.5	276.4	16	387.4	28.6	38.1
12	520.7	327.2	16	450.9	31.8	41.4
14	584.2	360.4	20	514.4	31.8	49.3
16	647.7	411.2	20	571.5	34.9	54.4
18	711.2	462.0	24	628.7	34.9	57.2
20	774.7	512.8	24	685.8	34.9	59.2
22	838.2	563.6	24	743.0	34.9	63.5
24	914.4	614.4	24	812.8	41.1	68.3
26	971.6	666.8	28	876.3	47.6	76.2
28	1035.1	717.6	28	939.8	47.6	79.5
30	1092.2	768.4	28	997.0	47.6	80.0
32	1149.4	819.2	28	1054.1	47.6	82.6
34	1206.5	870.0	28	1104.9	47.6	85.9
36	1270.0	920.8	32	1168.4	54	87.9
38	1327.2	971.6	32	1219.2	54	88.9
40	1378.0	1022.4	36	1276.4	54	92.2
42	1447.8	1073.2	36	1339.9	54	96.8
44	1505.0	1124.0	36	1397.0	54	101.6
46	1562.1	1174.8	40	1454.2	54	104.9
48	1651.0	1225.6	40	1543.1	54	114.3

Notes:

(1) Ring flanges may be over-bored or counter bored to accommodate larger outside-diameter pipe than shown as nominal. This is done to allow a clear inside diameter after cement-mortar lining. Wrench clearance between the pipe O.D. and bolt circle must be maintained as well as sufficient gasket seating area.

(2) Metric conversion: nominal pipe size: in. x 25=mm; dimensions: in. x 25.4=mm; psi x 6.895=kPa

- Pressure rating at atmospheric temperature is 300 psi. These flanges have the same diameter and drilling as ANSI B16.2, class 250 cast iron pipe and flanged fittings.psi standard for steel flanges.
- Bolt holes shall be drilled in ⅛ in. for larger in diameter than the nominal diameter of the bolt except as stated in Sec. 4.2.3.

TABLE 7

AWWA BLIND FLANGES THICKNESS

AWWA C207

(Dimensions in mm)

Nominal Pipe Size		Minmum Thickness*				
		Mating Flange I.D.	Class B	Class D †	Class E	Class F
			86psi	....	275psi	300psi
in	mm	mm	mm	mm	mm	mm
4	100	116	15.88	15.88	28.58	28.70
5	125	144	15.88	16.51	30.18	30.73
6	150	171	17.48	17.59	33.35	33.27
8	200	221	17.48	20.62	38.10	33.27
10	250	276	17.48	24.21	39.70	38.10
12	300	327	18.26	28.37	44.45	41.40
14	350	360	20.10	28.78	47.63	49.28
16	400	411	22.66	32.13	50.80	54.36
18	450	462	24.13	33.81	53.98	57.15
20	500	513	26.42	36.77	60.33	59.18
22	550	564	28.74	39.83	63.50	63.50
24	600	648	30.89	42.18	66.68	68.53
26	650	699	33.20	45.37	69.85	76.20
28	700	749	35.50	48.40	69.85	79.50
30	750	800	37.53	51.00	73.03	80.42
32	800	851	40.16	54.60	76.20	84.62
34	850	902	42.19	57.21	77.46	88.25
36	900	956	44.48	60.20	81.51	93.25
38	950	1,006	47.06	63.66	86.20	96.90
40	1,000	1,057	49.09	66.28	89.74	101.40
42	1,050	1,108	51.40	69.32	93.86	105.92
44	1,100	1,159	53.70	72.36	97.97	110.19
46	1,150	1,210	55.73	74.99	101.53	114.43
48	1,200	1,260	58.03	78.03	105.65	121.44
50	1,250	1,314	60.38	81.17	109.90	
52	1,300	1,365	62.69	84.21	114.02	
54	1,350	1,416	64.99	87.25	118.14	
60	1,500	1,568	71.63	95.97	129.95	
66	1,650	1,724	78.53	105.06	142.26	
72	1,800	1,876	85.17	113.80	154.08	

Notes:

(1) All flanges are flat faced.

(2) ASTM A-36 steel used (allowable stress 16,000 psi)

(3) ASTM A-307 Grade B bolts (7,000 psi allowable stress) used for class B and D.

(4) ASTM A-193 Grade B7 bolts (25,000 psi allowable stress) used for class E and F.

(5) For diameters over 48 in. designers should consider using dished heads welded to a standard flange.

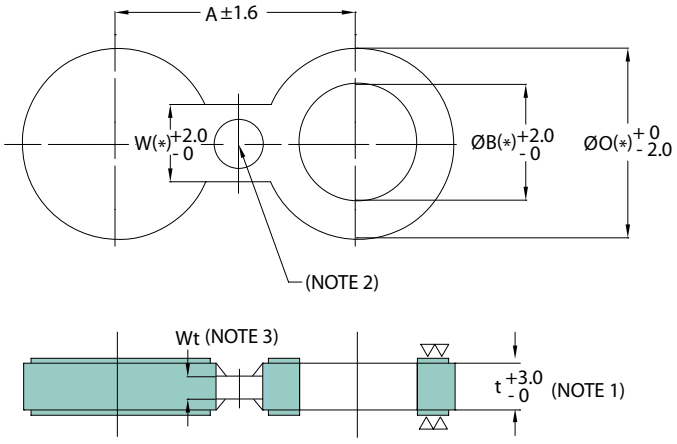
- Design Method: ASME Boiler & Pressure Vessel code, Sec. VIII, Div. 1.
- Class D flanges are rated at 175 psi (1,207 kPa) for nominal pipe sizes ≤ 12 in. (600 mm), and 150 psi (1,034 kPa) for nominal pipe sizes > 12 in. (600 mm)

FIGURE 8 BLANKS, PADDLE SPACERS & BLANKS

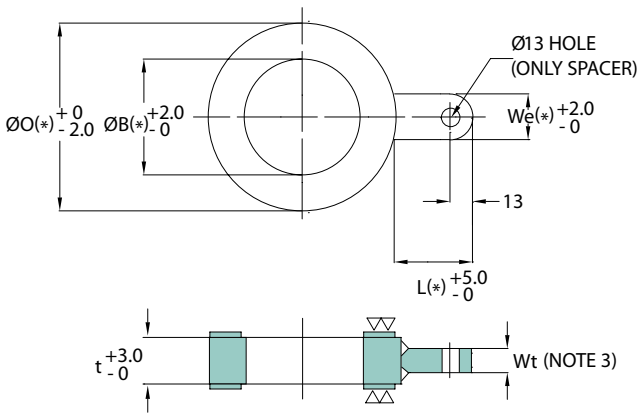
TABLE 1

CLASS 150 RAISED FACE FIGURE 8 BLANKS (ASME B16.48)

FIGURE 8 BLANKS



PADDLE SPACERS & BLANKS



(Dimensions in mm)

