

## Products

### Flanges

We are engaged in providing a supreme range of Industrial Flanges widely used in diverse industrial application. The company has taken the leading position in providing the best possible Industrial Flanges available in the market. This range of Industrial Flanges is put through rigorous quality control checks to make it superior to other similar products available in the market. The Industrial Flanges are superbly engineered to fit the criteria dictated by the industry and is offered at affordable rates.

#### ● Range Of Industrial Flanges Includes

- Plate Flanges
- Slip On Flanges
- Welding Flanges
- Forged Flanges
- Carbon Steel Flanges
- Mild Steel Flanges
- Stainless Steel Flanges

### Plate Flanges

We have instore for our clients an extensive range of Plate Flanges that is highly popular among clients worldwide. The Plate Flanges are made in accordance with market demands and specifications. These Plate Flanges are available in a variety of sizes and types for their accurate and exact usage.

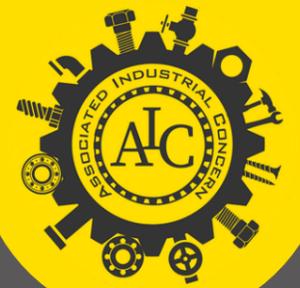
### Salient Features

- Rust Proof
- Available in variety of sizes
- Resistance to high temperature and pressure
- Weather proof

### Used In

- Oil and Gas Industry
- Pharmaceutical Industry
- Sugar Industry
- Food and Beverages
- Marine Equipment
- Cement Industry
- Steel Industry
- Chemical Industry

# ASSOCIATED INDUSTRIAL CONCERN



| MANUFACTURER STOCKIST & SUPPLIERS OF :

| MS, CS, SS FLANGES, PIPES.

| PIPES FITTINGS & PROFILES

| MS & SS ROUND PIPES

| MS & SS SQUARE PIPES

 164/5 Mariswamappa Lane, S.J.P Road  
Cross, Bangalore - 560002

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+91 8970256600

 [www.aicindustrialsolutions.com](http://www.aicindustrialsolutions.com)





# Flange Dimensions

Royal Steel India is one of the leading producer of various plate flanges as per standard and of course in accordance with purchasers drawings, We also specialise in Forged Flanges and Rings as per the international standards and catering to the need of various international clients throughout the globe with or without the inspection of third party arrangement. The company is managed by experts and a professional team of engineers highly skilled technical staff, Customer satisfaction is our prime focus with continuous commitment to after sales service by qualified technicians. Now we can manufacture and fabricate any size of the flange/ Ring to suit for large pipe connections as per sketch apart from our forging operations. The company has stepped into export market, with a confidence to delivery our various customers across the globe goods well before the stipulated time. Our vast infrastructure will help us in this future business.

Royal Steel Industries, has been the leader in the design and manufacture of top quality irrigation equipment and products for the irrigation industry. Every product we manufacture reflects the our emphasis on craftsmanship, workmanship and quality.

## Company Details

**Name Of Company :** ROYAL STEEL INDIA  
**Office :** Plot No. 246, Kolsa Bundar, Darukhana, Mumbai - 400 010. INDIA  
**Factory (Unit) :** Plot No. 246, Kolsa Bundar, Darukhana, Mumbai - 400 010. INDIA  
**Communications :** T/F : 022-2370 5725  
 E : royalsteelindiamumbai@gmail.com  
 W : www.royalsteelindia.in  
**VAT TINNO :** 27310655352 V w.e.f. 31/03/2008  
**CST NO :** 27310655352 C w.e.f. 31/03/2008  
**PAN NO :** AFYPC8106N  
**Bankers :** UNION BANK OF INDIA  
 Branch : Cotton Green  
**Account No :** 316501010035234  
**IFSC :** UBIN0531651  
**SSI No. :** 2723100832  
**Bankers :** ABHYUDAYA CO-OP. BANK LTD.  
 Branch : Darukhana  
**Account No :** 005021100024722  
**IFSC :** ABHY0065005

## Who are we?

We are one of the celebrated Manufacturers, Exporters and Suppliers of an assortment of Industrial Products, We offer a proven range of products that includes Metal Pipes, Metal Plates, Metal Pipe Fittings, Industrial Flanges, Steel Scraps, Sugar Mill Spares, Alloy Steel Tubes, Industrial Valves and many more. Manufactured using exceptional quality raw materials such as Plats, Forgings and Rounds, the assortment of Industrial products is offered in varied sizes, shapes and surface finish. The Industrial Product that we provide are well known for durability, dimensional accuracy, corrosion resistance and capacity to withstand temperature variations. The applications of our products are in varied industries namely Oil and Gas, Marine Equipments, Pharmaceuticals, Sugar, Food and Beverages, Cement, Steel and Chemicals and so on. Moverover, we also offer customized packaging materials for the range of products as per the client's specifications.

### BRIEF DESCRIPTION OF ITEMS : PLATE / FORGED / MILD STEEL, CARBON STEEL AND STAINLESS STEEL FLANGES

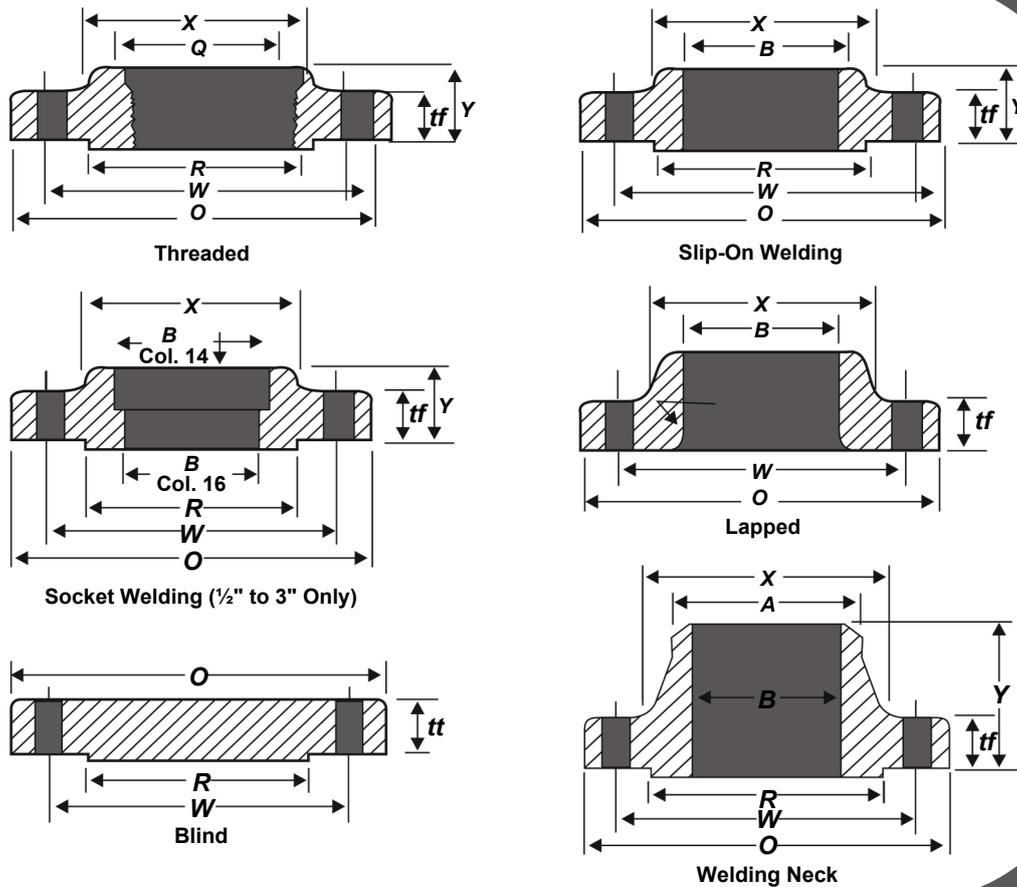
Types	Slip-on, Weld Neck, Blind, Threaded Socket-Weld Lap Joint	
Standards	BS 10 (Table - D, E, F, H, J & K) ASA 150, 300, 600, 900, 1500 and 2500 lbs. DINND6, 10, 16, 25 and 40 IS 6392, 1538. ANSI B 16.5, MSS-SP-44, API 605, AWWA 207	
MATERIALS OF CONSTRUCTION :		
	Size	
Mild Steel	½" - 90"	IS 2062
Carbon Steel	½" - 60"	ASTM A-105, IS 2002, Lf2
Stainless Steel	½" - 24"	ASTM, A-182, F 304, F 316, F 321, F 304L, F 316L
FITTINGS		
1) Buttweld Forged Steel Elbows (1.5D) and Bends (3D)		
Size ½" to 24"	in SCH. 40, 80 and 160 As per ANSI B 16.9	
2) Forged Carbon Steel Types Size Size ½" to 24" Ends	Fittings for High Pressure of 3000/6000 lbs. Union Coupling, Elbow, Tee, Nipple, Reducer. ½" to 6" DIA Socket / Butt Weld, Flanges BSPT / NPT	
Specifications	As per ANSI B 16.11	
Inspection	Lloyds / BVIS / DNV / IBR / SGS / RITES	
Ex-Stock Range	From ½" to 6" Fittings, ½" to 24" Flanges & ASA 150 and 300 lbs.	

**Specialisation : DOUBLE FACE • SERRATED SURFACE • THREE GASKET GROOVES • IBR CERTIFICATES RAISED FACE • COLLAR SCREWED • BLUE PRINT & Also as per Drawings.**

**FLANGES SUITABLE FOR UPTO 60° O.D. PIPE**



# DIMENSIONS OF CLASS 150 FLANGES

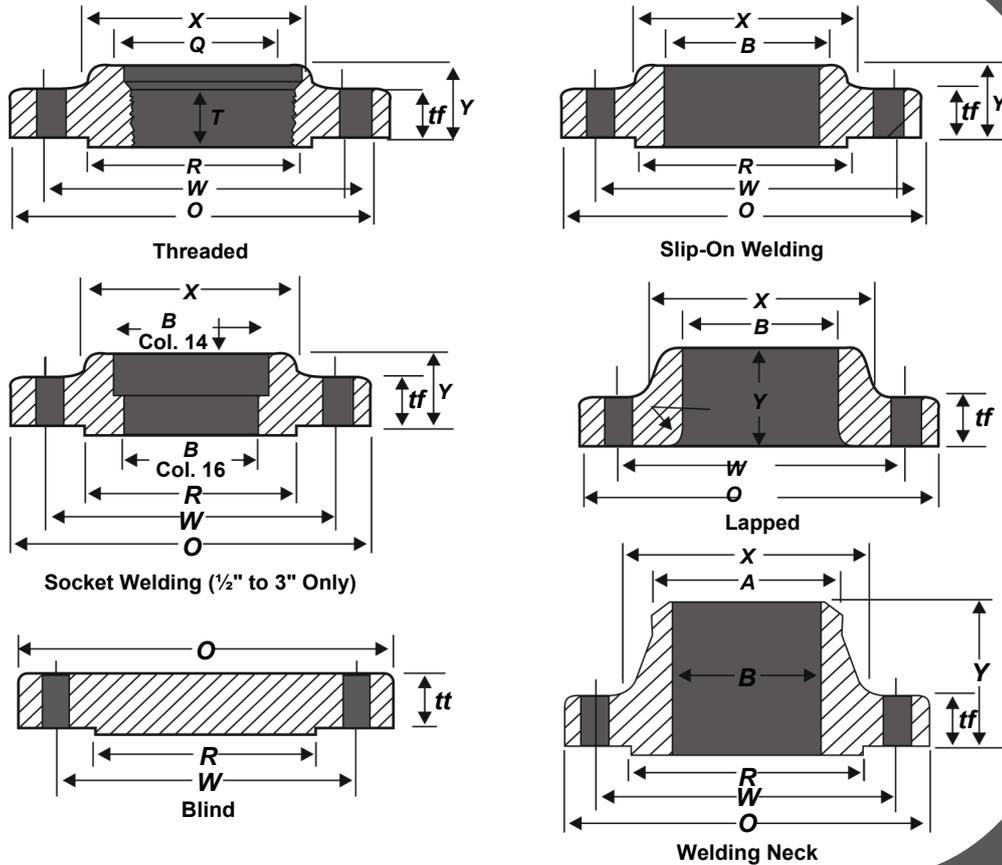


## DIMENSIONS OF CLASS 150 FLANGES

DIMENSIONS OF CLASS 150 FLANGES																						
1	2	3	4			5	6	7	8	9			10	11	12		13	14	15	16	17	18
Nominal Pipe Size NPS	Outside Diameter of Flange, O	Thickness of Flange Min., t	Drilling			Number of Bolts	Diameter of Hub, X	Hub Diameter Beginning of Chamfer Welding Neck, A	Length Thru Hub			Welding Neck, Y	Threaded / Length Threaded Min., T	Bore		Welding Neck / Socket Welding, B [Note (2)]	Corner Radius of Bore of Lapped Flange and Pipe, r	Depth of Socket, D	Diameter of RF, R			
			Diameter of Bolt Circle, W	Diameter of Bolt Holes					Threaded / Slip-On / Socket Welding, Y	Lapped, Y	Slip-On / Socket Welding Min., B			Lapped Min., B								
1/2	89.0	11.2	60.3	15.9	4	30	21.3	14	16	46	16	22.2	22.9	15.8	3	10	34.9					
3/4	98.5	12.7	69.9	15.9	4	38	26.7	14	16	51	16	27.7	28.2	20.9	3	11	42.9					
1	108.0	14.3	79.4	15.9	4	49	33.4	16	17	54	17	34.5	34.9	26.6	3	13	50.8					
1 1/4	117.5	15.9	88.9	15.9	4	59	42.2	19	21	56	21	43.2	43.7	35.1	5	14	63.5					
1 1/2	127.0	17.5	98.4	15.9	4	65	48.3	21	22	60	22	49.5	50.0	40.9	6	16	73.0					
2	152.5	19.1	120.7	19.1	4	78	60.3	24	25	62	25	61.9	62.5	52.5	8	17	92.1					
2 1/2	178.0	22.3	139.7	19.1	4	90	73.0	27	29	68	29	74.6	75.4	62.7	8	19	104.8					
3	190.5	23.9	152.4	19.1	4	108	88.9	29	30	68	30	90.7	91.4	77.9	10	21	127.0					
3 1/2	216.0	23.9	177.8	19.1	8	122	101.6	30	32	70	32	103.4	104.1	90.1	10	....	139.7					
4	228.5	23.9	190.5	19.1	8	135	114.3	32	33	75	33	116.1	116.8	102.3	11	....	157.2					
5	254.0	23.9	215.9	22.3	8	164	141.3	35	36	87	36	143.8	144.4	128.2	11	....	185.7					
6	279.0	25.4	241.3	22.3	8	192	168.3	38	40	87	40	170.7	171.4	154.1	13	....	215.9					
8	343.0	28.6	298.5	22.3	8	246	219.1	43	44	100	44	221.5	222.2	202.7	13	....	269.9					
10	406.5	30.2	362.0	25.4	12	305	273.0	48	49	100	49	276.2	277.4	254.6	13	....	323.8					
12	482.5	31.8	431.8	25.4	12	365	323.8	54	56	113	56	327.0	328.2	304.8	13	....	381.0					
14	533.5	35.0	476.3	28.6	12	400	355.6	56	79	125	57	359.2	360.2	To be Specified by Purchaser	13	....	412.8					
16	597.0	36.6	539.8	28.6	16	457	406.4	62	87	125	64	410.5	411.2		13	....	469.9					
18	635.0	39.7	577.9	31.8	16	505	457.0	67	97	138	68	461.8	462.3		13	....	533.4					
20	698.5	42.9	635.0	31.8	20	559	508.0	71	103	143	73	513.1	514.4		13	....	584.2					
24	813.0	47.7	749.3	35.0	20	663	610.0	81	111	151	83	616.0	616.0	13	....	692.2						

NOTE : (1) Height of RF 2mm  
 (2) Dimensions in Column 16 correspond to the inside diameter 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. These bore sizes are furnished unless otherwise specified by the purchaser.

# DIMENSIONS OF CLASS 300 FLANGES

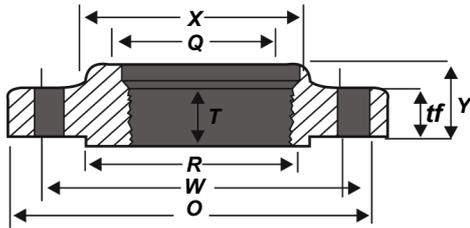


## DIMENSIONS OF CLASS 300 FLANGES

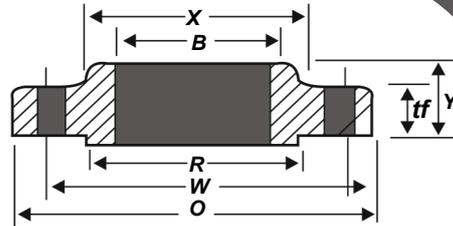
1	2	3	4			5	6	7	8	9			10	11	12			13	14	15	16	17	18	19
Nominal Pipe Size NPS	Outside Diameter of Flange, O	Thickness of Flange Min., t	Drilling			Number of Bolts	Diameter of Hub, X	Hub Diameter Beginning of Chamfer Welding Neck, A	Threaded / Slip-On / Socket Welding, Y	Lapped, Y	Welding Neck, Y	Threaded / Length Threaded Min., T	Slip-On / Socket Welding Min., B	Lapped Min., B	Welding Neck / Socket Welding, B [Note (2)]	Corner Radius of Bore of Lapped Flange and Pipe, r	Counter-bore Threaded FLANGE Min., Q	Depth of Socket, D	Diameter of RF, R					
			Diameter of Bolt Circle W	Diameter of Bolt Holes	Number of Bolt Holes															Length Thru Hub	Bore			
1/2	95.5	14.3	66.7	15.9	4	38	21.3	24	22	51	16	22.2	22.9	15.8	3	23.6	10	34.9						
3/4	117.5	15.9	82.6	19.1	4	48	26.7	24	25	56	16	27.7	28.2	20.9	3	29.0	11	42.9						
1	124.0	17.5	88.9	19.1	4	54	33.4	25	27	60	18	34.5	34.9	26.6	3	35.8	13	50.8						
1 1/4	133.5	19.1	98.4	19.1	4	64	42.2	25	27	64	21	43.2	43.7	35.1	5	44.4	14	63.5						
1 1/2	155.5	20.7	114.3	22.2	4	70	48.3	29	30	67	23	49.5	50.0	40.9	6	50.3	16	73.0						
2	165.0	22.3	127.0	19.0	8	84	60.3	32	33	68	29	61.9	62.5	52.5	8	63.5	17	92.1						
2 1/2	190.5	25.4	149.2	22.3	8	100	73.0	37	38	75	32	74.6	75.4	62.7	8	76.2	19	104.8						
3	209.5	28.6	168.3	22.3	8	117	88.9	41	43	78	32	90.7	91.4	77.9	10	92.2	21	127.0						
3 1/2	228.5	30.2	184.2	22.3	8	133	101.6	43	44	79	37	103.4	104.1	90.1	10	104.9	....	139.7						
4	254.0	31.8	200.0	22.3	8	146	114.3	46	48	84	37	116.1	116.8	102.3	11	117.6	....	157.2						
5	279.5	35.0	235.0	22.3	8	178	141.3	49	51	97	43	143.8	144.4	128.2	11	144.4	....	185.7						
6	317.5	36.6	269.9	22.3	12	206	168.3	51	52	97	47	170.7	171.4	154.1	13	171.4	....	215.9						
8	381.0	41.3	330.2	25.4	12	260	219.1	60	62	110	51	221.5	222.2	202.7	13	222.2	....	269.9						
10	444.5	47.7	387.4	28.6	16	321	273.0	65	95	116	56	276.2	277.4	254.6	13	276.2	....	323.8						
12	520.5	50.8	450.8	31.8	16	375	323.8	71	102	129	61	327.0	328.2	304.8	13	328.6	....	381.0						
14	584.0	54.0	514.4	31.8	20	425	355.6	75	111	141	64	359.2	360.2	To be Specified by Purchaser	13	360.4	....	412.8						
16	647.5	57.2	571.5	35.0	20	483	406.4	81	121	144	69	410.5	411.2		13	411.2	....	469.9						
18	711.0	60.4	628.6	35.0	24	533	457.0	87	130	157	70	461.8	462.3		13	462.0	....	533.4						
20	774.5	63.5	685.8	35.0	24	587	508.0	94	140	160	74	513.1	514.4		13	512.8	....	584.2						
24	914.5	69.9	812.8	41.3	24	702	610.0	105	152	167	83	616.0	616.0		13	614.4	....	692.2						

NOTE : (1) Height of RF 2mm  
 (2) Dimensions in Column 16 correspond to the inside diameter 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. These bore sizes are furnished unless otherwise specified by the purchaser.

