



Jaypee

STEEL & ENGINEERING CO.

HOUSE OF INDUSTRIAL RAW MATERIALS

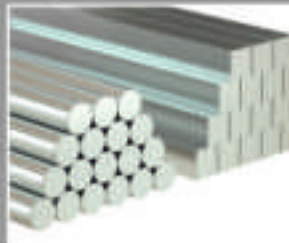


Manufacturer of :
All Type of Flanges & Fittings, Nut, Bolt, Fasteners.

Stockist & Suppliers of :
**Ferrous & Non Ferrous, Alloy Steel, S.S.,
M.S., Copper, Brass, Aluminum, Phosphor Bronze and All Type
En-Series Available in All Shapes, Size & Specification With T.C.**

AN ISO 9001:2000 CERTIFIED COMPANY

Quality is our top priority



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ABOUT US

Jaypee Steel Engineering Co. is a leading Manufacturer & Supplier of all Ferrous & Non-Ferrous Metals. As a pioneer and leader in the manufacturing industry, **Jaypee Steel Engineering Co.** is at the forefront of technology and research. We are constantly innovating, listening to the rapidly changing market and giving the consumer the best value for his money.

We have great pleasure to introduce ourselves as one of the leading Manufacturers & Suppliers of Hastalloy C 276, 17-4 PH, XM 19, Titanium, Duplex Steel, SS 303, EN 1A, Stainless Steel, Carbon Steel, Alloy Steel, Copper, Brass, Monel, Inconel, Aluminium, Lead in the shape of Pipes, Tubes, Rods, Sheets, Plates, Wires, Angles, Coils, Strips and the entire range of Pipe Fittings.

Jaypee Steel Engineering Co. is a force to reckon with in the field of manufacturing and exporting premium quality Fittings, & Flanges in Carbon Steel, Alloy Steel, Stainless Steel, Duplex Stainless Steel and Low Temperature Services. We are based in Mumbai (India), the company has scaled incredible heights in business owing to its innovative products. The company's productivity and clients base is always on an upward swing.

We believe that commercial success and corporate responsibility should go hand-in-hand. We must therefore recognise and manage the impact of our business and its contribution to society. Responsible behaviour is not just the ethical way to act.



◆ It helps us to :

Build strong relationships with our customers – which we achieve, for example, by employing and training local workforces. Develop trust in our reliability and integrity – which we are reinforcing, for instance, by developing a global compliance network. Manage risks more effectively – as we do with the social and environmental impact assessments that we carry out in all geographies. establish strong employee engagement.

◆ Why Us

Some of our specialities that make us a profitable business partner for our clients are:

- Superior quality products
- Timely delivery
- Proven execution of small as well as large batch orders
- A design solution to design problem
- Customer focused approach

◆ Our Values

Jaypee Steel Engineering Co. people are:

- Safe
- Ethical
- Innovative
- Responsive
- Quality and cost conscious
- Driven to deliver

◆ Customer Service

Keeping efficient and friendly customer service as the top concern, provides ultimate flexibility in fulfilling each & every customer requirement irrespective of the size of order. Most of our clients are doing business with us since years, which indicates higher levels of customer satisfaction. We always welcome any queries or suggestions from our clients to improve the services and hence to serve them better.

◆ Our Mission

Provide technically sound solutions and create additional value in mutual interest with our customers resulting in being a preferred manufacturer within the Fitting & Flanges sector.

◆ Vision

We help customers develop their energy resources; bringing world class capability and delivering it locally. We promote commercial arrangements that are aligned to our customers' needs, allowing us to deliver more value to the customer while increasing the returns from our most precious asset – our people.



Range

FLANGES

Stainless Steel	: ASTM A182 F 304/304L / 304H / 316/ 316L / 317 / 317L / 321 / 310 / 347 / 904L etc
Carbon Steel	: ASTM A105/ A694/F42/46/52/56/60/ 65/70/A350LF3/A350 LF2, etc
Alloy Steel	: ASTM A182 F1/F5/F9/F11/F22/F91 etc.
Others	: Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead, etc.
Types	: Weldneck, Silicon, Blind, Socket Weld, Lap Joint, Spectacles, Ring Joint, Oriface, Long Weldneck, Deck Flange, etc.
Size	: 1/2" NB 24" NB
Class	: 150#, 300#, 400#, 600#, 900#, 1500# & 2500#.

SCREWED & FORGED FITTINGS

Stainless Steel	: ASTM A182 F 304/304L / 304H / 316/ 316L / 317 / 317L / 321 / 310 / 347 / 904L etc.
Carbon Steel	: ASTM A105 / A694 F42 / 46 / 52 / 56 / 60 / 65 / 70/ A350 LF3/ A350 LF2.
Alloy Steel	: ASTM A182 F1 /F5 /F9 /F11 /F22 /F91 etc.
Others	: Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead etc.
Types	: Elbow, Tee, Union, Cross, CouBushing, Plug, Swage Nipple, Welding Boss, Hexagon Nipple, Barrel Nipple, Welding Nipple, Parraler Nipple, Street Elbow, Hexagon Nut, Hose Nipple, Bend Adapter, Insert, Weldolet, Elbowlet, Sockolet, Thredolet, Nipolet, Letrolet, etc.
Size	: 1/4" NB TO 4" NB. (Socketweld & Threaded)
Class	: 3000#, 6000#, 9000#.

FERRULE FITTINGS



FLANGES



BUTT WELD FITTINGS

SCREWED & FORGED FITTINGS



Product RANGE

Product

BUTT WELD FITTINGS

Stainless Steel	: ASTM A403 WP 304/304L / 304H / 316/ 316L / 317 / 317L / 321 / 310 / 347 / 904L etc.
Carbon Steel	: ASTM A234 WPB / A420 WPL3 / A420 WPL6 / MSS-SP-75 WPHY 42/46/52/ 56/60/65/70
Alloy Steel	: ASTM A234 WP1/WP5/WP9/WP11/ WP22/WP91 etc.
Others	: Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead etc.
Types	: Elbow, Tee, Reducer, Return Bends, Stub Ends, Cap, Collar, Cross, Insert etc.
Size	: 1/4" NB to 32" NB. (Seamless & Welded)
Wall Thickness	: Sch. SS to Sch. XXS.

PIPES

Stainless Steel	: ASTM A403 WP 304/304L / 304H / 316/ 316L / 317 / 317L / 321 / 310 / 347 / 904L etc.
High Nickel Alloy	: Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead etc.
Carbon Steel	: ASTM A53 GR. B/ A106 GR. B/API 5L GRADE B/API 5L GR.X 42/ 46 /52/ 56/ 60/65/70/ A333 GR. 3/ GR.6 etc.
Alloy Steel	: ASTM A335 GR. P1/P5/P9/ P11/ P22/ P91 etc.
Types	: Round, Square, Rectangular,
Size	: Upto 24" NB. (Seamless & Welded)
Wall Thickness	: Sch. 5S to Sch. XXS

QUALITY POLICY

Quality POLICY



- to strive for customer satisfaction through quality and efficient after sales service.
- All departments are headed by qualified people supported by dedicated work force which in turn ensures quality at all times.
- All the items passes through stringent quality procedures like Materials Testing, Process Control, Testing, Finishing etc.
- Entire team work like a family which ensures responsibility among the members automatically.
- We are trying to improve our quality in all possible manners keeping in mind that consistent quality shall always take us to the top.
- In recognition of our quality only we have been awarded the coveted ISO 9001:2008 Certification.

THIRD PARTY INSPECTION

Jaypee Steel & Engineering Co. can offer you material with Third party Inspection.

The Inspection Agency can be nominated by client or we can arrange as the case may be

Third Party IN S P E C T I O N



CHEMICAL COMPOSITION OF STAINLESS STEEL

Grade AISI	Chemical Composition - Per cent									Nearest Equivalent Specification	
	C Max	Mn Max	P Max	S Max	Si Max	Cr	Ni	Mo	Other Element	I.S.	En
301	0.15	2.0 max	0.045	0.040	1.0	16.0/18.0	6.0/8.0	-	-	10Cr 17Ni7	-
302	0.15	2.0	0.045	0.030	1.0	17.0/19.0	8.0/10.0	-	-	07Cr18Ni9	En-58A
303	0.15	2.0	0.045	-	1.0	17.0/19.0	8.0/10.0	-	-	15Cr18Ni9	En-58M
304	0.08	2.0	0.045	0.030	1.0	18.0/19.0	8.0/10.0	-	-	04Cr18Ni10	En-58E
304L	0.030	2.0	0.045	0.030	1.0	18.0/20.0	8.0/10.0	-	-	02Cr18Ni11	-
308	0.08	2.0	0.040	0.030	1.0	10.0/21.0	10.0/12.0	-	-	-	-
309	0.20	2.0 max	0.045	0.030	1.0	22.0/24.0	12.0/15.0	-	-	20Cr24Ni12	-
309S	0.08	2.0	0.045	0.030	1.0	22.0/24.0	12.9/15.0	-	-	-	-
310	0.25	2.0	0.045	0.030	1.50	24.0/26.0	19.0/22.0	-	-	10Cr25Ni12	-
310S	0.08	2.0	0.045	0.030	1.50	24.0/26.0	19.0/22.0	-	-	-	-
314	0.25	2.0	0.040	0.030	1.5to3	25.0/26.0	19.0/22.0	-	-	-	-
316	0.08	2.0	0.045	0.030	1.0	16.0/18.0	10.0/14.0	2.0/3.0	-	04Cr17Ni12Mo2	En 58H
316L	0.030	2.0	0.045	0.030	1.0	16.0/18.0	10.0/14.0	2.0/3.0	-	03Cr17Ni12Mo2	-
317	0.08	2.0	0.045	0.030	1.0	18.0/20.0	11.0/15.0	3.0/4.0	-	-	-
317L	0.030	2.0	0.045	0.030	1.0	18.0/20.0	11.0.15.0	3.0/4.0	-	Tiy5 c Min	-
316TI	0.080	2.0	0.045	0.030	1.0	16.0/18.0	10.0/14.0	2.0/3.0	Ti5xCmin	-	-
321	0.08	2.0	0.045	0.030	1.0	17.0/19.0	9.0/12.0	-	Ti5xcmin	04Cr18Ni10Ti20	En-58C
347	0.08	2.0	0.045	0.030	1.0	17.0/19.0	9.0/12.0	-	Nb/Ta10xCmin	04Cr18Ni10Nb-40	En-58G
430	0.12	1.0	0.040	0.030	0.75	14.0/18.0	0.60	-	-	07Cr17	En-60
446	0.20	1.50max	0.040	0.030	1.0	23.0/27.0	0.60max	-	N-25max	-	-
403	0.15	1.0	0.040	0.030	0.50	11.5/13.0	0.60	-	-	-	-
410	0.15	1.0	0.040	0.030	1.0	11.5/13.5	0.60	-	-	12Cr13	En-58A
410S	0.08	1.0	0.040	0.030	1.0	11.5/13.5	0.60max	-	-	-	-
414	0.15	1.0max	0.040	0.030	1.0	11.5/13.5	1.25/2.5	-	-	-	-
420	Over .15	1.0	0.040	0.030	1.0	12.0/14.0	0.60	-	-	22Cr13	En56C&D
431	0.20	1.0max	0.040	0.030	1.0	15.0/17.0	1.25/2.50	0.75max	-	15Cr16Ni2	En-57
440A	0.60/0.70	1.0	0.040	0.030	1.0	16/18	-	-	-	-	-
440B	0.75	1.0	0.040	0.030	1.0	16.0/18.0	-	0.75max	-	-	-
409	0.08	1.0	0.045	0.030	1.0	10.5/11.75	0.50max	-	6x%cmmin.75max	-	-
440C	0.96	1.0	0.040	0.030	1.0	16/18	-	0.75max	-	-	-
409M	0.028	0.8/1.2	0.030	0.030	1.0	11.0/12.0	0.75	-	T10.25/0.75	-	-
446	0.20	1.50	0.040	0.030	40to75	23.0/30.0	0.50	-	-	N 0.25max	-