Dimensions of Class 150 Raised Face Figure 8 Blanks								B16.48 Weight (kg)		
NPS	B	O	A	t	W	L	We	Spacer	Blank	Spec'
½	16	45	60	3.0	38	100	25	0.1	0.1	0.2
¾	21	54	70	3.0	38			0.1	0.1	0.2
1	27	64	80	3.0	38			0.2	0.2	0.3
1 ¼	42	73	90	6.4	38			0.2	0.2	0.4
1 ½	48	83	100	6.4	38			0.2	0.3	0.5
2	61	102	120	6.4	51			0.3	0.5	0.8
2 ½	73	107	140	6.4	51	125		0.4	0.6	1.1
3	89	133	150	6.4	64			0.4	0.8	1.2
3 ½	102	159	175	9.7	64		38	1.1	1.7	2.8
4	114	172	190	9.7	64			1.2	2.0	3.2
5	141	194	215	9.7	76			1.5	3.2	4.7
6	168	219	240	12.7	76	150		1.8	4.3	6.1
8	219	276	300	12.7	76			2.6	6.8	9.4
10	273	337	360	15.7	102			4.4	12.6	17.0
12	324	406	430	19.1	102	165		8.1	21.7	29.8
14	356	448	475	19.1	108			10.0	26.4	36.4
16	406	511	540	22.4	108	170		15.1	39.7	54.8
18	457	546	580	25.4	114			15.9	51.5	67.4
20	508	603	635	28.4	121	175		21.0	70.4	91.4
24	610	714	750	31.8	140			31.4	112.8	144.2

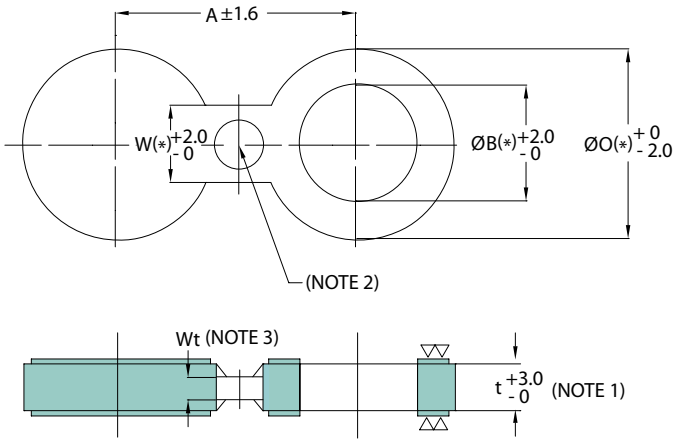
Notes:

1. Thickness (Dimensions) includes a corrosion of 0.05 inch (1.3 mm) for material groups 1.1, 1.7, 1.9, 1.10 and 1.12. Corrosion allowance is 0.0 inch for material groups 2.1, 2.2, 2.4 and 2.5.
2. Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole.
3. The thickness of the web (or the bar) dimension wt, shall be 0.25 inch (6.4 mm) minimum, except when is less than 0.25 inch, wt shall equal.
4. The gasket seating surface finish and dimensions for raised face line blanks shall be in accordance with ASME B16.5. A raised face may be specified at the option of the purchaser. The height of the raised faces shall add 2mm on "t".
5. * Tolerances shall be in accordance with Kofco STD.

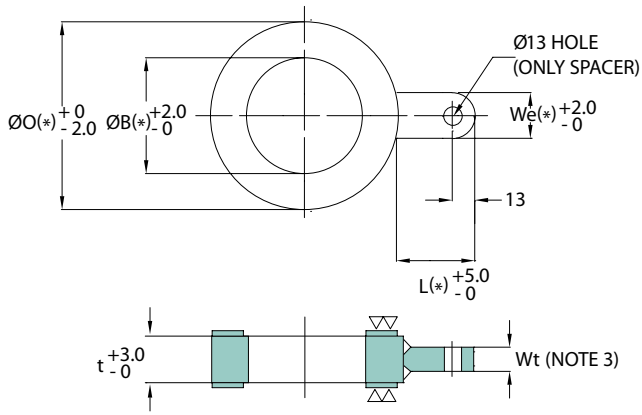
TABLE 2

CLASS 300 RAISED FACE FIGURE 8 BLANKS (ASME B16.48)

FIGURE 8 BLANKS



PADDLE SPACERS & BLANKS



(Dimensions in mm)

Dimensions of Class 300 Raised Face Figure 8 Blanks								B16.48 Weight (kg)		
NPS	B	O	A	t	W	L	We	Spacer	Blank	Spec'
½	16	51	65	6.4	38	100	25	0.1	0.1	0.2
¾	21	64	80	6.4	38			0.2	0.2	0.3
1	27	70	90	6.4	38			0.2	0.2	0.4
1 ¼	42	79	100	6.4	38			0.2	0.3	0.5
1 ½	48	92	115	6.4	38			0.3	0.4	0.7
2	61	108	125	9.7	51			0.6	0.8	1.4
2 ½	73	127	150	9.7	51	125		0.8	1.1	1.9
3	89	146	170	9.7	64			1.0	1.5	2.4
3 ½	102	162	185	12.7	64		38	1.5	2.4	3.8
4	114	178	200	12.7	64			1.7	2.8	4.6
5	141	213	235	15.7	76	150		2.8	4.8	7.6
6	168	248	270	15.7	76			3.8	6.8	10.6
8	219	305	330	22.4	76			7.1	14.1	21.2
10	273	359	385	25.4	102	165		9.7	22.3	31.9
12	324	419	450	28.4	102			14.1	34.0	48.1
14	356	483	515	31.8	108	170		24.3	51.6	75.9
16	406	536	570	38.1	108			33.4	75.8	109.2
18	457	594	630	41.1	114	175		42.0	100.0	142.0
20	508	651	685	44.5	121			51.9	128.9	180.8
24	610	772	810	50.8	140	180		81.3	210.2	291.4

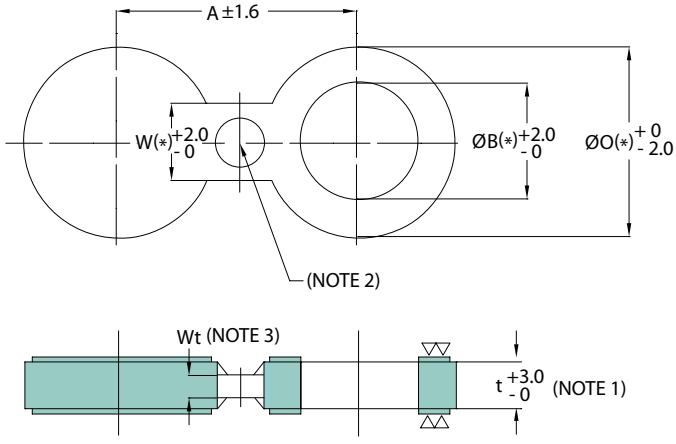
Notes:

1. Thickness (Dimensions) includes a corrosion of 0.05 inch (1.3 mm) for material groups 1.1, 1.7, 1.9, 1.10 and 1.12. Corrosion allowance is 0.0 inch for material groups 2.1, 2.2, 2.4 and 2.5.
2. Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole.
3. The thickness of the web (or the bar) dimension wt, shall be 0.25 inch (6.4 mm) minimum, except when is less than 0.25 inch, wt shall equal.
4. The gasket seating surface finish and dimensions for raised face line blanks shall be in accordance with ASME B16.5. A raised face may be specified at the option of the purchaser. The height of the raised faces shall add 2mm on "t".
5. * Tolerances shall be in accordance with Kofco STD.