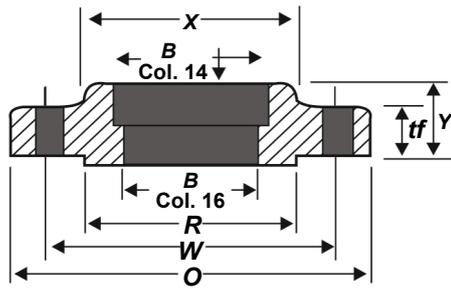
# DIMENSIONS OF CLASS 400 FLANGES



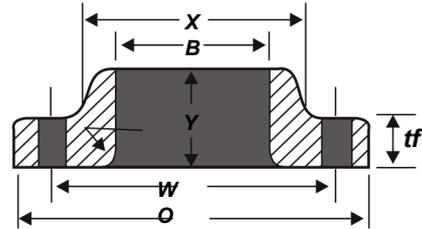
Threaded



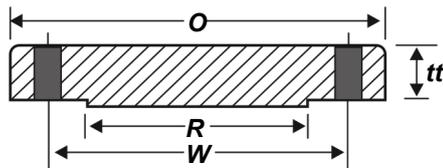
Slip-On Welding



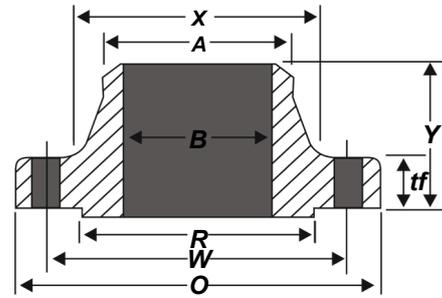
Socket Welding (1/2" to 2 1/2" Only)



Lapped



Blind



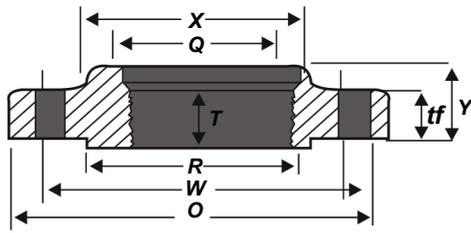
Welding Neck

## DIMENSIONS OF CLASS 400 FLANGES

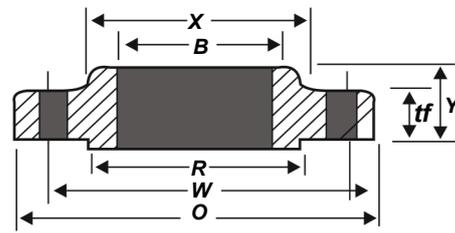
1	2	3	4	5 6 7				8	9 10 11			12	13 14		15	16	17	18	19
				Drilling	Length Thru Hub				Bore										
Nominal Pipe Size NPS	Outside Diameter of Flange, O	Thickness of Flange, Min., t	Diameter of Hub, X	Diameter of Bolt Circle, W	Diameter of Bolt Holes, in.	Number of Bolts	Hub Diameter Beginning of Chamfer Welding Neck, A	Threaded / Slip-On, Y	Lapped, Y	Welding Neck, Y	Threaded Length Threaded Min., T	Slip-On Min., B	Lapped Min., B	Socket Weld / Welding Neck, B	Corner Radius of Bore of Lapped Flange and Pipe, r	Counter-bore Threaded FLANGE Min., Q	Diameter of RF, R	Socket Weld, D	
1/2	95	14.3	38	66.7	15.9	4	21.3	22	22	52	16	22.2	22.9	3	23.6	34.9	10		
3/4	115	15.9	48	82.6	19.0	4	26.7	25	25	57	16	27.7	28.2	3	29.0	42.9	11		
1	125	17.5	54	88.9	19.0	4	33.4	27	27	62	18	34.5	34.9	3	35.8	50.8	13		
1 1/4	135	20.7	64	98.4	19.0	4	42.2	29	29	67	21	43.2	43.7	5	44.4	63.5	14		
1 1/2	155	22.3	70	114.3	22.2	4	48.3	32	32	70	23	49.5	50.0	6	50.6	73.0	16		
2	165	25.4	84	127.0	19.0	8	60.3	37	37	73	29	61.9	62.5	8	63.5	92.1	17		
2 1/2	190	28.6	100	149.2	22.2	8	73.0	41	41	79	32	74.6	75.4	8	76.2	104.8	19		
3	210	31.8	117	168.3	22.2	8	88.9	46	46	83	35	90.7	91.4	10	92.2	127.0			
3 1/2	230	35.0	133	184.2	25.4	8	101.6	49	49	86	40	103.4	104.1	10	104.9	139.7			
4	255	35.0	146	200.0	25.4	8	114.3	51	51	89	37	116.1	116.8	11	117.6	157.2			
5	280	38.1	178	235.0	25.4	8	141.3	54	54	102	43	143.8	144.4	11	144.4	185.7			
6	320	41.3	206	269.9	25.4	12	168.3	57	57	103	46	170.7	171.4	13	171.4	215.9			
8	380	47.7	260	330.0	28.6	12	219.1	68	68	117	51	221.5	222.2	13	222.2	269.9			
10	445	54.0	321	387.4	31.8	16	273.0	73	102	124	56	276.2	277.4	13	276.2	323.8			
12	520	57.2	375	450.8	35.0	16	323.8	79	108	137	61	327.0	328.2	13	328.6	381.0			
14	585	60.4	425	514.4	35.0	20	355.6	84	117	149	64	359.2	360.2	13	360.4	412.8			
16	650	63.5	483	571.5	38.1	20	406.4	94	127	152	69	410.5	411.2	13	411.2	469.9			
18	710	66.7	533	628.6	38.1	24	457.0	98	137	165	70	461.8	462.3	13	462.0	533.4			
20	775	69.9	587	685.8	41.3	24	508.0	102	146	168	74	513.1	514.4	13	512.8	584.2			
24	915	76.2	702	812.8	47.7	24	610.0	114	159	175	83	616.0	616.0	13	614.4	692.2			

NOTE: (1) Height of RF 7mm

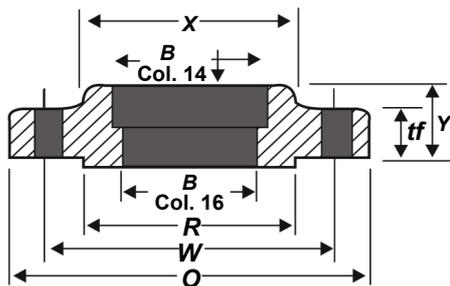
# DIMENSIONS OF CLASS 600 FLANGES



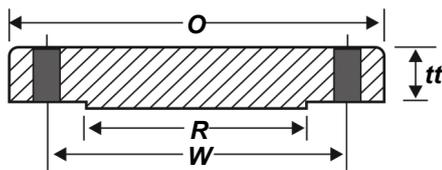
**Threaded**



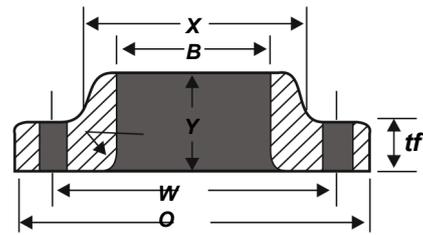
**Slip-On Welding**



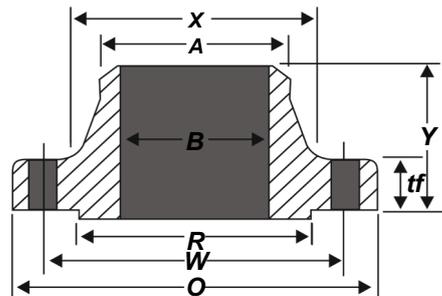
**Socket Welding (1/2" to 2 1/2" Only)**



**Blind**



**Lapped**



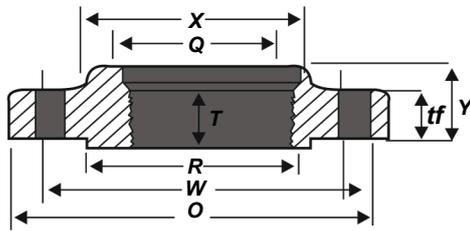
**Welding Neck**

## DIMENSIONS OF CLASS 600 FLANGES

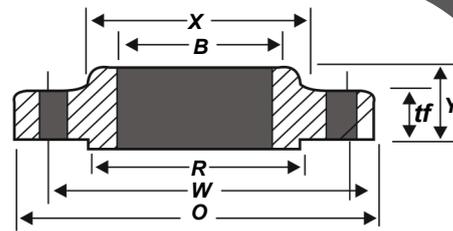
DIMENSIONS OF CLASS 600 FLANGES																		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Nominal Pipe Size NPS	Outside Diameter of Flange, $\phi$	Thickness of Flange, Min., $t$	Diameter of Hub, X	Drilling			Hub Diameter Beginning of Chamfer Welding Neck, A	Length Thru Hub			Threaded Length Threaded, Min., T	Bore			Corner Radius of Bore of Lapped Flange and Pipe, r	Counter-bore Threaded FLANGE Min., Q	Depth of Socket, D	Diameter of RF R
				Diameter of Bolt Circle W	Diameter of Bolt Holes, in.	Number of Bolts		Threaded / Slip-On/ Socket Welding, Y	Lapped Y	Welding Neck, Y		Slip-On/ Socket Welding Min., B	Lapped Min., B	Socket Weld/ Welding Neck, B				
1/2	95.5	14.3	38	66.7	15.9	4	21.3	22	22	52	16	22.2	22.9		3	23.6	10	34.9
3/4	117.5	15.9	48	82.6	19.1	4	26.7	25	25	57	16	27.7	28.2		3	29.0	11	42.9
1	124.0	17.5	54	88.9	19.1	4	33.4	27	27	62	18	34.5	34.9		3	35.8	13	50.8
1 1/4	133.5	20.7	64	98.4	19.1	4	42.2	29	29	67	21	43.2	43.7		5	44.4	14	63.5
1 1/2	155.5	22.3	70	114.3	22.3	4	48.3	32	32	70	23	49.5	50.0		6	50.6	16	73.0
2	165.0	25.4	84	127.0	19.1	8	60.3	37	37	73	29	61.9	62.5		8	63.5	17	92.1
2 1/2	190.5	28.6	100	149.2	22.3	8	73.0	41	41	79	32	74.6	75.4		8	76.2	19	104.8
3	209.5	31.8	117	168.3	22.3	8	88.9	46	46	83	35	90.7	91.4		10	92.2	21	127.0
3 1/2	228.5	35.0	133	184.2	25.4	8	101.6	49	49	86	40	103.4	104.1		10	104.9	....	139.7
4	273.0	38.1	152	215.9	25.4	8	114.3	54	51	102	42	116.1	116.8		11	117.6	....	157.2
5	330.0	44.5	189	266.7	28.6	8	141.3	60	54	114	48	143.8	171.4	To be Specified by Purchaser	11	144.4	....	185.7
6	355.5	47.7	222	292.1	28.6	12	168.3	67	57	117	51	170.7	222.2		13	171.4	....	215.9
8	419.0	55.6	273	349.2	31.8	12	219.1	76	68	133	58	221.5	277.4		13	222.2	....	269.9
10	508.0	63.5	343	431.8	35.0	16	273.0	86	102	152	66	276.2	328.2		13	276.2	....	323.8
12	559.0	66.7	400	489.0	35.0	20	323.8	92	108	156	70	327.0			13	328.6	....	381.0
14	603.5	69.9	432	527.0	38.1	20	355.6	94	117	165	74	359.2	360.2		13	360.4	....	412.8
16	686.0	76.2	495	603.2	41.3	20	406.4	106	127	178	78	410.5	411.2	13	411.2	....	469.9	
18	743.0	82.6	546	654.0	44.5	20	457.0	117	137	184	80	461.8	462.3	13	462.0	....	533.4	
20	813.0	88.9	610	723.9	44.5	24	508.0	127	146	190	83	513.1	514.4	13	512.8	....	584.2	
24	940.0	101.6	718	838.2	50.8	24	610.0	140	159	203	93	616.0	616.0	13	614.4	....	692.2	

NOTE : (1) Height of RF 7mm

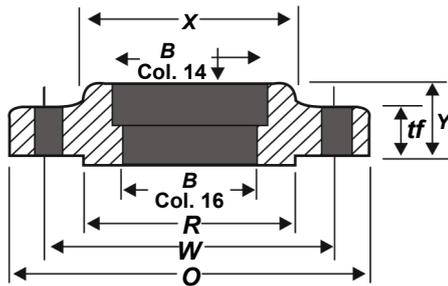
# DIMENSIONS OF CLASS 900 FLANGES



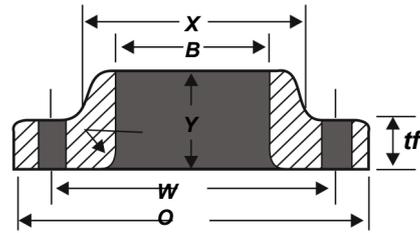
**Threaded**



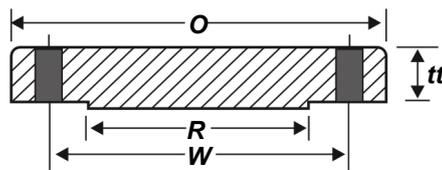
**Slip-On Welding**



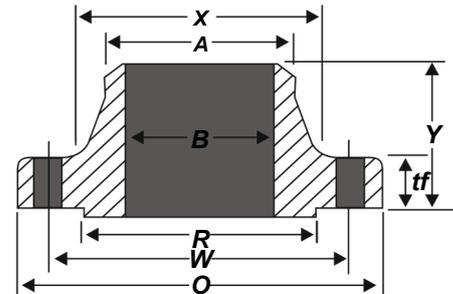
**Socket Welding (1/2" to 2 1/2" Only)**



**Lapped**



**Blind**



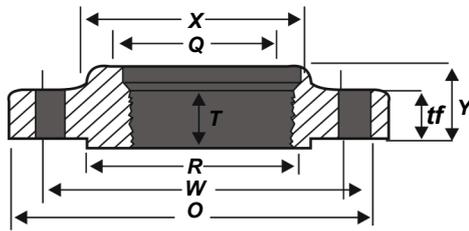
**Welding Neck**

## DIMENSIONS OF CLASS 900 FLANGES

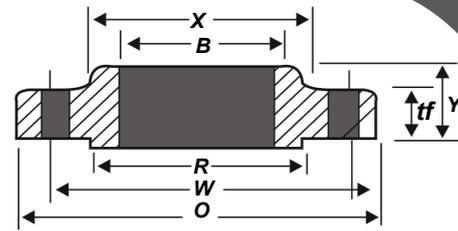
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Nominal Pipe Size NPS	Outside Diameter of Flange, O	Thickness of Flange, Min., t	Diameter of Hub, X	Drilling			Hub Diameter Beginning of Chamfer Welding Neck, A	Length Thru Hub			Bore			Corner Radius of Bore of Lapped Flange and Pipe, r	Counter-bore Threaded FLANGE Min., Q	Diameter of RF, R	Socket Weld D	
				Diameter of Bolt Circle, W	Diameter of Bolt Holes, in.	Number of Bolts		Threaded / Slip-On / Y	Lapped, Y	Welding Neck, Y	Threaded Length Threaded Min., T	Slip-On / Min., B	Lapped Min., B					Welding Neck, B
1/2	120.7	22.3	38	82.6	22.3	4	21.3	32	32	60	23	22.2	22.9		3	23.6	34.9	10
3/4	130.0	25.4	44	88.9	22.3	4	26.7	35	35	70	26	27.7	28.2		3	29.0	42.9	11
1	149.4	28.6	52	101.6	25.4	4	33.4	41	41	73	29	34.5	34.9		3	35.8	50.8	13
1 1/4	158.8	28.6	64	111.1	25.4	4	42.2	41	41	73	31	43.2	43.7		5	44.4	63.5	14
1 1/2	177.8	31.8	70	123.8	28.6	4	48.3	44	44	83	32	49.5	50.0		6	50.6	73.0	16
2	215.9	38.1	105	165.1	25.4	8	60.3	57	57	102	39	61.9	62.5		8	63.5	92.1	17
2 1/2	244.3	41.3	124	190.5	28.6	8	73.0	64	64	105	48	74.6	75.4		8	76.2	104.8	19
3	241.3	38.1	127	190.5	25.4	8	88.9	54	54	102	42	90.7	91.4		10	92.2	127.0	
4	292.1	44.5	159	235.0	31.8	8	114.3	70	70	114	48	116.1	116.8		11	117.6	139.7	
5	349.3	50.8	190	279.4	35.0	8	141.3	79	79	127	54	143.8	144.4	To be Specified by Purchaser	11	144.4		
6	381.0	55.6	235	317.5	31.8	12	168.3	86	86	140	58	170.7	171.4		13	171.4	185.7	
8	469.9	63.5	298	393.7	38.1	12	219.1	102	114	162	64	221.5	222.2		13	222.2	215.9	
10	546.1	69.9	368	469.9	38.1	16	273.0	108	127	184	72	276.2	277.4		13	276.2	269.9	
12	609.5	79.4	419	533.4	38.1	20	323.8	117	143	200	77	327.0	328.2		13	328.6	323.8	
																		381.0
14	641.4	85.8	451	558.8	41.3	20	355.6	130	156	213	83	359.2	360.2	13	360.4			
16	704.9	88.9	508	616.0	44.5	20	406.4	133	165	216	86	410.5	411.2	13	411.2	412.8		
18	787.4	101.6	565	685.8	50.8	20	457.0	152	190	229	89	461.8	462.3	13	462.0	469.9		
20	857.3	108.0	622	749.3	54.0	20	508.0	159	210	248	93	513.1	514.4	13	512.8	533.4		
24	1041.4	139.7	749	901.7	66.7	20	610.0	203	267	292	102	616.0	616.0	13	614.4	584.2		
																	692.2	

