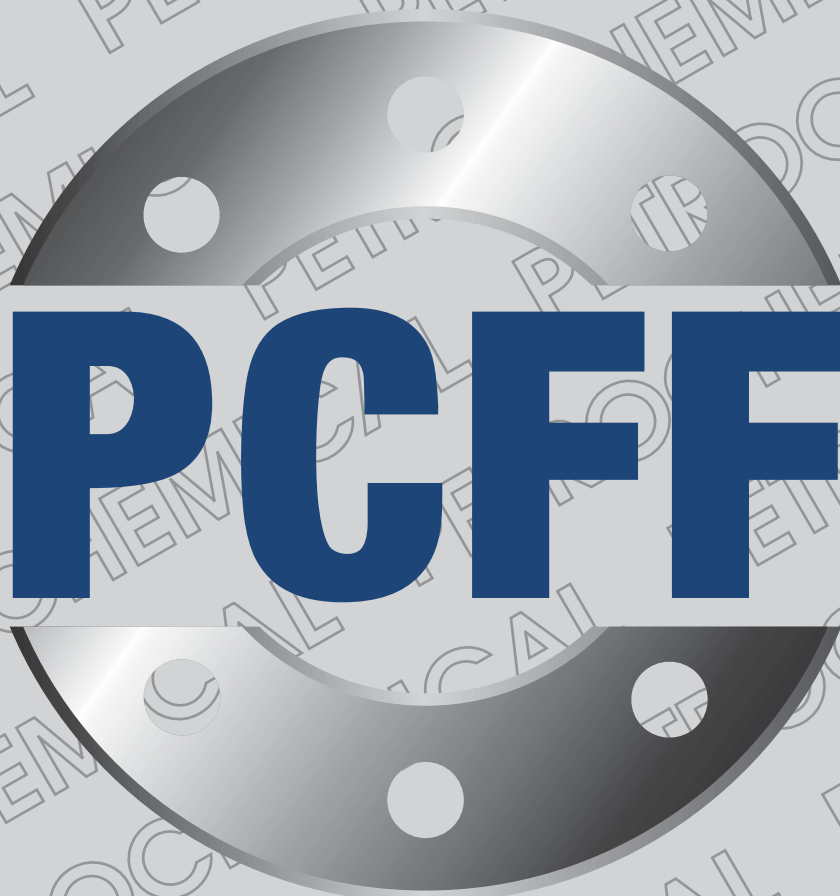




Precision • Quality • Delivery
Custom Solutions



PETROCHEMICAL
Flange Fittings Manufacturing Inc.





About Us

PetroChemical Flange Fittings Manufacturing Inc.

We are specialized in the manufacturing and distribution of forge stainless steel and carbon steel flange and fittings. With the commitment of quality products and timely delivery, Our Company has achieved 100% satisfaction of our clients and continues to build strong relationship with our clients worldwide.

We have first-class inspection devices, perfect detecting means and well-trained specialists. And we stick to ISO 9001:2008 quality systems and efficiently control procedure in production. We have confidence about our best quality products with competitive prices.

We are based in Canada and have distribution office in UK, USA and the Gulf region.

STANDARD:

ASME B16.5, ASME B16.47, ANSI B16.36, AWWA

DIN 2527, DIN 2573, DIN 2576, DIN 2575, DIN 2630, DIN 2631, DIN 2632, DIN 2633, DIN 2634, DIN 2635, DIN 2636, DIN 2637, DIN 2641, DIN 2642, DIN 2652

EN 1092-1, **JIS** B2220

FLANGE:

Stainless Steel: ASTM A182 F304/ 304L/ 304H/ 316/ 316L/ 317/ 317L/ 321/ 310/ 347/904L etc.

Carbon Steel: ASTM A105/ A105N/ A694 F42/46/52/56/60/65/70 / A350 LF3/ A350 LF2 **Alloy Steel:** ASTM A182 F1/ F5/ F9/ F11/ F22/ F91/ etc.

Types: Weldneck , Slipon, Blind, Socket Weld , Lap Joint, Spectacles, Ring Joint, Orifice, Long Weldneck, Deck Flange, etc.

Size: 1/2" NB TO 48" NB. Class: 150#, 300#, 400#, 600#, 900#, 1500# & 2500#.

FORGED HIGH PRESSURE FITTINGS

Carbon Steel: ASTM A105/ A105N/ A694 F42/46/52/56/60/65/70 / A350 LF3/ A350 LF2

Stainless Steel: ASTM A182 F304/ 304L/ 304H/ 316/ 316L/ 317/ 317L/ 321/ 310/ 347/904L etc.

Alloy Steel: ASTM A182 F1/ F5/ F9/ F11/ F22/ F91/ etc.

Types : Elbow, Tee, Union, Cross, Coupling, Cap, Bushing , Plug, Swage Nipple, Welding Boss, Hexagon Nipple, Barrel Nipple, Welding Nipple, Parraler Nipple, Street Elbow, Hexagon Nut, Hose Nipple, Bend, Adapter, Insert, Cross, Weldolet, Sockolet, Thredolet, etc.

Please send all enquires: sales@petrocff.com

PetroChemical Flange Fittings Manufacturing Inc

Phone: 1- 866-590-3835

Fax: 1-866-315-8484

Email: sales@petrocff.com

www.petrocff.com

1744 Meyerside Drive

Mississauga, ON L5T 1A3, CANADA

Precision . Quality . Delivery . Custom Solutions

OUR SERVICES

Top workmanship



Best in class Workmanship is our top priority to produce top Quality

Quality Assurance



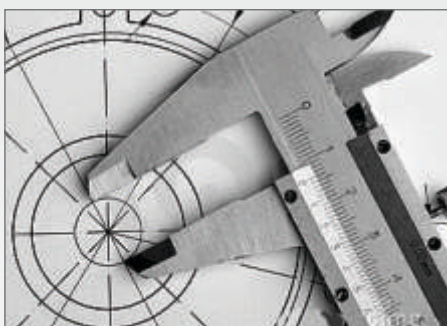
Strict quality assurance resulted trust of our Customers

Delivery



On time delivery, committed to understand customer's urgency

Precision



Precise in production according to customer's required size

Custom Solutions



Capacity to produce Custom Flange on customer's request on short notice

Services:

Manufacturer of top quality Flange and Fittings for Oil and Chemical Industry.
We also make Custom Flange and Fittings according to customer's requirement on quick turnaround.

Vision:

To become the benchmark manufacturing company for the PetroChemical industry providing world-class products to satisfied customers through continuous improvement driven by the integrity, teamwork and creativity of our people.

Mission:

Our Company is committed to provide the highest quality product possible through our highly skilled and dedicated employee with the highest level of technical knowledge in the industry. We will achieve excellence through identifying, communicating and promoting: Quality, Knowledge and Precision.

Values:

The following are our core values against which we measure ourselves in the way in which we do business on a day-to-day basis:

Integrity– We will conduct our business in a way that makes us proud, doing what we promise to do and doing it in the right way.

Teamwork– Partnerships are our greatest strength both internally and externally. We will come together and strive for continuous improvement in all we do and encourage every individual to realize our full potential.

Respect– Everyone is important to us and we will respect our customers, partners, and suppliers and the trust they place in doing business with us. We will strive to serve to the greatest of our abilities through understanding and exceeding expectations.

Innovation– We will support and encourage the sharing of ideas, insights and experiences to continually improve our products, processes and capabilities for the benefit of our customers.

Performance– Underpins our success in all we do. Through continuously challenging and measuring ourselves we will achieve our vision of becoming the benchmark against which all other manufacturing companies are measured.