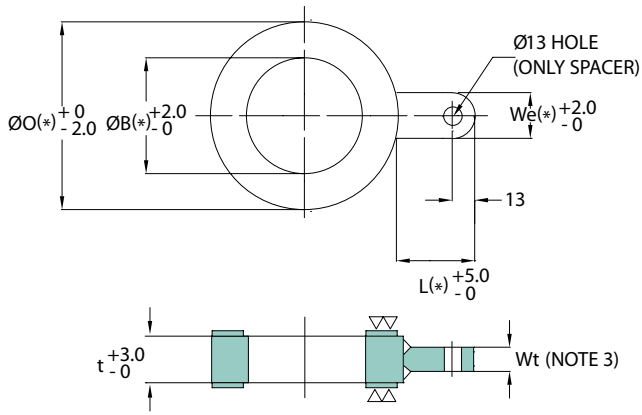
TABLE 3

CLASS 600 RAISED FACE FIGURE 8 BLANKS (ASME B16.48)

FIGURE 8 BLANKS



PADDLE SPACERS & BLANKS



(Dimensions in mm)

Dimensions of Class 600 Raised Face Figure 8 Blanks								B16.48 Weight (kg)		
NPS	B	O	A	t	W	L	We	Spacer	Blank	Spec'
½	16	51	65	6.4	38	100	25	0.1	0.1	0.2
¾	21	64	80	6.4	38			0.2	0.2	0.3
1	27	70	90	6.4	57			0.2	0.2	0.4
1 ¼	37	79	100	9.7	57			0.4	0.4	0.8
1 ½	43	92	115	9.7	67			0.5	0.6	1.1
2	55	108	125	9.7	57			0.6	0.8	1.4
2 ½	67	127	150	12.7	67	125		1.1	1.5	2.5
3	83	146	170	12.7	67			1.3	1.9	3.2
3 ½	96	159	185	15.7	76		38	1.8	2.8	4.6
4	108	191	215	15.7	76	150		2.8	4.0	6.9
5	135	238	265	19.1	86			5.2	7.3	12.5
6	162	264	290	22.4	86			7.6	10.6	18.2
8	212	318	350	28.4	95	165		12.7	19.6	32.3
10	265	397	430	35.1	105			26.1	41.4	67.5
12	315	454	490	41.1	105	170		31.2	58.4	89.6
14	346	489	525	44.5	114			37.4	72.7	110.1
16	397	562	605	50.8	124	175		66.8	115.4	182.2
18	448	610	655	53.8	133			75.9	138.9	204.8
20	497	679	725	63.5	133	180		97.5	204.0	301.5
24	597	787	840	73.2	152	185		136.6	312.6	449.2

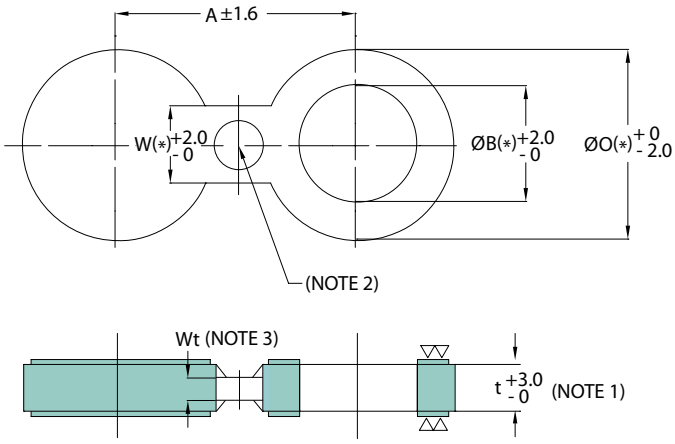
Notes:

1. Thickness (Dimensions) includes a corrosion of 0.05 inch (1.3 mm) for material groups 1.1, 1.7, 1.9, 1.10 and 1.12. Corrosion allowance is 0.0 inch for material groups 2.1, 2.2, 2.4 and 2.5.
2. Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole.
3. The thickness of the web (or the bar) dimension wt, shall be 0.25 inch (6.4 mm) minimum, except when is less than 0.25 inch, wt shall equal.
4. The gasket seating surface finish and dimensions for raised face line blanks shall be in accordance with ASME B16.5. A raised face may be specified at the option of the purchaser. The height of the raised faces shall add 7mm on "t".
5. * Tolerances shall be in accordance with Kofco STD.

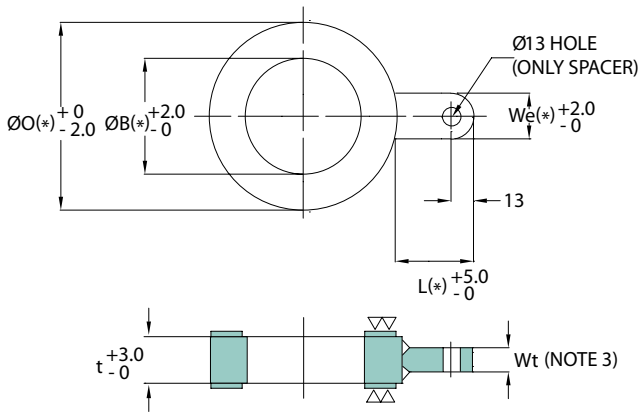
TABLE 4

CLASS 900 RAISED FACE FIGURE 8 BLANKS (ASME B16.48)

FIGURE 8 BLANKS



PADDLE SPACERS & BLANKS



(Dimensions in mm)

Dimensions of Class 900 Raised Face Figure 8 Blanks								B16.48 Weight (kg)		
NPS	B	O	A	t	W	L	We	Spacer	Blank	Spec'
½	16	60	80	6.4	38	100	25	0.2	0.2	0.3
¾	21	67	90	6.4	41			0.2	0.2	0.4
1	27	76	100	6.4	57			0.2	0.3	0.5
1 ¼	37	86	110	9.7	57			0.3	0.3	0.6
1 ½	43	95	125	9.7	67			0.5	0.6	1.1
2	55	140	165	12.7	57	125		1.5	1.8	3.3
2 ½	67	162	190	12.7	67			2.0	2.4	4.4
3	83	165	190	15.7	67	150	38	2.3	3.0	5.3
4	108	203	235	19.1	76			4.0	5.4	9.4
5	135	244	280	22.4	86			6.9	9.8	16.7
6	162	286	320	25.4	86	165		9.9	14.1	24.0
8	212	356	395	35.1	95			20.4	30.7	51.0
10	265	432	470	41.1	105	170		34.0	52.9	86.9
12	315	495	535	47.8	105			49.8	81.3	131.1
14	346	518	560	53.8	114	175		57.1	100.2	157.3
16	397	572	615	60.5	124			72.4	135.7	208.1
18	448	635	685	66.5	133	180		96.6	186.8	283.4
20	497	696	750	73.2	133	185		122.6	243.8	366.4
24	597	835	900	88.9	152	190		215.9	429.0	644.9