NOTE : (1) Height of RF 7mm

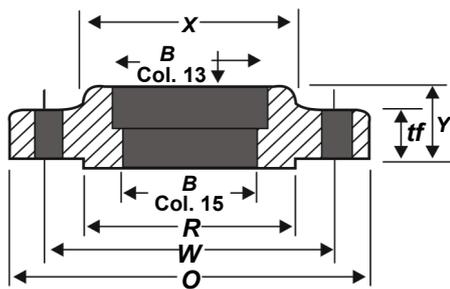
# DIMENSIONS OF CLASS 1500 FLANGES



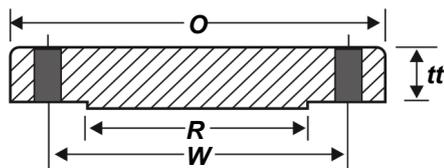
**Threaded (NPS ½" to 2½" Only)**



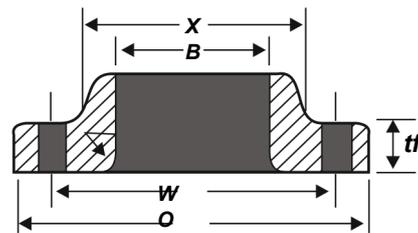
**Slip-On Welding (NPS ½" to 2½" Only)**



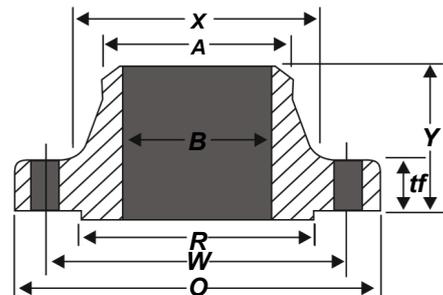
**Socket Welding (½" to 2½" Only)**



**Blind**



**Lapped**



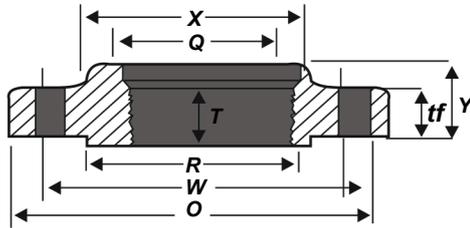
**Welding Neck**

## DIMENSIONS OF CLASS 1500 FLANGES

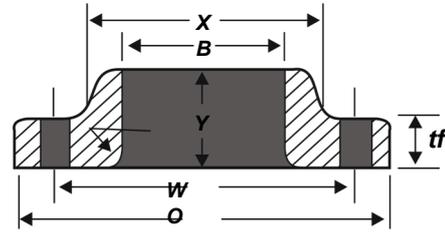
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Nominal Pipe Size NPS	Outside Diameter of Flange, $\phi$	Thickness of Flange, Min.,	Diameter of Hub, X	Drilling				Hub Diameter Beginning of Chamfer Welding Neck, A	Length Thru Hub			Bore			Corner Radius of Bore of Lapped Flange and Pipe, r	Counter-bore Threaded FLANGE Min., Q	Depth of Socket R	Diameter of RF R
				Diameter of Bolt Circle W	Diameter of Bolt Holes, in.	Number of Bolts	Threaded / Slip-On/ Socket Welding, Y		Lapped, Y	Welding Neck, Y	Threaded Length Threaded Min., T	Slip-On/Socket Welding Min., B	Lapped Min., B	Welding Neck, B				
½	120.7	22.3	38	82.6	22.3	4	21.3	32	32	60	23	22.2	22.9		3	23.6	10	34.9
¾	130.0	25.4	44	88.9	22.3	4	26.7	35	35	70	26	27.7	28.2		3	29.0	11	42.9
1	149.4	28.6	52	101.6	25.4	4	33.4	41	41	73	29	34.5	34.9		3	35.8	13	50.8
1 ½	158.8	28.6	64	111.1	25.4	4	42.2	41	41	73	31	43.2	43.7		5	44.4	14	63.5
	177.8																	73.0
1½		31.8	70	123.8	28.6	4	48.3	44	44	83	32	49.5	50.0		6	50.6	16	
2	215.9	38.1	105	165.1	25.4	8	60.3	57	57	102	39	61.9	62.5		8	63.5	17	92.1
2½	244.3	41.3	124	190.5	28.6	8	73.0	64	64	105	48	74.6	75.4		8	76.2	19	104.8
3	266.7	47.7	133	203.2	31.8	8	88.9	....	73	117	....	....	91.4		10	....	....	127.0
4	311.2	54.0	162	241.3	35.0	8	114.3	....	90	124	....	....	116.8		11	....	....	139.7
																		157.2
5	374.7	73.1	197	292.1	41.3	8	141.3	....	105	156	....	....	144.4	To be Specified by Purchaser	11	....	....	185.7
6	393.7	82.6	229	317.5	38.1	12	168.3	....	119	171	....	....	222.2		13	....	....	215.9
8	482.6	92.1	292	393.7	44.5	12	219.1	....	143	213	....	....	277.4		13	....	....	269.9
10	584.2	108.0	368	482.6	50.8	12	273.0	....	178	254	....	....	328.2		13	....	....	323.8
12	673.1	123.9	451	571.5	54.0	16	323.8	....	219	283	....	....	....	13	....	....	381.0	
14	749.3	133.4	495	635.0	60.4	16	355.6	....	241	298	....	....	360.2	13	....	....	412.8	
16	825.5	146.1	552	704.8	66.7	16	406.4	....	260	311	....	....	411.2	13	....	....	469.9	
18	914.4	162.0	597	774.7	73.0	16	457.0	....	276	327	....	....	462.3	13	....	....	533.4	
20	984.3	177.8	641	831.8	79.4	16	508.0	....	292	356	....	....	514.4	13	....	....	584.2	
24	1168.4	203.2	762	990.6	92.1	16	610.0	....	330	406	....	....	616.0	13	....	....	692.2	

NOTE : (1) Height of RF 7mm

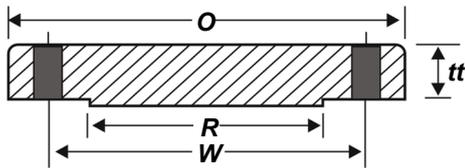
# DIMENSIONS OF CLASS 2500 FLANGES



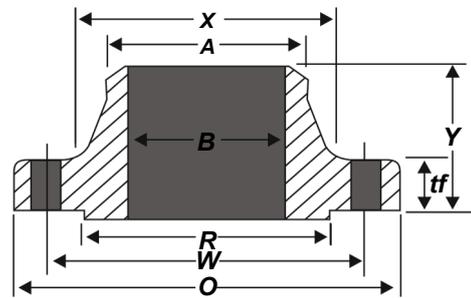
Thread (NPS ½ " to 2½" Only)



Lapped



Blind



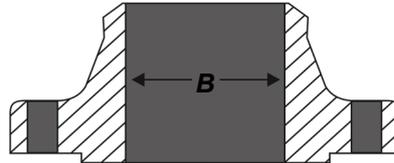
Welding Neck

## DIMENSIONS OF CLASS 2500 FLANGES

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Nominal Pipe Size NPS	Outside Diameter of Flange, O	Thickness of Flange, Min., t <sub>f</sub>	Diameter of Hub, X	Drilling			Hub Diameter Beginning of Chamfer Welding Neck, A	Length Throw Hub			Threaded/Length Threaded Min., T	Bore		Corner Radius of Bore of Lapped Flange and Pipe, r	Counter-bore Threaded Flange Min., Q	Diameter of RF R
				Diameter of Bolt Circle W	Diameter of Bolt Holes, in.	Number of Bolts		Threaded, Y	Lapped, Y	Welding Neck, Y		Lapped, Min., B	Welding Neck/Socket Welding, B			
½	133.4	30.2	48	88.9	22.3	4	21.3	40	40	73	29	22.9		3	23.6	34.9
¾	139.7	31.8	51	95.2	22.3	4	26.7	43	43	79	32	28.2		3	29.0	42.9
1	158.8	35.0	57	108.0	25.4	4	33.4	48	48	89	35	34.9		3	35.8	50.8
1 ¼	184.2	38.1	73	130.2	28.6	4	42.2	52	52	95	39	43.7		5	44.4	63.5
1½	203.2	44.5	79	146.0	31.8	4	48.3	60	60	111	45	50.0		6	50.6	73.0
2	235.0	50.9	95	171.4	28.6	8	60.3	70	70	127	51	62.5		8	63.5	92.1
2½	266.7	57.2	114	196.8	31.8	8	73.0	79	79	143	58	75.4		8	76.2	104.8
3	304.8	66.7	133	228.6	35.0	8	88.9	....	92	168	....	91.4	To be Specified by Purchaser	10	....	127.0
4	355.6	76.2	165	273.0	41.3	8	114.3	....	108	190	....	116.8		11	....	139.7
5	419.1	92.1	203	323.8	47.7	8	141.3	....	130	229	....	144.4		11	....	157.2
6	482.6	108.0	235	368.3	54.0	8	168.3	....	152	273	....	171.4		13	....	185.7
8	552.5	127.0	305	438.2	54.0	12	219.1	....	178	318	....	222.2		13	....	215.9
10	673.1	165.1	375	539.8	66.7	12	273.0	....	229	419	....	277.4		13	....	269.9
12	762.0	184.2	441	619.1	73.0	12	323.8	....	254	464	....	328.2		13	....	323.8

NOTE : (1) Height of RF 7mm

# BORE (w.r.t) SCHEDULES



Welding Neck

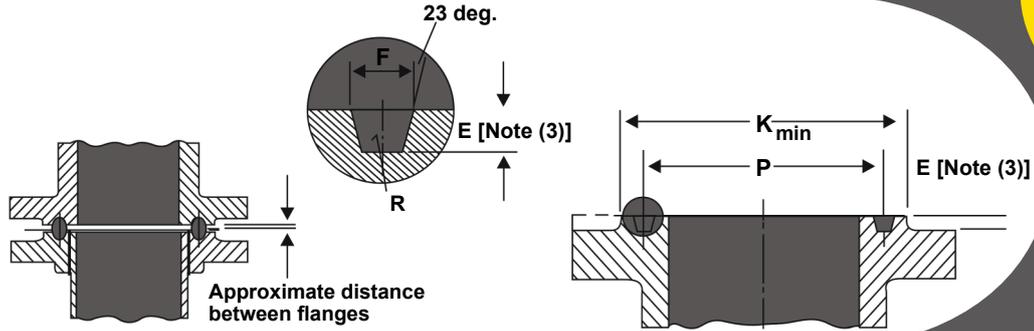


Socket Welding (½" to 3" Only)

## BORE (w.r.t) SCHEDULES

N.P	PIPE DIA	5S	10/10S	20	30	STD	40/40S	XS	60	80/80S	100	120	140	160	AA
½	21.3	18.0	17.0	N.A.	16.4	15.7	15.7	13.8	N.A.	13.8	N.A.	N.A.	N.A.	11.7	6.3
¾	26.7	23.4	22.4	N.A.	21.8	20.9	20.9	18.8	N.A.	18.8	N.A.	N.A.	N.A.	15.5	11.0
1	33.4	30.1	27.8	N.A.	27.6	26.6	26.6	24.3	N.A.	24.3	N.A.	N.A.	N.A.	20.7	15.2
1¼	42.2	38.9	36.6	N.A.	36.2	35.0	35.0	32.5	N.A.	32.5	N.A.	N.A.	N.A.	29.5	22.8
1½	48.3	45.0	42.7	N.A.	41.9	40.9	40.9	38.1	N.A.	38.1	N.A.	N.A.	N.A.	34.0	28
2	60.3	57.0	54.7	N.A.	53.9	52.4	52.4	49.2	N.A.	49.2	N.A.	N.A.	N.A.	42.8	38.1
2½	73.0	68.7	66.9	N.A.	63.4	62.6	62.6	58.9	N.A.	58.9	N.A.	N.A.	N.A.	53.9	44.9
3	88.9	84.6	82.8	N.A.	79.3	77.9	77.9	73.6	N.A.	73.6	N.A.	N.A.	N.A.	66.6	58.4
3 ½	101.6	97.3	95.5	N.A.	92.0	90.1	90.1	85.4	N.A.	85.4	N.A.	N.A.	N.A.	N.A.	N.A.
4	114.3	110.0	108.2	N.A.	104.7	102.2	102.2	97.1	N.A.	97.1	N.A.	92.0	N.A.	87.3	80.0
5	141.3	135.7	134.5	N.A.	N.A.	128.2	128.2	122.2	N.A.	122.2	N.A.	115.9	N.A.	109.5	103.2
6	168.3	162.7	161.5	N.A.	N.A.	154.0	154.0	146.3	N.A.	146.3	N.A.	139.7	N.A.	131.7	124.4
8	219.1	213.5	211.5	206.4	205.0	202.7	202.7	193.7	198.4	193.7	188.9	182.5	177.8	173.0	174.6
10	273.0	266.2	264.6	260.3	257.4	254.4	254.4	247.6	247.6	242.8/247.6	236.4	230.1	222.2	215.8	222.2
12	323.8	315.8	314.6	311.1	307.0	304.7	303.1/303.7	298.4	295.2	288.8/298.4	280.9	273	266.6	257.1	273
14	355.6	347.6	342.9/346.0	339.7	336.5	336.5	333.3	330.2	325.4	317.5	307.9	300.0	292.1	284.1	N.A.
16	406.4	398.0	393.7/396.8	390.5	387.3	387.3	381	381	373.0	363.5	354.0	344.4	333.3	325.4	N.A.
18	457.2	448.6	443.3/447.6	441.1	434.7	437.9	428.4	431.6	418.9	409.3	398.2	387.1	377.6	366.5	N.A.
20	508.0	498.4	495.3/496.9	488.9	482.6	488.9	477.8	482.6	466.7	455.6	442.9	431.8	419.1	407.9	N.A.
22	559.0	549.4	546.3/547.7	539.9	533.6	539.9	N.A.	533.6	514.5	501.8	489.1	476.4	463.7	451.0	N.A.
24	610	598.9	597.3	590.9	581.4	590.9	575.0	584.6	560.7	548.0	532.2	517.9	505.2	490.9	N.A.

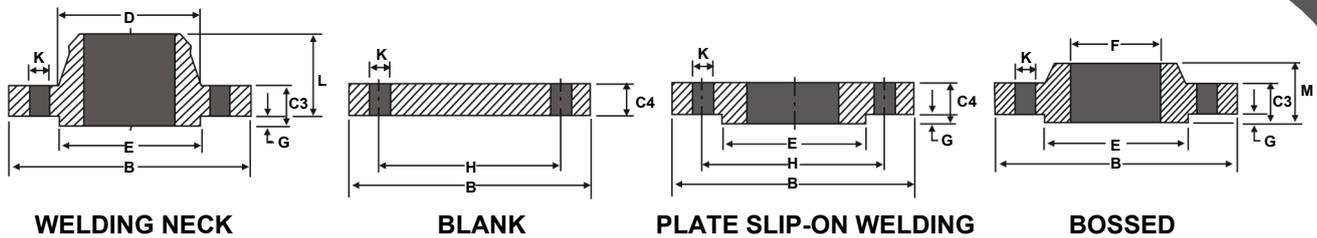
**DIMENSION OF RING-JOINT FACINGS  
(ALL PRESSURE RATING CLASSES) AS PER ASME B16.5 - 2003**



**DIMENSION OF RING-JOINT FACINGS (ALL PRESSURE RATING CLASSES)  
AS PER ASME B16.5-2003**

1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17	
Nominal Size							Groove Number	Groove Dimensions			Radius at Bottom, R	Diameter of Raised Portion, K																					
Class 150 NPS	Class 300 NPS	Class 400 NPS	Class 600 NPS	Class 900 NPS	Class 1500 NPS	Class 2500 NPS		Groove Diameter, P	Depth, E	Width, F		Class 150	Class 300 400 600	Class 900	Class 1500	Class 2500																	
....	1/2	....	1/2	....	....	....	R11	34.14	5.54	7.14	0.8	....	51.0	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
....	....	....	....	....	1/2	....	12	39.67	6.35	8.74	0.8	....	....	....	60.5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
....	3/4	....	3/4	....	....	1/2	13	42.88	6.35	8.74	0.8	....	....	....	63.5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	65.0		
....	....	....	....	....	3/4	....	14	44.45	6.35	8.74	0.8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
1	....	....	....	....	....	....	15	47.63	6.35	8.74	0.8	63.5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
....	1	....	1	....	1	3/4	16	50.80	6.35	8.74	0.8	....	70.0	....	71.5	73.0	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
1 1/4	....	....	....	....	....	....	17	57.15	6.35	8.74	0.8	73.0	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
....	1 1/4	....	1 1/4	....	1 1/4	1	18	60.33	6.35	8.74	0.8	....	79.5	....	81.0	82.5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
1 1/2	....	....	....	....	....	....	19	65.07	6.35	8.74	0.8	82.5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
....	1 1/2	....	1 1/2	....	1 1/2	....	20	68.27	6.35	8.74	0.8	....	90.5	....	92.0	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
....	....	....	....	....	....	1/4	21	72.23	7.92	11.91	0.8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	102	
2	....	....	....	....	....	....	22	82.55	6.35	8.74	0.8	102	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
....	2	....	2	....	....	1 1/2	23	82.55	7.92	11.91	0.8	....	108	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	114	
....	....	....	....	....	2	....	24	95.25	7.92	11.91	0.8	....	....	....	124	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
2 1/2	....	....	....	....	....	....	25	101.60	6.35	8.74	0.8	121	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
....	2 1/2	....	2 1/2	....	....	2	26	101.60	7.92	11.91	0.8	....	127	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	133	
....	....	....	....	....	2 1/2	....	27	107.95	7.92	11.91	0.8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
....	....	....	....	....	....	2 1/2	28	111.13	9.52	13.49	0.8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
3	....	....	....	....	....	....	29	114.30	6.35	8.74	0.8	133	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
....	(2)	....	(2)	....	....	....	30	117.48	7.92	11.91	0.8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
....	3 (2)	....	3 (2)	3	....	....	31	123.83	7.92	11.91	0.8	....	146	156	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
....	....	....	....	....	....	3	32	127.00	9.53	13.49	1.5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
3 1/2	....	....	....	....	....	....	33	131.78	6.35	8.74	0.8	154	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	3 1/2	....	3 1/2	....	....	....	34	131.78	7.92	11.91	0.8	....	159	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	3	....	35	136.53	7.92	11.91	0.8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
4	....	....	....	....	....	....	36	149.23	6.35	8.74	0.8	171	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	4	4	4	4	....	....	37	149.23	7.92	11.91	0.8	....	175	181	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	4	38	157.18	11.13	16.66	1.5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	203
....	....	....	....	....	....	4	39	161.93	7.92	11.91	0.8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
5	....	....	....	....	....	....	40	171.45	6.35	8.74	0.8	194	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	5	5	5	5	....	....	41	180.98	7.92	11.91	0.8	....	210	216	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	5	42	190.50	12.70	19.84	1.5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
6	....	....	....	....	....	....	43	193.69	6.35	8.74	0.8	219	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	5	....	44	193.68	7.92	11.91	0.8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	6	6	6	6	....	....	45	211.12	7.92	11.91	0.8	....	241	241	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	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	273	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	8	8	8	8	....	....	49	269.88	7.92	11.91	0.8	....	302	308	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

NOTE : (1) USE CLASS 600 FOR SIZES NPS 1/2 TO NPS 3/4 FOR CLASS 400  
 (2) USE CLASS 1500 FOR SIZES NPS 1/2 TO 2 1/2 FOR CLASS 900  
 (3) Height of raised portion is equal to the depth of groove dimension E, but is not subjected to the tolerance for E, Former full-face contour maybe used.  
 (4) For ring joints with lapped flanges in Classes 300 to 600, ring and groove number R30 is used instead of R31  
**TOLERANCES** : E (depth) +0.4, -0.0F (width) +0.2p (pitch diameter) ±0.13 R (radius at bottom) R≤ 2+0.8, -0.0 R>2±0.8 23 deg (angle) ±1/2 deg.