INDUSTRIES WE SERVE



Petroleum



Offshore Platforms



Chemical Industry



Shipyard Industry



Pharmaceutical Industry



Water Treatment



Food & Beverage Industry



Chemical Industry

PRODUCT RANGE

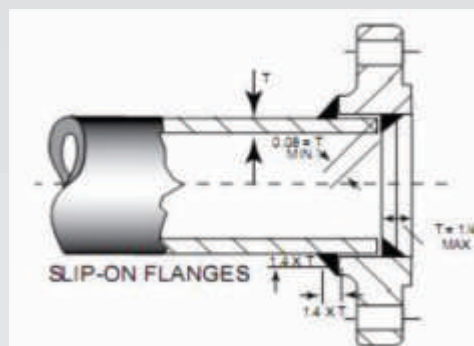


Welding Neck Flanges:

are flanges that designed to be joined to a piping system by butt welding. This kind of flange include lots of specification, Weld neck Flange is expensive because of its long neck and cost of people for contact WN flange with pipeline or fitting, but is preferred for high stress applications. The bore of Weld-Neck flange matches bore of the pipeline, reducing turbulence and erosion.

Slip-on Flanges:

are slipped over the pipe and welded to provide strength and prevent leakage. Slip on Flanges are at the low cost end of the scale, and do not require high accuracy when cutting the pipe to length. These slip on can sometimes have a boss or hub, and can be made with a bore to suit either pipe or tube.



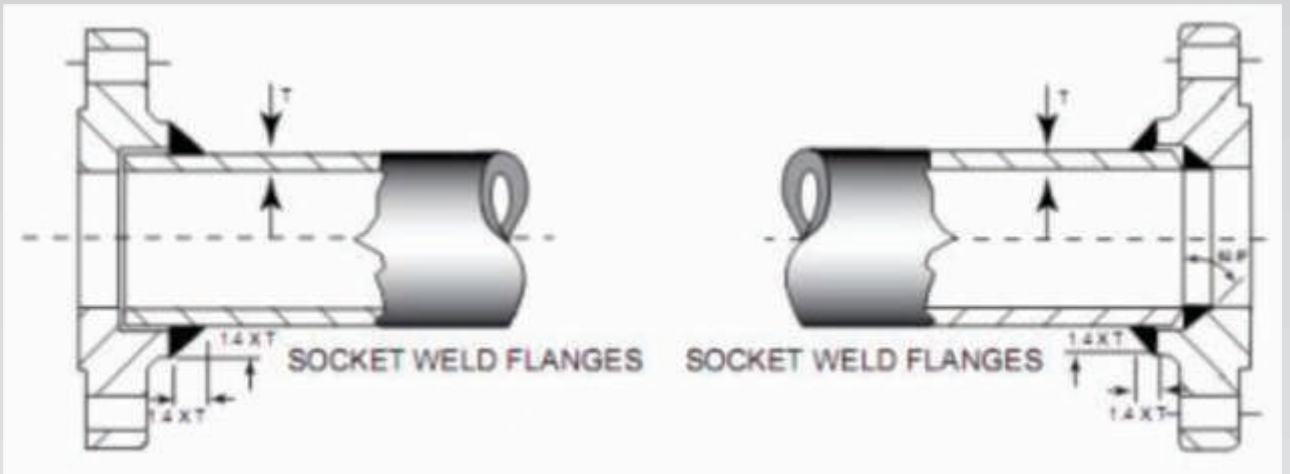
Screwed or Threaded Flanges:

(Screwed flanges) are similar to slip-on flanges in outline, but the bore is threaded, thus enabling assembly without welding. This obviously limits its application to relatively low pressure piping systems. Threaded Flanges may be welded around the joint after assembly, but this is not considered a satisfactory method of increasing the flanges' pressure applications. Threaded flange use in low press condition usually.

Lap Joint or Van Stone Flanges:

(LJ Flanges) or Loose flange (LF flange) called are used on piping fitted with lapped pipe or with lap joint stub ends the combined initial cost of the two items being approximately one-third higher than that of comparable welding neck flanges. Their pressure-holding ability is little, Lap Joint flanges have certain special advantages: Freedom to swivel around the pipe facilitates the lining up of opposing flange bolt holes. Lack of contact with the fluid in the pipe often permits the use of inexpensive carbon steel flanges with corrosion resistant pipe. In systems which erode or corrode quickly, the flanges may be salvaged for re-use.



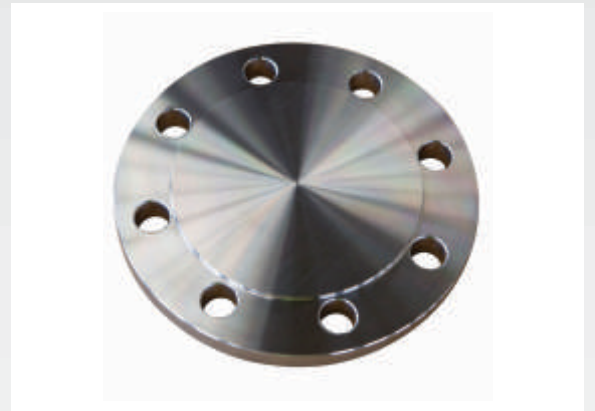


Socket-Welding Flanges:

forged flange is similar to the slip-on flange, same to socket welding flange, but the bore is counter-bored to accept pipe. The diameter of the remaining bore is the same as the inside diameter of the pipe. The Socket Welding Flange is attached to the pipe by a fillet weld around the hub of the flange. An optional internal weld may be applied in high stress applications. The biggest use of Socket Flanges is in high pressure systems such as hydraulic and steam lines.

Blind Flanges:

include lots of kinds, which has no bore, and is used to close piping system. When you open a piping system and Blind flange also permits easy access to a line once it has been closed. The low pressure pipe system be contacted by threaded / screwed.



Custom Flange:

We are the capable and have capacity to make any Custom Designed flange and fittings according to customer's requirements.

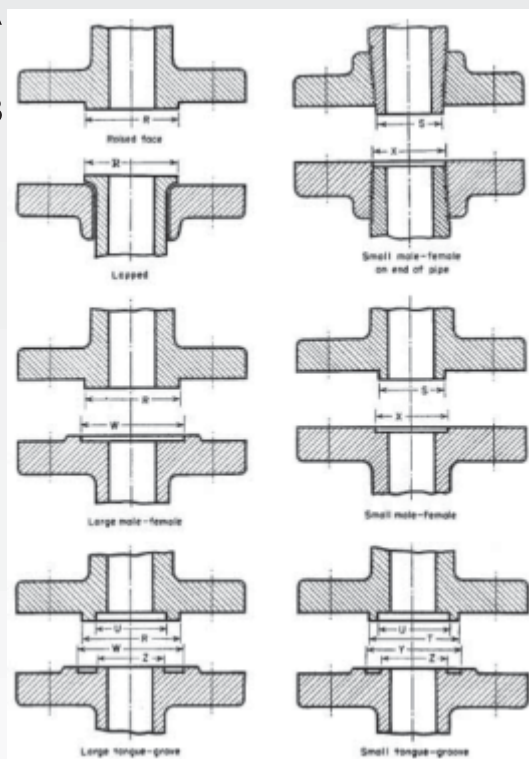
CLASSES AVAILABLE

ASME B16.5

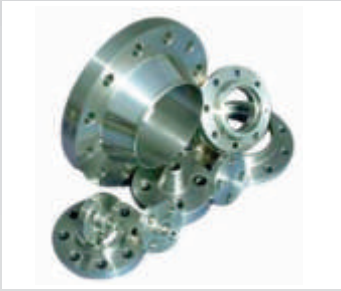
- ◆ 150#, 300#, 400#, 600#, 900#, 1500#, 2500#

ASME B16.47 Ser. A & Ser. B, Industry Standard and A.W.W.A. Flanges:

- ◆ Series A MSS SP44
- ◆ Series B API 605
- ◆ Class 75 per ASME 16.47 Ser. B
- ◆ Class 75 per Industry Standard
- ◆ Class 75 per Industry Standard
- ◆ Class 125 LW, A.W.W.A C207 Class B & D
- ◆ Class 125, A.W.W.A C207 Class E
- ◆ Class 150 Welding Neck per ASME 16.47 Ser. A
- ◆ Class 150 Welding Neck per ASME 16.47 Ser. B
- ◆ Class 175 Industry Standard
- ◆ Class 300 Welding Neck & Blind per ASME B16.47 Ser. A
- ◆ Class 300 Welding Neck & Blind per ASME B16.47 Ser. B
- ◆ Class 300 Welding Neck Industry Standard
- ◆ Class 350 Slip-On Industry Standard
- ◆ Class 400 ASME B16.47 Ser. A & B
- ◆ Class 600 ASME B16.47 Ser. A & B



FLANGE FACING AND FINISHING



When ordered, these flange types can be furnished with a variety of other facings, such as male and female, ring joint, tongue and groove, etc. Lap Joint flanges are machined with a flat face and a fillet radius to accommodate the stub end or pipe lap.

Flange Face Surface Finish

The ASME B16.5 code requires that the flange face (raised face and flat face) has a specific roughness to ensure that this surface be compatible with the gasket and provide a high quality seal.

A serrated finish, either concentric or spiral, is required with 30 to 55 grooves per inch and a resultant roughness between 125 and 500 micro inches. This allows for various grades of surface finish to be made available by flange manufactures for the gasket contact surface of metal flanges.

Stock Finish

The most widely used of any flange surface finish, because practically, is suitable for all ordinary service conditions. Under compression, the soft face from a gasket will embed into this finish, which helps create a seal, and a high level of friction is generated between the mating surfaces.

Spiral Serrated

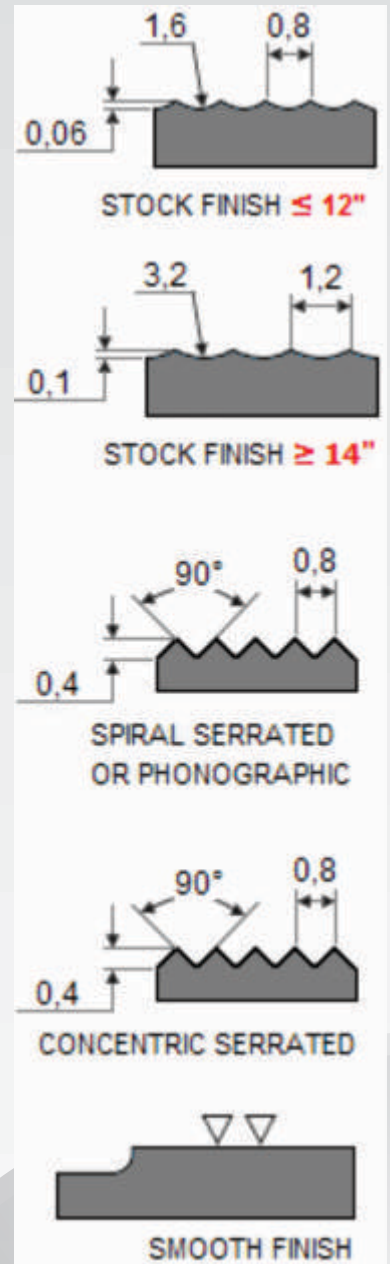
This is also a continuous or pornographic spiral groove, but it differs from the stock finish in that the groove typically is generated using a 90-deg tool which creates a "V" geometry with 45° angled serration.

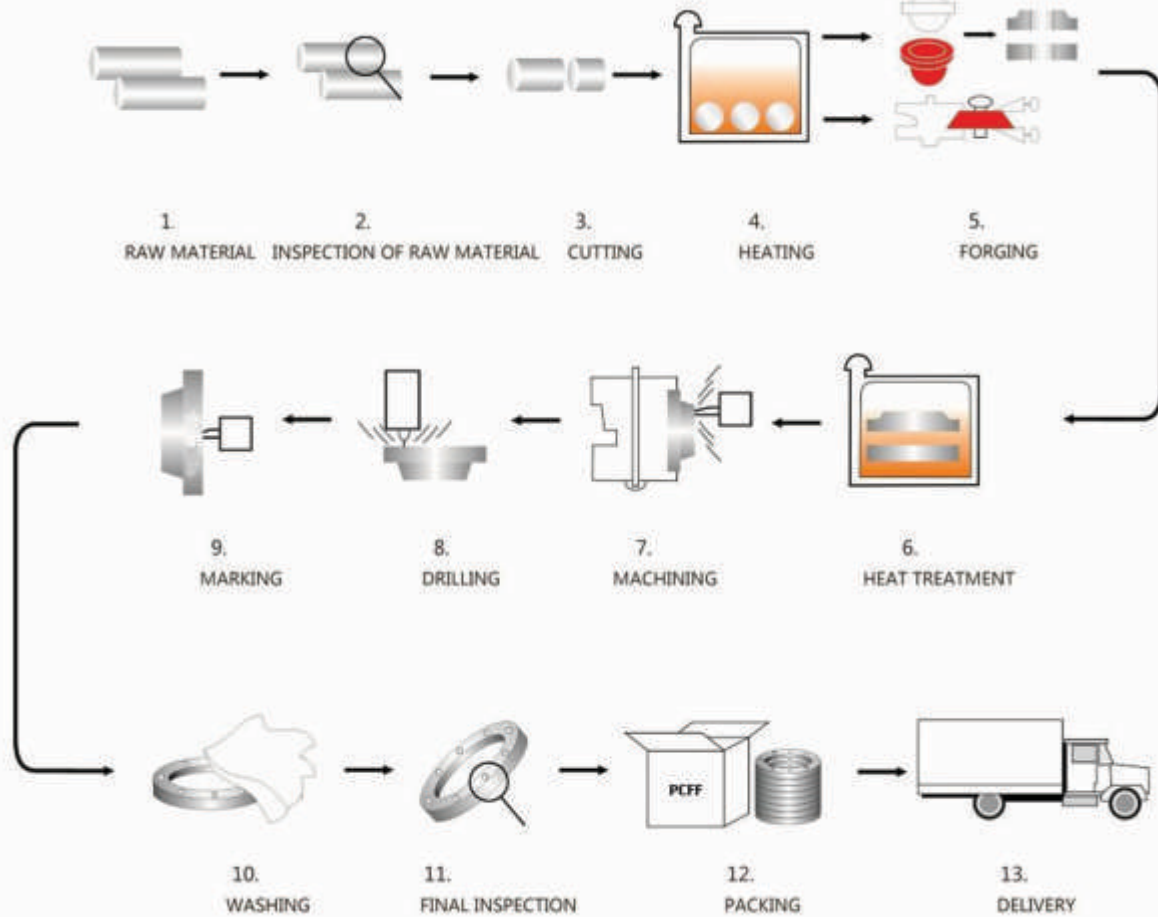
Concentric Serrated

As the name suggests, this finish is comprised of concentric grooves. A 90° tool is used and the serrations are spaced evenly across the face.