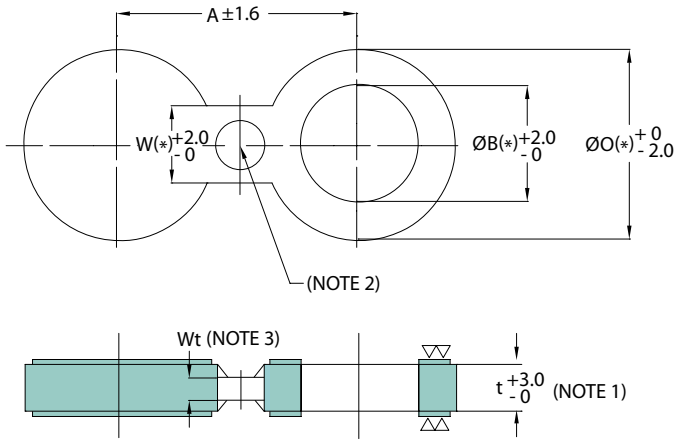
Notes:

1. Thickness (Dimensions) includes a corrosion of 0.05 inch (1.3 mm) for material groups 1.1, 1.7, 1.9, 1.10 and 1.12. Corrosion allowance is 0.0 inch for material groups 2.1, 2.2, 2.4 and 2.5.
2. Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole.
3. The thickness of the web (or the bar) dimension wt, shall be 0.25 inch (6.4 mm) minimum, except when is less than 0.25 inch, wt shall equal.
4. The gasket seating surface finish and dimensions for raised face line blanks shall be in accordance with ASME B16.5. A raised face may be specified at the option of the purchaser. The height of the raised faces shall add 7mm on "t".
5. * Tolerances shall be in accordance with Kofco STD.

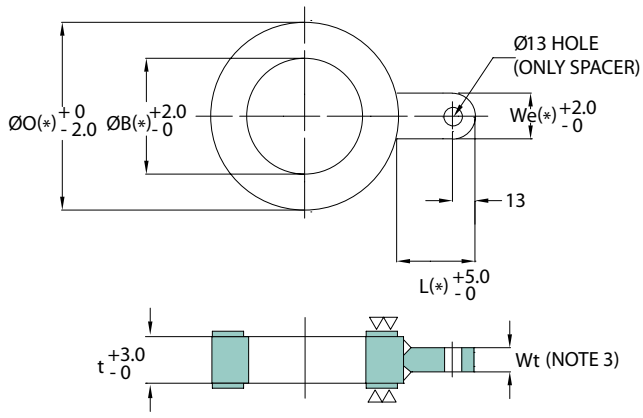
TABLE 5

CLASS 1500 RAISED FACE FIGURE 8 BLANKS (ASME B16.48)

FIGURE 8 BLANKS



PADDLE SPACERS & BLANKS



(Dimensions in mm)

Dimensions of Class 1500 Raised Face Figure 8 Blanks								B16.48 Weight (kg)		
NPS	B	O	A	t	W	L	We	Spacer	Blank	Spec'
½	16	61	80	6.4	38	100	25	0.2	0.2	0.3
¾	21	67	90	9.7	41			0.3	0.3	0.6
1	27	76	100	9.7	64			0.4	0.4	0.8
1 ¼	35	86	110	9.7	64			0.4	0.5	0.9
1 ½	41	95	125	12.7	70			0.7	0.8	1.5
2	53	140	165	12.7	70	125		1.6	1.8	3.3
2 ½	63	162	190	15.7	76			2.5	2.9	5.4
3	78	172	205	19.1	76	150	38	2.9	3.6	6.4
4	102	206	240	22.4	89			5.0	6.5	11.5
5	128	251	290	28.4	89	165		9.3	12.6	21.9
6	154	279	320	35.1	89			13.5	18.8	32.3
8	203	349	395	41.1	102	170		23.5	34.5	58.0
10	255	432	480	50.8	114			44.1	65.8	109.9
12	303	518	570	60.5	114	175		75.4	111.3	186.7
14	333	575	635	66.5	127			104.8	153.2	258.0
16	381	638	705	76.2	133	180		141.7	213.9	355.5
18	429	702	775	85.9	146	185		189.0	293.0	482.0
20	478	752	830	95.3	152	190		227.9	371.4	599.3
24	575	899	990	111.3	178	200		377.3	620.3	997.6

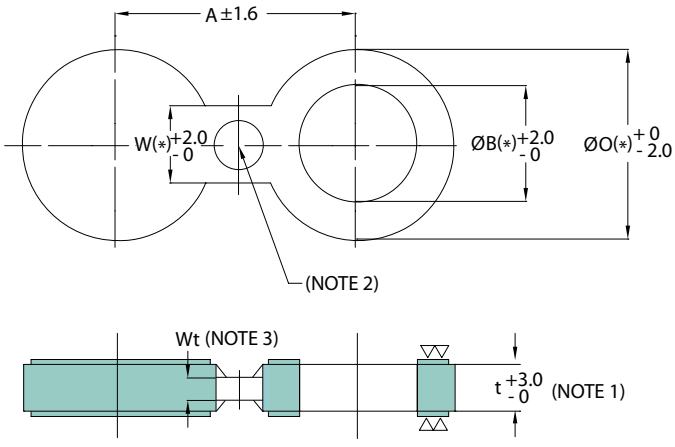
Notes:

1. Thickness (Dimensions) includes a corrosion of 0.05 inch (1.3 mm) for material groups 1.1, 1.7, 1.9, 1.10 and 1.12. Corrosion allowance is 0.0 inch for material groups 2.1, 2.2, 2.4 and 2.5.
2. Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole.
3. The thickness of the web (or the bar) dimension wt, shall be 0.25 inch (6.4 mm) minimum, except when is less than 0.25 inch, wt shall equal.
4. The gasket seating surface finish and dimensions for raised face line blanks shall be in accordance with ASME B16.5. A raised face may be specified at the option of the purchaser. The height of the raised faces shall add 7mm on "t".
5. * Tolerances shall be in accordance with Kofco STD.