NROMA ANSI

pipe dimension in accordance to

Diametro Tubi Size Pipe		Nominal Thickness													
		Number of													
		5S		10S		10		20		30		40		60	
Nominal in inch	Out Side in mm	mm	kg / m	mm	kg / m	mm	kg / m	mm	kg / m	mm	kg / m	mm	kg / m	mm	kg / m
1/8"	10.3	--	--	1.28	0.28	--	--	1.60	0.345	--	--	1.78	0.36	--	--
1/4"	13.7	--	--	1.65	0.49	--	--	2.00	0.580	--	--	2.24	0.63	--	--
3/8"	17.1	--	--	1.65	0.63	--	--	2.00	0.750	--	--	2.31	0.85	--	--
1/2	21.3	1.65	0.80	2.11	1.00	--	--	2.0	0.957	--	--	2.77	1.26	--	--
3/4	26.7	1.65	1.03	2.11	1.28	--	--	2.5	1.500	--	--	2.87	1.68	--	--
1	33.4	1.65	1.29	2.77	2.08	--	--	2.5	1.916	--	--	3.38	2.50	--	--
1 1/4	42.2	1.65	1.65	2.77	2.69	--	--	3.00	2.910	--	--	3.56	3.33	--	--
1 1/2	48.8	1.65	1.90	2.77	3.12	--	--	3.0	3.370	--	--	3.08	4.05	--	--
2	60.3	1.65	2.38	2.77	3.94	--	--	3.0	4.263	--	--	3.91	5.43	--	--
2 1/2	73.0	2.11	3.70	3.05	5.26	--	--	4.00	6.846	--	--	5.16	8.62	--	--
3	88.9	2.11	4.50	3.05	6.45	--	--	4.00	8.423	--	--	5.49	11.28	--	--
3 1/2	101.6	2.11	5.20	3.05	7.40	--	--	4.5	10.838	--	--	5.74	13.56	--	--
4	114.3	2.11	5.61	3.05	8.34	--	--	4.5	12.255	--	--	6.02	16.06	--	--
5	141.3	2.77	9.45	3.40	11.56	--	--	5.00	16.900	--	--	6.55	21.76	--	--
6	168.3	2.77	11.31	3.40	13.82	--	--	6.35	24.150	--	--	7.11	28.23	--	--
8	219.1	2.77	14.78	3.76	19.94	--	--	6.35	33.28	7.04	36.76	8.18	42.49	10.31	53.07
10	273.1	3.40	22.62	4.19	27.83	--	--	6.35	41.73	7.80	50.96	9.27	60.24	12.70	81.46
12	323.9	3.96	33.00	4.57	36.00	--	--	6.35	49.68	8.38	65.14	10.31	79.71	14.27	108.97
14	355.6	3.96	34.23	4.78	41.18	6.35	54.63	7.92	67.98	9.52	81.21	11.13	94.31	15.09	126.51
16	406.4	4.19	41.60	4.78	47.33	6.35	62.58	7.92	77.92	9.52	93.13	12.70	123.18	16.66	160.04
18	457.2	4.19	46.83	4.78	53.18	6.35	70.53	7.92	87.85	11.13	122.12	14.21	155.90	19.05	205.62
20	508.0	4.78	59.22	5.54	68.50	6.35	78.47	9.52	116.97	12.70	154.97	15.09	183.14	20.92	247.79
22	558.8	4.78	63.75	5.54	73.81	6.35	86.42	9.52	128.89	12.70	170.86	--	--	22.22	293.80
24	609.6	5.54	82.60	6.35	94.37	6.35	94.37	9.52	140.81	14.27	209.54	17.48	254.74	24.61	354.62
26	660.4	--	--	--	--	7.92	127.58	12.70	202.65	--	--	--	--	--	--
28	711.2	--	--	--	--	7.92	137.52	12.70	218.54	15.88	271.94	--	--	--	--
30	762.0	--	--	--	--	7.92	147.45	12.70	234.44	15.88	219.81	--	--	--	--
32	812.8	--	--	--	--	7.92	157.39	12.70	250.33	15.88	311.67	17.48	342.17	--	--
34	863.6	--	--	--	--	7.92	157.32	12.70	266.22	15.88	331.54	17.48	364.01	--	--
36	914.4	--	--	--	--	7.92	177.26	12.70	282.12	15.88	351.41	19.05	420.21	--	--

B 36-10

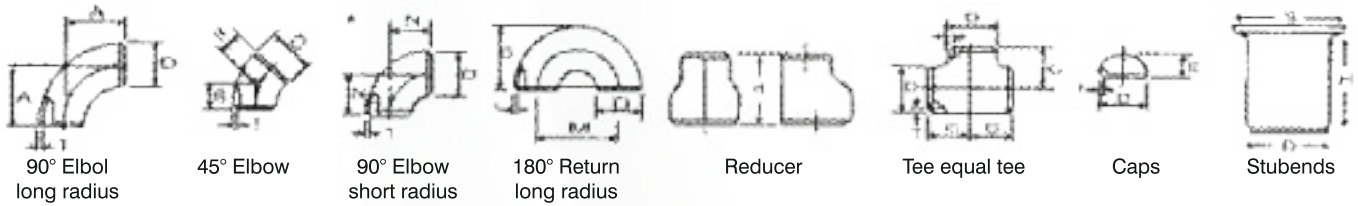
and Weights														
Schedule														
80		100		120		160		Standard		Extra-Strong		Double Extra Strong		D. Tubi Size P.
mm	kg / m	mm	kg / m	mm	kg / m	mm	kg / m	mm	kg / m	mm	kg / m	mm	kg / m	nominal in inch
2.41	0.46	--	--	--	--	--	--	1.73	0.36	2.41	0.46	--	--	1/8"
3.02	0.80	--	--	--	--	--	--	2.24	0.63	3.02	0.80	--	--	1/4"
3.20	1.10	--	--	--	--	--	--	2.31	0.85	3.20	1.10	--	--	3/8
3.73	1.62	--	--	--	--	4.78	1.95	2.77	1.26	3.73	1.62	7.47	2.54	1/2
3.91	2.19	--	--	--	--	5.56	2.89	2.87	1.68	3.91	2.19	7.82	3.63	3/4
4.55	3.23	--	--	--	--	6.35	4.23	3.38	2.50	4.55	3.23	9.09	5.45	1
4.85	4.46	--	--	--	--	6.35	5.60	3.56	3.38	4.48	4.46	9.70	7.75	1 1/4
5.08	5.40	--	--	--	--	7.14	7.23	3.68	4.05	5.08	5.40	10.16	9.54	1 1/2
5.54	7.47	--	--	--	--	8.74	11.10	3.91	5.43	5.54	7.47	11.07	13.44	2
7.01	11.40	--	--	--	--	9.52	14.90	5.16	8.62	7.01	11.40	14.02	20.39	2 1/2
7.62	15.25	--	--	--	--	11.13	21.30	5.49	11.28	7.62	15.25	15.24	27.65	3
8.08	18.62	--	--	--	--	--	--	5.74	13.56	8.08	18.82	--	--	3 1/2
8.56	22.29	--	--	11.13	28.25	13.49	33.51	6.02	16.06	8.56	22.29	17.12	40.99	4
9.52	30.92	--	--	12.70	40.24	15.88	49.05	6.55	21.76	9.52	30.92	19.05	57.37	5
10.97	42.52	--	--	14.27	54.20	18.26	67.47	7.11	28.23	10.97	42.52	21.95	79.11	6
12.70	64.57	15.09	75.79	18.26	90.32	23.01	111.18	8.18	42.49	12.70	64.57	22.22	107.78	8
15.09	95.84	18.26	114.59	21.44	132.85	28.58	172.11	9.27	60.24	12.70	81.46	25.40	154.97	10
17.48	131.81	21.44	159.67	25.40	186.75	33.32	238.60	9.52	73.76	12.70	97.86	25.40	186.75	12
19.05	157.94	23.83	194.64	27.79	224.36	35.71	281.49	9.52	81.21	12.70	107.28	--	--	14
21.44	203.26	26.19	245.34	30.96	286.33	40.49	364.94	9.52	93.13	12.70	123.18	--	--	16
23.83	254.24	29.36	309.55	34.92	363.33	39.67	459.18	9.52	105.05	12.70	139.07	--	--	18
26.19	310.91	32.54	381.20	38.10	441.06	44.45	564.24	9.52	116.97	12.70	154.97	--	--	20
28.58	373.27	34.92	450.75	41.28	526.24	47.62	671.28	9.52	128.89	12.70	170.86	--	--	22
30.96	441.30	38.89	546.84	46.02	639.18	52.37	806.74	9.52	140.81	12.70	202.75	--	--	24
--	--	--	--	--	--	--	--	9.52	152.73	12.70	202.65	--	--	26
--	--	--	--	--	--	--	--	9.52	152.73	12.70	218.54	--	--	28
--	--	--	--	--	--	--	--	9.52	164.65	12.70	234.44	--	--	30
--	--	--	--	--	--	--	--	9.52	176.57	12.70	234.44	--	--	32
--	--	--	--	--	--	--	--	9.52	188.50	12.70	250.83	--	--	34
--	--	--	--	--	--	--	--	9.52	212.34	12.70	282.12	--	--	36

N. B. :- Thickness and weight "standard" "Extra-Strong" and "Double Extra Strong" within swell elges have a correspondent value in a "Schedule"

For Different thickness that suitable the weights can proceeds by following formula $\frac{24.66(D-t) t}{1000}$

* In accordance to ANSI B 36.19

BUTT WELING PIPE FITTING DIMENSIONAL STANDARD ANSI B 16.28



Nominal Pipe Size		Outside Diameter	Centre to Face				Back to Face			Centre to Centre			Length "L" MSSSP43 B16.9	
Inch	mm	D	A	B	C	N	E	F	G	R	M	S	L	L
1/2	15	21.3	19.00	16.0	25.0	-	25.0	48.0	-	76.0	-	35.0	50.8	76.2
3/4	20	26.7	29.00	11.0	29.0	-	25.0	43.0	-	57.0	-	43.0	50.8	76.2
1	25	33.4	38.00	22.0	38.0	25.0	38.0	56.0	41.0	76.0	51.0	51.0	50.8	101.6
1 1/4	32	42.2	48.00	25.0	48.0	32.0	38.0	70.0	52.0	95.0	64.0	64.0	50.8	101.6
1 1/2	40	48.3	57.15	29.0	57.0	38.0	38.0	83.0	62.0	114.0	67.0	73.0	50.8	101.6
2	50	60.3	76.00	35.0	64.0	51.0	38.0	106.0	81.0	152.0	102.0	93.0	63.5	152.4
2 1/2	65	73.0	95.25	44.0	76.0	64.0	38.0	132.0	100.0	191.0	127.0	105.0	63.5	152.4
3	80	88.9	114.30	51.0	86.0	76.0	51.0	159.0	121.0	229.0	152.0	127.0	63.5	152.4
3 1/2	90	101.6	133.35	57.0	95.0	89.0	64.0	184.0	140.0	267.0	178.0	140.0	76.2	152.4
4	100	114.3	152.0	63.0	105.0	102.0	64.0	210.0	159.0	305.0	203.0	157.0	76.2	152.4
5	125	141.3	190.0	79.0	123.0	127.0	76.0	262.0	197.0	381.0	254.0	186.0	76.2	203.2
6	150	168.3	229.0	95.0	143.0	152.0	89.0	313.0	237.0	457.0	305.0	216.0	88.9	203.2
8	200	219.1	305.0	127.0	178.0	203.0	102.0	414.0	313.0	610.0	406.0	270.0	101.6	203.2
10	250	273.1	381.0	159.0	216.0	254.0	127.0	515.0	391.0	762.0	508.0	324.0	127.0	254
12	300	323.9	457.0	190.0	254.0	303.0	152.0	619.0	467.0	914.0	610.0	381.0	152.4	254
14	350	355.6	533.0	222.0	279.0	356.0	165.0	711.0	533.0	1067.0	711.0	413.0	152.4	305.0
16	400	406.4	610.0	254.0	305.0	406.0	178.0	813.0	610.0	1219.0	813.0	470.0	152.4	305.0
18	450	457.2	686.0	286.0	343.0	457.0	203.0	914.0	686.0	1372.0	914.0	533.0	152.4	305.0
20	500	508.0	762.0	318.0	381.0	508.0	229.0	1016.0	762.0	1524.0	1016.0	584.0	152.4	305.0
22	550	559.	838.0	343.0	419.0	559.0	254.0	1118.0	838.0	1676.0	1118.0	614.40	152.4	305.0
24	600	610.0	914	381.0	432.0	610.0	267.0	1219.0	914.0	1829.0	1219.0	692.0	152.4	305.0
26	650	660.0	991.0	406.0	495.0	660.0	267.0							
28	700	711.0	1067.0	438.0	521.0	771.0	267.0							
30	750	762.0	1143.0	470.0	559.0	762.0	267.0							
32	800	813.0	1219.0	502.0	597.0	813.0	267.0							
34	850	864.0	1295.0	533.0	635.0	864.0	267.0							
36	900	914.0	1372.0	565.0	673.0	914.0	267.0							

DIMENSIONS OF FORGED FLANGES ANSI B 16.5



DIMENSIONS OF CLASS 150 FLANGES AS PER ANSI B 16.5

Nominal Pipe Size		Flange Dia	Dia of Bolt Circle	Dia of Bolt Holes	No. of Holes	Thk of Flange	Dia of Hub	Length through Hub			Dia of Bore		Dia of R/F	Depth of Socket	Pipe Dia
								S/O & S/W	W/N	L/J	S/O & S/W	L/J			
(MM)	(INCH.)	O	A	D		C	E	Y	Y	Y	B	B	R	F	X
15	1/2	88.9	60.3	15.9	4	11.1	30.2	15.9	47.6	15.9	22.3	22.9	34.9	9.5	21.33
20	3/4	98.4	69.8	15.9	4	12.7	38.1	15.9	52.4	15.9	27.7	28.2	42.9	11.1	26.67
25	1	107.9	79.4	15.9	4	14.3	49.2	17.5	55.6	17.5	34.5	35.0	50.8	12.7	33.40
32	1 1/4	117.5	88.9	15.9	4	15.9	58.7	20.6	57.1	20.6	43.2	43.7	63.5	14.3	42.16
40	1 1/2	127.0	98.4	15.9	4	17.5	65.1	22.2	61.9	22.2	49.5	50.0	73.0	15.9	48.26
50	2	152.4	120.6	19.0	4	19.0	77.8	25.4	63.5	25.4	62.0	62.5	92.1	17.5	60.31
65	2 1/2	177.8	139.7	19.0	4	22.2	90.5	28.6	69.8	28.6	74.7	75.4	104.8	19.0	73.02
80	3	190.5	152.4	19.0	4	23.8	107.9	30.2	69.8	30.2	90.7	91.4	127.0	20.6	88.90
100	4	228.6	190.5	19.0	8	23.8	134.9	33.3	76.2	33.3	116.1	116.8	157.2	23.8	114.30
125	5	254.0	215.9	22.2	8	23.8	163.5	36.5	88.9	36.5	143.8	144.5	185.7	23.8	141.30
150	6	279.4	241.3	22.2	8	25.4	192.1	39.7	88.9	39.7	170.7	171.4	215.9	27.0	168.27
200	8	342.9	298.4	22.2	8	28.6	246.1	44.4	101.6	44.4	221.5	222.2	269.9	31.7	219.07
250	10	406.4	361.9	25.4	12	30.2	304.8	49.2	101.6	49.2	276.3	277.4	323.8	33.3	273.05
300	12	482.6	431.8	25.4	12	31.8	365.1	55.6	114.3	55.6	327.1	328.2	381.0	39.7	323.85
350	14	533.4	476.2	28.6	12	34.9	400.0	57.1	127.0	79.4	359.1	360.2	412.7	41.3	355.60
400	16	596.9	539.7	28.6	16	36.5	457.2	63.5	127.0	87.3	410.5	411.2	469.9	44.4	406.40
450	18	635.0	577.8	31.7	16	39.7	504.8	68.3	139.7	96.8	461.8	462.3	533.4	49.2	457.20
500	20	698.5	635.0	31.7	20	42.9	558.8	73.0	144.5	103.2	513.1	514.3	584.2	54.0	508.00
600	24	812.8	749.3	34.9	20	47.6	663.6	82.5	152.4	111.1	615.9	615.9	692.1	63.5	609.60

All Dimensions are in Millimeters • Flanges except Lap Joint will be furnished with (1.6mm) Raised Face, which is included in Thickness (C) and Length through Hub(Y).