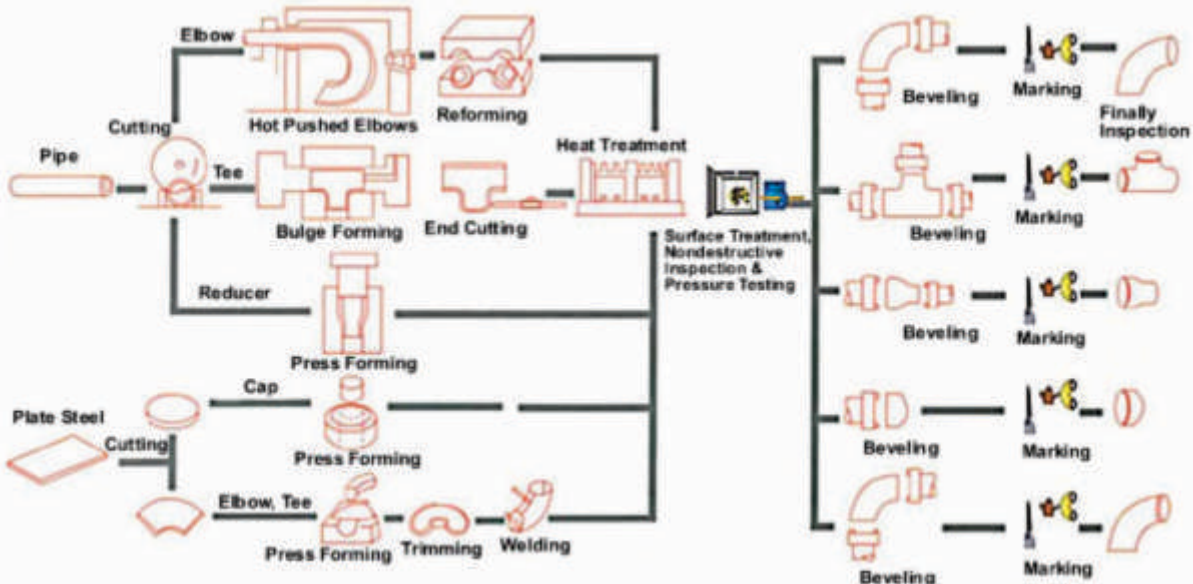
Smooth Finish

This finish shows no visually apparent tool markings. These finishes are typically utilized for gaskets with metal facings such as double jacketed, flat steel and corrugated metal. The smooth surfaces mate to create a seal and depend on the flatness of the opposing faces to effect a seal.





Flange Production Process



Fittings Production Process

BUTTWELD FITTINGS

A pipe fitting is defined as a part used in a piping system, to change direction or function, which is mechanically joined to the system.

Probably the simplest way to achieve this would be to bend the pipe in the direction required, but this process will stretch and thin the outer wall whilst thickening and wrinkling the inner wall. This results in flow resistance and accelerated wall erosion.

A second method sometimes used is a mitre joint, where pipes are cut to the correct angle and welded together to achieve the desired change. Whilst the cross-sectional area and wall thickness are maintained, a great deal of efficiency is lost due to friction and turbulence resulting from the severe changes in direction. For example, a single-mitre bend offers about six times the resistance of a swept elbow.

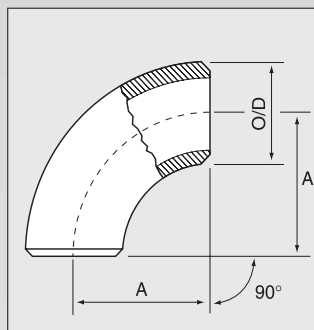
For these reasons swept fittings are preferred on most piping systems, particularly where internal pressure, flow and corrosion are of major consideration.

TYPES AND APPLICATIONS OF BUTTWELD FITTINGS

A piping system using butt weld fittings has many inherent advantages over other forms.

- Welding a fitting to the pipe means it is permanently leakproof.
- The continuous metal structure formed between pipe and fitting adds strength to the system.
- Smooth inner surface and gradual directional changes reduce pressure losses and turbulence and minimise the action of corrosion and erosion.
- A welded system utilises a minimum of space.

90° ELBOWS



The function of a 90° elbow is to change direction or flow in a piping system.

Elbows are split into three groups which define the distance over which they change direction, expressed as a function of the distance from the centre line of one end to the opposite face.

This is known as the centre to face distance and is equivalent to the radius through which the elbow is bent.

Long Radius Elbow

The most common is the long radius (L.R.) elbow where the centre to face dimension is always $1\frac{1}{2}$ times the nominal pipe size of the elbow.

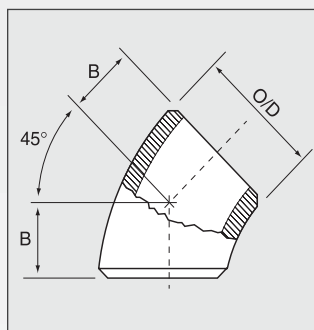
Short Radius Elbow

In this case the centre to face dimension is the same as the nominal pipe size of the elbow.

Extra Long Radius

This is where the centre to face dimension is longer than the standard long radius type. The most common of these is where the centre to face dimension is three times the nominal size. i.e. 3D.

45° ELBOWS

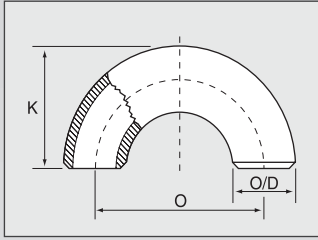


The function of a 45° elbow is the same as a 90° elbow, but the measurement of dimensions, however, is different to that of the 90° elbow. The radius of a 45° elbow is the same as the radius of the 90° L.R. elbow where 'R' equals $1\frac{1}{2}$ D.

However, the centre to face

dimension is not equivalent to the radius as in 90° L.R. elbows. This is measured from each face to the point of intersection of the centre lines perpendicular to each other. This is due to the smaller degree of bend.

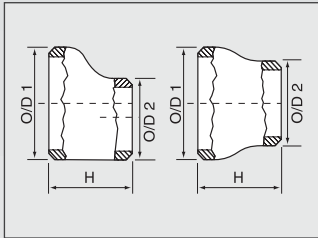
180° RETURN BENDS



The function of a 180° return bend is to change direction of flow through 180° and there are two basic types, long radius and short radius. Both types have a centre to centre dimension double the matching 90° elbows. The

primary application for these fittings is in heater coils and heat exchangers, boilers etc.

ECCENTRIC AND CONCENTRIC REDUCERS

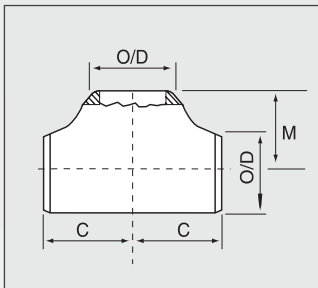


The function of both types of reducer is to reduce the line from a larger to a smaller pipe size, this obviously results in an increased flow pressure. With the eccentric reducer the smaller outlet end is off centre to the larger end enabling it to

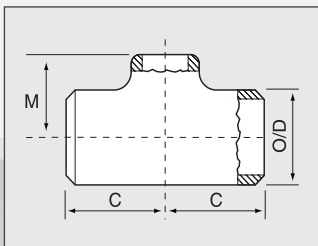
line up with one side of the inlet and not with the other.

The concentric reducer is so manufactured that both inlet and outlet ends are on a common centre line. The concentric reducer is easier and less expensive to produce but does not allow quite the same versatility as the eccentric reducer. The lengths of both types are fixed by manufacturing standards.

EQUAL AND REDUCING TEES

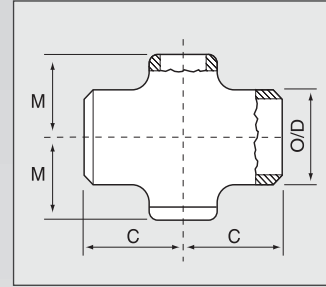
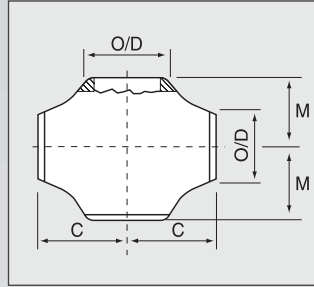


The function of a tee is to permit flow at 90° to the main direction of flow. The main flow passes through the 'run' whilst the 90° outlet is known as the 'branch'. The equal tee is manufactured with all three outlets being the same size.