PN 6

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PIP	FLANGE OUTSIDE DIAMETER	FLANGE THICKNESS BOSSED			HUB DIAMETER W/NECK	RAISED FACE DIAMETER	SLIP ON BORE	RAISED FACE THICKNESS	DRILLING DATA			LENGTH THROUGH HUB		NOMINAL PIPE SIZE		
			PLATE	W/NECK	BLIND					BOLT CIRCLE DIAMETER	NUMBER OF HOLES	DIAMETER OF HOLES	OVERALL THICKNESS (W/NECK)	OVERALL THICKNESS (BOSSED)	mm.	(in)	
mm.	(in)	A	B	C1	C3	C4	D	E	F	G	H	J	K	L	M	mm.	(in)
15	(1/2)	21.3	80	12	12	12	30	40	22.3	2	55	4	11	30	20	15	(1/2)
20	(3/4)	26.7	90	14	14	14	38	50	27.6	2	65	4	11	32	24	20	(3/4)
25	(1)	33.4	100	14	14	14	42	60	34.5	2	75	4	11	35	24	25	(1)
32	(1 1/4)	42.2	120	16	14	14	55	70	43.1	2	90	4	14	35	26	32	(1 1/4)
40	(1 1/2)	48.3	130	16	14	14	62	80	49.5	3	100	4	14	38	26	40	(1 1/2)
50	(2)	60.3	140	16	14	14	74	90	61.9	3	110	4	14	38	28	50	(2)
65	(2 1/2)	73	160	16	14	14	88	110	74.6	3	130	4	14	38	32	65	(2 1/2)
80	(3)	88.9	190	18	16	16	102	128	90.8	3	150	4	18	42	34	80	(3)
100	(4)	114.3	210	18	16	16	130	148	116.0	3	170	4	18	45	40	100	(4)
125	(5)	141.3	240	20	18	18	155	178	143.7	3	200	8	18	48	44	125	(5)
150	(6)	168.3	265	20	18	18	184	202	170.8	3	225	8	18	48	44	150	(6)
200	(8)	219.1	320	22	20	20	236	258	221.4	3	280	8	18	55	44	200	(8)
250	(10)	273.1	375	24	22	22	290	312	276.3	3	335	12	18	60	44	250	(10)
300	(12)	323.8	440	24	22	22	342	365	327.1	4	395	12	22	62	44	300	(12)
350	(14)	355.6	490	26	22	22	385	415	359.1	4	445	12	22	62	-	350	(14)
400	(16)	406.4	540	28	22	22	438	465	410.4	4	495	16	22	65	-	400	(16)
450	(18)	457	595	30	24	24	492	520	461.7	4	550	16	22	65	-	450	(18)
500	(20)	508	645	30	24	24	538	570	513.0	4	600	20	22	68	-	500	(20)
600	(24)	610	755	32	24	34	640	670	615.9	5	705	20	26	70	-	600	(24)

PN 10

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PIP	FLANGE OUTSIDE DIAMETER	FLANGE THICKNESS BOSSED			HUB DIAMETER W/NECK	RAISED FACE DIAMETER	SLIP ON BORE	RAISED FACE THICKNESS	DRILLING DATA			LENGTH THROUGH HUB		NOMINAL PIPE SIZE		
			PLATE	W/NECK	BLIND					BOLT CIRCLE DIAMETER	NUMBER OF HOLES	DIAMETER OF HOLES	OVERALL THICKNESS (W/NECK)	OVERALL THICKNESS (BOSSED)	mm.	(in)	
mm.	(in)	A	B	C1	C3	C4	E	F	G	H	J	K	L	M	N	mm.	(in)
<b>USE PN 16 FOR SIZES BELOW 200mm</b>																	
200	(8)	219.1	340	24	24	24	246	268	221.4	3	295	8	22	62	44	200	(8)
250	(10)	273.1	395	26	26	26	298	320	276.3	3	350	12	22	68	46	250	(10)
300	(12)	323.8	445	26	26	26	350	370	327.1	4	400	12	22	68	46	300	(12)
350	(14)	355.6	505	28	26	26	400	430	359.1	4	460	16	22	68	53	350	(14)
400	(16)	406.4	565	32	26	26	456	482	410.4	4	515	16	26	72	57	400	(16)
450	(18)	457	615	36	28	28	502	532	461.7	4	565	20	26	72	63	450	(18)
500	(20)	508	670	38	28	28	559	585	513.0	4	620	20	26	75	67	500	(20)
600	(24)	610	780	42	28	34	658	685	615.9	5	725	20	30	80	75	600	(24)

NOTE : (1) DIMENSIONS ARE IN MM  
 (2) LARGER SIZES AVAILABLE ON REQUEST  
 (3) AVAILABLE WITH OR WITHOUT RAISED FACE  
 (4) WELD NECK BORE IS EQUAL TO PIPE

# BS 4504 1993 PN 16,25 & 40



## PN 16

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PIPE	FLANGE OUTSIDE DIAMETER	FLANGE THICKNESS			HUB DIAMETER W. NECK	RAISED FACE DIAMETER	SLIP ON BORE	RAISED FACE THICKNESS	DRILLING DATA			LENGTH THROUGH HUB		NOMINAL PIPE SIZE		
			PLATE	BOSSED & W/NECK	BLIND					BOLT CIRCLE DIAMETER	NUMBER OF HOLES	DIAMETER OF HOLES	OVERALL THICKNESS (W. NECK)	OVERALL THICKNESS (BOSSED)	mm.	(in)	
mm.	(in)	A	B	C1	C3	C4	D	E	F	G	H	J	K	L	M	mm.	(in)
15	(1/2)	21.3	95	14	14	14	35	45	22.3	2	65	4	14	35	20	15	(1/2)
20	(3/4)	26.7	105	16	16	16	45	58	27.6	2	75	4	14	38	24	20	(3/4)
25	(1)	33.4	115	16	16	16	52	68	34.5	2	85	4	14	38	24	25	(1)
32	(1 1/4)	42.2	140	18	16	16	60	78	43.1	2	100	4	18	40	26	32	(1 1/4)
40	(1 1/2)	48.3	150	18	16	16	70	88	49.5	3	110	4	18	42	26	40	(1 1/2)
50	(2)	60.3	165	20	18	18	84	102	81.9	3	125	4	18	45	28	50	(2)
65	(2 1/2)	73	185	20	20	20	104	122	74.6	3	145	4	18	45	32	65	(2 1/2)
80	(3)	88.9	200	22	20	20	118	138	90.8	3	160	8	18	50	34	80	(3)
100	(4)	114.3	220	22	22	22	140	158	116.0	3	180	8	18	52	40	100	(4)
125	(5)	141.3	250	24	22	22	168	188	143.7	3	210	8	18	55	44	125	(5)
150	(6)	168.3	285	26	24	24	195	212	170.6	3	240	8	22	55	44	150	(6)
200	(8)	219.1	340	29	26	26	246	268	221.4	3	295	12	22	62	44	200	(8)
250	(10)	273.1	405	32	28	28	298	320	276.3	3	355	12	26	70	46	250	(10)
300	(12)	323.8	460	35	30	30	350	378	327.1	4	410	12	26	78	46	300	(12)
350	(14)	355.6	520	38	32	32	400	438	359.1	4	470	16	26	82	57	350	(14)
400	(16)	406.4	580	42	34	34	456	490	410.4	4	525	16	30	85	63	400	(16)
450	(18)	457	640	46	34	36	502	550	461.7	4	585	20	30	87	68	450	(18)
500	(20)	508	715	52	36	44	559	610	513.0	4	650	20	33	90	73	500	(20)
600	(24)	610	840	52	36	44	658	725	615.9	5	770	20	36	95	83	600	(24)

## PN 25

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PIPE	FLANGE OUTSIDE DIAMETER	FLANGE THICKNESS			HUB DIAMETER W. NECK	RAISED FACE DIAMETER	SLIP ON BORE	RAISED FACE THICKNESS	DRILLING DATA			LENGTH THROUGH HUB		NOMINAL PIPE SIZE		
			PLATE	BOSSED & W/NECK	BLIND					BOLT CIRCLE DIAMETER	NUMBER OF HOLES	DIAMETER OF HOLES	OVERALL THICKNESS (W. NECK)	OVERALL THICKNESS (BOSSED)	mm.	(in)	
mm.	(in)	A	B	C1	C3	C4	D	E	F	G	H	J	K	L	M	mm.	(in)
<b>USE PN 40 FOR SIZES BELOW 200mm</b>																	
200	(8)	219.1	360	32	30	30	256	278	221.4	3	310	12	26	80	52	200	(8)
250	(10)	273.1	425	35	32	32	310	335	278.3	3	370	12	30	88	60	250	(10)
300	(12)	323.8	485	38	34	34	364	395	327.1	4	430	16	30	92	67	300	(12)
350	(14)	355.6	555	42	38	38	418	450	359.1	4	490	16	33	100	72	350	(14)
400	(16)	406.4	620	46	40	40	472	505	410.4	4	550	16	36	110	78	400	(16)
450	(18)	457	670	50	42	42	520	555	481.7	4	600	20	36	110	84	450	(18)
500	(20)	508	730	56	44	45	580	615	513.0	4	660	20	36	125	90	500	(20)
600	(24)	610	845	68	46	54	684	720	615.9	5	770	20	39	125	100	600	(24)

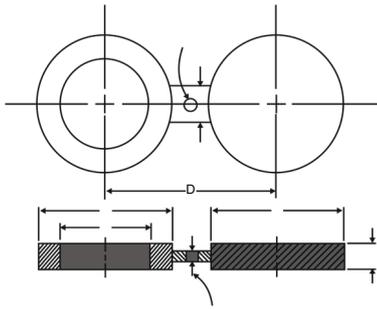
## PN 40

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PIPE	FLANGE OUTSIDE DIAMETER	FLANGE THICKNESS			HUB DIAMETER W. NECK	RAISED FACE DIAMETER	SLIP ON BORE	RAISED FACE THICKNESS	DRILLING DATA			LENGTH THROUGH HUB		NOMINAL PIPE SIZE		
			PLATE	BOSSED & W/NECK	BLIND					BOLT CIRCLE DIAMETER	NUMBER OF HOLES	DIAMETER OF HOLES	OVERALL THICKNESS (W. NECK)	OVERALL THICKNESS (BOSSED)	mm.	(in)	
mm.	(in)	A	B	C1	C3	C4	D	E	F	G	H	J	K	L	M	mm.	(in)
15	(1/2)	21.3	95	14	16	16	35	45	22.3	2	65	4	14	38	22	15	(1/2)
20	(3/4)	26.7	105	16	18	18	45	58	27.6	2	75	4	14	40	26	20	(3/4)
25	(1)	33.4	115	16	18	18	52	68	34.5	2	85	4	14	40	28	25	(1)
32	(1 1/4)	42.2	140	18	18	18	60	78	43.1	2	100	4	18	42	30	32	(1 1/4)
40	(1 1/2)	48.3	150	18	18	18	70	88	49.5	3	110	4	18	45	32	40	(1 1/2)
50	(2)	60.3	165	20	20	20	84	102	81.9	3	125	4	18	48	34	50	(2)
65	(2 1/2)	73	185	22	22	22	104	122	74.6	3	145	4	18	52	38	65	(2 1/2)
80	(3)	88.9	200	24	24	24	118	138	90.8	3	160	8	18	58	40	80	(3)
100	(4)	114.3	235	26	24	24	145	162	118.0	3	190	8	22	65	44	100	(4)
125	(5)	141.3	270	28	26	26	170	188	143.7	3	220	8	26	68	48	125	(5)
150	(6)	168.3	300	30	28	28	200	218	170.6	3	250	8	26	75	52	150	(6)
200	(8)	219.1	375	36	34	34	285	285	221.4	3	320	8	26	88	52	200	(8)
250	(10)	273.1	450	42	38	38	260	345	276.3	3	385	12	33	105	60	250	(10)
300	(12)	323.8	515	48	42	42	380	410	327.1	4	450	12	33	115	67	300	(12)
350	(14)	355.6	580	54	46	46	424	465	359.1	4	510	16	36	125	72	350	(14)
400	(16)	406.4	660	60	50	50	478	535	410.4	4	585	16	39	135	78	400	(16)
450	(18)	457	685	66	50	54	522	560	461.7	4	610	20	39	135	84	450	(18)
500	(20)	508	755	72	52	56	576	615	513.0	4	670	20	42	140	90	500	(20)
600	(24)	610	890	84	60	70	686	735	615.9	5	795	20	48	150	100	600	(24)

- NOTES:-
1. DIMENSIONS ARE IN MM
  2. LARGER SIZES AVAILABLE ON REQUEST
  3. AVAILABLE WITH OR WITHOUT RAISED FACE
  4. WELD NECK BORE IS EQUAL TO PIPE

# SPECTACLE BLINDS TO API 590

## ANSI Class 150, 300 & 600



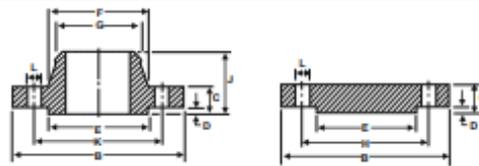
### CLASS 150

### CLASS 300

### CLASS 600

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PIPE	INSIDE DIAMETER	OUTSIDE DIAMETER	CENTRE LINE SPACING	THICKNESS	WEB WIDTH	INSIDE DIAMETER	OUTSIDE DIAMETER	CENTRE LINE SPACING	THICKNESS	WEB WIDTH	INSIDE DIAMETER	OUTSIDE DIAMETER	CENTRE LINE SPACING	THICKNESS	WEB WIDTH	NOMINAL PIPE SIZE
15																	15
20																	20
25																	25
32																	32
40																	40
50																	50
65																	65
80																	80
100																	100
125																	125
150																	150
200																	200
250																	250
300																	300
350																	350
400																	400
450																	450
500																	500
600																	600

- NOTES:-
- HOLE SIZE SHALL BE THE SAME AS THE FLANGE BOLT HOLE.
  - THE THICKNESS OF WEB SHALL BE THE LEAST OF "t" OR 6.4 mm
  - ALSO AVAILABLE IN LARGER SIZES & RING TYPE JOINT FACING.