DIMENSIONS OF CLASS 300 FLANGES AS PER ANSI B 16.5

Nominal Pipe Size		Flange Dia	Dia of Bolt Circle	Dia of Bolt Holes	No. of Holes	Thk of Flange	Dia of Hub	Length through Hub			Dia of Bore		Dia of R/F	Depth of Socket	Pipe Dia
								S/O & S/W	W/N	L/J	S/O & S/W	L/J			
(MM)	(INCH.)	O	A	D		C	E	Y	Y	Y	B	B	R	F	X
15	1/2	95.2	66.7	15.9	4	14.3	38.1	22.2	52.4	22.2	22.3	22.9	34.9	9.5	21.33
20	3/4	117.5	82.5	19.0	4	15.9	47.6	25.4	57.1	25.4	27.7	28.2	42.9	11.1	26.67
25	1	123.8	88.9	19.0	4	17.5	54.0	27.0	61.9	27.0	34.5	35.0	50.8	12.7	33.40
32	1 1/4	133.3	98.4	19.0	4	19.0	63.5	27.0	65.1	27.0	43.2	43.7	63.5	14.3	42.16
40	1 1/2	155.6	114.3	22.2	4	20.6	69.8	30.2	68.3	30.2	49.5	50.0	73.0	15.9	48.26
50	2	165.1	127.0	19.0	8	22.2	84.1	33.3	69.8	33.3	62.0	62.5	92.1	17.5	60.31
65	2 1/2	190.5	149.2	22.2	8	25.4	100.0	38.1	76.2	38.1	74.7	75.4	104.8	19.0	73.02
80	3	209.5	168.3	22.2	8	28.6	117.5	42.9	79.4	42.9	90.7	91.4	127.0	20.6	88.90
100	4	254.0	200.0	22.2	8	31.8	146.0	47.6	85.7	47.6	116.1	116.8	157.2	23.8	114.30
125	5	279.4	234.9	22.2	8	34.9	177.8	50.8	98.4	50.8	143.8	144.5	185.7	-	141.30
150	6	317.5	269.9	22.2	12	36.5	206.4	52.4	98.4	52.4	170.7	171.4	215.9	-	168.27
200	8	381.0	330.2	25.4	12	41.3	260.3	61.9	111.1	61.9	221.5	222.2	269.9	-	219.07
250	10	444.5	387.3	28.6	16	47.6	320.7	66.7	117.5	95.2	276.3	277.4	323.8	-	273.05
300	12	520.7	450.8	31.7	16	50.8	374.6	73.0	130.2	101.6	327.1	328.2	381.0	-	323.85
350	14	584.2	514.3	31.7	20	54.0	425.4	76.2	142.9	111.1	359.1	360.2	412.7	-	355.60
400	16	647.7	571.5	34.9	20	57.2	482.6	82.5	146.0	120.6	410.5	411.2	469.9	-	406.40
450	18	711.2	628.5	34.9	24	60.3	533.4	88.9	158.7	130.2	461.8	482.3	533.4	-	457.20
500	20	774.7	685.8	34.9	24	63.5	587.4	95.2	161.9	139.7	513.1	514.3	584.2	-	508.00
600	24	914.4	812.8	41.3	24	69.8	701.7	106.4	188.3	152.4	615.9	615.9	692.1	-	609.60

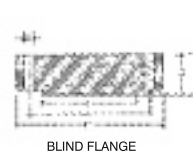
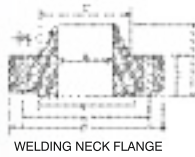
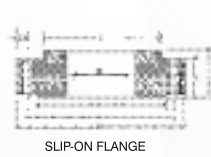
All Dimensions are in Millimeters • Flanges except Lap Joint will be furnished with (1.6mm) Raised Face, which is included in Thickness (C) and Length through Hub(Y).

DIMENSIONS OF CLASS 600 FLANGES AS PER ANSI B 16.5

Nominal Pipe Size	Flange Dia	Dia of Bolt Circle	Dia of Bolt Holes	No. of Holes	Thk of Flange	Dia of Hub	Length through Hub			Dia of Bore		Dia of R/R	Depth of Socket	Pipe Dia
							S/O & S/W	W/N	L/J	S/O & S/W	L/J			
(MM)	O	A	D		C	E	Y	Y	Y	B	B	R	F	X
15	95.2	66.7	15.9	4	14.3	38.1	22.2	52.4	22.3	22.3	22.8	34.9	9.5	21.33
20	117.5	82.5	19.0	4	15.9	47.6	25.4	57.1	25.4	27.7	28.1	42.9	11.1	26.67
25	123.8	88.9	19.0	4	17.5	54.0	27.0	61.9	26.9	34.5	35.0	50.8	12.7	33.40
32	133.3	98.4	19.0	4	20.6	63.5	28.6	66.7	28.4	43.2	43.6	63.5	14.2	42.16
40	155.6	114.3	22.2	4	22.2	69.8	31.7	69.8	31.7	49.5	50.0	73.0	15.8	48.26
50	165.1	127.0	19.0	8	25.4	84.1	36.5	73.0	36.5	62.0	62.4	92.1	17.4	60.31
65	190.5	149.2	22.2	8	28.6	100.0	41.3	79.4	41.1	74.7	75.4	104.8	19.0	73.02
80	209.5	168.3	22.2	8	31.8	117.5	46.0	82.5	45.9	90.7	91.4	127.0	-	88.90
100	273.0	215.9	25.4	8	38.1	152.4	54.0	101.6	53.8	116.1	116.8	157.2	-	114.30
125	330.2	266.7	28.6	8	44.4	188.9	60.3	114.3	60.4	143.8	144.5	185.7	-	141.30
150	355.6	292.1	28.6	12	47.6	222.2	66.7	117.5	66.4	170.7	171.4	215.9	-	168.27
200	419.1	349.2	31.7	12	55.6	273.0	76.2	133.3	76.2	221.5	222.2	269.9	-	219.07
250	508.0	431.8	34.9	16	63.5	342.9	85.7	152.4	111.2	276.3	277.4	323.8	-	273.05
300	558.8	488.9	34.9	20	66.7	400.0	92.1	155.6	117.3	327.1	328.2	381.0	-	323.85
350	603.2	527.0	38.1	20	69.9	431.8	93.7	165.1	127.0	359.1	360.1	412.7	-	355.60
400	685.8	603.2	41.3	20	76.2	495.3	106.4	177.8	139.7	410.5	411.2	469.9	-	406.40
450	742.9	654.0	44.4	20	82.6	546.1	117.5	184.1	152.4	461.8	462.3	533.4	-	457.20
500	812.8	723.9	44.4	24	88.9	609.9	127.0	190.5	165.1	513.1	514.3	584.2	-	508.00
600	939.8	838.2	50.8	24	101.6	717.5	139.7	203.2	184.1	615.9	615.9	692.1	-	609.60

All Dimensions are in Millimeters • Flanges except Lap Joint will be furnished with (6.35mm) Raised Face, which is not included in Thickness (C) and Length through Hub(Y).

DIMENSIONS OF FORGED FLANGES ANSI B 16.5



DIMENSIONS OF CLASS 900 FLANGES AS PER ANSI B 16.5

Nominal Pipe Size (MM)	Flange Dia O	Dia of Bolt Circle A	Dia of Bolt Holes D	No. of Holes	Thk of Flange C	Dia of Hub E	Length through Hub			Dia of Bore		Dia of R/R	Depth of Socket F	Pipe Dia X
							S/O & S/W	W/N	L/J	S/O & S/W	L/J			
							Y	Y	Y	B	B			
15	120.6	82.5	22.2	4	22.2	38.1	31.7	60.3	31.7	22.3	22.8	34.9	9.5	21.33
20	130.2	88.9	22.2	4	25.4	44.4	34.9	69.8	35.0	27.7	28.1	42.9	11.1	26.67
25	149.2	101.6	25.4	4	28.6	52.4	41.3	73.0	41.1	34.5	35.0	50.8	12.7	33.40
32	158.7	111.1	25.4	4	28.6	63.5	41.3	73.0	41.1	43.2	43.6	63.5	14.2	42.16
40	177.8	123.8	28.6	4	31.8	69.8	44.4	82.5	44.4	49.5	50.0	73.0	15.8	48.26
50	215.9	165.1	25.4	8	38.1	104.8	57.1	101.6	57.1	62.0	62.4	92.1	17.4	60.31
65	244.5	190.5	28.6	8	41.3	123.8	63.5	104.8	63.5	74.7	75.4	104.8	19.0	73.02
80	241.3	190.5	25.4	8	38.1	127.0	53.9	101.6	53.8	90.7	91.4	127.0	-	88.90
100	292.1	234.9	31.7	8	44.4	158.7	69.8	114.3	69.8	116.0	116.8	157.2	-	114.30
125	349.2	279.4	35.0	8	50.8	190.5	79.3	127.0	79.2	143.7	144.5	185.7	-	141.30
150	381.0	317.5	31.7	12	55.6	234.9	85.8	139.7	85.8	170.6	171.4	215.9	-	168.27
200	469.9	393.7	38.1	12	63.5	298.4	101.6	162.0	114.3	221.4	222.2	269.9	-	219.07
250	546.1	469.9	38.1	16	69.8	368.3	107.9	184.1	127.0	276.3	277.3	323.8	-	273.05
300	609.6	533.4	38.1	20	79.3	419.1	117.4	200.0	142.7	327.1	328.1	381.0	-	323.85

All Dimensions are in Millimeters • Flanges except Lap Joint will be furnished with (6.35mm) Raised Face, which is not included in Thickness (C) and Length through Hub(Y).

DIMENSIONS OF CLASS 1500 FLANGES AS PER ANSI B 16.5

Nominal Pipe Size (MM) (INCH.)	Flange Dia O	Dia of Bolt Circle A	Dia of Bolt Holes D	No. of Holes	Thk of Flange C	Dia of Hub E	Length through Hub			Dia of Bore		Dia of R/R	Depth of Socket F	Pipe Dia X
							S/O & S/W	W/N	L/J	S/O & S/W	L/J			
							Y	Y	Y	B	B			
15	1/2	120.6	82.5	22.2	4	22.2	31.7	60.3	31.7	22.3	22.8	34.9	9.5	21.33
20	3/4	130.2	88.9	22.2	4	25.4	34.9	69.8	34.9	27.7	28.1	42.9	11.1	26.67
25	1	149.2	101.6	25.4	4	28.6	41.3	73.0	41.3	34.5	35.0	50.8	12.7	33.40
32	1 1/4	158.7	111.1	25.4	4	28.6	41.3	73.0	41.3	43.2	43.6	63.5	14.2	42.16
40	1 1/2	177.8	123.8	28.6	4	31.8	44.4	82.5	44.4	49.5	50.0	73.0	15.8	48.26
50	2	215.9	165.1	25.4	8	38.1	57.1	101.6	57.1	62.0	62.4	92.1	17.4	60.31
65	2 1/2	244.5	190.5	28.6	8	41.3	63.5	104.8	63.5	74.7	75.4	104.8	19.0	73.02
80	3	266.7	203.2	31.7	8	47.6	73.0	117.5	73.0	90.7	91.4	127.0	-	88.90
100	4	311.1	241.3	34.9	8	54.0	90.5	123.0	90.4	116.1	116.8	157.2	-	114.30
125	5	374.6	292.1	41.3	8	73.0	104.8	155.6	104.8	143.8	144.5	185.7	-	141.30
150	6	393.7	317.5	38.1	12	82.6	119.1	171.4	119.1	170.7	171.4	215.9	-	168.27
200	8	482.6	393.7	44.4	12	92.1	142.9	212.7	142.8	221.5	222.2	269.9	-	219.07
250	10	584.2	482.6	50.8	12	107.9	158.7	254.0	177.8	276.3	277.3	323.8	-	273.05
300	12	673.1	571.5	54.0	16	123.8	181.0	282.5	218.9	327.1	328.1	381.0	-	323.85

All Dimensions are in Millimeters • Flanges except Lap Joint will be furnished with (6.35mm) Raised Face, which is not included in Thickness (C) and Length through Hub(Y).