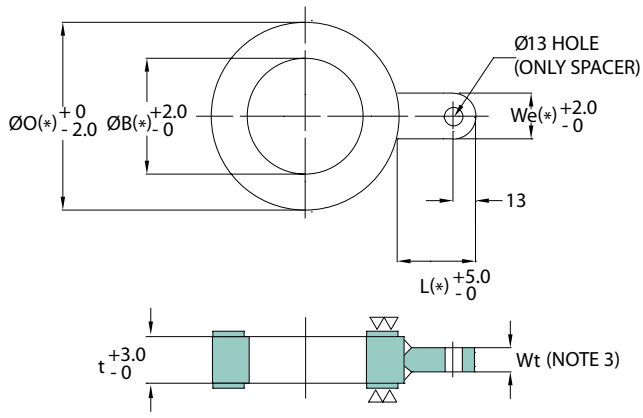
TABLE 6

CLASS 2500 RAISED FACE FIGURE 8 BLANKS (ASME B16.48)

FIGURE 8 BLANKS



PADDLE SPACERS & BLANKS



(Dimensions in mm)

Dimensions of Class 2500 Raised Face Figure 8 Blanks								B16.48 Weight (kg)		
NPS	B	O	A	t	W	L	We	Spacer	Blank	Spec'
½	16	67	90	9.7	38	100	25	0.3	0.3	0.6
¾	21	73	95	9.7	41			0.4	0.4	0.7
1	27	83	110	9.7	64	125		0.4	0.5	0.9
1 ¼	35	102	130	12.7	64			0.8	0.9	1.8
1 ½	41	114	145	15.7	70			1.3	1.4	2.7
2	53	143	170	15.7	70	150		2.0	2.3	4.3
2 ½	63	165	195	19.1	76			3.1	3.6	6.7
3	78	194	230	22.4	76	165	38	4.9	5.7	10.7
4	102	232	275	28.4	89			8.7	10.4	19.1
5	128	276	325	35.1	89	170		15.3	19.2	34.4
6	154	314	370	41.1	89			21.8	28.0	49.8
8	198	384	440	53.8	102	175		41.6	55.1	96.7
10	248	473	540	66.5	114	180		77.4	103.6	181.0
12	289	546	620	79.2	114	190		129.3	174.7	304.0

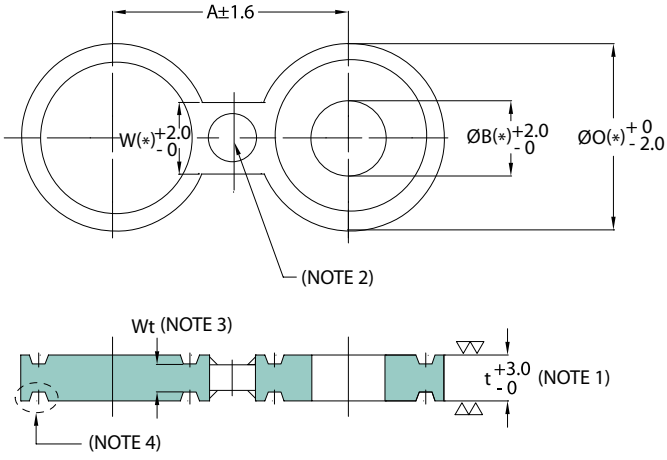
Notes:

1. Thickness (Dimensions) includes a corrosion of 0.05 inch (1.3 mm) for material groups 1.1, 1.7, 1.9, 1.10 and 1.12. Corrosion allowance is 0.0 inch for material groups 2.1, 2.2, 2.4 and 2.5.
2. Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole.
3. The thickness of the web (or the bar) dimension wt, shall be 0.25 inch (6.4 mm) minimum, except when is less than 0.25 inch, wt shall equal.
4. The gasket seating surface finish and dimensions for raised face line blanks shall be in accordance with ASME B16.5. A raised face may be specified at the option of the purchaser. The height of the raised faces shall add 7mm on "t".
5. * Tolerances shall be in accordance with Kofco STD.

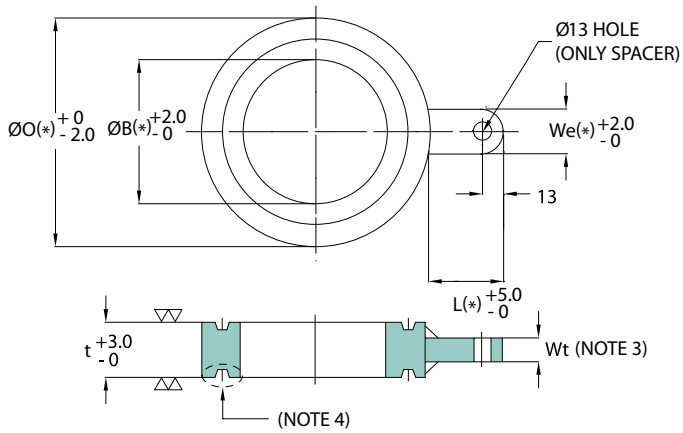
TABLE 7

CLASS 150 FEMALE RING-JOINT FACING FIGURE 8 BLANKS (ASME B16.48)

FIGURE 8 BLANKS



PADDLE SPACERS & BLANKS



(Dimensions in mm)

Dimensions of Class 150 Female Ring-Joint Facing Figure 8 Blanks								API 590 (B16.48) WEIGHT (KG)		
NPS	B	O	A	t	W	L	We	Spacer	Blank	Spec'
1	34	64	80	19.1	51	100	25	0.4	0.5	0.9
1 ¼	42	73	90	19.1	51			0.4	0.6	1.1
1 ½	48	83	100	19.1	57			0.6	0.8	1.4
2	61	102	120	19.1	57			0.8	1.2	2.1
2 ½	73	121	140	22.4	57	125		1.3	2.0	3.4
3	89	133	150	22.4	57			1.4	2.5	3.8
3 ½	102	154	175	22.4	64		38	3.0	4.4	7.4
4	114	172	190	22.4	64			3.3	5.0	8.3
5	141	194	215	25.4	70			4.1	7.1	11.1
6	168	219	240	25.4	83	150		4.8	9.1	14.0
8	219	273	300	28.4	95			7.4	15.6	23.0
10	273	330	360	31.8	102			11.7	26.4	38.1
12	324	406	430	35.1	121	165		18.5	41.1	59.6
14	356	426	475	35.1	127			22.6	49.8	72.5
16	406	483	540	38.1	127	170		31.2	69.7	100.8
18	457	546	580	41.1	127			33.2	86.1	119.3
20	508	597	635	41.1	127	175		38.5	103.9	142.4
24	610	711	750	47.8	152			58.7	169.3	227.9

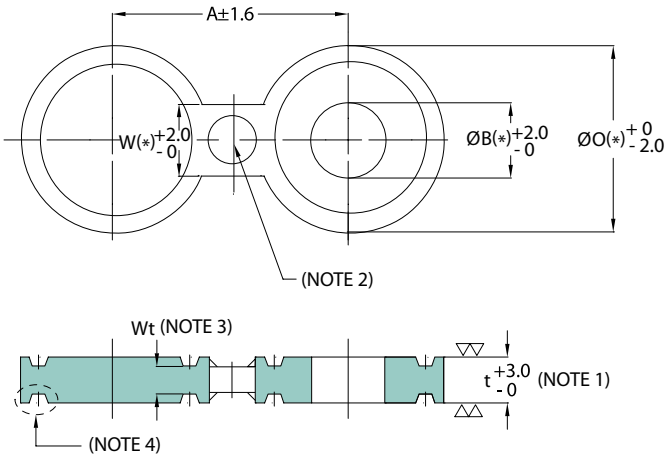
Notes:

1. Thickness (Dimensions) includes a corrosion of 0.05 inch (1.3 mm) for material groups 1.1, 1.7, 1.9, 1.10 and 1.12. Corrosion allowance is 0.0 inch for material groups 2.1, 2.2, 2.4 and 2.5.
2. Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole.
3. The thickness of the web (or the bar) dimension wt, shall be 0.25 inch (6.4 mm) minimum, except when is less than 0.25 inch, wt shall equal.
4. * Tolerances shall be in accordance with Kofco STD.