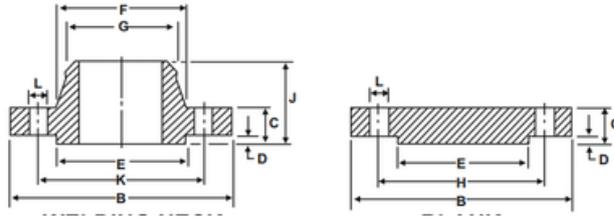
### CLASS 150

### Series A Class 150

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PIPE	FLANGE OUTSIDE DIAMETER	THICKNESS OF FLANGE	THICKNESS OF FLANGE	RAISED FACE THICKNESS	RAISED FACE DIAMETER	HUB DIAMETER	HUB DIA. START OF CHAMFER	LENGTH THROUGH HUB	BOLT CIRCLE DIAMETER	DIAMETER OF BOLT HOLES	NUMBER OF BOLTS	NOMINAL PIPE SIZE
650													650
700													700
750													750
800													800
850													850
900													900
950													950
1000													1000
1050													1050
1100													1100
1150													1150
1200													1200
1250													1250
1300													1300
1350													1350
1400													1400
1450													1450
1500													1500

- NOTES:-
- DIMENSIONS ARE IN MM
  - BORE IS TO BE SPECIFIED BY THE CUSTOMER TO SUIT PIPE
  - RING TYPE JOINT ALSO AVAILABLE
- Previously MSS SP44

# ASME B16.47 - 1996 Series A Class 300



## CLASS 300

### WELDING NECK

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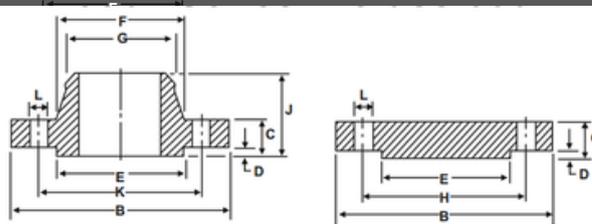
### DRILLING DATA

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PIPE	FLANGE OUTSIDE DIAMETER	THICKNESS OF FLANGE MIN W NECK	THICKNESS OF FLANGE MIN BLIND	RAISED FACE THICKNESS	RAISED FACE DIAMETER	HUB DIAMETER	HUB DIA. START OF CHAMFER	LENGTH THROUGH HUB	BOLT CIRCLE DIAMETER	DIAMETER OF BOLT HOLES	NUMBER OF BOLTS	NOMINAL PIPE SIZE		
													mm.	(in)	
650	(26)	660.4	971.6	79.2	84.1	1.6	749.3	720.9	660.4	184.2	876.3	44.5	28	650	(26)
700	(28)	711.2	1035.1	85.9	90.4	1.6	800.1	774.7	711.2	196.9	939.8	44.5	28	700	(28)
750	(30)	762.0	1092.2	91.9	95.3	1.6	857.3	827.0	762.0	209.6	997.0	47.8	28	750	(30)
800	(32)	812.8	1149.4	98.6	100.1	1.6	914.4	881.1	812.8	222.3	1054.1	50.8	28	800	(32)
850	(34)	863.6	1206.5	101.6	104.6	1.6	965.2	936.8	863.6	231.6	1104.9	50.8	28	850	(34)
900	(36)	914.4	1270.0	104.6	111.3	1.6	1022.4	990.6	914.4	241.3	1168.4	53.8	32	900	(36)
950	(38)	965.2	1168.4	108.0	108.0	1.6	1028.7	993.6	965.2	180.8	1092.2	41.1	32	950	(38)
1000	(40)	1016.0	1238.3	114.3	114.3	1.6	1085.9	1047.8	1016.0	193.5	1155.7	44.5	32	1000	(40)
1050	(42)	1066.8	1289.1	119.1	119.1	1.6	1136.7	1098.6	1066.8	200.2	1206.5	44.5	32	1050	(42)
1100	(44)	1117.6	1352.6	124.0	124.0	1.6	1193.8	1149.4	1117.6	206.2	1263.7	47.8	32	1100	(44)
1150	(46)	1168.4	1416.1	128.5	128.5	1.6	1244.6	1203.5	1168.4	215.9	1320.8	50.8	28	1150	(46)
1200	(48)	1219.2	1466.9	133.4	133.4	1.6	1301.8	1254.3	1219.2	223.8	1371.6	50.8	32	1200	(48)
1250	(50)	1270.0	1530.4	139.7	139.7	1.6	1358.9	1305.1	1270.0	231.6	1428.8	53.8	32	1250	(50)
1300	(52)	1320.8	1581.2	144.5	144.5	1.6	1409.7	1355.9	1320.8	238.3	1479.6	53.8	32	1300	(52)
1350	(54)	1371.6	1657.4	152.4	152.4	1.6	1466.9	1409.7	1371.6	252.5	1549.4	60.5	28	1350	(54)
1400	(56)	1422.4	1708.2	153.9	153.9	1.6	1517.7	1463.5	1422.4	260.4	1600.2	60.5	28	1400	(56)
1450	(58)	1473.2	1759.0	158.8	158.8	1.6	1574.8	1514.3	1473.2	266.7	1651.0	60.5	32	1450	(58)
1500	(60)	1524.0	1809.8	163.6	163.6	1.6	1625.6	1565.1	1524.0	273.1	1701.8	60.5	32	1500	(60)

- NOTES:- 1. DIMENSIONS ARE IN MM  
2. BORE IS TO BE SPECIFIED BY THE CUSTOMER TO SUIT PIPE  
3. RING TYPE JOINTS AVAILABLE

Previously MSS SP44

# ASME B16.47 - 1996 Series A Class 600



## CLASS 600

### WELDING NECK

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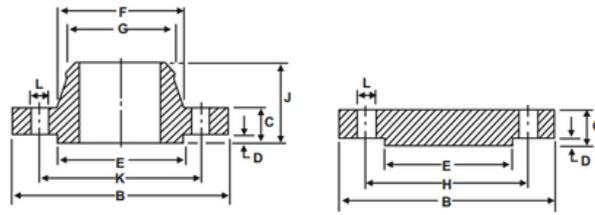
### DRILLING DATA

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PIPE	FLANGE OUTSIDE DIAMETER	THICKNESS OF FLANGE MIN W NECK	THICKNESS OF FLANGE MIN BLIND	RAISED FACE THICKNESS	RAISED FACE DIAMETER	HUB DIAMETER	HUB DIA. START OF CHAMFER	LENGTH THROUGH HUB	BOLT CIRCLE DIAMETER	DIAMETER OF BOLT HOLES	NUMBER OF BOLTS	NOMINAL PIPE SIZE		
													mm.	(in)	
650	(26)	660.4	1016.0	108.0	125.5	6.4	749.3	747.8	660.4	222.3	914.4	50.8	28	650	(26)
700	(28)	711.2	1073.2	111.3	131.8	6.4	800.1	803.1	711.2	235.0	965.2	53.8	28	700	(28)
750	(30)	762.0	1130.3	114.3	139.7	6.4	857.3	862.1	762.0	247.7	1022.4	53.8	28	750	(30)
800	(32)	812.8	1193.8	117.3	147.6	6.4	914.4	917.4	812.8	260.4	1079.5	60.5	28	800	(32)
850	(34)	863.6	1244.6	120.7	153.9	6.4	965.2	973.1	863.6	269.7	1130.3	60.5	28	850	(34)
900	(36)	914.4	1314.5	124.0	162.1	6.4	1022.4	1031.7	914.4	282.4	1193.8	66.5	28	900	(36)
950	(38)	965.2	1270.0	152.4	155.4	6.4	1054.1	1022.4	965.2	254.0	1162.1	60.5	28	950	(38)
1000	(40)	1016.0	1320.8	158.8	162.1	6.4	1111.3	1073.2	1016.0	263.7	1212.9	60.5	32	1000	(40)
1050	(42)	1066.8	1403.4	168.1	171.5	6.4	1168.4	1127.3	1066.8	279.4	1282.7	66.5	28	1050	(42)
1100	(44)	1117.6	1454.2	173.0	177.8	6.4	1225.6	1181.1	1117.6	289.1	1333.5	66.5	32	1100	(44)
1150	(46)	1168.4	1511.3	179.3	185.7	6.4	1276.4	1234.9	1168.4	300.0	1390.7	66.5	32	1150	(46)
1200	(48)	1219.2	1593.9	189.0	195.3	6.4	1333.5	1289.1	1219.2	316.0	1460.5	73.2	32	1200	(48)
1250	(50)	1270.0	1670.1	196.9	203.2	6.4	1384.3	1343.2	1270.0	328.7	1524.0	79.2	28	1250	(50)
1300	(52)	1320.8	1720.9	203.2	209.6	6.4	1435.1	1394.0	1320.8	336.6	1574.8	79.2	32	1300	(52)
1350	(54)	1371.6	1778.0	209.6	217.4	6.4	1492.3	1447.8	1371.6	349.3	1632.0	79.2	32	1350	(54)
1400	(56)	1422.4	1854.2	217.4	225.6	6.4	1543.1	1501.6	1422.4	362.0	1695.5	85.9	32	1400	(56)
1450	(58)	1473.2	1905.0	222.3	231.6	6.4	1600.2	1552.4	1473.2	369.8	1746.3	85.9	32	1450	(58)
1500	(60)	1524.0	1993.9	233.4	242.8	6.4	1657.4	1609.9	1524.0	388.9	1822.5	91.9	28	1500	(60)

- NOTES:- 1. DIMENSIONS ARE IN MM  
2. BORE IS TO BE SPECIFIED BY THE CUSTOMER TO SUIT PIPE  
3. RING TYPE JOINT ALSO AVAILABLE

Previously MSS SP44

# ASME B16.47 - 1996 Series B Class 150



## CLASS 150

### WELDING NECK

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### DRILLING DATA

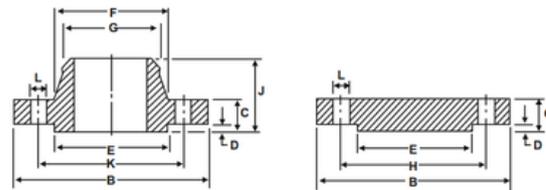
NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PIPE	FLANGE OUTSIDE DIAMETER	THICKNESS OF FLANGE MIN W NECK	THICKNESS OF FLANGE MIN BLIND	RAISED FACE THICKNESS	RAISED FACE DIAMETER	HUB DIAMETER	HUB DIA. START OF CHAMFER	LENGTH THROUGH HUB	BOLT CIRCLE DIAMETER	DIAMETER OF BOLT HOLES	NUMBER OF BOLTS	NOMINAL PIPE SIZE		
													mm.	(in)	
650	(26)	660.4	785.9	41.1	44.5	1.6	711.2	684.3	661.9	88.9	744.5	22.4	36	650	(26)
700	(28)	711.2	836.7	44.5	47.8	1.6	762.0	735.1	712.7	95.3	795.3	22.4	40	700	(28)
750	(30)	762.0	887.5	44.5	50.8	1.6	812.8	787.4	763.5	100.1	846.1	22.4	44	750	(30)
800	(32)	812.8	941.3	46.0	53.8	1.6	863.6	839.7	814.3	108.0	900.2	22.4	48	800	(32)
850	(34)	863.6	1004.8	49.3	57.2	1.6	920.8	892.0	865.1	110.2	957.3	25.4	40	850	(34)
900	(36)	914.4	1057.1	52.3	58.7	1.6	971.6	944.6	915.9	117.3	1009.7	25.4	44	900	(36)
950	(38)	965.2	1124.0	53.8	63.5	1.6	1022.4	997.0	968.2	124.0	1069.8	28.4	40	950	(38)
1000	(40)	1016.0	1174.8	55.6	66.5	1.6	1079.5	1049.3	1019.0	128.5	1120.6	28.4	44	1000	(40)
1050	(42)	1066.8	1225.6	58.7	68.3	1.6	1130.3	1101.9	1069.8	133.4	1171.4	28.4	48	1050	(42)
1100	(44)	1117.6	1276.4	60.5	71.4	1.6	1181.1	1152.7	1120.6	136.7	1222.2	28.4	52	1100	(44)
1150	(46)	1168.4	1341.4	62.0	74.7	1.6	1234.9	1205.0	1171.4	144.5	1284.2	31.8	40	1150	(46)
1200	(48)	1219.2	1392.2	65.0	77.7	1.6	1289.1	1257.3	1222.2	149.4	1335.0	31.8	44	1200	(48)
1250	(50)	1270.0	1443.0	68.3	80.8	1.6	1339.9	1308.1	1273.0	153.9	1385.8	31.8	48	1250	(50)
1300	(52)	1320.8	1493.8	69.9	84.1	1.6	1390.7	1360.4	1323.8	157.2	1436.6	31.8	52	1250	(52)
1350	(54)	1371.6	1549.4	71.4	87.4	1.6	1441.5	1412.7	1374.6	162.1	1492.3	31.8	56	1300	(54)
1400	(56)	1422.4	1600.2	73.2	90.4	1.6	1492.3	1465.3	1425.4	166.6	1543.1	31.8	60	1350	(56)
1450	(58)	1473.2	1674.9	74.7	93.5	1.6	1543.1	1516.1	1476.2	174.8	1611.4	35.1	48	1400	(58)
1500	(60)	1524.0	1725.7	76.2	96.8	1.6	1600.2	1570.0	1527.0	179.3	1662.2	35.1	52	1450	(60)

NOTES:-

1. DIMENSIONS ARE IN MM
2. BORE IS TO BE SPECIFIED BY THE CUSTOMER TO SUIT PIPE
3. RING TYPE JOINT ALSO AVAILABLE

Previously API 605

# ASME B16.47 - 1996 Series B Class 300



## CLASS 300

### WELDING NECK

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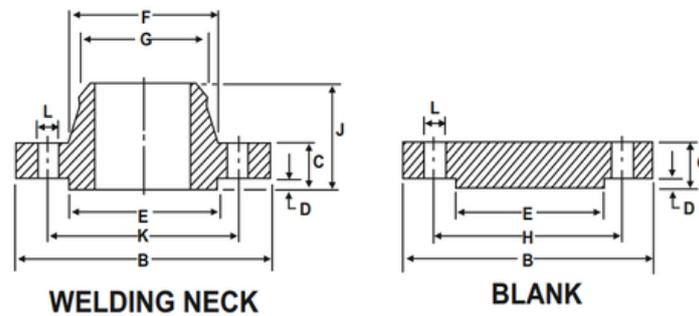
### DRILLING DATA

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PIPE	FLANGE OUTSIDE DIAMETER	THICKNESS OF FLANGE MIN W NECK	THICKNESS OF FLANGE MIN BLIND	RAISED FACE THICKNESS	RAISED FACE DIAMETER	HUB DIAMETER	HUB DIA. START OF CHAMFER	LENGTH THROUGH HUB	BOLT CIRCLE DIAMETER	DIAMETER OF BOLT HOLES	NUMBER OF BOLTS	NOMINAL PIPE SIZE		
													mm.	(in)	
650	(26)	660.4	866.6	88.9	88.9	1.6	736.6	701.5	665.2	144.5	803.1	35.1	32	650	(26)
700	(28)	711.2	920.8	88.9	88.9	1.6	787.4	755.7	716.0	149.4	857.3	35.1	36	700	(28)
750	(30)	762.0	990.6	93.7	93.7	1.6	844.6	812.8	768.4	158.0	920.8	38.1	36	750	(30)
800	(32)	812.8	1054.1	103.1	103.1	1.6	901.7	863.6	819.2	168.1	977.9	41.1	32	800	(32)
850	(34)	863.6	1107.9	103.1	103.1	1.6	952.5	917.4	870.0	173.0	1031.7	41.1	36	850	(34)
900	(36)	914.4	1171.4	103.1	103.1	1.6	1009.7	965.2	920.8	180.8	1089.2	44.5	32	900	(36)
950	(38)	965.2	1222.2	111.3	111.3	1.6	1060.5	1016.0	971.6	192.0	1140.0	44.5	36	950	(38)
1000	(40)	1016.0	1273.0	115.8	115.8	1.6	1114.6	1066.8	1022.4	198.4	1190.8	44.5	40	1000	(40)
1050	(42)	1066.8	1333.5	119.1	119.1	1.6	1168.4	1117.6	1074.7	204.7	1244.6	47.8	36	1050	(42)
1100	(44)	1117.6	1384.3	127.0	127.0	1.6	1219.2	1173.2	1125.5	214.4	1295.4	47.8	40	1100	(44)
1150	(46)	1168.4	1460.5	128.5	130.0	1.6	1270.0	1228.9	1176.3	222.3	1365.3	50.8	36	1150	(46)
1200	(48)	1219.2	1511.3	128.5	134.9	1.6	1327.2	1277.9	1227.1	223.8	1416.1	50.8	40	1200	(48)
1250	(50)	1270.0	1562.1	138.2	139.7	1.6	1378.0	1330.5	1277.9	235.0	1466.9	50.8	44	1250	(50)
1300	(52)	1320.8	1612.9	142.7	144.3	1.6	1428.8	1382.8	1328.7	242.8	1517.7	50.8	48	1250	(52)
1350	(54)	1371.6	1673.4	136.7	149.4	1.6	1479.6	1435.1	1379.5	239.8	1577.8	50.8	48	1300	(54)
1400	(56)	1422.4	1765.3	153.9	157.0	1.6	1536.7	1493.8	1430.3	268.2	1651.0	60.5	36	1350	(56)
1450	(58)	1473.2	1827.3	153.9	162.1	1.6	1593.9	1547.9	1481.1	274.6	1713.0	60.5	40	1400	(58)
1500	(60)	1524.0	1878.1	150.9	166.6	1.6	1651.0	1598.7	1531.9	271.5	1763.8	60.5	40	1450	(60)

NOTES:-

1. DIMENSIONS ARE IN MM
2. BORE IS TO BE SPECIFIED BY THE CUSTOMER TO SUIT PIPE
3. RING TYPE JOINT ALSO AVAILABLE

Previously API 605



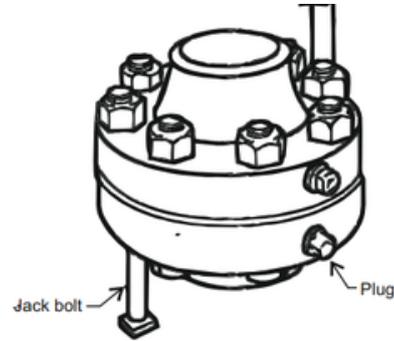
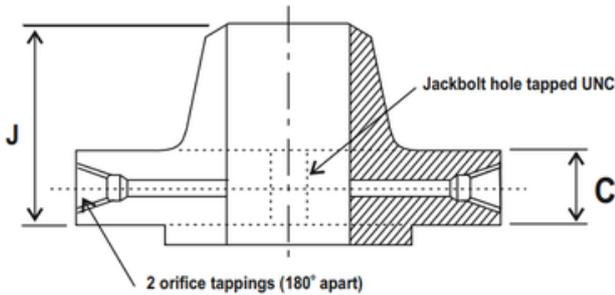
## CLASS 600

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PIPE	FLANGE OUTSIDE DIAMETER	THICKNESS OF FLANGE MIN W NECK	THICKNESS OF FLANGE MIN BLIND	RAISED FACE THICKNESS	RAISED FACE DIAMETER	HUB DIAMETER	HUB DIA. START OF CHAMFER	LENGTH THROUGH HUB	DRILLING DATA			NOMINAL PIPE SIZE
										BOLT CIRCLE DIAMETER	DIAMETER OF BOLT HOLES	NUMBER OF BOLTS	
mm. (in)	A	B	C	C1	D	E	F	G	J	K	L	M	mm. (in)
650 (26)	660.4	889.0	111.3	111.3	6.4	726.9	698.5	660.4	180.8	806.5	44.5	28	650 (26)
700 (28)	711.2	952.5	115.8	115.8	6.4	784.4	752.3	711.2	190.5	863.6	47.8	28	700 (28)
750 (30)	762.0	1022.4	125.5	127.0	6.4	841.2	806.5	762.0	204.7	927.1	50.8	28	750 (30)
800 (32)	812.8	1085.9	130.0	134.9	6.4	895.4	860.6	812.8	215.9	984.3	53.8	28	800 (32)
850 (34)	863.6	1162.1	141.2	144.3	6.4	952.5	914.4	863.6	233.4	1054.1	60.5	24	850 (34)
900 (36)	914.4	1212.9	146.1	150.9	6.4	1009.7	968.2	914.4	242.8	1104.9	60.5	28	900 (36)

## CLASS 900

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF PIPE	FLANGE OUTSIDE DIAMETER	THICKNESS OF FLANGE MIN W NECK	THICKNESS OF FLANGE MIN BLIND	RAISED FACE THICKNESS	RAISED FACE DIAMETER	HUB DIAMETER	HUB DIA. START OF CHAMFER	LENGTH THROUGH HUB	DRILLING DATA			NOMINAL PIPE SIZE
										BOLT CIRCLE DIAMETER	DIAMETER OF BOLT HOLES	NUMBER OF BOLTS	
mm. (in)	A	B	C	C1	D	E	F	G	J	K	L	M	mm. (in)
650 (26)	660.4	1022.4	134.9	153.9	6.4	762.0	743.0	660.4	258.8	901.7	66.5	20	650 (26)
700 (28)	711.2	1104.9	147.6	166.6	6.4	819.2	797.1	711.2	276.4	971.6	73.2	20	700 (28)
750 (30)	762.0	1181.1	155.4	176.0	6.4	876.3	850.9	762.0	289.1	1035.1	79.2	20	750 (30)
800 (32)	812.8	1238.3	160.3	185.7	6.4	927.1	908.1	812.8	303.3	1092.2	79.2	20	800 (32)
850 (34)	863.6	1314.5	171.5	195.1	6.4	990.6	962.2	863.6	319.0	1155.7	85.9	20	850 (34)
900 (36)	914.4	1346.2	173.0	201.7	6.4	1028.7	1016.0	914.4	325.4	1200.2	79.2	24	900 (36)

NOTES:-  
 1. DIMENSIONS ARE IN MM  
 2. BORE IS TO BE SPECIFIED BY THE CUSTOMER TO SUIT PIPE  
 3. RING TYPE JOINT ALSO AVAILABLE  
 Previously API 605



Tapping Bore size :  
 100nb & over: 12.7 mm  
 80nb 9.5mm, 65nb & less: 6.3mm

Orifice flanges are supplied in sets comprising:  
 2 flanges, jack bolts and 1/2" npt hex plugs in tapped hole.