DIMENSIONS OF CLASS 2500 FLANGES AS PER ANSI B 16.5

Nominal Pipe Size (MM) (INCH.)	Flange Dia O	Dia of Bolt Circle A	Dia of Bolt Holes D	No. of Holes	Thk of Flange C	Dia of Hub E	Length through Hub			Dia of Bore		Dia of R/F	Depth of Socket F	Pipe Dia X
							S/O & S/W	W/N	L/J	S/O & S/W	L/J			
							Y	Y	Y	B	B			
15	1/2	133.3	88.9	22.2	4	30.2	39.7	73.0	39.7	22.3	22.3	34.9	-	21.33
20	3/4	139.7	95.3	22.2	4	31.7	42.9	79.4	42.9	27.7	27.7	42.9	-	26.67
25	1	158.7	107.9	25.4	4	34.9	47.7	88.9	47.7	34.5	34.5	50.8	-	33.40
32	1 1/4	184.1	130.2	28.6	4	38.1	52.4	95.2	52.4	43.2	43.2	63.5	-	42.16
40	1 1/2	203.2	146.0	31.7	4	44.4	60.3	111.1	60.3	49.5	49.5	73.0	-	48.26
50	2	234.9	171.4	28.6	8	50.8	69.8	127.0	69.8	62.4	62.0	92.1	-	60.31
65	2 1/2	266.7	196.8	31.7	8	57.1	79.4	142.9	79.4	74.7	74.7	104.8	-	73.02
80	3	304.8	228.6	34.9	8	66.7	92.1	168.3	92.1	90.7	90.7	127.0	-	88.90
100	4	355.6	273.0	41.2	8	76.2	107.9	190.5	107.9	116.1	116.1	157.2	-	114.30
125	5	419.1	323.8	47.6	8	92.1	130.0	228.6	130.0	143.8	143.8	185.7	-	141.30
150	6	482.6	368.3	54.0	8	107.9	152.4	273.0	152.4	170.7	170.7	215.9	-	168.27
200	8	552.4	438.1	54.0	12	127.0	177.8	317.5	177.8	221.5	221.5	269.9	-	219.07
250	10	673.1	539.7	66.7	12	165.1	228.6	419.1	228.6	276.3	276.3	323.8	-	273.05
300	12	762.0	619.1	73.0	12	184.1						381.0	-	323.85

All Dimensions are in Millimeters • Flanges except Lap Joint will be furnished with (6.35mm) Raised Face, which is not included in Thickness (C) and Length through Hub(Y).

WELDING NECK FLANGE BORES (B)

Nominal Pipe Size	Outside Dia	Sch. 20	Sch. 30	Std. Wall	Sch. 40	Extra Strong	Sch. 80	Sch. 120	Sch. 160	Double Extra Strong
15	21.33	-	-	15.7	15.7	13.8	13.3	-	11.7	6.4
20	26.67	-	-	20.8	20.8	18.8	18.8	-	15.5	11.0
25	33.40	-	-	26.6	25.4	24.3	24.3	-	20.7	15.2
32	42.16	-	-	35.0	35.0	32.4	32.4	-	29.4	22.7
40	48.26	-	-	40.8	40.8	38.1	38.1	-	33.7	27.9
50	60.31	-	-	52.3	52.3	49.2	49.2	-	42.8	38.1
65	73.02	-	-	62.4	62.4	59.0	59.0	-	53.9	44.9
80	88.90	-	-	77.9	77.9	73.6	73.6	-	66.6	58.4
100	114.30	-	-	102.2	102.2	97.1	97.1	92.0	87.3	80.0
125	141.30	-	-	128.1	128.1	122.2	122.2	115.9	109.5	103.2
150	168.27	-	-	154.0	154.0	146.3	146.3	139.7	131.7	124.3
200	219.07	206.2	204.9	202.7	202.7	193.6	193.6	182.5	173.0	174.6
250	273.05	260.3	257.4	252.5	254.5	247.6	242.8	230.1	251.9	222.2
300	323.85	311.1	307.0	304.8	303.2	298.4	288.8	273.0	257.2	273.0
350	355.60	337.8	336.5	336.5	333.3	330.2	371.5	300.0	284.1	-
400	406.40	390.3	387.3	387.3	381.0	381.0	363.5	344.5	325.4	-
450	457.20	441.1	434.9	438.1	428.6	431.8	409.5	387.3	366.7	-
500	508.00	488.9	482.6	488.9	477.8	482.6	455.6	431.8	407.9	-
600	609.60	590.5	581.0	590.5	574.6	584.2	547.6	517.5	490.5	-

All dimensions are in Millimeters

DIMENSION OF FLANGES AS PER TABLE BS - 10

TABLE - D

TABLE - E

For Working Steam Pressure upto 50 lbs per sq. inch

Nominal Pipe Size	O.D. of Pipe	O.D.	P.C.D.	No. of Bolt	Dia of Bolt	Thickness
½"	21.3	95.3	66.7	4	12.7	4.8
¾"	26.7	101.6	73.0	4	12.7	4.8
1"	33.4	114.3	82.6	4	12.7	4.8
1¼"	42.2	120.7	87.3	4	12.7	6.4
1½"	48.3	133.4	98.4	4	12.7	6.4
2"	60.3	152.4	114.3	4	15.9	7.9
2½"	73.0	165.1	127.0	4	15.9	7.9
3"	88.9	184.2	146.1	4	15.9	9.5
3½"	101.6	203.2	165.1	4	15.9	9.5
4"	114.3	215.9	177.8	4	15.9	9.5
5"	141.3	254.0	209.6	8	15.9	12.7
6"	168.3	279.4	228.6	8	15.9	12.7
7"	190.5	304.8	260.4	8	15.9	12.7
8"	219.1	336.6	292.1	8	15.9	12.7
9"	244.5	368.3	323.9	8	15.9	15.9
10"	273.0	406.4	355.6	8	19.1	15.9
12"	323.9	457.2	406.4	12	19.1	15.9
14"	355.6	527.1	469.9	12	22.2	19.1
16"	406.4	577.9	520.7	12	22.2	19.1
18"	457.2	641.4	584.2	12	22.2	22.2
20"	508.0	704.9	641.4	16	22.5	25.4
24"	609.6	825.5	755.7	16	25.4	28.6

For Working Steam Pressure from 50 lbs to 100 lbs per sq. inch

Nominal Pipe Size	O.D. of Pipe	O.D.	P.C.D.	No. of Bolt	Dia of Bolt	Thickness
½"	21.3	95.3	66.3	4	12.7	6.4
¾"	26.7	101.6	73.0	4	12.7	6.4
1"	33.4	114.3	82.6	4	12.7	7.1
1¼"	42.2	120.7	87.3	4	12.7	7.9
1½"	48.3	133.4	98.4	4	12.7	8.7
2"	60.3	152.4	114.3	4	15.9	9.5
2½"	73.0	165.1	127.0	4	15.9	10.3
3"	88.9	184.2	146.1	4	15.9	11.1
3½"	101.6	203.2	165.1	8	15.9	11.9
4"	114.3	215.9	177.8	8	15.9	12.7
5"	141.3	254.0	209.6	8	15.9	14.3
6"	168.3	279.4	228.6	8	19.1	17.5
7"	190.5	304.8	260.4	8	19.1	19.1
8"	219.1	336.6	292.1	8	19.1	19.1
9"	244.5	368.3	323.9	12	19.1	20.6
10"	273.0	406.4	355.6	12	19.1	22.2
12"	323.9	457.2	406.4	12	22.2	25.4
14"	355.6	527.2	469.9	12	22.2	25.4
16"	406.4	577.9	520.7	12	22.2	25.4
18"	457.2	641.4	584.2	16	22.2	28.6
20"	508.0	704.9	647.4	16	22.2	31.8
24"	609.6	825.5	755.7	16	25.4	38.1

TABLE - F For Working Steam Pressure
From 100 lbs to 150 lbs per sq. inch

Nominal Pipe Size	O.D. of Pipe	O.D.	P.C.D.	No. of Bolt	Dia of Bolt	Thickness
½"	21.3	95.3	66.7	4	12.7	9.5
¾"	26.7	101.6	73.0	4	12.7	9.5
1"	33.4	120.7	87.3	4	15.9	9.5
1¼"	42.2	133.4	98.4	4	15.9	12.7
1½"	48.3	139.7	104.8	4	15.9	12.7
2"	60.3	165.1	127.0	4	15.9	15.9
2½"	73.0	184.2	146.1	8	15.9	15.9
3"	88.9	203.2	165.1	8	15.9	15.9
3½"	101.6	215.9	177.8	8	15.9	19.1
4"	114.3	228.6	190.5	8	15.9	19.1
5"	141.3	279.4	235.0	8	19.1	22.2
6"	168.3	304.8	260.4	12	19.1	22.2
7"	190.5	336.6	292.1	12	19.1	22.2
8"	219.1	368.3	323.9	12	19.1	25.4
9"	244.5	406.4	355.6	12	22.2	25.4
10"	273.0	431.8	381.0	12	22.2	25.4
12"	323.9	489.0	438.2	16	22.2	28.6
14"	355.6	552.5	495.3	16	25.4	31.8
16"	406.4	609.6	552.5	20	25.4	31.8
18"	457.2	673.1	609.6	20	28.6	34.9
20"	508.0	736.6	673.1	24	28.6	38.1
24"	609.6	850.9	781.1	24	31.8	41.3

TABLE - H For Working Steam Pressure
From 150 lbs to 250 lbs per sq. inch

Nominal Pipe Size	O.D. of Pipe	O.D.	P.C.D.	No. of Bolt	Dia of Bolt	Thickness
½"	21.3	114.3	82.6	4	15.9	12.7
¾"	26.7	114.3	82.6	4	15.9	12.7
1"	33.4	120.7	87.3	4	15.9	14.3
1¼"	42.2	133.4	98.4	4	15.9	17.5
1½"	48.3	139.7	104.8	4	15.9	17.5
2"	60.3	165.1	127.0	4	15.9	19.1
2½"	73.0	184.2	146.1	8	15.9	19.1
3"	88.9	203.2	165.1	8	15.9	22.2
3½"	101.6	215.9	177.8	8	15.9	22.2
4"	114.3	228.6	190.5	8	15.9	25.4
5"	141.3	279.4	235.0	8	19.1	28.6
6"	168.3	302.8	260.4	12	19.1	28.6
7"	190.5	336.6	292.1	12	19.1	31.8
8"	219.1	368.3	323.9	12	19.1	31.8
9"	244.5	406.4	355.6	12	22.2	34.9
10"	273.0	431.8	381.0	12	22.2	34.9
12"	323.9	489.0	438.2	16	22.2	38.1
14"	355.6	552.5	495.3	16	25.4	41.3
16"	406.4	609.6	552.5	20	25.4	44.5
18"	457.2	673.1	609.6	20	28.6	47.6
20"	508.0	736.6	673.1	24	28.6	50.8
24"	609.6	850.9	781.1	24	31.8	57.2

Note : For 12.7 mm and 15.87 mm Bolts Dia the diameters of the holes will be 1.58 mm larger and for 19.01 and above the Hole Dia will be 3.17 larger



PLUG

HALF COUPLING = G/2

DIMENSION IN MM OF FORGED SCREWED FITTINGS TO ANSI B-16.11 THREADED TO ASA B 2.1

NOM BORE	PIPE O.D.	3000 L.B.S.						COMMON FACTORS						6000 L.B.S.					
		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	4	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	28	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

TEE

45° ELBOW

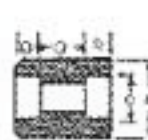
UNION

COUPLING

REDUCER

HALF COUPLING

CAP



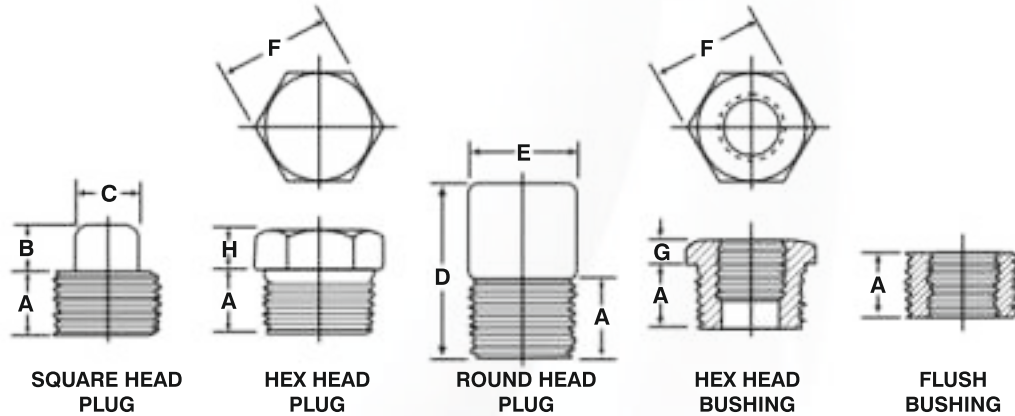
SOCKET WELD FITTING TO ANSI B-16.11

NOM BORE	PIPE O.D.	3000 L.B.S.						COMMON FACTORS						6000 L.B.S.					
		A	B	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	