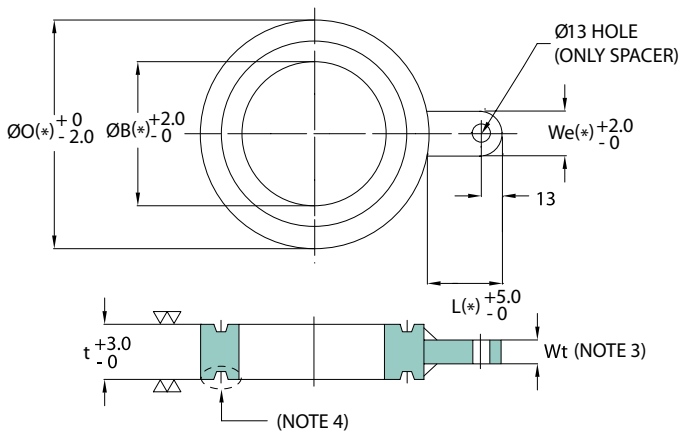
TABLE 8

CLASS 300 FEMALE RING-JOINT FACING FIGURE 8 BLANKS (ASME B16.48)

FIGURE 8 BLANKS



PADDLE SPACERS & BLANKS



(Dimensions in mm)

Dimensions of Class 300 Female Ring-Joint Facing Figure 8 Blanks								API 590 (B16.48) WEIGHT (KG)		
NPS	B	O	A	t	W	L	We	Spacer	Blank	Spec'
½	21	51	65	15.7	38	100	25	0.2	0.3	0.5
¾	27	64	80	19.1	45			0.4	0.5	0.9
1	34	70	90	19.1	51			0.5	0.6	1.1
1 ¼	42	79	100	22.4	51			0.6	0.9	1.5
1 ½	48	90	115	22.4	57			0.8	1.1	2.0
2	61	108	125	25.4	57			1.3	1.8	3.1
2 ½	73	127	150	28.4	57	125		2.0	2.8	4.8
3	89	146	170	28.4	57			2.4	3.8	6.2
3 ½	102	159	185	28.4	64		38	2.7	4.5	7.2
4	114	175	200	31.8	64			3.7	6.2	9.8
5	141	210	235	35.1	70	150		5.2	9.5	14.7
6	168	241	270	35.1	83			6.8	12.8	19.5
8	219	302	330	41.1	95			11.5	23.5	35.0
10	273	356	385	44.5	102	165		14.9	35.1	49.9
12	324	413	450	50.8	121			21.6	54.7	76.3
14	356	457	515	53.8	127	170		28.7	70.9	99.6
16	406	508	570	57.2	127			34.4	92.5	126.8
18	457	575	630	60.5	127	175		47.3	124.7	172.0
20	508	635	685	69.9	127			65.8	177.4	243.2
24	610	749	810	79.2	152	180		96.6	278.6	375.1

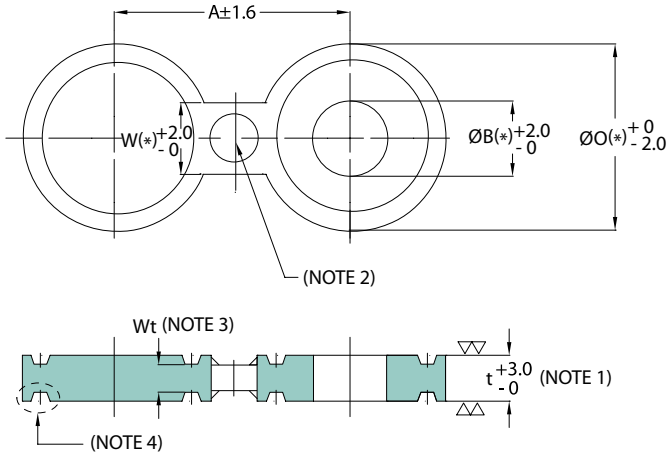
Notes:

1. Thickness (Dimensions) includes a corrosion of 0.05 inch (1.3 mm) for material groups 1.1, 1.7, 1.9, 1.10 and 1.12. Corrosion allowance is 0.0 inch for material groups 2.1, 2.2, 2.4 and 2.5.
2. Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole.
3. The thickness of the web (or the bar) dimension wt, shall be 0.25 inch (6.4 mm) minimum, except when is less than 0.25 inch, wt shall equal.
4. * Tolerances shall be in accordance with Kofco STD.

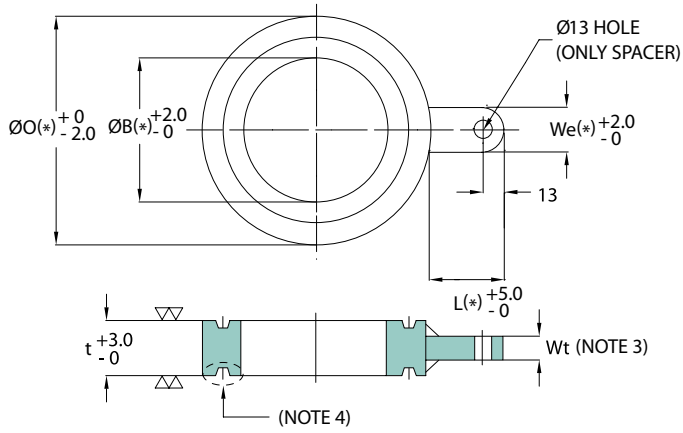
TABLE 9

CLASS 600 FEMALE RING-JOINT FACING FIGURE 8 BLANKS (ASME B16.48)

FIGURE 8 BLANKS



PADDLE SPACERS & BLANKS



(Dimensions in mm)