Dimensions not shown here are shown in ANSI B16.5a

**CLASS 300**

**CLASS 600**

**CLASS 900**

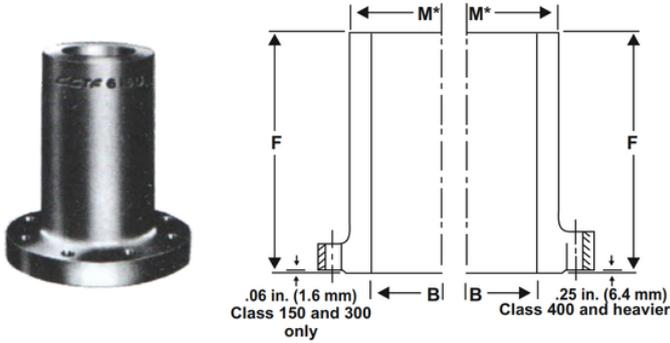
**CLASS 1500**

NOMINAL PIPE SIZE	THICKNESS		LENGTH THRU NECK		THICKNESS		LENGTH THRU NECK		THICKNESS		LENGTH THRU NECK		NOMINAL PIPE SIZE	
	C	J	C	J	C	J	C	J	C	J	mm.	(in)	mm.	(in)
25 (1)	38.1	82.6	Use ANSI 300 in this range		Use ANSI 1500 in this range				38.1	82.6	25	(1) (1)	32	¾
32 (1 ¼)	38.1	85.7							38.1	88.9	40	(1 ½)		
40 (1 ½)	38.1	85.7							38.1	101.6	50	(2)		
50 (2)	38.1	88.9							41.1	104.6	65	(2 ½)		
65 (2 ½)	38.1	88.9	38.1	101.6	47.8	117.3	80	124.0	80	(3)	100	(4)		
80 (3)	38.1	92.1	38.1	101.6	44.5	114.3	53.8	124.0	125	(5)	125	(5)		
100 (4)	38.1	100.0	47.7	117.3	55.6	139.7	82.6	171.5	150	(6)	150	(6)		
125 (5)	41.3	111.1	55.6	133.4	63.5	162.1	91.9	212.9	200	(8)	200	(8)		
150 (6)	47.7	117.5	63.6	152.4	69.9	184.2	108.0	254.0	250	(10)	250	(10)		
200 (8)	50.9	130.2	66.7	155.4	79.2	200.2	124.0	282.4	300	(12)	300	(12)		
250 (10)	54.0	142.9	69.9	165.1	85.9	212.9	133.4	298.5	350	(14)	350	(14)		
300 (12)	57.2	146.1	76.3	177.8	88.9	215.9	146.1	311.2	400	(16)	400	(16)		
350 (14)	60.4	158.8	82.6	184.2	101.6	228.6	162.1	327.2	450	(18)	450	(18)		
400 (16)	63.6	161.9	89.0	190.5	108.0	247.7	177.8	355.6	500	(20)	500	(20)		
450 (18)	69.9	168.3	101.7	203.2	139.7	292.1	203.2	406.4	600	(24)	600	(24)		

ALSO AVAILABLE IN LARGER SIZES AND RING JOINT FACING

- NOTES:-1. WHERE RAISED FACE IS 1.6mm THEN THIS DIMENSION IS INCLUDED IN C, H & J  
 2. WHERE RAISED FACE IS 6.4mm THEN IT IS ADDITIONAL TO G, H & J  
 3. BORE IS TO BE SPECIFIED BY THE PURCHASER  
 4. JACK BOLT HOLES CAN BE SUPPLIED WITH TAPPED HOLES OR MILLED NUT SLOT  
 5. SLIP ON FLANGES ALSO AVAILABLE

# LONG WELDING NECKS



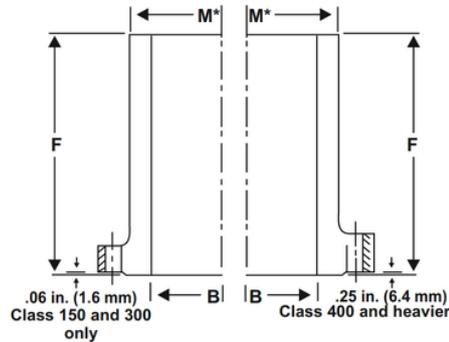
NOMINAL SIZE AND BORE B	LENGTH THRU HUB		HUB DIAMETER CLASS 150 PN 20 *M	WEIGHTS						
	CLASS 150 THRU 600	CLASS 900 THRU 2500		CLASS 150 PN 20	CLASS 300 PN 50	CLASS 400 PN 64	CLASS 600 PN 100	CLASS 900 PN 160	CLASS 1500 PN 250	CLASS 2500 PN 400
	PN 20 THRU 100 F	PN 160 THRU 400 F								
1.00	9	9	2.00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

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

\*Dimension "M" is given here for Class 150 Long Welding Necks only. For Class 300 and higher pressure ratings, outside diameter of the neck is the same as dimension "M" of ANSI flanges of comparable pressure rating.

INCHES	POUNDS
MILLIMETERS	KILOGRAMS

# LONG WELDING NECKS

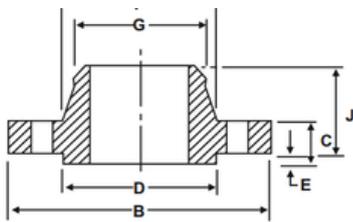


NOMINAL SIZE AND BORE B	LENGTH THRU HUB			HUB DIAMETER CLASS 150 PN 20 *M	WEIGHTS						
	CLASS 150 THRU 600	CLASS 900 THRU 2500	CLASS 150 PN 20 F		CLASS 150 PN 20	CLASS 300 PN 50	CLASS 400 PN 64	CLASS 600 PN 100	CLASS 900 PN 160	CLASS 1500 PN 250	CLASS 2500 PN 400
	PN 20 THRU 100	PN 160 THRU 400			CLASS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

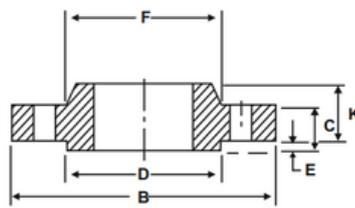
SPECIFICATIONS : Long Welding Necks conform to ASTM specification A-105. Except as shown above, Long Welding Necks conform dimensionally to ASME / ANSI Standard B16.5

\*Dimension "M" is given here for Class 150 Long Welding Necks only. For Class 300 and higher pressure ratings, outside diameter of the neck is the same as dimension "M" of ANSI flanges of comparable pressure rating.

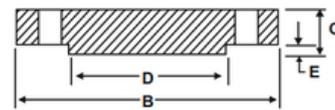
INCHES	POUNDS
MILLIMETERS	KILOGRAMS



WELDING NECK



SLIP-ON



BLANK

## CLASS 150

NOMINAL PIPE SIZE		OUTSIDE DIAMETER OF PIPE	FLANGE OUTSIDE DIAMETER	THICKNESS OF FLANGE MIN	RAISED FACE THICKNESS	RAISED FACE DIAMETER	HUB DIAMETER	NECK DIAMETER	DRILLING DATA			LENGTH THROUGH HUB		NOMINAL PIPE SIZE	
									BOLT CIRCLE DIAMETER	NUMBER OF HOLES	DIAMETER OF HOLES	OVERALL THICKNESS (W.NECK)	OVERALL THICKNESS (BOSS)		
mm.	(in)	A	B	C	D	E	F	G	Note 4			J	K	mm.	(in)
650	(26)	660.4	870.0	50.9	743.0	(26)	(26)	(26)	806.4	24	34.9	127.1	85.5	650	(26)
700	(28)	711.2	927.2	52.4	793.8	(28)	(28)	(28)	863.6	28	34.9	128.6	87.5	700	(28)
750	(30)	762.0	984.3	54.0	857.3	(30)	(30)	(30)	914.4	28	34.9	130.2	89.0	750	(30)
800	(32)	812.8	1060.5	57.2	908.1	(32)	(32)	(32)	977.9	28	41.2	133.4	92.0	800	(32)
850	(34)	863.6	1111.3	58.8	958.9	(34)	(34)	(34)	1028.7	32	41.2	135.0	93.5	850	(34)
900	(36)	914.4	1168.5	60.4	1022.4	(36)	(36)	(36)	1085.8	32	41.2	136.6	95.5	900	(36)
950	(38)	965.2	1238.3	60.4	1073.2	(38)	(38)	(38)	1149.3	32	41.2	136.6	95.5	950	(38)
1000	(40)	1016.0	1289.1	63.8	1124.0	(40)	(40)	(40)	1200.1	36	41.2	139.8	98.5	1000	(40)
1050	(42)	1066.8	1346.3	66.7	1193.9	(42)	(42)	(42)	1257.3	36	41.2	142.9	101.5	1050	(42)
1100	(44)	1117.6	1403.4	66.7	1244.7	(44)	(44)	(44)	1314.4	40	41.2	142.9	101.5	1100	(44)
1150	(46)	1168.4	1454.2	68.3	1295.5	(46)	(46)	(46)	1365.2	40	41.2	144.5	103.0	1150	(46)
1200	(48)	1219.2	1511.4	69.9	1359.0	(48)	(48)	(48)	1422.4	44	41.2	146.1	105.0	1200	(48)

## CLASS 300

NOMINAL PIPE SIZE		OUTSIDE DIAMETER	FLANGE OUTSIDE DIAMETER	THICKNESS OF FLANGE	RAISED FACE THICKNESS	RAISED FACE DIAMETER	HUB DIAMETER	NECK DIAMETER	DRILLING DATA			LENGTH THROUGH HUB		NOMINAL PIPE SIZE	
									BOLT CIRCLE DIAMETER	NUMBER OF HOLES	DIAMETER OF HOLES	OVERALL THICKNESS (W.NECK)	OVERALL THICKNESS (BOSS)		
mm.	(in)	A	B	C	D	E	F	G	Note 4			J	K	mm.	(in)
650	(26)	660.4	971.6	79.4	749.4	1.6	720.8	666.8	876.3	28	44.4	184.2	184.2	650	(26)
700	(28)	711.2	1035.1	85.8	800.2	1.6	774.8	717.6	939.8	28	44.4	196.9	196.9	700	(28)
750	(30)	762.0	1092.3	92.1	857.3	1.6	827.1	768.4	996.9	28	47.6	209.6	209.6	750	(30)
800	(32)	812.8	1149.4	98.5	914.5	1.6	881.1	819.2	1054.1	28	50.8	222.3	222.3	800	(32)
850	(34)	863.6	1206.8	101.7	965.3	1.6	936.7	871.6	1104.9	28	50.8	231.8	231.8	850	(34)
900	(36)	914.4	1270.1	104.8	1022.4	1.6	990.7	922.4	1168.4	32	53.9	241.4	241.4	900	(36)

## CLASS 600

NOMINAL PIPE SIZE		OUTSIDE DIAMETER	FLANGE OUTSIDE DIAMETER	THICKNESS OF FLANGE	RAISED FACE THICKNESS	RAISED FACE DIAMETER	HUB DIAMETER	NECK DIAMETER	DRILLING DATA			LENGTH THROUGH HUB		NOMINAL PIPE SIZE	
									BOLT CIRCLE DIAMETER	NUMBER OF HOLES	DIAMETER OF HOLES	OVERALL THICKNESS (W.NECK)	OVERALL THICKNESS (BOSS)		
mm.	(in)	A	B	C	D	E	F	G	Note 4			J	K	mm.	(in)
650	(26)	660.4	1016.1	108.0	749.4	6.4	747.7	671.5	914.4	28	50.8	222.3	222.3	650	(26)
700	(28)	711.2	1073.2	111.2	800.2	6.4	803.3	724.0	965.2	28	53.9	235.0	235.0	700	(28)
750	(30)	762.0	1130.4	114.4	857.3	6.4	862.1	774.8	1022.3	28	53.9	247.7	247.7	750	(30)
800	(32)	812.8	1193.9	117.5	914.5	6.4	917.6	825.8	1079.5	28	60.3	260.4	260.4	800	(32)
850	(34)	863.6	1244.7	120.7	965.3	6.4	973.2	877.9	1130.3	28	60.3	269.9	269.9	850	(34)
900	(36)	914.4	1314.5	123.9	1022.4	6.4	1031.9	928.7	1193.8	28	66.6	282.8	282.8	900	(36)

- NOTES:-
1. DIMENSIONS ARE IN MM
  2. LARGER SIZES AVAILABLE ON REQUEST
  3. AVAILABLE WITH OR WITHOUT RAISED FACE
  4. THICKNESS DIMENSIONS INCLUDE RAISED FACE WHEN 1.8 mm  
THICKNESS DIMENSIONS DOES NOT INCLUDE RAISED FACE WHEN IT IS 6.4 mm

# Approximate Weights ANSI B16.5 Forged Flanges



- NOTES:- 1. WEIGHTS ARE IN KILLOGRAMS  
 2. WEIGHTS SHOWN ARE APPROXIMATE FOR CARBON STEEL ONLY.  
 3. ADD 5% TO WEIGHTS SHOWN FOR STAINLESS STEEL.

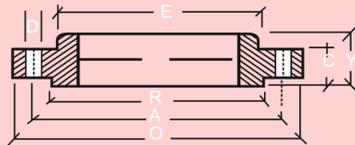
Class	Nominal Pipe Size		Slip On	Screwed	Socket Weld	Lap Joint	Blind	Welding Neck
	mm	inch						
150 #	15	( ½ )	0.45	0.45	0.91	0.45	0.91	0.91
	20	( ¾ )	0.68	0.68	0.91	0.68	0.91	0.91
	25	(1)	0.91	0.91	0.91	0.91	0.91	1.14
	32	(1 ¼)	1.14	1.14	1.36	1.14	1.36	1.14
	40	(1 ½)	1.36	1.36	1.36	1.36	1.36	1.81
	50	(2)	2.27	2.27	2.27	2.27	1.82	2.72
	65	(2½)	3.63	3.63	3.18	3.63	3.18	4.54
	80	(3)	4.09	4.09	3.63	4.09	4.09	5.22
	90	(3½)	4.99	4.99	4.99	4.99	5.9	5.45
	100	(4)	5.9	5.9	5.9	5.45	7.72	7.49
	125	(5)	6.81	6.81	6.81	5.9	9.08	9.53
	150	(6)	7.72	7.72	8.63	8.17	12.26	11.8
	200	(8)	12.71	12.71	13.62	12.71	21.34	19.07
	250	(10)	18.16	18.16	19.52	16.34	30.42	24.52
	300	(12)	27.69	27.69	29.06	27.24	55.84	39.95
	350	(14)	37.68	37.68	38.59	34.96	63.11	51.76
	400	(16)	48.12	48.12	42.22	47.22	84.9	64.47
	450	(18)	49.49	49.49	54.48	66.28	98.52	74.90
	500	(20)	67.19	67.19	70.37	72.19	128.48	89.44
	600	(24)	92.62	92.62	95.34	88.53	188.41	121.67
300 #	15	( ½ )	0.68	0.68	1.36	0.68	0.91	0.91
	20	( ¾ )	1.14	1.14	1.36	1.14	1.36	1.36
	25	(1)	1.36	1.36	1.36	1.36	1.82	1.82
	32	(1 ¼)	2.04	2.04	1.82	2.04	2.72	2.27
	40	(1 ½)	2.95	2.95	2.72	2.95	3.18	3.18
	50	(2)	3.18	3.18	3.18	3.18	3.63	3.63
	65	(2½)	4.54	4.54	4.54	4.54	5.45	5.45
	80	(3)	5.9	5.9	5.9	6.58	7.26	8.17
	90	(3½)	7.26	7.26	7.72	7.26	9.53	9.08
	100	(4)	10.67	10.67	9.99	10.9	12.71	12.03
	125	(5)	13.17	13.17		11.8	16.8	16.34
	150	(6)	16.34	16.34		17.25	21.79	20.43
	200	(8)	25.42	25.42		24.97	35.87	31.33
	250	(10)	34.96	34.96		39.95	55.39	45.4
	300	(12)	51.3	51.3		63.11	83.08	64.47
	350	(14)	72.19	72.19		83.54	109.41	93.52
	400	(16)	95.34	95.34		106.24	143.01	113.05
	450	(18)	114.86	114.86		138.47	187.96	138.92
	500	(20)	139.38	139.38		170.25	233.18	167.53
	600	(24)	222.46	222.46		240.62	363.2	235.63

Great care has been taken in the preparation of this publication. However Royal Steel Industries does not accept responsibility for ant loss or other damages caused to any person or company as a result of the information contained herein.