DIMENSIONS AND OTHER SPECIFICATIONS AS PER CUSTOMERS REQUIREMENTS ARE AVAILABLE ON REQUEST

HIGH PRESSURE FITTINGS

ANSI B 16.11:1996 Steel Plugs and Bushings



Nominal Pipe Size	Thread Length (Minimum) A	Plugs Square Head		Plugs Round Head		Hex Plugs and Bushings		
		Height of Square (Minimum) B	Width Flats (Minimum) C	Nom. Diam. of Head E	Length (Minimum) D	Width Flats (Nominal) F	Hex. Height (Min.)	
							Bushing G	Plug H
1/8	0.38	0.25	0.28	0.41	1.38	0.44		0.25
1/4	0.44	0.25	0.38	0.53	1.62	0.62	0.12	0.25
3/8	0.50	0.31	0.44	0.69	1.62	0.69	0.16	0.31
1/2	0.56	0.38	0.56	0.84	1.75	0.88	0.19	0.31
3/4	0.62	0.44	0.62	1.06	1.75	1.06	0.22	0.38
1	0.75	0.50	0.81	1.31	2.00	1.38	0.25	0.38
1 1/4	0.81	0.56	0.94	1.69	2.00	1.75	0.28	0.56
1 1/2	0.81	0.62	1.12	1.91	2.00	2.00	0.31	0.62
2	0.88	0.69	1.31	2.38	2.50	2.50	0.34	0.69
2 1/2	1.06	0.75	1.50	2.88	2.75	3.00	0.38	0.75
3	1.12	0.81	1.69	3.50	2.75	3.50	0.41	0.81
4	1.25	1.00	2.50	4.50	3.00	4.62	0.50	1.00

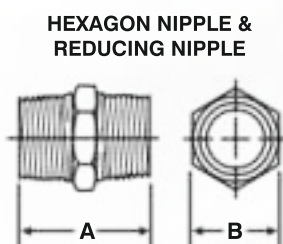


Fig. 5 & 6

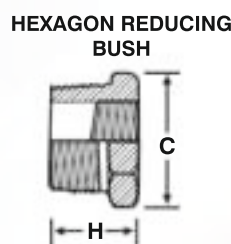


Fig. 7

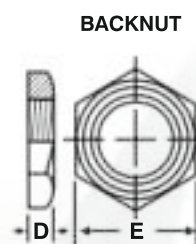


Fig. 8

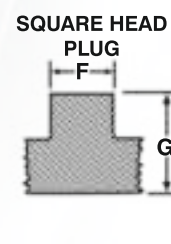


Fig. 9

	Nominal Bore											
	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
A	1.37	1.5	1.68	2.12	2.31	2.62	2.80	2.87	3.06	3.12	3.5	4.1
B	0.525	0.600	0.820	0.920	1.10	1.39	1.86	2.05	2.50	3.125	3.625	5.51
C	0.525	0.600	0.820	0.920	1.10	1.39	1.86	2.05	2.50	3.125	3.625	5.51
D	0.25	0.25	0.28	0.31	0.37	0.37	0.37	0.44	0.50	0.62	0.75	0.89
E	0.600	0.820	0.920	1.10	01.48	1.67	2.25	2.375	2.750	3.35	4.45	5.50
F	0.250	0.34	0.44	0.50	0.56	0.75	0.87	1.05	1.25	1.44	1.50	2.00
G	0.56	0.75	0.75	0.93	1.00	1.25	1.37	1.37	1.68	1.87	2.06	2.43
H	0.68	0.68	0.68	0.87	0.93	1.18	1.37	1.43	1.62	1.81	2.06	2.50

- 1) Available on demand
2) All dimensions are in inches.

CHEMICAL & PHYSICAL PROPER TIES OF C.S., S.S. & A.S., S.W. FORGED FITTINGS

ASTM A 105/A 105M Forged Socket Weld, Screwed, Flanges, Carbon Steel Pipe Fittings

IASTM GRADE	C	MnSi	Si	S	P	Cr	Ni	Mo	Other Psi (Mpa)	Tensile (MPa)	Psi Yield %	Elongation in Area	Hardness	Redu
A 105/105 M	0.35 max	0.60 max 1.05	0.35 max	0.50 max	0.04 max	-	-	-	-	70000 485	36000 (250)	30-Strip 22-Round	187 HB max	30 Round
A 182C1160&170 30000(20.29)	0.08 max	1.10 max	0.32 max	0.35min 0.50max	0.05 max	-	-	-	-	Cl.70-70000(49-46) Cl.60-60000(42-32)	30000 (200)	22	-	35

ASTM A 182/A 182M Austenitic, Stainless Steel Forged (SW), Screwed, Flanges, For High Temps, Service

IA 182/182M F 304	0.08 max	2.00 max	1.00 max	0.03 max	0.04 max	18.0 max 20.0	8.0 11.0	-	-	75000 (515)	30000 (205)	30	-	50
A 182/182 M F 304L	0.035 max	2.00 max	1.00 max	0.03 max	0.04 max	18.0 max 20.0	18.0 13.0	-	-	70000 (485)	25000 (170)	30	223	50
A 182/182M F 316	0.08 max	2.00 max	1.00 max	0.03 max	0.04 max	16.0 max 18.0	10.0 14.0	2.0 3.0	-	75000 (515)	30000 (205)	30(Long) 25(Trans)	-	50 (Long) 45 (Trans)
A 182/182M F316L	0.035 max	2.00 max	1.00 max	0.03 max	0.04 max	16.0 max 18.0	10.0 15.0	2.0 3.0	-	70000 (485)	25000 (170)	30	-	50
A182/182M F 316 H	0.04 max 0.10	2.00 max	1.00 max	0.03 max	0.04 max	16.0 max 18.0	10.0 14.0	2.0 3.0	-	75000 (515)	30000 (205)	30	-	50
A182/182M F321	0.08 max	2.00 max	1.00 max	0.03 max	0.04 max	17.0 max mm.	9.0 12.0	-	Tixc= 0.70max	75000 (515)	30000 (205)	30	-	50
A182/182M F310	0.15 max	2.00 max	1.00 max	0.03 max	0.04 max	24.0 max 26.0	19.0 22.0	-	-	75000 (515)	30000 (205)	30	-	50
A182/182M F317L	0.030 max	2.00 max	1.00 max	0.03 max	0.045 max	18.0 max 20.0	11.0 15.0	3.00 4.00	-	70000 (485)	25000 (170)	30	-	50
A182/182M F347H	0.04 max 0.10	2.00 max	1.00 max	0.03 max	0.04 max	17.0 max 20.0	9.0 13.0	-	Cb+Ta= 8.0=1.10	75000 (515)	30000 (205)	30	-	50

ASTM A182M Forged Alloy Steel, (SW), Screwed, Flanges, for High Temperature Service

IA 182/182M F1	0.28 max	0.60 max 0.90	0.15 max 0.35	0.045 max	0.045 max	-	-	0.44 0.65	-	70000 (485)	40000 (275)	20	143-192 Bremell Hrdn.	30
IA 182/182M F12 Class2	0.10 max 0.20	0.30 max 0.80	0.10 max 0.60	0.04 max	0.04 max	0.80 max 1.25	-	0.44 0.65	-	70000 (485)	40000 (275)	20	143-207	30
IA 182 / 182M F11 Class2	0.10 max 0.20	0.30 max 0.80	0.50 max 1.0	0.04 max	0.04 max	1.0 max 1.50	-	0.44 0.65	-	70000 (485)	40000 (275)	20	143-207	30
IA 182/1821M F22 Class3	0.05 max 0.15	0.30 max 0.60	0.5 max max	0.04 max	0.04 max	2.0 max 2.50	-	0.87 1.13	-	75000 (515)	45000 (310)	20	156-207	30
IA 182/182M F5	0.15 max	0.30 max 0.60	0.50 max max	0.03 max	0.03 max	4.0 max 6.0	0.5 max max	0.44 0.65	-	70000 (485)	40000 (275)	20	143-217	35
IA 182/182M F9	0.15 max	0.30 max 0.60	0.5 max max	0.03 max	0.03 max	8.0 max 10.0	-	0.90 1.10	-	85000 (585)	55000 (386)	20	179-217	40

NICKEL AND NICKEL ALLOYS COMPARATIVE CHART

ALLOY	UNS Nr	WS.Nr	C	Cr	Ni	Cu	Mo	Co	Fe	Mn	Al	Ti	Others %
NICKEL 200	N02200	2.4066	0.15 max	-	99.0 min	0.25 max	-	-	0.4 max	0.35 max	-	-	Si<0.35 S<0.01
NICKEL 201	N02201	2.4068	0.02 max	-	99.0 min	0.25 max	-	-	0.4 max	0.35 max	-	-	Si<0.35 S<0.02
NICKEL 205	N02205	2.4061	0.15 max	-	99.0 max	0.15 max	-	-	0.2 max	0.35 max	-	0.01-0.05	Mg<0.08 Si<0, S<0.008
NICKEL 211	-	2.4116	0.06	-	95	0.03	-	-	0.1	5	-	-	Si0.1
NICKEL 212	-	2.4110	0.1 max	-	97.0 min	0.2 max	-	-	0.25 max	1.5-2.5	-	-	Mg<0.2 Si<0.2
NICKEL 222	-	2.4053	-	-	99.0 min	0.1 max	-	-	0.1 max	0.3 max	-	0.005 max	Mg<0.1 Si<0.1, S<0.008
NICKEL 270	N02270	-	0.02 max	-	99.9 min	0.01 max	-	-	0.05 max	0.003 max	-	0.005 max	Mg<0.005 Si<0.005, S<0.003
MONEL 400	N04400	2.4360	0.3 max	-	63.5 min	28-34.0	-	-	2.5 max	2.0 max	-	-	Si<0.5 S<0.024
MONEL 401	N04401	-	0.1 max	-	40.0-45	bal	-	-	0.75 max	2.25 max	-	-	Si<0.25 S<0.015
MONEL R-405	N04405	-	0.3 max	-	63.0 min	28.0-34	-	-	2.5 max	2.0 max	-	-	Si<0.5 S0.025-0.06
MONEL K500	N05500	2.4375	0.25 max	-	63.5 max	27-33.0	-	-	2.0 max	1.5 max	2.3-3.2	0.85	Si<0.5 S<0, 0.1
INCONEL 600	N06600	2.4816	0.15 max	14-17.0	72.0 min	0.5 max	-	-	6-10.0	1.0 max	-	-	Si<0.5 S<0.015
ALLOY 600L	N06600	2.4817	0.025 max	14-17.0	72.0 min	-	-	-	6-10.0	-	-	0.3 max	-
INCONEL 601	N06601	2.4851	0.1 max	21-25.0	58-63.0	1.0 max	-	-	bal	1.0 max	1.0-1.7	-	Si<0.5 S<0.015
INCONEL 617	N06617	2.4663	0.05-0.15	20-24.0	44.5 min	0.5 max	8-10.0	10-15.0	3.0 max	1.0 max	0.8-1.5	0.6 max	Si<0.1 S<0.015 B<0.006
INCONEL 625	N06625	2.4856	0.1 max	20.-23.0	58.0 min	-	8-10.0	1.0 max	5.0 max	0.5 max	0.4 max	0.4 max	Si<0.5 S<0.015 P<0.015 Nb4.0
INCONEL 625LCF	N06626	-	-	21.5	61	-	9	-	2.5	-	-	-	Nb3.6
INCONEL 686	N06636	2.4606	0.01 max	19-23.0	bal	-	15-17.0	-	5.0 max	0.75 max	-	0.02-0.25	W 3-4.4 Si<0.08 S<0.02 P<0.04
INCONEL MA754	N07754	-	0.05	20	78	-	-	-	1	-	0.3	0.5	Y203 0.6
INCONEL MA758	-	-	-	30	67	-	-	-	1	-	0.3	0.5	Y203 0.6
INCONEL 783	R30783	-	-	3	28.5	-	-	34	26	-	5.4	0.1	Nb3.0
INCONEL MA6000	-	-	-	15	68.5	-	2	-	-	-	4.5	2.5	W4.0 Ta 2.0 Y203 = 1.1
INCONEL G3	N06985	2.4619	0.015 max	21-23.5	36.0 min	1.5-2.5	6-8.0	5.0 max	18-21.0	1.0 max	-	-	W<1.5 Si<1.0 Nb<0.5 P<0.04 S<0.03
INCOLOY 800	N08800	1.4876	0.1 max	19-23.0	30-35.0	0.75 max	-	-	39.5 min	1.5 max	0.15-0.60	0.15-0.60	Si<0.1 S<0.015
INCOLOY 800H	N08810	1.4876	0.08	21	32.5	-	-	-	46	-	-	-	Al+Ti0.85-1.2
INCOLOY 800HT	N08811	-	0.06-0.1	19-23.0	30-35.0	0.75 min	-	-	39.5 min	1.5 max	0.15-0.60	0.15-0.60	Al+Ti0.85-1.2 Si<1.0 S<0.015
INCOLOY 028	N08028	1.4563	0.015 max	26-28.0	30-32.0	1-1.4	3-4.0	-	bal	-	-	-	N 0.04 - 0.07
ALLOY 31	N08031	1.4562	0.015 max	26-28.0	30-32.0	1-1.4	6-7.0	-	bal	-	-	-	N 0.15 - 0.25
INCOLOY 801	N08801	-	-	21	32	-	-	-	45	-	-	1	
INCOLOY 802	N08802	-	0.4	21	32.5	-	-	-	46	-	-	-	
INCOLOY 803	S35045	-	0.06-0.10	25-29	32-37	0.75 max	-	-	bal	1.5 max	0.15-0.6	0.15-0.6	Si<1.0 S<0.015
INCOLOY 825	N08825	2.4858	0.05 max	19.5-23.5	38-46.0	1.5-3.0	2.5-3.5	-	22.0 min	1.0 max	0.2 max	0.6-1.2	Si<0.5 S<0.03
INCOLOY 840	-	1.4847	-	20	20	-	-	-	60	-	-	-	
INCOLOY 864	S35135	-	0.03	21	34	-	4.2	-	bal	-	-	0.6	Si 0.8
NI-SPAN C-902	N09902	-	0.06max	4.9-5.75	41-43.5	-	-	-	bal	0.8 max	0.3-0.8	2.2-2.75	Si<1.0 S<0.04 P<0.04
INCOLOY 903	N19903	-	-	-	38	-	-	15	42	-	0.7	1.4	Nb 3.0
INCOLOY 907	N19907	2.4693	-	-	38	-	-	13	42	-	0.03	1.5	Nb 4.7 Si 0.15
INCOLOY 909	N19909	2.4692	-	19.5-22.5	38	-	-	13	42	-	0.03	1.5	Nb 4.7 Si 0.4
INCOLOY 925	N09925	-	0.03 max	17-19.0	42-46.0	1.5-3.0	2.5-3.5	-	22.0 min	1.0 max	0.1-0.5	1.9-2.4	Si < 0.5 Nb < 0.5 P<0.03 S<0.03
INCOLOY DS	-	1.4862	0.1 max	19-21	34.5-41.0	0.5 max	-	-	bal	0.8-1.5	-	0.2 max	Si 1.9 - 2.6 S<0.03
INCOLOY 020	N08020	2.4660	0.02 max	20	35-48	3.0-4.0	2.0-3.0	-	37	-	-	-	Nb 0.6
INCOLOY 25-6MO	N08926	1.4529	-	15	25	1.2	6.5	-	47	-	-	-	N 0.5
INCOLOY A-286	S66286	1.4980	-		25.5	-	1.25	-	56.5	-	-	2.1	-