Dimensions of Class 600 Female Ring-Joint Facing Figure 8 Blanks								API 590 (B16.48) WEIGHT (KG)		
NPS	B	O	A	t	W	L	We	Spacer	Blank	Spec'
½	21	51	65	19.1	38	100	25	0.3	0.3	0.6
¾	27	64	80	22.4	45			0.5	0.6	1.1
1	34	70	90	22.4	51			0.5	0.7	1.2
1 ¼	42	79	100	22.4	51			0.6	0.9	1.5
1 ½	48	90	115	22.4	57			0.8	1.1	2.0
2	61	108	125	28.4	57			1.2	1.6	2.8
2 ½	73	127	150	31.8	57	125		2.0	2.8	4.8
3	89	146	170	31.8	57			2.8	4.3	7.1
3 ½	102	159	185	35.1	64		38	3.1	5.1	8.2
4	114	175	215	35.1	64	150		4.0	6.7	10.7
5	141	210	265	38.1	70			6.2	11.4	17.6
6	168	241	290	44.5	83			8.5	16.1	24.6
8	219	302	350	50.8	95	165		14.3	29.2	43.5
10	273	356	430	57.2	102			19.3	45.4	64.7
12	324	413	490	63.5	121	170		27.2	68.6	95.8
14	356	457	525	66.5	127			35.6	88.0	123.6
16	406	508	605	73.2	127	175		44.0	118.4	162.4
18	457	575	655	79.2	127			62.3	164.2	226.4
20	508	635	725	88.9	127	180		83.6	225.6	309.2
24	610	749	840	104.6	152	185		128.6	370.5	499.2

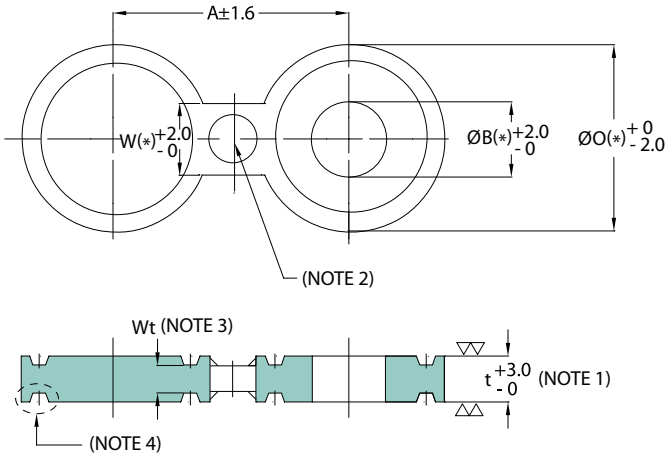
Notes:

1. Thickness (Dimensions) includes a corrosion of 0.05 inch (1.3 mm) for material groups 1.1, 1.7, 1.9, 1.10 and 1.12. Corrosion allowance is 0.0 inch for material groups 2.1, 2.2, 2.4 and 2.5.
2. Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole.
3. The thickness of the web (or the bar) dimension wt, shall be 0.25 inch (6.4 mm) minimum, except when is less than 0.25 inch, wt shall equal.
4. ∗Tolerances shall be in accordance with Kofco STD.

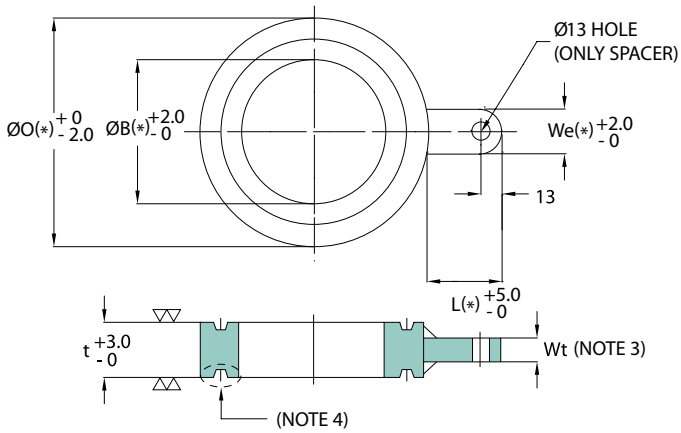
TABLE 10

CLASS 900 FEMALE RING-JOINT FACING FIGURE 8 BLANKS (ASME B16.48)

FIGURE 8 BLANKS



PADDLE SPACERS & BLANKS



(Dimensions in mm)

Dimensions of Class 900 Female Ring-Joint Facing Figure 8 Blanks								API 590 (B16.48) WEIGHT (KG)		
NPS	B	O	A	t	W	L	We	Spacer	Blank	Spec'
½	21	61	80	22.4	38	100	25	0.5	0.5	1.0
¾	27	67	90	22.4	45			0.5	0.6	1.2
1	34	71	100	22.4	51			0.6	0.7	1.3
1 ¼	42	81	110	25.4	51			0.8	1.0	1.8
1 ½	48	92	125	25.4	64			1.0	1.3	2.3
2	61	124	165	31.8	51	125		1.9	2.4	4.3
2 ½	73	137	190	35.1	67			2.8	3.8	6.6
3	89	155	190	35.1	67	150	38	3.7	5.4	9.1
4	114	181	235	41.1	73			5.2	8.4	13.7
5	141	216	280	44.5	73			7.3	13.0	20.2
6	168	241	315	47.8	73	165		9.3	17.5	26.8
8	219	308	395	57.2	80			17.3	34.0	51.3
10	273	362	470	63.5	121	170		23.4	52.7	76.1
12	324	419	535	73.2	121			33.3	80.6	113.9
14	356	467	560	82.6	121	175		49.1	113.8	162.8
16	406	524	615	91.9	127			65.3	158.8	224.1
18	457	594	685	101.6	133	180		95.0	226.2	321.2
20	508	648	750	111.3	127	185		116.2	293.0	409.2
24	610	772	900	133.4	140	190		192.7	498.2	690.9

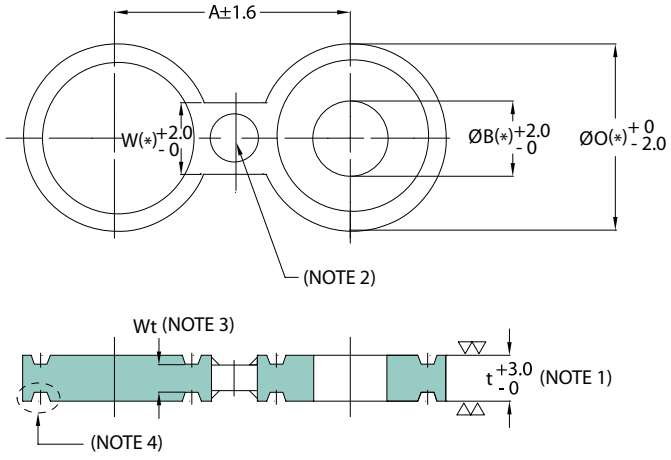
Notes:

1. Thickness (Dimensions) includes a corrosion of 0.05 inch (1.3 mm) for material groups 1.1, 1.7, 1.9, 1.10 and 1.12. Corrosion allowance is 0.0 inch for material groups 2.1, 2.2, 2.4 and 2.5.
2. Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole.
3. The thickness of the web (or the bar) dimension wt, shall be 0.25 inch (6.4 mm) minimum, except when is less than 0.25 inch, wt shall equal.
4. * Tolerances shall be in accordance with Kofco STD.