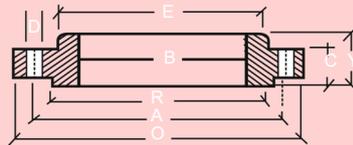


Class	Nominal Pipe Size		Slip On	Screwed	Socket Weld	Lap Joint	Blind	Welding Neck
	mm	inch						
<b>600 #</b>	15	( $\frac{1}{2}$ )	0.91	0.91		0.91	0.91	1.36
	20	( $\frac{3}{4}$ )	1.36	1.36		1.36	1.36	1.59
	25	(1)	1.59	1.59		1.59	1.82	1.82
	32	(1 $\frac{1}{4}$ )	2.04	2.04		2.04	2.72	2.50
	40	(1 $\frac{1}{2}$ )	2.95	2.95		2.95	3.63	3.63
	50	(2)	3.63	3.63		3.63	4.54	4.54
	65	(2 $\frac{1}{2}$ )	5.45	5.45		4.99	6.81	6.36
	80	(3)	6.81	6.81		6.36	9.08	8.17
	90	(3 $\frac{1}{2}$ )	9.53	9.53		9.08	13.17	
	100	(4)	14.98	14.98		14.07	18.61	11.80
	125	(5)	28.60	28.60		28.60	30.87	16.80
	150	(6)	36.32	36.32		35.41	39.04	30.87
	200	(8)	44.04	44.04		50.85	63.11	33.14
	250	(10)	80.36	80.36		88.53	104.87	50.85
	300	(12)	97.61	97.61		108.96	133.93	85.81
	350	(14)	117.59	117.59		131.66	148.91	102.60
	400	(16)	166.16	166.16		181.60	239.26	157.54
	450	(18)	216.10	216.10		212.93	301.91	218.37
500	(20)	277.85	277.85		274.22	388.17	251.97	
600	(24)	397.70	397.70		393.16	533.45	313.26	
							443.56	
<b>900 #</b>	15	( $\frac{1}{2}$ )	2.72	2.72		2.72	1.82	3.18
	20	( $\frac{3}{4}$ )	2.72	2.72		2.72	2.72	3.18
	25	(1)	3.41	3.41		3.41	4.09	3.86
	32	(1 $\frac{1}{4}$ )	4.54	4.54		4.54	4.54	4.54
	40	(1 $\frac{1}{2}$ )	6.36	6.36		6.36	6.36	6.36
	50	(2)	9.99	9.99		9.53	11.35	10.90
	65	(2 $\frac{1}{2}$ )	16.34	16.34		13.17	15.89	16.34
	80	(3)	14.07	14.07		11.35	14.53	13.17
	100	(4)	24.06	24.06		23.15	24.52	23.15
	125	(5)	37.68	37.68		36.77	39.50	39.04
	150	(6)	49.03	49.03		47.67	51.30	49.94
	200	(8)	78.09	78.09		85.35	89.44	84.90
	250	(10)	111.23	111.23		125.76	131.66	121.67
	300	(12)	148.00	148.00		168.43	187.50	168.89
	350	(14)	172.52	172.52		180.24	224.28	255.15
	400	(16)	208.38	208.38		221.55		
	450	(18)	293.74	293.74		304.18	281.03	310.99
	500	(20)	359.57	359.57		394.07	399.52	419.50
600	(24)	671.92	671.92		753.19	502.58	528.46	
						952.95	956.58	
<b>1500 #</b>	15	( $\frac{1}{2}$ )	2.72	2.72		2.72	1.82	3.18
	20	( $\frac{3}{4}$ )	2.72	2.72		2.72	2.72	3.18
	25	(1)	3.41	3.41		3.41	4.09	3.86
	32	(1 $\frac{1}{4}$ )	4.54	4.54		4.54	4.54	4.54
	40	(1 $\frac{1}{2}$ )	6.36	6.36		6.36	6.36	6.36
	50	(2)	9.99	9.99		9.53	11.35	10.90
	65	(2 $\frac{1}{2}$ )	16.34	16.34		13.17	15.89	16.34
	80	(3)	21.79	21.79		17.25	21.79	21.79
	100	(4)	33.14	33.14		34.05	33.14	31.33
	125	(5)	59.93	59.93		62.65	64.47	59.93
	150	(6)	74.46	74.46		77.18	72.19	74.46
	200	(8)	117.13	117.13		129.84	137.11	123.94
	250	(10)	197.94	197.94		220.19	230.18	206.12
	300	(12)	302.82	302.82		340.05	351.85	313.26
<b>2500 #</b>	15	( $\frac{1}{2}$ )	3.18	3.18		3.18	3.18	3.63
	20	( $\frac{3}{4}$ )	4.09	4.09		3.63	4.54	4.09
	25	(1)	5.45	5.45		5.45	5.45	5.90
	32	(1 $\frac{1}{4}$ )	8.17	8.17		7.72	8.17	9.08
	40	(1 $\frac{1}{2}$ )	11.35	11.35		10.90	11.35	12.71
	50	(2)	17.25	17.25		16.80	17.71	19.07
	65	(2 $\frac{1}{2}$ )	24.97	24.97		24.06	25.42	23.61
	80	(3)	37.68	37.68		36.32	39.04	42.68
	100	(4)	57.66	57.66		55.39	60.38	66.28
	125	(5)	95.34	95.34		92.62	101.24	110.78
	150	(6)	146.64	146.64		142.56	156.63	171.61
	200	(8)	220.19	220.19		213.83	241.98	261.50
	250	(10)	419.95	419.95		407.24	465.35	484.87
	300	(12)	590.20	590.20		572.95	644.66	730.03

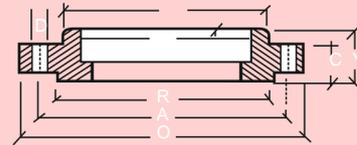
### SLIP - ON FLANGE



### WELDING NECK FLANGE



### BLIND FLANGE



## Material Specifications for forged Components as per ASTM (Flanges, Fittings & others)

	Chemical Composition									Physical Properties (Mandatory requirement)								
	C	Si	Mn	P		Ni	Cr	Mo	Ti	Tensile strength PSK(Kg/mm2)	Yield Strength PSI(Kg.MM3)	Elong. %	Reduction of area %	Impact Values			BHN	
				Max	Max									Min	Average	Test Temp		
A 105	0.35 Max	0.35 Max	0.60 1.05	0.035	0.040	0.40 Max	0.30 Max	0.12 Max		70000 (49.3)	36000 (25.35)	22	30					
A 350 LF1	0.30 Max	0.15 0.30	1.35 Max	0.035	0.040					60000 to 85000 (42.25 to 59.86)	36000 (21.13)	25	38	10 (14)	13 (18)	-20 (-28.9)	197 Max	
A350 LF2	0.30 Max	0.15 0.30	1.35 Max	0.035	0.040					70000 to 95000 (49.3 to 66.9)	36000 (25.35)	22	30	12 (16)	15 (20)	-50(-45.6)	197 Max	
A 350 LF3	0.20 Max	0.20 0.35	0.90 Max	0.035	0.040	3.25 3.75				70000 to 95000 (49.3 to 66.9)	37500 (26.4)	22	35	12 (16)	15 (20)	-150(-101.1)	197 Max	
A182F1	0.28 Max	0.15 0.35	0.60 0.90	0.045	0.045			0.44 0.65		70000 (49.3)	40000 (28.17)	20	30	-	-	-	143 192	
A182F12	0.10 0.20	0.10 0.60	0.30 0.80	0.040	0.040		0.80 1.25	0.44 0.65		70000 (49.3)	40000 (28.17)	20	30	-	-	-	143 207	
A182F11	0.10 0.20	0.50 1.00	0.30 0.80	0.040	0.040		1.00 1.50	0.44 0.65		70000 (49.3)	40000 (28.17)	20	30	-	-	-	143 207	
A182F22	0.15 Max	0.50 Max	0.30 0.60	0.040	0.040		2.02 2.50	0.87 1.13		75000 (52.8)	45000 (31.7)	20	30	-	-	-	156 207	
A182F5	0.15 Max	0.50 Max	0.30 0.60	0.030	0.030	0.50 Max	4.0 6.0	0.44 0.65		70000 (49.3)	40000 (28.17)	20	35	-	-	-	143 217	
A182F304	0.08 Max	1.00 Max	2.00 Max	0.040	0.030	8.00 11.00	18.00 20.00			75000 (52.8)	30000 (21.13)	30	50	-	-	-	-	
A182F304L	0.035 Max	1.00 Max	2.00 Max	0.040	0.030	8.00 13.00	18.00 20.00			70000 (49.3)	25000 (17.6)	30	50	-	-	-	-	
A182F316	0.08 Max	1.00 Max	2.00 Max	0.045	0.030	10.00 14.00	16.00 18.00	2.00 3.00		75000 (52.8)	30000 (21.33)	30	50	-	-	-	-	
A182F316L	0.035 Max	1.00 Max	2.00 Max	0.040	0.030	10.00 15.00	16.00 18.00	2.00 3.00		70000 (49.3)	25000 (17.6)	30	50	-	-	-	-	
A182F321	0.08 Max	1.00 Max	2.00 Max	0.040	0.030	9.00 12.00	17.00 Min			75000 (52.8)	30000 (21.33)	30	50	-	-	-	-	
A182F316 Ti	0.08 Max	1.00 Max	2.00 Max	0.040	0.030	10.00 14.00	16.00 18.00	2.00 3.00		75000 (52.8)	30000 (21.13)	30	50	-	-	-	-	

a) Grade F321 Ti shall have, Ti not less than 5 Times of C and not more than 0.70%



## 1. Facings

Required tolerances for various flange and flanged fitting facings are as follows:

- 1.1 Inside and outside diameter of large and small tongue and Groove and female,  $\pm 0.5$  mm
- 1.2 Outside diameter, 2.0 mm Raised face,  $\pm 1.0$  mm
- 1.3 Outside diameter, 7.0 mm Raised face,  $\pm 0.5$  mm

## 2. Flange Thickness

Required tolerances for flange thickness are as follows.

- NPS <18                    + 3.0,-0.0 MM
- NPS  $\geq$  20                    + 5.0,-0.0 MM

The plus tolerances is applicable to bolting bearing surfaces whether as forged, as cast, spot-faced or back-faces

## 3. Welding End Flange Ends and Hubs

**3.1 Outside Diameter.** Required tolerances for the nominal outside diameter dimension A of figs. Welding end of welding neck flanges are as follow:

- NPS <5                    + 2.0, -1.0 mm
- NPS  $\geq$  6                    + 4.0, -1.0 mm

**3.2 Inside Diameter.** Required tolerances for the nominal inside diameter of welding ends of welding neck flanges and smaller bore of socket welding flanges (dimension B in the referenced figures) are as follows.

- NPS <1                    + 1.0 mm
- 12 < NPS < 18            + 1.5 mm
- NPS  $\geq$  20,                + 3.0, 1.5 mm

**3.3 Hub Thickness.** Despite the tolerance specified for dimensions A and B, the thickness of the hub at the welding end shall not be less than 87½% of the nominal thickness of the Pipe, having an under tolerance of 2.5% for the pipe wall thickness to which the flange is to be attached, or the minimum wall thickness as specified by the purchaser.

## 4.0 Length Through Hub on Welding Neck Flanges

The required tolerances for the length through hubs on welding neck flanges are as follows.

- NPS <4                     $\pm 1.5$  mm
- 5 < NPS < 10            1 1.5, -3.0 mm
- NPS  $\geq$  12,                + 3.0, mm -5.0 mm

## 5.0 Flange Bore

### 5.1 Lapped, Slip-on, and Socket Welding Flange Bores.

The required tolerances for the lapped, slip-on and socket welding neck flanges are as follows.

- NPS <10                    + 1.0, -0.0 mm
- NPS  $\geq$  12,                + 1.5, -0.0 mm

**5.2 Counterbores, Threaded Flanges.** The required tolerances for threaded flange counterbores are as follows.

- NPS <10                    + 1.0, -0.0 mm
- NPS  $\geq$  12,                + 1.5, -0.0 mm

**5.3 Counterbores, Socket Welding Flanges.** The required tolerances for socket and counterbores is as follows.

- ½ < NPS < 3                 $\pm 0.25$  mm

## 6.0 Drilling and Facing

**6.1 Bolt Circle Diameter.** The required tolerance for all bolt circle diameters is  $\pm 1.5$  mm

**6.2 Bolt Hole to Bolt Hole.** The required tolerance for the center-to-center of adjustment bolt holes is  $\pm 0.8$  mm

**6.3 Bolt Circle Concentricity.** The required tolerance for concentricity between the flange bolt circle diameter and machined facing diameters are as follows.

- NPS < 2½                    0.8 mm
- NPS < 3                    1.5 mm



## British Standard Pipe Flanges DIMENSION OF PIPE FLANGES AS PER TABLES BS-10

Table D for working Steam Pressure upto 50 lbs per Sq. Inch.

Table E for working Steam Pressure upto 50 lbs and upto 100 lb per Sq. Inch.

Nominal Pipe Size	O. D. of Pipe	Dia. of Flange	Dia. of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness
1/2"	27/32"	3.3/4"	2.5/8"	4	1/2"	3/16"
3/4"	1.1/16"	4"	2.7/8"	4	1/2"	3/16"
1"	1.11/32"	4.1/2"	3.1/4"	4	1/2"	3/16"
1.1/4"	1.11/16"	4.3/4"	3.7/16"	4	1/2"	1/4"
1.1/2"	1.29/32"	5.1/4"	3.7/8"	4	1/2"	1/4"
2"	2.3/8"	6"	4.1/2"	4	5/8"	5/16"
2.1/2"	3"	6.1/2"	5"	4	5/8"	5/16"
3"	3.1/2"	7.1/4"	5.3/4"	4	5/8"	3/8"
3.1/2"	4"	8"	6.1/2"	4	5/8"	3/8"
4"	4.1/2"	8.1/2"	7"	4	5/8"	3/8"
5"	5.1/2"	10"	8.1/4"	8	5/8"	1/2"
6"	6.1/2"	11"	9.1/4"	8	5/8"	1/2"
7"	7.1/2"	12"	10.1/4"	8	5/8"	1/2"
8"	8.5/8"	13.1/4"	11.1/2"	8	5/8"	1/2"
9"	9.5/8"	14.1/2"	12.3/4"	8	5/8"	5/8"
10"	10.3/4"	16"	14"	8	3/4"	5/8"
12"	12.3/4"	18"	16"	12	3/4"	5/8"
14"	14"	20.3/4"	18.1/2"	12	7/8"	3/4"
16"	16"	22.3/4"	20.1/2"	12	7/8"	3/4"
18"	18"	25.1/4"	23"	12	7/8"	7/8"
20"	20"	27.3/4"	25.1/4"	16	7/8"	1"
24"	24"	32.1/2"	29.3/4"	16	1"	1.1/8"

Nominal Pipe Size	Dia. of Flange	Dia. of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness
1/2"	3.3/4"	2.5/8"	4	1/2"	1/4
3/4"	4"	2.7/8"	4	1/2"	1/4
1"	4.1/2"	3.1/4"	4	1/2"	9/32
1.1/4"	4.3/4"	3.7/16"	4	1/2"	5/16
1.1/2"	5.1/4"	3.7/8"	4	1/2"	11/32
2"	6"	4.1/2"	4	5/8"	3/8
2.1/2"	6.1/2"	5"	4	5/8"	13/32
3"	7.1/4"	5.3/4"	4	5/8"	7/16
3.1/2"	8"	6.1/2"	8	5/8"	15/32
4"	8.1/2"	7"	8	5/8"	1/2
5"	10"	8.1/4"	8	5/8"	9/16
6"	11"	9.1/4"	8	3/4"	11/16
7"	12"	10.1/4"	8	3/4"	3/4
8"	13.1/4"	11.1/2"	8	3/4"	3/4
9"	14.1/2"	12.3/4"	12	3/4"	13/16
10"	16"	14"	12	3/4"	7/8
12"	18"	16"	12	7/8"	1
14"	20.3/4"	18.1/2"	12	7/8"	1
16"	22.3/4"	20.1/2"	12	7/8"	1
18"	25.1/4"	23"	16	7/8"	1.1/8
20"	27.3/4"	25.1/4"	16	7/8"	1.1/4
24"	32.1/2"	29.3/4"	16	1"	1.1/2

Table F for working Pressure above 100 and upto 150 lbs per Sq. Inch.

Table H for working Pressure above 150 and upto 550 lbs per Sq. Inch.

Nominal Pipe Size	Dia. of Flange	Dia. of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness
1/2"	3.3/4"	2.5/8"	4	1/2"	3/8"
3/4"	4"	2.7/8"	4	1/2"	3/8"
1"	4.3/4"	3.7/16"	4	5/8"	3/8"
1.1/4"	5.1/4"	3.7/8"	4	5/8"	1/2"
1.1/2"	5.1/2"	4.1/8"	4	5/8"	1/2"
2"	6.1/2"	5"	4	5/8"	5/8"
2.1/2"	7.1/4"	5.3/4"	8	5/8"	5/8"
3"	8"	6.1/2"	8	5/8"	5/8"
3.1/2"	8.1/2"	7"	8	5/8"	3/4"
4"	9"	7.1/2"	8	5/8"	3/4"
5"	11"	9.1/4"	8	5/8"	7/8"
6"	12"	10.1/4"	12	5/8"	7/8"
7"	13.1/4"	11.1/2"	12	3/4"	7/8"
8"	14.1/2"	12.3/4"	12	3/4"	1"
9"	16"	14"	12	7/8"	1"
10"	17"	15"	12	7/8"	1"
12"	19.1/4"	17.1/4"	16	7/8"	1.1/8"
14"	21.3/4"	19.1/2"	16	1"	1.1/4"
16"	24"	21.3/4"	20	1"	1.1/4"
18"	26 1/2"	24"	20	1.1/8"	1.3/8"
20"	29"	26.1/2"	24	1.1/8"	1.1/2"
24"	33.1/2"	30.3/4"	24	1.1/4"	1.5/8"

Nominal Pipe Size	Dia. of Flange	Dia. of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness
1/2"	4.1/2"	3.1/4"	4	5/8"	1/2"
3/4"	4.1/2"	3.1/4"	4	5/8"	1/2"
1"	4.3/4"	3.7/16"	4	5/8"	9/16"
1.1/4"	5.1/4"	3.7/8"	4	5/8"	11/16"
1.1/2"	5.1/2"	4.1/8"	4	5/8"	11/16"
2"	6.1/2"	5"	4	5/8"	3/4"
2.1/2"	7.1/4"	5.3/4"	8	5/8"	3/4"
3"	8"	6.1/2"	8	5/8"	7/8"
3.1/2"	8.1/2"	7"	8	5/8"	7/8"
4"	9"	7.1/2"	8	5/8"	1"
5"	11"	9.1/4"	8	3/4"	1.1/8"
6"	12"	10.1/4"	12	3/4"	1.1/8"
7"	13.1/4"	11.1/2"	12	3/4"	1.1/4"
8"	14.1/2"	12.3/4"	12	3/4"	1.1/4"
9"	16"	14"	12	7/8"	1.3/8"
10"	17"	15"	12	7/8"	1.3/8"
12"	19.1/4"	17.1/4"	16	7/8"	1.1/2"
14"	21.3/4"	19.1/2"	16	1"	1.5/8"
16"	24"	21.3/4"	20	1"	1.3/4"
18"	26.1/2"	24"	20	1.1/8"	1.7/8"
20"	29"	26.1/2"	24	1.1/8"	2"
24"	33.1/2"	30.3/4"	24	1.1/4"	2.1/4



## British Standard Pipe Flanges

Table J: For working pressure above 250 lb and up to 250 lb per Sq. Inch.