MILD STEEL PIPES CONFIRMING TO IS : 1239 (Part 1) - 1979

Nominal Bore		Outside Diameter		Light		Medium		Heavy	
Inch	In mm	In	mm	Thickness mm	Weight kg/mtr	Thickness mm	Weight kg/mtr	Thickness mm	Weight kg/mtr
1/8"	3 mm	0.406	10.32	1.80	0.361	2.00	0.407	2.65	0.493
1/4"	6 mm	0.532	13.49	1.80	0.517	2.35	0.650	2.90	0.769
3/8"	10 mm	0.872	17.10	1.80	0.674	2.35	0.852	2.90	1.02
1/2"	15 mm	0.844	21.43	2.00	0.952	2.65	1.122	3.25	1.45
3/4"	20 mm	1.094	27.20	2.35	1.410	2.65	1.580	3.25	1.90
1"	25 mm	1.312	33.80	2.65	2.010	3.25	2.440	4.05	2.97
1.1/4"	32 mm	1.656	42.90	2.65	2.580	3.25	3.140	4.05	3.84
1.1/2"	40 mm	1.906	48.40	2.90	3.250	3.25	3.610	4.05	4.43
2"	50 mm	2.375	60.30	2.90	4.110	3.65	5.100	4.47	6.17
2.1/2"	65 mm	3.004	76.20	2.25	5.840	3.65	6.610	4.47	7.90
3"	80 mm	3.500	88.90	3.25	6.810	4.05	8.470	4.85	10.1
4"	100 mm	4.500	114.30	3.65	9.890	4.50	12.10	5.40	14.4
5"	125 mm	5.500	139.70	-	-	4.85	16.20	5.40	17.8
6"	150 mm	6.500	165.10	-	-	4.85	19.20	5.40	21.2

BIG DIAMETER ERW PIPES CONFIRMING 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	kg/mtr
4.85	22.59	25.62	32.07	38.13	-	-	-	-
5.20	24.17	27.43	34.34	40.85	-	-	-	-
5.60	26.00	29.28	36.93	43.93	48.11	-	-	-
6.00	27.88	31.53	39.50	47.02	51.49	61.00	69.00	-
6.35	29.34	33.28	41.73	49.67	54.43	62.35	70.50	78.50
7.01	32.27	36.76	46.43	55.45	61.82	69.04	-	-
7.94	-	41.00	50.95	61.85	67.98	77.92	87.80	-
8.18	-	42.56	53.42	65.12	-	-	-	-
9.53	-	51.50	60.24	73.75	81.21	93.13	105.00	117.00
12.70	-	-	-	-	107.28	123.30	139.00	155.00

Tolerance 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 percent
- Medium and Heavy tubes +Not Limited
-8 percent
- (2) Seamless +Not Limited
-12.5 percent
- (b) Weight :
- (1) Single tube (light series) +10 percent
- 8 percent
- (2) Single tube (medium and heavy series) +10 pernt

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

Nominal Bore	Maximum Permissible Pressure	Maximum Permissible Temperature
mm	N/mm ²	°C
Upto and including 25 mm	1.20	12.24
Over 25 mm upto and Including 40 mm	1.03	10.50
Over 40 mm upto and including 80 mm	0.86	8.77
Over 80 mm upto and including 100 mm	0.69	7.04
	0.83	8.47
Over 100 mm upto and including 125 mm	0.69	7.04
Over 125 mm upto and includi 150 mm	0.50	5.10

For tubes fitted with appropriate fittings of suitably butt welded together, the Max. permissible press shall be 21.00 Kg/cm² and Max. Permissible temp. 260°C

CARBON STEEL, ALLOY STEEL, LOWTEMP, PIPE, AND TUBES SPECIFICATION

CHEMICAL ANALYSIS									MECHANICAL PROPERTIES			SPECIFIC REQUIREMENT
									TENSILE STRENGTH	YIELD STRENGTH	ELONGATION	
SPECIFICATION	WT	C%	Mn%	P% MAX	S% MAX	Si%	Cr%	Mo%	Mpa	Mpa	5mm MN longitudinal	
ASTM A 53/A	AW	0.25 MAX	0.92 MAX	0.50	0.060	-	-	-	331 MIN	207 MIN	36	
ASTM A 53N	AW	0.30 MAX	1.20 MAX	0.50	0.060	-	-	-	413 MIN	240 MIN	29.5	
ASTM 106/A	AW	0.25 MAX	0.27-0.93	0.025	0.025	0.10 MIN	0.40 MAX	0.15 MAX	330 MIN	205 MIN	35/28	
ASTM A106/B	AW	0.30 MAX	0.29-1.06	0.025	0.025	0.10 MIN	0.40 MAX	0.15 MAX	415 MIN	240 MIN	30/22	
ASTM A 106/C	AW	0.35 MAX	0.29-1.06	0.025	0.025	0.10 MIN	0.40 MAX	0.15 MAX	485 MIN	275 MIN	30/22	
ASTM A 179	MW	0.06-0.18	0.27-0.63	0.048	0.048	-	-	-	325 MIN	180 MIN	35.0	Hardness 72 HRB Max
ASTM A 214	MW	0.18 MAX	0.27-0.63	0.050	0.050	-	-	-	385 MIN	180 MIN	35.0	Hardness 72 HRB Max
ASTM A 192	MW	0.06-0.18	0.27-0.63	0.048	0.048	0.2 MAX	-	-	325 MIN	180 MIN	35.0	Hardness 77 HRB Max
ASTM A 209/T1	MW	0.10-0.20	0.30-0.80	0.045	0.045	0.10-0.50	-	0.44-0.65	380 MIN	205 MIN	30/22	Hardness 80 HRB Max
ASTM A 209/T1a	MW	0.15-0.25	0.30-0.80	0.045	0.045	0.10-0.50	-	0.44-0.65	365 MIN	195 MIN	30/22	Hardness 81 HRB Max
ASTM A 209/T1b	MW	0.14 MAX	0.30-0.80	0.045	0.045	0.10-0.50	-	0.44-0.65	415 MIN	220 MIN	30/22	Hardness 77 HRB Max
ASTM A 210/A-1	MW	0.27 MAX	0.93 MAX	0.058	0.058	0.10 MIN	-	-	415 MIN	255 MIN	30/22	Hardness 79 HRB Max
ASTM A 210/C	MW	0.35 MAX	0.29-1.06	0.058	0.058	0.10 MIN	-	-	485 MIN	275 MIN	30/22	Hardness 89 HRB Max
ASTM A 213/T2	MW	0.10/0.20	0.30-0.61	0.045	0.045	0.10-0.30	0.50-0.81	0.44-0.65	415 MIN	205 MIN	30/22	Hardness 85 HRB Max
ASTM A 213/T5	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50 MAX	4.00-6.00	0.44-0.65	415 MIN	205 MIN	30/22	Hardness 85 HRB Max
ASTM A 213/T11	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50-1.00	1.00-1.50	0.44-0.65	415 MIN	205 MIN	30/22	Hardness 85 HRB Max
ASTM A 213/T12	MW	0.15 MAX	0.30-0.61	0.045	0.045	0.50 MAX	0.80-1.25	0.44-0.65	415 MIN	220 MIN	30/22	Hardness 85 HRB Max
ASTM A 213/T22	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50 MAX	1.90-2.60	0.87-1.13	415 MIN	205 MIN	30/22	Hardness 85 HRB Max
ASTM A 333/1	AW	0.30 MAX	0.40-1.06	0.025	0.025	-	-	-	380 MIN	205 MIN	25/20	IMPACT TEST-50F
ASTM A 333/6	AW	0.30 MAX	0.29-1.06	0.025	0.025	0.10 MIN	-	-	415 MIN	240 MIN	30/22	40X10J/18/14
ASTM A 334/1	AW	0.30 MAX	0.40-1.06	0.025	0.025	-	-	-	380 MIN	205 MIN	35/28	-50F 40X10J/18/14
ASTM A 334/6	MW	0.30 MAX	0.29-1.06	0.025	0.025	0.10 MIN	-	-	415 MIN	240 MIN	30/22	90 HRB MAX
ASTM A 335/P1	AW	0.10-0.20	0.30-0.80	0.025	0.025	0.10-0.50	-	0.44-0.65	380 MIN	205 MIN	30/22	
ASTM A 335/P2	AW	0.10-0.20	0.30-0.61	0.025	0.025	0.10-0.30	0.50-0.81	0.44-0.65	380 MIN	205 MIN	30/22	
ASTM A 335/P5	AW	0.15 MAX	0.30-0.60	0.025	0.025	0.50 MAX	4.00-6.00	0.45-0.65	415 MIN	205 MIN	30/22	
ASTM A 335/P9	AW	0.15 MAX	0.30-0.60	0.025	0.025	0.25-1.00	8.00-10.00	0.09-1.10	415 MIN	172 MIN	30/22	
ASTM A 335/P11	AW	0.15 MAX	0.30-0.60	0.025	0.025	0.50-1.00	1.00-1.50	0.44-0.65	415 MIN	205 MIN	30/22	
ASTM A 335/P12	AW	0.15 MAX	0.30-0.61	0.025	0.025	0.50 MAX	0.80-1.25	0.44-0.65	415 MIN	205 MIN	50/22	
ASTM A 335/P22	AW	0.15 MAX	0.30-0.60	0.025	0.025	0.50 MAX	1.90-2.60	0.87-1.13	415 MIN	205 MIN	30/22	
BS/3059/1/33		0.15 MAX	0.30-0.70	0.050	0.050	-	-	-	324-441	186 MIN	25	
BS/3059/2/33		0.15 MAX	0.40-0.70	0.050	0.050	0.10-0.35	-	-	324-441	186 MIN	21	
BS/3059/2/45		0.12-0.18	0.90-1.20	0.035	0.035	0.10-0.35	-	-	441-560	245 MIN	22	
BS/3059/2/620		0.10-0.15	0.40-0.70	0.040	0.040	0.10-0.35	0.70-1.10	0.45-0.65	441-618	235 MIN	22	
DIN/1715/ST35.8		0.17 MAX	0.40 MIN	0.040	0.040	0.35 MAX	-	-	340-441	235 MIN	25	
DIN/17175/ST45.8		0.22 MAX	0.45 MIN	0.040	0.040	0.10-0.35	-	-	441-540	255 MIN	25	
DIN/17175/15MO3		0.12-0.20	0.50-0.80	0.040	0.040	0.10-0.35	-	0.25-0.35	441-540	284 MIN	21	
DIN17175/13CrMo44		0.10-0.18	0.40-0.70	0.040	0.040	0.10-0.35	0.70-0.16	0.40-0.50	441-570	294 MIN	22	
DIN17175/10CrMo910		0.15 MAX	0.40-0.60	0.040	0.040	0.15-0.50	2.0-2.5	0.9-1.10	441-570	294 MIN	22	
ASTM A 199/T5	MW	0.50-0.15	0.30-0.60	0.030	0.030	0.50 MAX	4.00-6.00	0.45-0.65	415 MIN	170 MIN	30/22	Hardness 85 HRB Max
ASTM A 199/T11	MW	0.05-0.15	0.30-0.60	0.030	0.030	0.50-1.00	1.00-1.50	0.44-0.65	415 MIN	170 MIN	30/22	Hardness 85 HRB Max
ASTM A 199/T22	MW	0.05-0.15	0.30-0.60	0.030	0.030	0.50 MAX	1.0-2.60	0.87-1.13	415 MIN	170 MIN	30/22	Hardness 85 HRB Max
ASTM A 199/T4	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50-1.00	2.15-2.85	0.44-0.65	415 MIN	170 MIN	30/22	Hardness 85 HRB Max
ASTM A 199/T7	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50-1.00	6.00-8.00	0.45-0.65	415 MIN	170 MIN	30/22	Hardness 85 HRB Max
ASTM A 200/T5	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50-1.00	4.00-6.00	0.45-0.65	415 MIN	170 MIN	30/22	Hardness 85 HBR Max
ASTM A 200/T11	MW	0.05-0.15	0.30-0.60	0.030	0.030	0.50-1.00	1.00-1.50	0.44-0.65	415 MIN	170 MIN	30/22	Hardness 85 HRB Max
ASTM A 200/T22	MW	0.05-0.15	0.30-0.60	0.030	0.030	0.50 MAX	1.90-2.60	0.87-1.13	415 MIN	170 MIN	30/22	Hardness 85 HRB Max
ASTM A 200/T4	MW	0.05-0.15	0.30-0.60	0.030	0.030	0.50-1.00	2.15-2.85	0.44-0.65	415 MIN	170 MIN	30/22	Hardness 85 HRB Max
ASTM A 200/T7	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.50-1.00	6.00-8.00	0.45-0.65	415 MIN	170 MIN	30/22	Hardness 85 HRB Max
ASTM A 199/T9	MW	0.15 MAX	0.30-0.60	0.030	0.030	0.25-1.00	8.00-10.0	0.90-1.00	415 MIN	170 MIN	30/22	Hardness 85 HRB Max