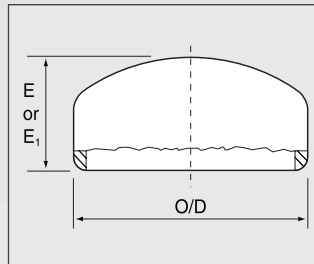
The reducing tee is manufactured with the branch outlet smaller than the run to obtain the desired flow and pressure through the system.

EQUAL AND REDUCING CROSSES



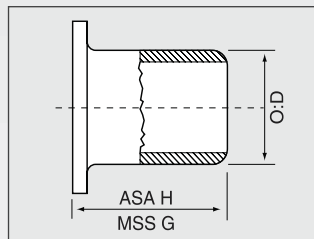
The function of a cross is similar to that of a tee with the exception of providing two 90° outlets opposite each other. Equal crosses have all four outlets of equal size. Reducing crosses have branches that are smaller in size to that of the run to obtain the desired flow and pressure through the system.

CAPS



The function of an end cap is to block off the end of a line in piping systems. This is achieved by placing the end cap over the open line and welding around the joint.

LAP JOINT STUB ENDS



A lap joint stub end and its associated slip-on flange in a piping system allows quick disconnection of the particular section involved. Stub ends are installed in pairs and mated together with two lap joint flanges.

The surface of the stub end has a phonographic serrated gasket surface which prevents leakage at the joint. Using stub ends allows sections of the line to be opened for cleaning, inspection or quick replacement etc., without the need to re-weld.

There are two basic types of stub end, ANSI types A & B long barrel, and M.S.S. types short barrel. Under certain design criteria such as temperature or pressure, etc., it is not acceptable to have the joint between stub end and pipe in close proximity with the flange joint, in these applications ANSI types are used.