Nominal Pipe Size	Dia. of Flange	Dia. of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness
½"	4.1/2"	3.1/4"	4	5/8"	5/8"
¾"	4.1/2"	3.1/4"	4	5/8"	5/8"
1"	4.3/4"	3.7/16"	4	5/8"	3/4"
1.1/4"	5.1/4"	3.7/8"	4	5/8"	3/4"
1.1/2"	5.1/2"	4.1/8"	4	5/8"	7/8"
2"	6.1/2"	5"	4	3/4"	1"
2.1/2"	7.1/4"	5.3/4"	8	3/4"	1"
3"	8"	6.1/2"	8	3/4"	1.1/4"
3.1/2"	8.1/2"	7"	8	3/4"	1.1/4"
4"	9"	7.1/2"	8	3/4"	1.3/8"
5"	11"	9.1/4"	8	7/8"	1.1/2"
6"	12"	10.1/4"	12	7/8"	1.1/2"
7"	13.1/4"	11.1/2"	12	7/8"	1.5/8"
8"	14.1/2"	12.3/4"	12	7/8"	1.5/8"
9"	16"	14"	12	7/1"	1.3/4"
10"	17"	15"	12	7/1"	1.7/8"
12"	19.1/4"	17.1/4"	16	7/1"	2"
14"	21.3/4"	19.1/2"	16	1.1/8"	2.1/8"
16"	24"	21.3/4"	20	1.1/8"	2.1/4"
18"	26.1/2"	24"	20	1.1/4"	2.3/8"
20"	29"	26.1/2"	24	1.1/4"	2.1/2"
24"	33.1/2"	30.3/4"	24	1.3/8"	2.3/4"

Table K: For working pressure above 350 lb and up to 450 lb per Sq. Inch.

Nominal Pipe Size	Dia. of Flange	Dia. of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness
½"	4.1/2"	3.1/4"	4	5/8"	3/4"
¾"	4.1/2"	3.1/4"	4	5/8"	3/4"
1"	4.3/5"	3.3/4"	4	5/8"	7/8"
1.1/4"	5.1/4"	3.7/8"	4	5/8"	7/8"
1.1/2"	5.1/6"	4.1/2"	4	3/4"	1"
2"	6.1/2"	5"	8	5/8"	1"
2.1/2"	7.1/4"	5.3/4"	8	3/4"	1.1/8"
3"	8"	6.1/2"	8	3/4"	1.1/4"
3.1/2"	8.1/9"	7.1/4"	8	7/8"	1.1/4"
4"	9.1/2"	7.3/4"	8	7/8"	1.3/8"
5"	11"	9.1/4"	12	7/8"	1.5/8"
6"	12"	10.1/4"	12	7/8"	1.5/8"
7"	13.1/2"	11.1/2"	12	1"	1.3/4"
8"	14.1/2"	12.1/2"	12	1"	1.7/8"
9"	16"	14"	16	1"	1.3/2"
10"	17"	15"	16	1"	1.7/2"
12"	19.1/4"	17"	16	1.1/8"	2.1/4"
14"	22.1/2"	20"	16	1.1/4"	2.3/8"
16"	24.3/4"	22.1/4"	20	1.1/4"	2.5/8"
18"	26.1/4"	25.3/4"	20	1.3/8"	8"
20"	31"	28"	20	1.1/21"	3.1/4"

For ½" and 5/8" Bolts the diameters of the holes 1/16" in Larger than the bolts  
For 3/4" bolts and sizes above, the diameter shall be 1/8" in Larger than the Bolts.

### BRITISH STANDARDS PIPE FLANGES PRESSURE-TEMPERATURE RATINGS FOR CARBON STEEL FLANGES TEMPERATURE

	oF 0-450	500	550	600	650	700	750	800	825	850	875	900	Max. Hydraulic Test Pressure
Table	-17.8 oC to 232.2	260.0	287.8	315.6	343.3	371.1	399	427	441	454	468	482	
D	100	95	85	80	70	65	55	50					150
E	200	185	170	155	140	130	115	100					300
F	300	280	255	235	215	195	170	150	-	-	-	-	450
H	500	465	430	395	355	320	285	250	215	180	150	115	750
J	700	650	600	550	500	450	400	350	300	255	210	160	1050
K	900	835	770	705	645	580	515	450	390	325	265	205	1350
R	1200	1115	1030	945	855	770	685	600	520	435	355	275	1800
S	1800	1670	1545	1415	1285	1155	1030	900	780	655	535	415	2700
T	2800	2600	2400	2200	2000	1800	1600	1400	1210	1026	835	645	4200



### MILD STEEL PIPES CONFIRM TO IS: 1239 (PART I) - 1979

Nominal Bore	Outside Diameter		Light		Medium		Heavy	
	Inch	mm	Thickness mm	Weight kg/mtr	Thickness mm	Weight kg/mtr	Thickness mm	Weight kg/mtr
16"	0.406	10.32	1.80	0.361	2.00	0.407	2.65	0.493
14"	0.532	13.49	1.80	0.517	2.35	0.650	2.90	0.769
36"	0.872	17.10	1.80	0.674	2.35	0.852	2.90	1.02
12"	0.884	21.43	2.00	0.652	2.65	1.122	3.25	1.45
38"	1.004	27.20	2.35	1.410	2.65	1.980	3.25	1.90
1"	1.312	33.00	2.65	2.010	3.25	2.440	4.05	2.67
1 1/4"	1.656	42.90	2.65	2.580	3.25	3.140	4.05	3.18
1 1/2"	1.906	48.40	2.90	3.350	3.25	3.610	4.05	4.43
2"	2.375	60.30	2.90	4.110	3.65	5.100	4.47	6.17
2 1/2"	3.004	76.20	3.25	5.840	3.65	6.610	4.47	7.90
3"	3.500	88.90	3.25	6.810	4.05	8.470	4.85	10.1
4"	4.500	114.30	3.65	9.690	4.50	12.10	5.40	14.4
5"	5.500	139.70	-	-	4.85	16.20	5.40	17.8
6"	6.500	165.10	-	-	4.85	19.20	5.40	21.2

### BIG DIAMETER ERW PIPES CONFIRM TO IS 3589

Wall Thickness In mm	Nominal Bore 7" NB 193.7 mm OD	Nominal Bore 8" NB 219.1 mm OD	Nominal Bore 10" NB 273 mm OD	Nominal Bore 12" NB 323.7 mm OD	Nominal Bore 14" NB 355.6 mm OD	Nominal Bore 16" NB 406.4 mm OD	Nominal Bore 18" NB 457 mm OD	Nominal Bore 20" NB 508 mm OD
	kg/mtr	kg/mtr	kg/mtr	kg/mtr	kg/mtr	kg/mtr	kg/mtr	kg/mtr
4.85	22.59	25.62	32.07	381.3	-	-	-	-
5.20	24.17	27.43	34.34	40.85	-	-	-	-
5.60	26.00	29.26	36.63	43.93	48.11	-	-	-
6.00	27.88	31.53	38.90	47.02	61.00	69.00	-	-
6.35	29.34	33.28	41.73	49.67	62.35	70.50	78.50	-
7.01	32.27	36.76	46.43	55.46	68.04	77.92	-	-
7.94	-	41.00	50.95	61.85	71.92	81.80	-	-
8.18	-	42.56	53.42	65.12	-	-	-	-
9.53	-	51.50	60.24	73.75	93.13	105.00	-	117.00
12.70	-	-	-	107.28	123.30	138.00	-	155.00

#### Tolerances on Thickness and Weight: as per IS 1239

The following manufacturing tolerance shall be permitted on the tubes and sockets.

- (a) Thickness:
- (1) Butt welded Light tubes +Not limited
  - 8 to +10 percent
  - Medium and Heavy tubes +Not limited
  - 10 to +10 percent
  - (2) Seamless tubes +Not limited
  - 12.5 to +10 percent
- (b) Weight:
- (1) Single tube (light series) +10 percent
  - 8 to +10 percent
  - (2) Single tube (medium and heavy series) +10 percent

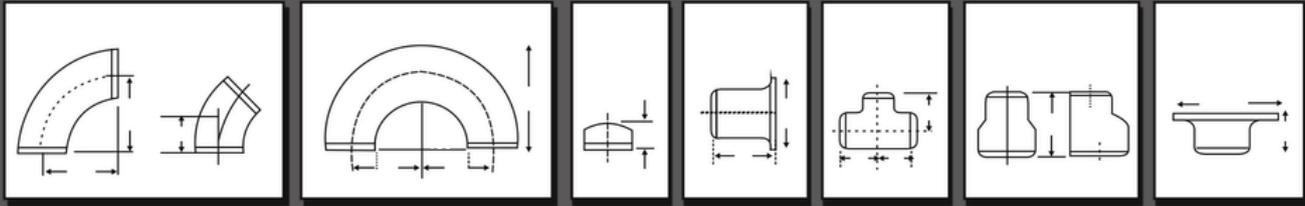
#### MAXIMUM PERMISSIBLE PRESSURE AND TEMPERATURE FOR TUBES WITH STEEL COUPLINGS OR SCREWED AND TEMPERATURE FOR TUBES

Nominal Bore mm	Maximum Permissible Pressure N/mm <sup>2</sup>	Maximum Permissible Temperature °C	Kg/cm <sup>2</sup>
Up to and including 25 mm	1.20	260	12.24
Over 25 mm upto and including 40 mm	1.03	260	10.50
Over 40 mm upto and including 80 mm	0.86	260	8.77
Over 80 mm upto and including 100 mm	0.69	260	7.04
Over 100 mm upto and including 125 mm	0.63	177	6.47
Over 125 mm upto and including 150 mm	0.69	171	7.04
Over 150 mm upto and including 200 mm	0.50	160	5.10

For tubes fitted with appropriate flanges of suitably butt welded together, the max. permissible pressure shall be 21.00 kg/cm<sup>2</sup> and max. permissible temp. 280°C



## BUTT WELDING FITTINGS TO ANSI B16.9 STAINLESS STEEL ASTM A 403/CARBON STEEL ASTM A 234



NOM BORE	PIPE O.D.	WALL THICKNESS								RADIUS			L						
		5S	10S	40S	80S	1D	1.5D	2D	3D	A	B	C	E	G	SHORT	LONG	H	D	H
1/2	21.34	1.65	2.11	2.77	3.73	12.7	19.05	25.4	38.1	12.7	15.9	25.4	25.4	34.9	50.8	76.2	50.8	42	8
3/4	26.67	1.65	2.11	2.87	3.91	19.05	28.57	38.10	57.15	19.05	11.1	28.6	25.4	42.8	50.8	76.2	50.8	52	8
1	33.40	1.65	2.77	3.38	4.55	25.4	38.1	50.8	76.2	25.4	22.2	38.1	38.1	50.8	50.8	101.6	50.8	62	10
1 1/4	42.16	1.65	2.77	3.56	4.85	31.75	47.6	63.5	95.25	31.75	25.0	47.6	38.1	63.5	50.8	101.6	50.8	72	12
1 1/2	48.26	1.65	2.77	3.68	5.08	38.1	57.15	76.2	114.3	38.10	28.6	57.2	38.1	73.0	50.8	101.6	63.5	82	12
2	60.32	1.65	2.77	3.91	5.54	50.8	76.2	101.6	152.4	50.8	34.0	63.5	38.1	92.0	63.5	152.4	76.2	98	16
2 1/2	73.02	2.11	3.05	5.16	7.01	63.5	95.25	127.0	190.5	63.5	44.0	76.2	38.1	104.8	63.5	152.4	88.9	118	16
3	88.90	2.11	3.05	5.49	7.62	76.2	114.30	152.4	228.6	76.2	50.8	85.7	50.8	127.0	63.5	152.4	88.9	130	18
3 1/2	101.60	2.11	3.05	5.74	8.08	88.9	133.35	177.8	266.7	88.9	57.2	95.3	63.5	139.7	76.2	152.4	101.6	140	18
4	114.30	2.11	3.05	6.02	8.56	101.6	152.4	203.2	304.8	101.6	63.5	104.8	63.5	157.2	76.2	152.4	101.6	168	20
5	141.30	2.77	3.40	6.55	9.52	127.0	190.5	254.0	381.0	127.0	82.6	123.8	76.2	185.7	76.2	203.2	127.0	188	25
6	168.27	2.77	3.40	7.11	10.97	152.4	228.6	304.8	457.2	152.4	95.3	142.7	88.9	215.9	88.9	203.2	139.7	215	25
8	219.07	2.77	3.76	8.18	12.7	203.2	304.8	406.4	609.6	203.2	127.0	177.5	101.6	270.0	101.6	203.2	152.4	270	30
10	273.05	3.40	4.19	9.27	12.7	254.0	381.0	508.0	762.0	254.0	158.7	215.9	127.0	324.0	127.0	254.0	177.8	330	35
12	323.85	3.96	4.57	9.52	12.7	304.8	457.2	609.6	914.4	304.8	190.5	254.0	152.4	381.0	152.4	254.0	203.2	400	40
14	355.60	3.96	4.76	9.52	12.7	355.6	533.4	711.2	1066	355.6	222.2	280.0	165.1	412.8	152.4	305.0	330.2	-	-
16	406.40	4.19	4.76	9.52	12.7	406.4	609.6	812.8	1219	406.4	254.0	304.8	177.8	470.0	152.4	305.0	355.6	-	-
18	457.20	4.19	4.76	9.52	12.7	457.2	685.8	914.4	1372	457.2	285.7	343.0	203.2	533.4	152.4	305.0	381.0	-	-
20	508.00	4.76	5.54	9.52	12.7	508.0	762.0	1016	1524	508.0	317.6	381.0	228.6	584.2	152.4	305.0	508.0	-	-
24	609.60	5.54	6.35	9.52	12.7	609.6	914.4	1219	1829	-	381.0	431.8	266.7	698.5	152.4	305.0	508.0	-	-

**STANDARDS** All dimensions are in mm and confirm to ANSI B 16.9 and MSS. SP-43

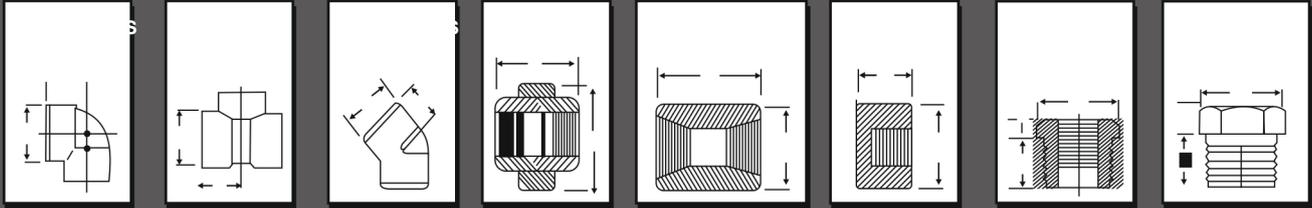
**RADIUS** :Radius of Short Radius Elbows is 1 times nominal pipe diameter, Radius of Long Radius Elbows is 1 1/2 times nominal pipe diameter.

**MATERIAL OF CONSTRUCTION**:S. 30/304L/316/316L/321 Carbon Steel and Alloy Steel.



**FORGED SCREWED FITTING TO ANSI B-16.11 3000/6000 LBS.**

**THREAD TO ASA B 2.1**



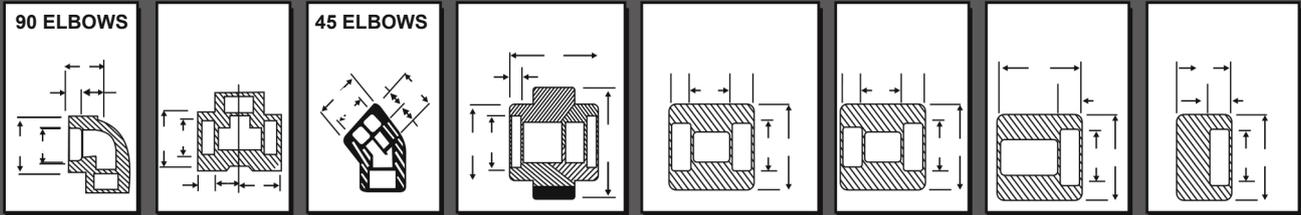
**(DIMENSIONS IN MM)**

HALF COUPLING = G/2

NOM BORE	PIPE O.D.	3000 LBS.												COMMON FACTORS						6000 LBS.				
		A	B	C	G	H	K	D	E	F	i	J	L	A	B	C	G	H	K					
1/8"	10.3	21	22	17	32	16	19	11	10	40		6		25	25	19	32	22						
1/4"	13.7	25	25	19	35	19	25	16	11	43	3	6	32	29	33	22	35	25	27					
3/8"	17.2	29	33	22	38	22	25	17.5	13	48	4	8	38	33	38	25	38	32	27					
1/2"	21.3	33	38	25	48	29	32	22	15	51	5	8	46	38	46	29	48	38	33					
3/4"	26.7	38	46	29	51	35	37	27	16	57	6	10	51	44	56	33	51	44	38					
1"	33.4	44	56	33	60	44	41	35	19	64	6	10	60	51	62	35	60	57	43					
1 1/4"	42.2	51	62	35	67	57	44	44.5	21	70	7	14	72	60	75	43	67	64	46					
1 1/2"	48.3	60	75	43	79	64	44	51	21	79	8	16	80	64	84	44	79	76	48					
2"	60.3	64	84	45	86	76	48	63.5	22	88	9	17	94	83	102	52	86	92	51					
2 1/2"	73.02	83	102	52	92	92	60	76	27	118	10	21	122	95	121	64	92	108	64					
3"	89.0	95	121	64	108	108	65	89	29	121	10	25	140	106	146	79	108	127	68					
4"	114.5	114	152	79	121	140	68	117.5	32	150	13	25	180	114	152	79	121	159	75					

**90 ELBOWS**

**45 ELBOWS**



NOM PIPE BORE	PIPE O.D.	3000 LBS.												COMMON FACTORS						6000 LBS.				
		A max	B max	K	J	L	M	N	P	Q	C	D	O	O	A	B	M	K	N					
1/8"	10.3	22	18.5	26	16	40	17.3	32	17.5	10	10.7	10	5	8	22	22	20	25	46					
1/4"	13.7	22	22	26	18	43	21.2	32	17.5	10	14.1	10	5	8	27	25	24	25	51					
3/8"	17.2	25	25	26	19	48	25.4	36	19	10	17.6	10	3	9	27	28	28	26	60					
1/2"	21.3	27	32	30	21	51	31	43	22	10	21.7	10	6	13	31	34	34	31	72					
3/4"	26.7	34	38	36	24	57	37	50	25	13	27	13	6	13	37	42	41	35	80					
1	33.4	37	46	40	25	64	45.2	60	27	13	33.8	13	9	17	42	50	50	40	94					
1 1/4"	42.2	42	56	40	29	70	55	70	30	13	42.6	13	9	17	47	59	58	41	100					
1 1/2"	48.3	47	62	40	30	79	61.4	78	32	13	48.7	13	9	17	53	67	66	43	122					
2"	60.3	56	75	52	37	89	75	95	38	13	61.2	16	15	23	59	84	83	55						
2 1/2"	73.02	60	92	52	48	114	91.3	125	38	16	73.8	16	14	24		102		56						
3"	89.00	76	110	52	51	127	108.8	140	44	16	89.8	16	14	24		121		58						
4"	114.50	88	137	58		150	136.9		48	19	115.5	19	14	24		152		64						