



CHIRAG STEEL

AN ISO 9001:2015 CERTIFIED CO.



FERROUS & NON FERROUS METALS



Company Profile

We are 30 years old company engaged in manufacturing quality pipe fittings, flanges stocking & supplying all other ferrous & non ferrous products to the discerning customers in India & Abroad.

As markets today demand better performance, more reliability & higher quality. We have expanded to new areas on the map globally, offering a larger range of products & services than even before.

With view in our mind of highlighting the products, it becomes necessary to dwell on various aspects of the products that we make and supply to various industries which are in continuous search of quality products.

Before introducing our products, we would like to answer the obvious question in your mind.

Some of the unique values that comes along with products

- Commitment to complete customer satisfaction
- Complete product knowledge
- Total Quality management
- State of the art manufacturing & assembling facilities
- Excellent sourcing capability
- Competitive pricing
- Prompt & reliable customer service

Quality Assurance

Every manufacturing phase is carried out with modern technique and is under the surveillance of our quality team that ensures all our products meet the national / international standards.

“NO COMPROMISE IN QUALITY” IS OUR MOTTO

Thus, main goal of **Chirag Steel** is high quality products. We have adopted quality analyst personnel to ensure complete satisfaction to our clients. As there is always a scope of betterment we are continually improving upon quality of products.

We have a stringent parameters set for the quality which are followed by all our employees. They see to it that the products are in accordance with the national / international standards.

From the time of procurement of raw material till the final delivery of the products, at every stage, our products are checked for various chemical and mechanical properties using the equipment certified by the Government and its agencies.

Pipes & Tubes

Pipes

Stainless Steel & Duplex Steel Pipe

Size	: ½" to 30"
Schedule	: Sch. 5 to Sch. XXS
Stainless Steel	: ASTM A312, A358 - TP 304/304H/304L/316/316H/ 316L/316Ti/309/310/317/317L/321/347/904L
Duplex Steel	: ASTM A790 - UNS S31803, S32750, S32760, S32205

Alloy Steel, Carbon Steel & LTCS Pipe

Size	: 1/2" to 36"
Schedule	: Sch. 5 to Sch. XXS
Alloy Steel Pipe	: ASTM A335 Gr. P5, P9, P11, P12, P22 & P91
Carbon Steel	: ASTM A 106 Gr. B ASTM A53
Low Temp. Pipe	: ASTM A 333 Gr. 6
Line Pipe	: API 5L, X 42, 46, 52, 56, 60, 70
Mild Steel &	: IS 1239, IS 3589
Galvanized Pipe	

Copper & Nickel Alloys pipe

Size	: ½" NB to 10" NB
Standard	: 10S/40S/80S
Copper Nickel	: C70600 (90:10), C71500 (70:30), C71640
Nickel	: UNS N02200, N02201
Monel	: UNS N04400, N05500,
Inconel	: UNS N06600, N06601, N06625, N08800, N08810, N08825
Hastelloy	: UNS N10276, N06022, N10665, N06455

Tubes

Size	: 6 mm OD to 219.08 mm OD
Thickness	: 0.6mm-10mm-Gauge : 22 SWG/BWG to 10 SWG/BWG
Form	: Round, Square, Rectangle, Coil, 'U' Shap
Length	: Standard Length & Cut Length
Stainless Steel Tube	: ASTM A-213, A-249, A- 312, A269-TP 304/304H/304L,316/316H/316L/316Ti, TP 309, 310, 317L, 321, 347, 904L etc.
Low Alloy Steel Tube	: ASTM A 213 - T-11, T-12, T-22, T-5, T-9 etc.
Carbon Steel Tube	: BS 3059 Gr. 360 / 440, SA 179, SA / ASTM A210 Gr. A1
Copper Nickel Tube	: ASTM B111, C70600 (90.10), C71500 (70:30), C71640
Admiralty Brass Tube	: ASTM B 111 C44300, C44400, C44500, C68700
Copper & Brass Tube	: ASTM B 188 C11000, C12200, C26000, C27000, C28000
Nickel Alloy Tube	: Nickel, Monel, Inconel, Alloy 20 etc.
Specialize	: EFW / EFSW Pipes with 100% Radiography

Test Certificate

Manufacturer Test Certification

En 3.1 & 3.2

IBR Test Certificate

Type :- Round | Square | Rectangle | Hydraulic





STAINLESS STEEL PIPE DIMENSION & WEIGHT-KG. PER MTR. (ANSI B36.19)