FITTINGS



Reducer Fittings



Equal Tee - 250x250



Carbon Fittings



Steel Fittings

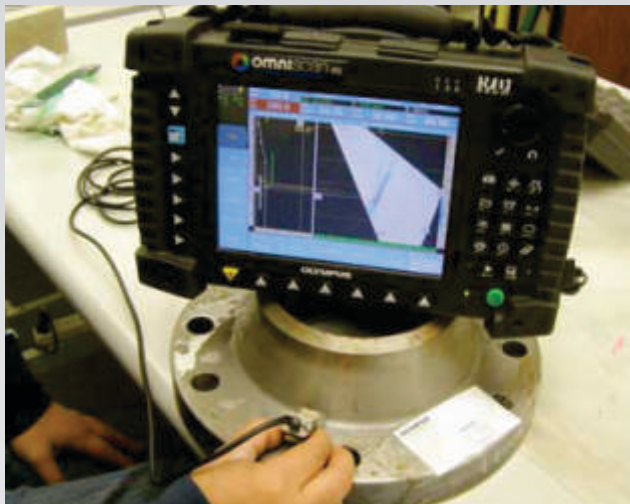


Equal Tee



Degree Elbows

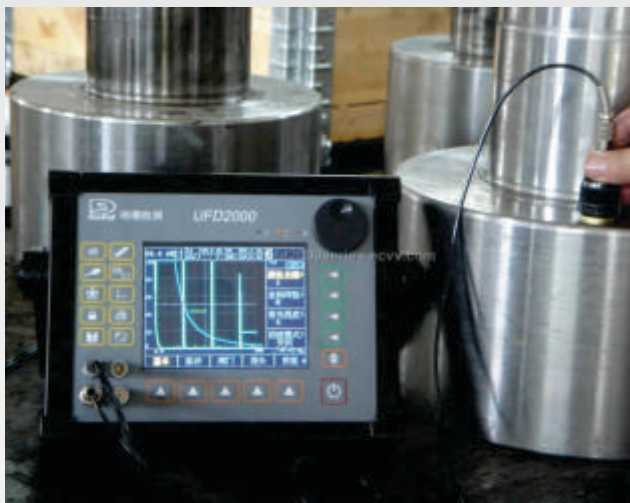
TESTING AND MEASURING INSTRUMENTS



Flange Omni Flange Probe



Hardness Testing

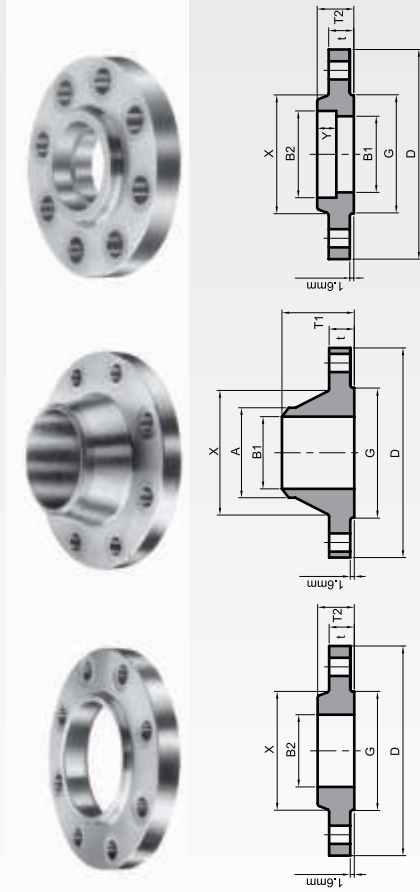


Ultrasonic Flaw Detector



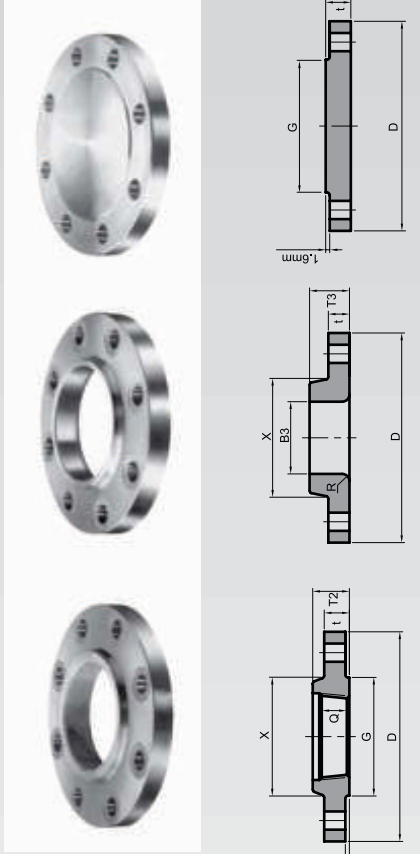
Ultrasonic Thickness Testing

Class 150 Flanges



ANSI B 16.5 Forged Flanges														SOCKET WELDING																											
SLIP-ON														WELDING NECK														Unit : mm													
nominal Pipe size	Outside Diam. of Hub	Diam. at Base of Hub	O.D of Raised Face	Thickness	Bore			length THRU HUB			Diam. of Hub at Bevel	Radius of Fillet	Thread length	Depth of socket																											
					Welding neck socket Welding	slip-on socket Welding	lap Joint Welding	Welding neck Welding	slip-on Threaded socket Joint Welding	T3																															
D	X	g	t	B1	B2	B3	T1	T2	T3	a	R	Q	Y																												
1/2	89	30.2	35.1	11.2	15.8	22.4	22.9	47.8	15.7	21.3	3.0	15.7	9.7																												
3/4	99	38.1	42.9	12.7	20.8	27.7	28.2	52.3	15.7	26.7	3.0	15.7	11.2																												
1	108	49.3	50.8	14.2	26.7	34.5	35.1	55.6	17.5	33.5	3.0	17.5	12.7																												
1 1/4	117	58.7	63.5	15.7	35.1	43.2	43.7	57.2	20.6	42.2	4.8	20.6	14.2																												
1 1/2	127	65.0	73.2	17.5	40.9	49.5	50.0	62.0	22.4	48.3	6.4	22.4	15.8																												
2	152	77.7	91.9	19.1	52.6	62.0	62.5	63.5	25.4	60.5	7.9	25.4	17.5																												
2 1/2	178	90.4	104.6	22.4	62.7	74.7	75.4	69.9	28.4	73.2	7.9	28.4	19.1																												
3	191	108.0	127.0	23.9	78.0	90.7	91.4	69.9	30.2	88.9	9.7	30.2	20.6																												
3 1/2	216	122.2	139.7	23.9	90.2	103.4	104.1	71.4	31.8	101.6	9.7	31.8	22.4																												
4	229	134.9	157.2	23.9	102.4	116.1	116.8	76.2	33.3	114.3	11.2	33.3	23.9																												
5	254	163.6	185.7	23.9	128.3	143.8	144.5	88.9	36.6	141.2	11.2	36.6	23.9																												
6	279	192.0	215.9	25.4	154.2	170.7	171.5	88.9	39.6	168.4	12.7	39.6	26.9																												
8	343	246.1	269.7	28.4	202.7	221.5	222.3	101.6	44.5	219.2	12.7	44.5	31.8																												
10	406	304.8	323.9	30.2	254.5	276.4	277.4	101.6	49.3	273.1	12.7	49.3	33.3																												
12	483	365.3	381.0	31.8	304.8	327.2	328.2	114.3	55.6	323.9	12.7	55.6	39.6																												
14	533	400.1	412.8	35.1	336.6	359.2	360.2	127.0	57.2	355.6	12.7	57.2	41.4																												
16	597	457.2	469.9	36.6	387.4	410.5	411.2	127.0	63.5	406.4	12.7	63.5	44.5																												
18	635	505.0	533.4	39.6	438.2	461.8	462.3	139.7	68.3	457.2	12.7	68.3	49.3																												
20	699	558.8	584.2	42.9	489.0	513.1	514.4	144.5	73.2	508.0	12.7	73.2	54.1																												
24	813	663.4	692.2	47.8	590.6	616.0	616.0	152.4	82.6	609.6	12.7	82.6	63.5																												

NOTE :
1. For the 'Bore' (B) other Standard Wall Thickness
2. Class 150 flanges except Lap Joint will be furnished with 0.06" (1.6mm) raised face, which is included in 'Thickness' (t) and 'Length through Hub' (T1), (T2).
3. For Slip-on, Threaded, Socket Welding and Lap Joint Flanges, the hubs can be shaped other vertical from base to top or tapered within the limits of 7 degrees.

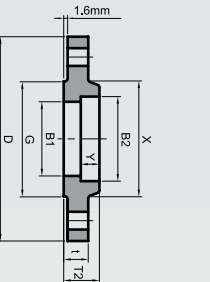
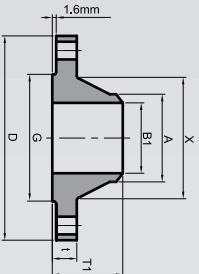
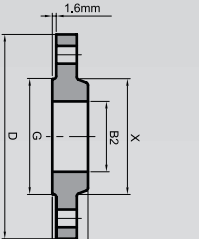


LAP JOINT										BLIND										Unit : mm
nominal Pipe size	Bolt Circle Diam.	number of Holes	Diam. of Bolts (inch)	BOTTING			aPPROXIMATE Weight													
				Machine Bolt length (inch)	stud Bolt length		Welding neck		slip-on and Threaded		lap Joint		Blind		socket Welding					
					Raised Face	Raised Face	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb	Kg	lb			
1/2	60.5	4	15.7	1/2	50.8	57.2	-	0.51	1.10	0.47	1.00	0.51	1.00	0.47	1.00	0.47	1.00			
3/4	69.9	4	15.7	1/2	50.8	63.5	-	0.73	1.60	0.58	1.30	0.64	1.40	0.63	1.40	0.59	1.30			
1	79.3	4	15.7	1/2	57.2	63.5	76.2	1.07	2.40	0.86	1.90	0.83	1.80	0.94	2.10	0.87	1.90			
1 1/4	88.9	4	15.7	1/2	57.2	69.9	82.6	1.40	3.10	1.08	2.40	1.16	2.00	1.23	2.70	1.11	2.40			
1 1/2	98.6	4	15.7	1/2	63.5	69.9	82.6	1.81	4.00	1.41	3.10	1.51	3.30	1.62	3.60	1.45	3.20			
2	120.7	4	19.1	5/8	69.9	82.6	95.3	2.59	5.70	2.26	5.00	2.38	5.20	2.64	5.80	2.33	5.00			
2 1/2	139.7	4	19.1	5/8	76.2	88.9	101.6	4.28	9.40	3.43	7.60	3.30	7.90	4.06	9.00	3.55	7.80			
3	152.4	4	19.1	5/8	76.2	88.9	101.6	5.18	11.40	3.87	8.50	4.04	8.90	4.90	10.80	4.02	8.90			
3 1/2	177.8	8	19.1	5/8	76.2	88.9	101.6	5.45	12.00	4.99	11.00	4.99	11.00	5.90	13.00	4.99	11.00			
4	190.5	8	19.1	5/8	76.2	88.9	101.6	7.32	16.10	5.75	12.70	5.96	13.00	7.41	16.30	5.99	13.20			
5	215.9	8	22.4	3/4	82.6	95.3	108.0	8.91	19.60	6.22	13.70	6.44	14.00	8.76	19.30	6.68	14.70			
6	241.3	8	22.4	3/4	82.6	101.6	114.3	11.26	24.90	7.38	16.30	7.59	16.70	11.31	24.90	7.99	17.60			
8	298.5	8	22.4	3/4	88.9	108.0	120.7	17.68	39.00	12.36	27.30	12.66	27.90	19.92	43.90	13.29	29.30			
10	362.0	12	25.4	7/8	101.6	114.3	127.0	24.79	54.70	17.10	37.70	16.78	37.00	28.39	64.80	19.50	43.00			
12	431.8	12	25.4	7/8	101.6	120.7	133.4	38.98	85.90	27.68	61.00	28.30	62.40	47.30	96.30	29.03	64.00			
14	476.3	12	28.5	1	114.3	133.4	146.1	51.71	114.00	35.20	77.60	41.50	91.50	59.42	140.00	38.56	85.00			
16	539.8	16	28.5	1	114.3	133.4	146.1	64.41	142.00	42.18	93.00	52.98	116.80	77.11	170.00	44.49	98.00			
18	577.9	16	31.8	1 1/8	127.0	146.1	158.8	74.84	165.00	49.71	109.60	59.00	130.00	94.80	209.00	54.43	120.00			
20	635.0	20	31.8	1 1/8	139.7	158.8	171.5	89.36	197.00	65.50	140.00	72.12	159.00	123.38	272.00	70.31	155.00			
24	749.3	20	35.1	1 1/4	152.4	171.5	184.2	119.66	263.80	90.50	199.50	99.02	218.30	188.22	415.00	95.25	210.00			

4. Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.
5. The gasket surface and backside (bearing surface for bolting) are made parallel within 1 degree. To accomplish parallelism, spot facing is carried out according to MSS SP-9, without reducing thickness (t).
6. Depth of Socket (Y) is covered by ANSI B 16.5 only in sizes through 3 inch, over 3 inch is at the manufacturer's option.