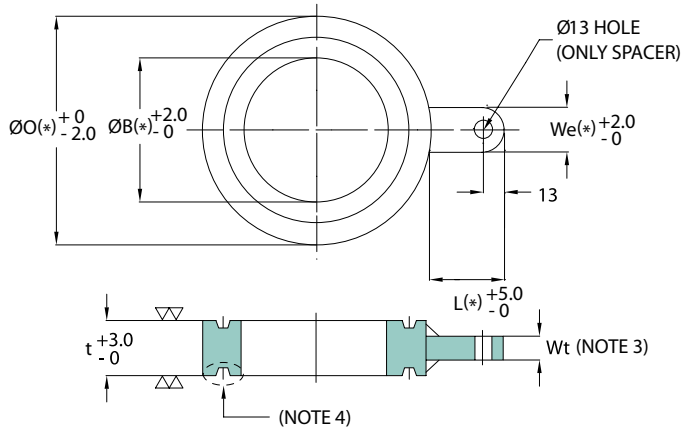
TABLE 11

CLASS 1500 FEMALE RING-JOINT FACING FIGURE 8 BLANKS (ASME B16.48)

FIGURE 8 BLANKS



PADDLE SPACERS & BLANKS



(Dimensions in mm)

Dimensions of Class 1500 Female Ring-Joint Facing Figure 8 Blanks								API 590 (B16.48) WEIGHT (KG)		
NPS	B	O	A	t	W	L	We	Spacer	Blank	Spec'
½	21	61	80	22.4	38	100	25	0.5	0.5	1.0
¾	27	67	90	25.4	45			0.6	0.7	1.3
1	34	71	100	25.4	54			0.6	0.8	1.4
1 ¼	42	81	110	25.4	54			0.9	1.2	2.0
1 ½	48	92	125	28.4	57			1.0	1.3	2.3
2	61	124	165	35.1	54	125		2.7	3.4	6.1
2 ½	73	137	190	38.1	57			3.3	4.5	7.8
3	89	168	205	44.5	73	150	38	5.8	7.8	13.6
4	114	194	240	47.8	76			7.7	11.4	19.0
5	141	229	290	53.8	76	165		10.3	17.3	27.6
6	168	248	315	60.5	79			12.9	23.2	36.1
8	219	318	395	73.2	86	170		25.1	46.4	71.5
10	273	371	480	82.5	133			33.9	71.8	105.7
12	324	438	570	101.6	133	175		57.3	123.0	180.3
14	356	489	635	111.3	140			80.7	166.8	247.6
16	406	546	705	124	146	180		106.9	232.4	339.3
18	457	613	775	133	152	185		143.6	314.1	457.8
20	508	673	830	142.7	165	190		180.3	407.1	587.4
24	610	794	990	168.1	178	200		280.8	665.7	946.5

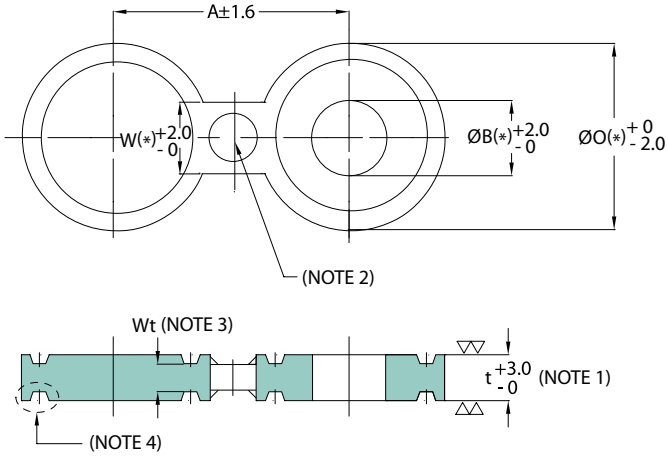
Notes:

1. Thickness (Dimensions) includes a corrosion of 0.05 inch (1.3 mm) for material groups 1.1, 1.7, 1.9, 1.10 and 1.12. Corrosion allowance is 0.0 inch for material groups 2.1, 2.2, 2.4 and 2.5.
2. Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole.
3. The thickness of the web (or the bar) dimension wt, shall be 0.25 inch (6.4 mm) minimum, except when is less than 0.25 inch, wt shall equal.
4. * Tolerances shall be in accordance with Kofco STD.

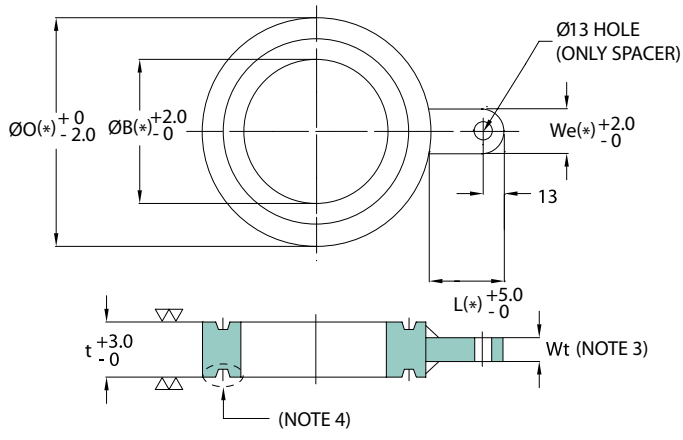
TABLE 12

CLASS 2500 FEMALE RING-JOINT FACING FIGURE 8 BLANKS (ASME B16.48)

FIGURE 8 BLANKS



PADDLE SPACERS & BLANKS



(Dimensions in mm)

Dimensions of Class 2500 Female Ring-Joint Facing Figure 8 Blanks								API 590 (B16.48) WEIGHT (KG)		
NPS	B	O	A	t	W	L	We	Spacer	Blank	Spec'
½	21	65	90	25.4	38	100	25	0.6	0.7	1.3
¾	27	73	95	28.4	45			0.8	0.9	1.8
1	34	83	110	28.4	54	125		1.0	1.2	2.3
1 ¼	42	102	130	35.1	54			2.0	2.3	4.3
1 ½	48	114	145	38.1	61			2.6	3.1	5.7
2	61	133	170	41.1	57	150		3.7	4.6	8.3
2 ½	73	149	195	47.8	61			5.2	6.7	11.9
3	89	168	230	50.8	76	165	38	6.7	9.1	15.8
4	114	203	270	63.5	83			11.7	16.6	28.3
5	141	241	325	73.2	89	170		19.2	28.6	47.8
6	168	279	370	82.6	95			26.7	40.6	67.3
8	219	340	440	98.6	95	175		43.3	71.9	115.3
10	273	425	540	117.3	91	180		80.3	132.8	213.2
12	324	495	620	133.4	152	190		118.0	202.4	320.3

Notes:

1. Thickness (Dimensions) includes a corrosion of 0.05 inch (1.3 mm) for material groups 1.1, 1.7, 1.9, 1.10 and 1.12. Corrosion allowance is 0.0 inch for material groups 2.1, 2.2, 2.4 and 2.5.
2. Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole.
3. The thickness of the web (or the bar) dimension wt, shall be 0.25 inch (6.4 mm) minimum, except when is less than 0.25 inch, wt shall equal.
4. * Tolerances shall be in accordance with Kofco STD.

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