COMPARISON TABLE OF DIN - ASTM - API - BS

	Tensile Strength				Yield Point		Elongation Min % abt.	%C	%C	%SI	% Min P=Max	% S=Max	% Mo	% Cr	Standard for Size + Tol	TECHNICAL SPEC.	CORRESPONDING QUALITY		
	daN/mm ² abt.	ltn/in ² abt.	daN/mm ² abt.	ltn/in ² abt.	Min % abt.	Min % abt.											ASA	DIN	BS
DIN	St 00	35-45	22-29	24	15	25	0	0	0	0	0	0	0		Din 1629/2	Din 1629/2	0	0	0
	St 36	35-45	22-29	24	15	25	0.18				0.05				Din 2448	Din 1629/3	A 53 A		3601 HFS22
	St 46	35-55	29-35	26	16.5	21	0.25				0.05				Din 2448	Din 1629/3	A 53 B		3601 HFS 27
	St 55	55-65	35-41	30	19	17	0.36				0.05				Din 2448	Din 1629/3			3601 HFS 35
	St 52	52-62	32-29	36	23	22	0.20	0.55		1.50	0.05	0.05			Din 2448	Din 1629/3			
	St 35.8	35-45	22-29	24	15	25	0.17	0.35		4.04	0.05	0.05			Din 17175		A 106 A		3059/1-2
	St 45.8	45-55	29-35	26	16.5	21	0.22	0.10/0.35		0.40/0.60	0.045	0.05			Din 2448	Din 17175	A 106 B		3059/5-6
	TT St 35 N	35-45	22-29	23	14.5	25	0.16	0.10/0.35		0.50/0.80	0.04	0.04			SE WERKSTOFF				
	15 Mo 3	45-55	29-35	29	18.5	22	0.12/0.20	0.15/0.35		0.05/0.80	0.04	0.04	5.25/0.35		Din 2448	BLATT680	A 333GR1		3603LT27
	16 Mo 5	38.7	24				0.10/0.20	0.10/0.50		0.30/0.80	0.045		0.045/0.65		Din 17175	Din 17175	A 935 PI		3059/7-8
ASTM	13 Cr Mo 44	45-58	29-37	30	19	22	0.010/0.18	0.15/0.35		0.40/0.070	0.04	0.04	0.40/0.50		Din 2448	WORKST BL 210	A 335 PI		3059/7-8
	10 Cr Mo 910	45-60	29-38	27	17	20	0.15	0.15/0.50		0.40/0.60	0.04	0.04	0.90/1.10		Din 2448	Din 17175	A 335 P12/P11		6304 GR 620
	12 Cr Mo 195	40	27	18	11.5	21	0.15	0.50		0.30/0.60	0.03	0.04	0.45/0.65		Din 2448	WORKST BL 231	A 335 P22		36004 GR 622
	Machanical C 35	62	38	32	20	20	0.35	0.40		0.60	0.035				Din 17200		A335 P5		3600 GR 625
	St 52.3	52-62	33-39	34	21.5	22	0.20	0.55		1.50	0.05	0.05			Din 17100				
	ASTM A 53 A	33.7	21	21.1	13.5	35		(0.10-0.30)			0.048				ASAB 36.10	AP1 5L GR A	St 35		3601HPS22
	A 53 B	42.2	27	24.6	15.5	30		(0.10-0.30)			0.048				ASAB 36.10	AP1 5L GR B	St 45		3601HFS27
	A 106 A	33.7	21	21.1	13.5	35	0.25	0.10		0.27/0.93	0.048	0.058			ASAB 36.10	AP1 5L GR A	St 35.8		3059/1-2
	A 106 B	42.2	27	24.6	15.5	30	0.30	0.10		0.29/1.06	0.048	0.058			ASAB 36.10	AP1 5L GR B	St 45.8		3059/5-6
	ASTM A 333/1	38.7	24.5	21.1	13.5	35	0.30			0.10/1.06	0.05	0.06			ASAB 36.10		TT St 35N		3503J.T.27
ASTM	A333/3	45.7	29	24.6	15.5	30	0.19	0.18/0.37		0.31/0.64	0.05	0.05			3.18/3.82 ASAB 36.10		10NI 14		3603 503LT 100
	ASTM A 335 P1	38.7	24.5	21.1	13.5	30	0.10/0.20	0.10/0.50		0.30/0.60	0.045	0.045	0.44/0.65		ASAB 36.10		15 Mo 3		3059/7-8
	P2	38.7	24.5	21.1	13.5	30	0.10/0.20	0.10/0.20		0.30/0.61	0.045	0.045	0.44/0.65		ASAB 36.10		13 GR Mo 44		
	P11	42.2	27	21.1	13.5	30	0.15	0.50/1.00		0.30/0.60	0.03	0.03	0.44/0.65		ASBA 36.10		13 CR Mo 44		3604GR621
	P12	42.2	27	21.1	13.5	30	0.15	0.50		0.30/0.61	0.045	0.045	0.44/0.65		ASBA 36.10		13 CR Mo 44		3604GR620
	P22	42.2	27	21.1	13.5	30	0.15	0.50		0.30/0.60	0.03	0.03	0.87/1.13		ASAB 36.10		10 CR Mo 910		3604GR622
	P5	42.2	27	21.1	13.5	30	0.15	0.50		0.30/0.60	0.03	0.03	0.45/0.65		ASAB 36.10		12 CR Mo 195		3604GR625
	API5L GR. A	33.7	21	21.1	13.5	variable	0.22			0.09	0.04	0.04			ASAB 36.10		ASTMA 53 A		
	API 5L GR. B	42.2	27	24.6	15.5	"	0.27			1.25	0.04	0.04			ASAB 36.10		ASTMA 53 B		
	API 5L N X 42	42.2	27	29	19	"	0.29			1.25	0.05				ASAB 36.10				
APLINEPIPE	API 5 X 46	44.3	28	32.2	20	"	0.31			1.35	0.04	0.05			ASAB 36.10				
	API 5L X 56	49.9	31.5	39.2	25	"	0.26			1.35	0.04	0.05			ASAB 36.10				
	API 5L X 60	52.7	33.5	42.2	27	"	0.26			1.35	0.04	0.05			ASAB 36.10				
	API 5L X 65	56.2	35.5	45.7	29	"	0.26			1.40	0.04	0.05			ASAB 36.10				
	BS 3601 HFS 22	34.6	22	21.3	13.5	700	0.22			0.70	0.05	0.05					A 53 A		
	BS 3601HFS 27	42.5	27	25.2	16	"	0.25			0.70	0.05	0.05					A 53 B		
	BS 3601 HFS 35	55.1	35	31.5	20	"	0.40	1.20		0.05	0.05	0.05							
	BS 3602 HFS 23	36.2/42.2	23-30	21.3	13.5	"	0.20	(0.10-0.35)		0.30/0.70	0.05	0.05					A 106 A		
	BS 3602 HFS 27	42.5/55.1	27-35	25.2	16	"	0.25	(0.10-0.35)		0.30/0.70	0.05	0.05					A 106 B		
	BS 3602 HFS 35	52.1/67.7	35-45	31.5	20	"	0.35	(0.10-0.35)		0.70/0.10	0.05	0.05					A 106 C		
BS	BS 30593 ERW	31.5/44.1	20-28	-	-	"	-	-	-	-	-	-	-	-	-	-	-	-	-

SUMMARY OF THE MAIN ASTM STANDARDS GENERALLY USED FOR PIPING

ASTM	Grade	Chemical requirements percent (%)										Mechanical requirements				
		C max	Mn max	P max	S max	Si max	Ni	Cr	Mo	Cu	Others	Tensile strength mini-MPa/Psi	Yield strength mini-MPa/Psi	Elong mini %	Impact test at C	F
A 53	Types A	0.25	0.95	0.05	0.06		0.40 max	0.40 max	0.15 max	0.40 max	0.08 max	330-4800	205-30000	36		
	B	0.30	1.20	0.05	0.06		0.40 max	0.40 max	0.15 max	0.40 max	0.08 max	415-6000	240-35000	29.5		
A 106	A	0.25	0.27-0.93	0.035	0.025	0.10mini	0.40 max	0.40 max	0.15 max	0.40 max	0.08 max	330-48000	205-30000	L35-T25		
	B	0.30	0.29-1.06	0.035	0.025	0.10mini	0.40 max	0.40 max	0.15 max	0.40 max	0.08 max	415-60000	240-35000	L30-T16.5		
	C	0.35	0.29-1.06	0.035	0.025	0.10mini	0.40 max	0.40 max	0.15 max	0.40 max	0.08 max	485-70000	275-40000	L30-T16.5		
A 312	TP 304	0.08	2.00	0.040	0.030	0.75	8.00-11.0	18.0-20.0				515-75000	205-30000	L35-T25		
	TP 304L	0.035	2.00	0.040	0.030	0.75	8.00-13.0	18.0-20.0				485-70000	170-25000	L35-T25		
	TP 310S	0.08	2.00	0.045	0.030	0.75	19.0-22.0	24.0-26.0	0.75 max			515-75000	205-30000	L35-T25		
	TP 316	0.08	2.00	0.040	0.030	0.75	11.00-14.0	16.0-18.0	2.00-3.00			515-75000	205-30000	L35-T25		
	TP 316L	0.035	2.00	0.040	0.030	0.75	10.00-15.0	16.0-18.0	2.00-3.00			485-70000	170-25000	L35-T25		
	TP 317L	0.035	2.00	0.040	0.030	0.75	11.00-15.0	18.0-20.0	3.00-4.00			515-75000	205-30000	L35-T25		
	TP 321	0.08	2.00	0.040	0.030	0.75	9.00-13.0	17.0-20.0			5C < Ti 0.7% 10Cb + Ta < 1.00%	515-75000	205-30000	L35-T25		
	TP 347	0.08	2.00	0.040	0.030	0.75	9.00-13.0	17.0-20.0				515-75000	205-30000	L35-T25		
	3	0.19	0.31-0.64	0.025	0.025	0.18-0.37	3.18-3.82					450-65000	205-35000	L35-T20	-100	-150
	4	0.12	0.50-0.05	0.025	0.025	0.18-0.37	0.47-0.98	0.44-1.01		0.40-0.75	Al: 0.04-0.30%	415-60000	240-35000	L30-T16.5	-100	-150
A 333	6	0.30	0.29-1.06	0.025	0.025	0.10 mini	2.03-2.57					415-60000	240-35000	L30-T16.5	-45	-50
	7	0.19	0.90	0.025	0.025	0.13-0.32	8.40-9.60					450-65000	240-35000	L30-T22	-75	-100
	8	0.13	0.90	0.025	0.025	0.13-0.32	1.60-2.24			0.75-1.25		690-100000	515-75000	L22	-195	-320
	9	0.20	0.40-0.06	0.025	0.025							435-63000	315-46000	L28	-75	-100
	P1	0.10-0.20	0.30-0.80	0.025	0.025	0.50			0.44-0.65			380-55000	205-30000	L30-T20		
	P2	0.10-0.20	0.30-0.61	0.025	0.025	0.10-0.30		0.50-0.81	0.44-0.65			380-55000	205-30000	L30-T25		
	P5	0.15	0.30-0.60	0.025	0.025	0.50		4.00-6.00	0.45-0.65			415-60000	205-30000	L30-T20		
	P9	0.15	0.30-0.60	0.025	0.025	0.25-1.00		8.00-10.0	0.90-1.10			415-60000	205-30000	L30-T20		
	P11	0.15	0.39-0.60	0.025	0.025	0.50-1.00		1.00-1.50	0.44-0.65			415-60000	205-30000	L30-T20		
A 335	P12	0.15	0.30-0.61	0.025	0.025	0.50		0.80-1.25	0.44-0.65			415-60000	205-30000	L30-T20		
	P15	0.05-0.15	0.30-0.60		0.025	1.15-1.65			0.44-0.65			415-60000	205-30000	L30-T20		
	P21	0.15	0.30-0.60	0.025	0.025	0.50		2.65-3.35	0.80-1.06			415-60000	205-30000	L30-T20		
	P22	0.15	0.30-0.60	0.025	0.025	0.50		1.90-2.60	0.87-1.13			415-60000	205-30000	L30-T20		
	P91	0.08-0.12	0.30-0.60	0.020	0.010	0.20-0.50	0.40 max	8.00-9.50	0.85-1.05		N0.30-0.70% Al 0.04% max/0.06-0.10 0.18-0.25	585-85000	415-65000	L20		
A 358	TP304	0.08	2.00	0.045	0.030	0.75	8.0-10.50	18.0-20.0	-			Class 1 : Double welded pipes & full Radiography Class 2 : Double welded no Radiography Class 3 : Single welded full Radiography Class 4 : Single welded full Radiography root pass without addition of filler metal Class : Double Welded spot Radiography				
	TP310S	0.08	2.00	0.045	0.030	0.75	19.0-22.0	24.0-26.0	-							
	TP316	0.08	2.00	0.045	0.030	0.75	10.0-14.0	16.0-18.0	2.0-3.0							
	TP 316L	0.030	2.00	0.045	0.030	0.75	10.4-14.0	16.0-18.0	2.0-3.0							
	TP 317L	0.035	2.00	0.045	0.030	0.75	11.0-15.0	18.0-20.0	3.0-4.0							
	TP 321	0.08	2.00	0.045	0.030	0.75	9.0-12.0	17.0-19.0	-							
Formula - Sheet Width Required for Rolled & Welded Pipes - O.D. (mm) - Thickness (mm) x 3.14 = Sheet Width	TP 347	0.08	2.00	0.045	0.030	0.75	9.0-13.0	17.0-19.0	-		N0.10 max Cb + TA10xC/10					