PETROCHEMICAL Flange Fittings Manufacturing Inc.

Class 300 Flanges



SLIP-ON

WELDING NECK

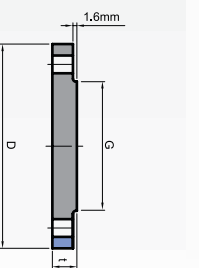
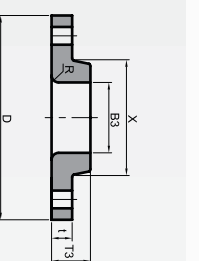
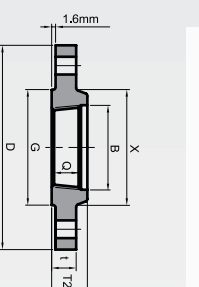
SOCKET WELDING

ANSI B 16.5 Forged Flanges

Unit : mm

nominal Pipe size	Outside Diam. of Hub	Diam. of Base	O.D of Raised Face	Thickness	Bore				length THRU HUB			Diam. of Hub at Bore	Radius of Fillet	Thread length	Depth of socket
					Welding socket Welding	slip-on socket Welding	lap Joint	Counter Bore Min.	Welding neck Welding	slip-on Thru socket Welding	lap Joint				
1/2	95	38.1	35.1	14.2	15.7	22.4	22.9	23.6	52.3	22.4	21.3	3.0	15.7	9.7	9.7
3/4	117	47.8	42.9	15.7	20.8	27.7	28.2	29.0	57.2	25.4	26.7	3.0	15.7	11.2	11.2
1	124	53.8	50.8	17.5	26.7	34.5	35.1	35.8	62.0	26.9	33.5	3.0	17.5	12.7	12.7
1 1/4	133	63.5	63.5	19.1	35.1	43.2	43.7	44.5	65.0	26.9	42.2	4.8	20.6	14.2	14.2
1 1/2	155	69.9	73.2	20.6	40.9	49.5	50.0	50.5	68.3	30.2	30.2	48.3	6.4	22.4	15.7
2	165	84.1	91.9	22.4	52.6	62.0	62.5	63.5	69.9	33.3	33.3	7.9	28.4	17.5	17.5
2 1/2	191	100.1	104.6	25.4	62.7	74.7	75.4	76.2	76.2	38.1	73.2	7.9	31.8	19.1	19.1
3	210	117.3	127.0	28.4	76.0	90.7	91.4	92.2	79.2	42.9	42.9	88.9	9.7	31.8	20.6
3 1/2	229	133.4	139.7	30.2	90.2	103.4	104.1	104.9	81.0	44.5	44.5	101.6	9.7	36.6	22.4
4	254	146.1	157.2	31.8	102.4	116.1	116.8	117.6	85.9	47.8	47.8	114.3	11.2	36.6	23.9
5	279	177.8	185.7	35.1	128.3	143.8	144.5	144.5	98.6	50.8	50.8	141.2	11.2	42.9	23.9
6	318	206.2	215.9	36.6	154.2	170.7	171.5	171.5	98.6	52.3	52.3	168.4	12.7	46.0	26.9
8	381	260.4	269.7	41.1	202.7	221.5	222.3	222.3	111.3	62.0	62.0	219.2	12.7	50.8	31.8
10	445	320.5	323.9	47.8	254.5	276.4	277.4	276.4	117.3	66.5	66.5	253.1	12.7	56.6	33.3
12	521	374.7	381.0	50.8	304.8	327.2	328.2	328.7	130.0	73.2	73.2	323.9	12.7	60.5	39.6
14	584	425.5	412.8	53.8	336.6	359.2	360.2	360.4	142.7	76.2	76.2	355.6	12.7	63.5	41.4
16	648	482.6	469.9	57.2	387.4	410.5	411.2	411.2	146.1	82.6	82.6	406.4	12.7	68.3	44.5
18	711	533.4	533.4	60.5	438.2	461.8	462.3	462.0	158.8	88.9	88.9	457.2	12.7	69.9	49.3
20	775	587.2	584.2	63.5	489.0	513.1	514.4	512.8	162.1	95.3	95.3	508.0	12.7	73.2	54.1
24	914	701.5	692.2	69.9	590.6	616.0	616.0	614.4	168.1	106.4	106.4	609.6	12.7	82.6	63.5

- NOTE :
1. For the Bore (B1) other Standard Wall Thickness
2. Class 300 Flanges except Lap Joint will be finished with 0.06" (1.6mm) raised face, which is included in Thickness (t) and Length through Hub (T1) (T2).
3. For Slip-on, Threaded, Socket Welding and Lap Joint Flanges, the hubs can be shaped either vertical from base to top or tapered within the limits of 7 degrees.



THREADED

LAP JOINT

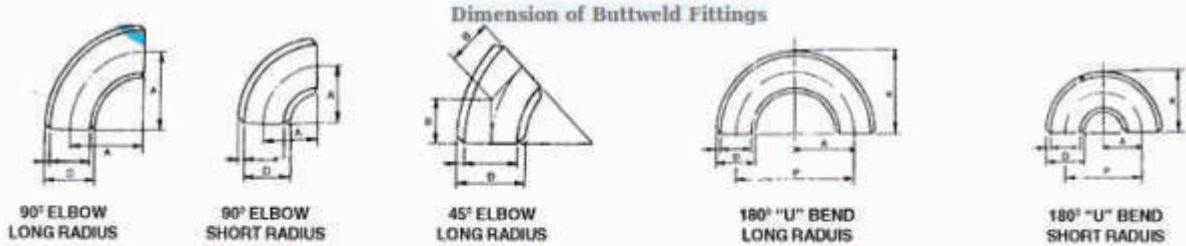
BLIND

Unit : mm

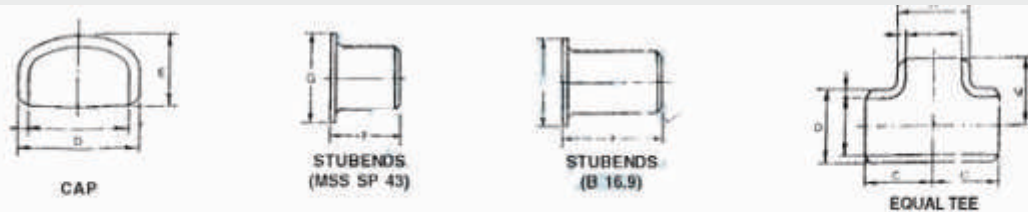
nominal Pipe size	Drilling		Diam. of Bolts	Machine Bolt length	stud Bolt length	Welding		slip-on and Threaded		lap Joint		Blind		socket Welding	
	Bot Circle Diam.	number of Holes				Raised Face	Ring Joint	Kg	lb	Kg	lb	Kg	lb	Kg	lb
1/2	66.5	4	15.7	1/2	57.2	63.5	76.2	0.78	1.70	0.62	1.40	0.61	1.30	0.62	1.40
3/4	82.6	4	19.1	5/8	63.5	76.2	88.9	1.34	3.00	1.15	2.50	1.15	2.50	1.19	2.60
1	88.9	4	19.1	5/8	63.5	76.2	88.9	1.64	3.60	1.39	3.10	1.38	3.00	1.42	3.20
1 1/4	98.6	4	19.1	5/8	69.9	82.6	95.3	2.06	4.50	1.67	3.70	1.66	3.70	1.79	3.80
1 1/2	114.3	4	22.4	3/4	76.2	88.9	101.6	3.06	6.70	2.53	5.60	2.52	5.60	2.68	5.90
2	127.0	8	19.1	5/8	76.2	88.9	101.6	3.40	7.50	2.80	6.20	2.79	6.20	2.94	6.50
2 1/2	146.4	8	22.4	3/4	82.6	101.6	114.3	5.31	11.70	4.25	9.40	4.22	9.30	4.75	10.50
3	168.1	8	22.4	3/4	88.9	108.0	120.7	7.32	16.10	5.81	12.80	5.78	12.70	6.79	14.90
3 1/2	184.2	8	22.4	3/4	95.3	108.0	127.0	8.17	18.00	7.72	17.00	7.72	17.00	9.53	21.00
4	200.2	8	22.4	3/4	95.3	114.3	127.0	11.30	24.90	10.13	22.30	10.07	22.20	12.00	26.50
5	235.0	8	22.4	3/4	108.0	120.7	133.4	15.12	33.30	12.56	27.70	12.52	27.60	15.96	35.20
6	269.7	12	22.4	3/4	108.0	120.7	139.7	19.68	43.40	16.04	35.40	15.96	35.20	21.20	46.70
8	330.2	12	25.4	7/8	120.7	139.7	152.4	30.48	67.20	24.50	54.00	24.37	53.70	34.60	76.30
10	387.4	16	28.4	1	139.7	158.8	171.5	43.74	96.40	34.16	75.30	39.92	88.00	55.34	122.00
12	450.9	16	31.8	1 1/8	146.1	171.5	184.2	64.41	142.00	51.28	113.00	58.70	129.40	78.90	174.00
14	514.4	20	31.8	1 1/8	158.8	177.8	190.5	88.30	194.70	72.12	159.00	83.46	184.00	107.05	236.00
16	571.5	20	35.1	1 1/4	165.1	190.5	203.2	112.94	249.00	90.40	199.30	106.14	234.00	139.25	307.00
18	628.7	24	35.1	1 1/4	171.5	196.9	209.6	138.54	305.00	109.00	240.30	133.95	295.30	176.90	396.00
20	685.8	24	35.1	1 1/4	184.2	203.2	222.3	167.37	369.00	136.00	300.00	157.65	347.60	223.17	492.00
24	812.8	24	41.1	1 1/2	203.2	228.6	254.0	235.41	519.00	204.00	449.70	240.40	530.00	342.00	754.00

4. Blind Flanges may be made with the same hub as that used for Slip-on Flanges or without hub.
5. The gasket surface and backside bearing surface for bolting are made parallel within 1 degree. To accomplish parallelism, spot facing is carried out according to MSS-SP-25, without raising the stress (t).
6. Depth of Socket (Y) is covered by ANSI B 16.5 only in sizes through 3 inch, over 3 inch is at the manufacturer's option.

DIMENSION OF BUTTWELD



Dimension of Butt weld Fittings (ANSI B 16.9 & 16.28)																								
			Centre to End									Centre to Centre						Back to Face						
	OD D			90° L/R A			45° L/R B			90° S/R A			180° L/R P			180° S/R P			180° L/R K			180° S/R K		
	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max
1/2	20	21	22	36	38	40	14	16	18	-	-	-	69	76	83	-	-	-	41	48	55	-	-	-
3/4	26	27	28	27	29	31	9	11	13	-	-	-	50	57	64	-	-	-	36	43	50	-	-	-
1	32	33	34	36	38	40	20	22	24	23	25	27	69	76	83	44	51	58	49	56	63	34	41	48
1¼	41	42	43	46	48	50	23	25	27	30	32	34	88	95	102	57	64	71	63	70	77	45	52	59
1½	47	48	49	55	57	59	27	29	31	36	38	40	107	114	121	69	76	83	76	83	90	55	62	69
2	59	60	61	74	76	78	33	35	37	49	51	53	145	152	159	95	102	109	99	106	113	74	81	88
2½	72	73	74	93	95	97	42	44	46	62	64	66	184	191	198	120	127	134	125	132	139	93	100	107
3	88	89	90	112	114	116	49	51	53	74	76	78	222	229	236	145	152	159	152	159	166	114	121	128
4	113	114	116	150	152	154	62	64	66	100	102	104	298	305	312	196	203	210	203	210	217	152	159	166
5	140	141	144	188	190	192	77	79	81	125	127	129	374	381	388	247	254	261	255	262	269	190	197	204
6	167	168	171	227	229	231	93	95	97	150	152	154	450	457	464	298	305	312	306	313	320	230	237	244
8	217	219	221	303	305	307	125	127	129	201	203	205	603	610	617	399	406	413	407	414	421	306	313	320
10	270	273	277	379	381	383	157	159	161	252	254	256	752	762	772	498	508	518	511	518	525	384	391	398
12	321	324	328	454	457	460	187	190	193	302	305	308	904	914	924	600	610	620	612	619	626	460	467	474
14	353	356	360	530	533	536	219	222	225	353	356	359	1057	1067	1077	701	711	721	704	711	718	526	533	540
16	403	406	410	607	610	613	251	254	257	403	406	409	1209	1219	1229	803	813	823	806	813	820	603	610	617
18	454	457	461	683	686	689	283	286	289	454	457	460	1362	1372	1382	904	914	924	907	914	921	679	686	693
20	503	508	514	759	762	765	315	318	321	505	508	511	1514	1524	1534	1006	1016	1026	1009	1016	1023	755	762	769
24	605	610	616	911	914	917	378	381	384	607	610	613	1819	1829	1839	1209	1219	1229	1212	1219	1226	907	914	921



Dimension of Butt weld Fittings (ANSI B 16.9 & MISS SP 43)																				
	OD			CAP			STUBEND		B 16.9			B MISS SP 43			EQUAL TEES					
	D			E			G		F			F			C			C		
	Min	Nom	Max	Min	Nom	Max	Min	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max
1/2	20	21	22	21	25	29	34	35	74	76	78	49	51	53	23	25	27	23	25	27
3/4	26	27	28	21	25	29	42	43	74	76	78	49	51	53	27	29	31	27	29	31
1	32	33	34	34	38	42	50	51	100	102	104	49	51	53	36	38	40	36	38	40
1¼	41	42	43	34	38	42	63	64	100	102	104	49	51	53	46	48	50	46	48	50
1½	47	48	49	34	38	42	72	73	100	102	104	49	51	53	55	57	59	55	57	59
2	59	60	61	34	38	42	91	92	150	152	154	62	64	66	62	64	66	62	64	66
2½	72	73	74	34	38	42	104	105	150	152	154	62	64	66	74	76	78	74	76	78
3	88	89	90	47	51	55	126	127	150	152	154	62	64	66	84	86	88	84	86	88
4	113	114	116	60	64	68	156	157	150	152	154	74	76	78	103	105	107	103	105	107
5	140	141	144	69	76	83	185	186	201	203	205	74	76	78	122	124	126	122	124	126
6	167	168	171	82	89	96	215	216	201	203	205	87	89	91	141	143	145	141	143	145
8	217	219	221	95	102	109	269	270	201	203	205	100	102	104	176	178	180	176	178	180
10	270	273	277	120	127	134	322	324	252	254	256	125	127	129	214	216	218	214	216	218
12	321	324	328	145	152	159	379	381	251	254	257	150	152	154	251	254	257	251	254	257
14	353	356	360	158	165	172	411	413	302	305	308	150	152	154	276	279	282	276	279	282
16	403	406	410	171	178	185	468	470	302	305	308	150	152	154	302	305	308	302	305	308
18	454	457	461	196	203	210	531	533	302	305	308	150	152	154	340	345	346	340	343	346
20	503	508	514	222	229	236	582	584	302	305	308	150	152	154	378	381	384	378	381	384
24	605	610	616	260	267	274	690	692	302	305	308	150	152	154	429	432	435	429	432	435





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