PHYSICAL & CHEMICAL PROPERTIES OF STAINLESS STEEL, ALLOY STEEL & CARBON STEEL BARS

ASTM A479 STAINLESS STEEL ROUND BAR CHEMICAL & PHYSICAL PROPERTIES

ASTM GRADE	C	Mn	Si	S	P	Cr	Ni	Mo	Other	Tensile Psi (MPa)	Yield Psi (Mpa)	Elongation Strip/Round	Hardn.	Reduction in Area (%)
304	0.08 max	2.00 max	1.00 max	0.030 max	0.045 max	18.0 20.0	8.0 10.5	--	--	75000 (515)	30000 (205)	30	--	40
316	0.08 max	2.00 max	1.00 max	0.030 max	0.045 max	16.0 18.0	10.0 14.0	2.0 3.0	--	75000 (515)	30000 (205)	30	--	40
317L	0.035 max	2.00 max	1.00 max	0.030 max	0.045 max	18 20.0	11.0 15.0	3.0 4.0	--	75000 (515)	30000 (205)	30	--	40
310S	0.08 max	2.00 max	1.00 max	0.030 max	0.045 max	24.0 26.0	19.0 22.0	--	--	75000 (515)	30000 (205)	30	--	40
347H	0.04 0.10	2.00 max	1.00 max	0.030 max	0.040 max	17.0 19.0	9.0 13.0	--	0b-BxC -13.0	75000 (515)	30000 (205)	30	--	40
321	0.08 max	2.00 max	1.00 max	0.030 max	0.045 max	17.0 19.0	9.0 12.0	--	5(C+N) < Ti < 0.70%	75000 (515)	30000 (205)	30	--	40

ASTM A182 ALLOY STEEL ROUND BAR CHEMICAL & PHYSICAL PROPERTIES

ASTM GRADE	C	Mn	Si	S	P	Cr	Ni	Mo	Other	Tensile Psi (MPa)	Yield Psi (Mpa)	Elongation Strip/Round	Hardn.	Reduction in Area (%)
A 182F11 Class2	0.10 0.20	0.30 0.80	0.50 1.00	0.04 max	0.04 max	1.00 1.50	--	0.44 0.65	--	70000 (45.46)	40000 (275)	20	143-207	30
A182F22 Class 3	0.05 0.15	0.30 0.60	0.50 max	0.04 max	0.04 max	2.00 2.50	--	0.87 1.13	--	75000 (52.52)	45000 (31.7)	20	156-207	30
A 182F5	0.15 max	0.30 0.60	0.50 max	0.03 max	0.03 max	4.00 6.00	0.5 max	0.44 0.65	--	70000 (48.45)	40000 (27.05)	20	143-217	35
A182F9	0.15 max	0.30 0.60	0.50 1.00	0.03 max	0.03 max	8.00 10.0	--Q	0.90 1.10	--	85000 (56.65)	55000 (380)	20	179-217 (BHN)	40

S-1875 / ASTM A105 CARBON STEEL ROUND BAR CHEMICAL & PHYSICAL PROPERTIES

ASTM GRADE	C	Mn	Si	S	P	Cr	Ni	Mo	Other	Tensile Psi (MPa)	Yield Psi (Mpa)	Elongation Strip/Round	Hardn.	Reduction in Area (%)
A 1-5 / IS 1875	0.35 max	0.60 1.05	0.35 max	0.50 max	0.040 max	--	--	--	--	70000 (485)	36000 (250)	30-Strip 22-Round	187 max	30 Round
AL-F2	0.30 max	1.35 max	0.15 0.30	0.040 max	0.035 max	0.30 max	0.40 max	0.12 max	Cu-0.4 max Cb-0.02 max Va-0.3 max	70000-95000 (485-655)	36000 (250)	30-Strip 22-Round	20/16 (-45-6°)	30 Round

Valves

Needle Valves :

Needle valves are designed in Screwed bonnet type & integral bonnet type with male or female screwed ends also available in bw / tube ends etc.

Material	: SS 304 / SS 316 / Carbon Steel / Monel / Hastelloy 'C' & Brass
Test Pressure	: upto 420 Kg/cm ² (High pressure valves also available on request)
Range	: 1/8 to 2"
Applications	: Needle valve are generally used in Food process Industries Chemical Plants, Oil & Petro Chemical Industries, Test Bench etc.

Ball Valves : (Medium Pressure & High Pressure)

Ball valves are designed in three, design with screw female end connections. Also end connections are available with tube ends etc.

Material	: SS 316, SS 304, Carbon Steel, Brass
Test Pressure	: upto 200 Kg/cm ² for Medium pressure & 400 Kg/cm ² for High Pressure
Range	: 1/8 to 2"
Applications	: These valves are generally useful where the full flow is required, For example, Oil & Petro chemical Industries, test bench etc.

Globe Valve :

Globe valves in union bonnet type & o s & y type (with separate body & yoke fitted with bolts) In which the separate seat & globe were provided, these valves are available with end connection screw / sw / bw & Tube ends etc.

Material	: A479/A182 Gr. F SS 316, SS 304, A 105
Range	: 1/4 to 2"
Test Pressure	: upto 420 Kg/cm ² (High Pressure Valves also available on request)
Applications	: Generally these valves are useful in Sugar Plants, Chemical & Mining Industries, Refineries, Power Plants etc.

Non Return Valve :

Inline NR V's are designed in two piece design. These valves are generally useful where the flow is required in one direction these valves are available in Screwed & Tube end connections.

Material	: SS 316, SS 304, Carbon Steel
Range	: 1/8 to 2"
Test Pressure	: Hydrotstatic - Body - 420 Kg/cm ² - Seat - 270 Kg/cm ² At Room Temp. Pneumatic - Seat - 40 Kg/cm ²

Adjustable Valve (Snubber) :

These are available in screwed design and suitable for adjusting the flow.

Test Pressure	:
Hydrotstatic	: Body - 420 Kg/cm ² Seat - 270 Kg/cm ² At Room Temp.
Pneumatic	: Seat - 40 Kg/cm ²
Material	: A 105, A276 SS 304, A276 SS 316, Monel, Hastelloy

Flow Control Valve :

These Valves are available in two types a) Flow control Needle Valve b) Flow Control Check Valve

Material	: SS 316, SS 304, Carbon Steel
Range	: 1/8 to 1"
Test Pressure	: Hydrotstatic - Body - 420 Kg/cm ² - Seat - 270 Kg/cm ² Pneumatic - Seat - 40 Kg/cm ² } At Room Temp.

Switching Service Ball Valve :

These valves are designed for instrumentation panels and for steam, oxygen lines etc.

These valves are available in following types

a) Two way Ball Valve b) Three way Ball Valve c) Four way Ball Valve

Three valves are available with Tube & Screwed ends.

Material	: SS 304, SS 316, Brass & CS	Test Pressure	: Hydtrostatic	- Body - 420 Kg/cm ² - Seat - 270 Kg/cm ²	} At Room Temp.
Range	: 1/8 to 1/2"		: Pneumatic	- Seat - 40 Kg/cm ²	

MANIFOLDS

Our specialty is in Manifolds. We have several types of Manifolds divided into various types.

	2 Valve Manifold a) Straight type b) Angle type		2 Valve Manifold "T" type (Integral type)		2 Valve Manifold Separately Mounted type
	3 Valve Manifold Separately Mounted type		3 Valve Manifold "T" type (Integral type)		3 Valve Manifold "H" type (Flange to flange)
	5 Valve Manifold Separately Mounted type		5 Valve Manifold "T" type (Integral type)		5 Valve Manifold "H" type (Flange to flange)

Applications - These manifolds are generally used in instrumentation & Automation for Pressure gauges, Transmitters, Differential transmitters, Static pressure etc.

Material	-	SS 316, SS 304, Carbon Steel
Range	-	1/8 to 1"
Test Pressure	-	
Hydrostatic	-	Body - 420 Kg/cm ² Seat - 270 Kg/cm ²
Pneumatic	-	Seat - 40 Kg/cm ²

} At Room Temp.

S. S. INSTRUMENTATION FERRULE FITTINGS



Union Elbow



Male Elbow



Female Elbow



Union Tee



Male Run Tee



Male Branch Tee



Female Run Tee



Female Branch



Union Cross



45° Elbow



Tube end Closure



Bulkhead Elbow



Positionable
Male Elbow



Nut Ferrule



Union



Reducing Union



Bulkhead Union



Male Connector



Female Connector



Male Adaptor



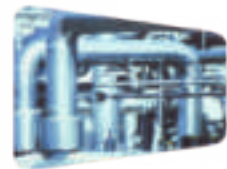
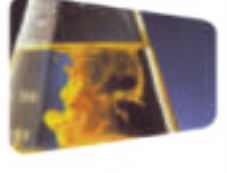
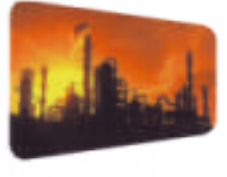
Female Adaptor

FORMULA OF CALCULATING WEIGHT

- 1) **Weight of Stainless Steel Pipe**
 $\text{O.D. (mm) - W. Thick (mm) x W. Thick (mm) x 0.0248 = Wt. Per Mtr.}$
 $\text{O.D. (mm) - W. Thick (mm) x W. Thick (mm) x 0.00756 = Wt. Per Feet}$
 - 2) **Weight of Stainless Steel Round Bar**
 $\text{Dia (mm) Dia (mm) x 0.00623 = Wt. Per Mtr.}$
 $\text{Dia (mm) x Dia (mm) x 0.0019 = Wt. Per Feet}$
 - 3) **Weight of Stainless Steel Square Bar**
 $\text{Dia (mm) x Dia (mm) x 0.00788 = Wt. Per Mtr.}$
 $\text{Dia (mm) x Dia (mm) x 0.0024 = Wt. Per Feet}$
 - 4) **Weight of Stainless Steel Hexagonal Bar**
 $\text{Dia (mm) x Dia (mm) x 0.00680 = Wt. Per Mtr.}$
 $\text{Dia (mm) x Dia (mm) x 0.002072 = Wt. per Feet}$
 - 5) **Weight of Stainless Steel Flat Bar**
 $\text{Width (mm) x Thickness (mm) x 0.00798 = Weight per Mtr.}$
 $\text{Width (mm) x Thickness (mm) x 0.00243 = Weight per Feet}$
 - 6) **Weight of Stainless Steel Sheets & Plates**
 $\text{Length (Mtrs.) x Width (Mtrs.) x Thick (mm) x 8 = Weight per PC}$
 $\text{Length (Feet) x Width (Feet) x Thick (mm) x 3/4 = Weight per PC}$
 - 7) **Weight of Stainless Steel Circle**
 $\text{Dia (mm) x Dia (mm) x Thick (mm) / 160 = Gms. per PC}$
 $\text{Dia (mm) x Dia (mm) x Thick (mm) x 0.0000063 = Kg. per PC}$
 - 8) **Weight of Brass Pipes / Copper Pipes**
 $\text{O.D. (mm) - W. Thick (mm) x W. Thick (mm) x 0.0260 = Wt. per Mtr.}$
 - 9) **SA Pipe**
 $\text{Total of 4 side 3.14 = Round Pipe Size}$
 - 10) **Weight of Aluminium Pipe**
 $\text{O.D. (mm) - W. Thick (mm) x W. Thick (mm) x 0.0083 = Wt. per Mtr.}$
 - 11) **Weight of Aluminium Sheet**
 $\text{Length (Mtrs) x Width (Mtrs) x Thick (mm) x 2.69 = Weight per PC}$
 - 12) **Weight of Square Pipe**
 $\text{OD (mm) x 4 } \div \text{ 3.14 = OD}$
- 1 METER = 3.281 FEET
 1 FT. = 304.8 MM
 1 INCH = 25.4 MM (1000 THOUGH)
 1 MM = 39.37 THROUGH
 MACRO = TEST OF CHECK WHETHER PIPE OF TUBE IS SEAMLESS OR WELDED
 MICRO = TEST OF CHECK BRAIN STRUCTURE OF SPECIMEN

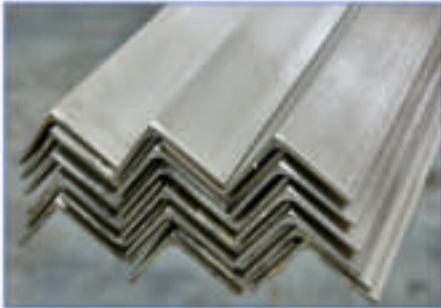
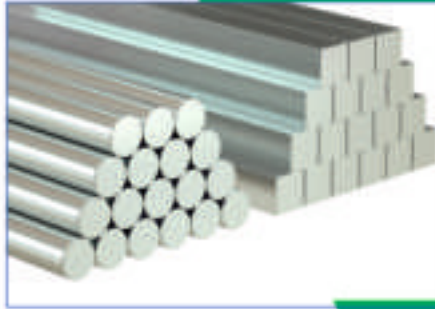
Industrial Application

Industrial APPLICATION



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- CEMENT
- CHEMICALS & FERTILIZERS
- CONSTRUCTION
- ENGINEERING
- FOOD
- NUCLEAR & THERMAL
- OIL & GAS
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