Nominal Bore		Outside Dia.	Schedule 5S		Schedule 10S		Schedule 20S		Schedule 40S		Schedule 80S		Schedule 160S		Schedule XXS	
mm	INCH	mm	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)
3	1/8	10.3	1.24	0.276	1.24	0.28	1.5	0.33	1.73	0.37	2.41	0.47	-	-	-	-
6	1/4	13.7	1.24	0.390	1.65	0.49	2.00	0.58	2.24	0.631	3.02	0.80	-	-	-	-
10	3/8	17.1	1.24	0.490	1.65	0.63	2.00	0.74	2.31	0.845	3.20	1.10	-	-	-	-
15	1/2	21.3	1.65	0.800	2.11	1.00	2.30	1.07	2.77	1.27	3.75	1.62	4.75	1.94	7.47	2.55
20	3/4	26.7	1.65	1.03	2.11	1.28	2.55	1.52	2.87	1.68	3.91	2.20	5.54	2.89	7.82	3.63
25	1	33.4	1.65	1.30	2.77	2.09	2.55	1.94	3.38	2.50	4.55	3.24	6.35	4.24	9.09	5.45
32	1 1/4	42.2	1.65	1.65	2.77	2.70	3.00	2.90	3.56	3.38	4.85	4.47	6.35	5.61	9.70	7.77
40	1 1/2	48.3	1.65	2.40	2.77	3.11	3.00	3.35	3.68	4.05	5.08	5.41	7.14	7.25	10.16	9.54
50	2	60.3	1.65	2.40	2.77	3.93	3.00	4.24	3.91	5.44	5.54	7.48	8.74	11.1	11.07	13.44
65	2 1/2	73.0	2.11	3.69	3.05	5.26	4.00	6.81	5.16	8.63	7.01	11.4	9.53	14.9	14.2	20.39
80	3	88.9	2.11	4.51	3.05	6.45	4.00	8.37	5.49	11.30	7.62	15.2	11.1	21.3	15.24	27.65
100	4	114.3	2.11	5.84	3.05	8.36	4.50	12.18	6.02	16.07	8.56	22.3	13.49	33.54	17.12	41.03
125	5	141.3	2.77	9.47	3.40	11.57	5.00	16.80	6.55	21.8	9.53	31.97	15.88	49.11	19.05	57.43
150	6	168.3	2.77	11.32	3.40	13.84	6.35	25.36	7.11	28.3	10.97	42.7	18.2	67.56	21.95	79.22
200	8	219.1	2.77	14.79	3.76	19.96	6.35	33.31	8.18	42.6	12.07	64.6	23.0	111.2	22.23	107.8
250	10	273.1	3.40	22.63	4.19	27.78	6.35	41.77	9.27	60.5	15.08	96.0	28.6	172.4	25.40	155.15
300	12	323.9	3.96	31.25	4.57	36.00	6.35	49.7	9.52	73.88	17.45	132.0	33.32	238.76	25.40	186.97
350	14	355.6	3.96	34.36	4.78	41.3	7.92	67.90	11.13	94.59	19.05	158.08	35.71	281.70	-	-
400	16	406.4	4.19	41.56	4.78	47.29	7.92	77.82	12.7	123.30	21.41	203.33	40.46	365.11	-	-
450	18	457.2	4.19	46.80	4.78	53.42	7.92	87.74	14.27	155.80	23.8	254.36	45.71	466.40	-	-
500	20	508.0	4.78	59.25	5.54	68.71	9.53	117.14	15.09	183.42	26.19	311.2	49.99	564.68	-	-
600	24	609.6	5.54	82.47	6.35	94.45	9.53	141.11	17.48	255.41	30.96	442.08	59.54	808.22	-	-

CARBON STEEL SEAMLESS PIPE DIMENSION & WEIGHT - KG. PER MTR. (ANSI B 36.10)

Nominal Pipe size	O/D	Schedule 10		Schedule 20		Schedule 30		Schedule STD		Schedule 40		Schedule 60		Schedule Extra Strong (XS)		Schedule 80		Schedule 100		Schedule 120		Schedule 140		Schedule 160		Schedule Double Extra Strong (XXS)		
		mm	kg/m	mm	kg/m	mm	kg/m	wall	wt.	wall	wt.	wall	wt.	wall	wt.	wall	wt.	wall	wt.	wall	wt.	wall	wt.	wall	wt.	wall	wt.	wall	wt.
3	1/8	10.3						1.73	0.37	1.73	0.37			2.41	0.47	2.41	0.47											
6	1/4	13.7						2.24	0.63	2.24	0.63			3.02	0.80	3.02	0.80											
10	3/8	17.1						2.31	0.84	2.31	0.84			3.20	1.10	3.20	1.10											
15	1/2	21.3						2.77	1.27	2.77	1.27			3.73	1.62	3.73	1.62							4.78	1.95	7.5	2.55	
20	3/4	26.7						2.87	1.69	2.87	1.69			3.91	2.20	3.91	2.20							5.6	2.90	7.82	3.64	
25	1	33.4						3.38	2.50	3.38	2.50			4.55	3.24	4.55	3.24							6.35	4.24	9.1	5.45	
32	1 1/4	42.2						3.56	3.39	3.56	3.39			4.85	4.47	4.85	4.47							6.35	5.61	9.7	7.77	
40	1 1/2	48.3						3.68	4.05	3.68	4.05			5.08	5.41	5.08	5.41							7.14	7.25	10.2	9.56	
50	2	60.3						3.91	5.44	3.91	5.44			5.54	7.48	5.54	7.48							8.74	11.11	11.07	13.4	
65	2 1/2	73.0						5.16	8.63	5.16	8.63			7.01	11.41	7.01	11.41							9.53	14.92	14.0	20.4	
80	3	88.9						5.49	11.3	5.49	11.3			7.62	15.27	7.62	15.3							11.13	21.35	15.24	27.7	
90	3 1/2	101.6						5.74	13.57	5.74	13.57			8.08	18.63	8.08	18.63							-	-	16.2	34.1	
100	4	114.3						6.02	16.07	6.02	16.07			8.56	22.3	8.56	22.3			11.13	28.32			13.5	33.5	17.12	41.03	
125	5	141.3						6.55	21.77	6.55	21.77			9.53	30.9	9.53	30.9			12.7	40.2			15.9	49.11	19.0	57.4	
150	6	168.3						7.11	28.26	7.11	28.26			10.97	42.5	10.97	42.5			14.3	54.2			18.3	67.5	21.95	79.22	
200	8	219.1			6.35	33.3	7.0	36.8	8.18	42.5	8.18	42.55	10.31	53.10	12.7	64.6	12.7	64.5	15.1	75.92	18.3	90.4	20.6	100.9	23.0	111.27	22.23	108.0
250	10	273.0			6.35	41.7	7.8	51.3	9.27	60.3	9.27	60.31	12.70	81.50	12.7	81.5	15.1	96.0	18.3	114.7	21.44	133.0	25.4	155	28.6	172.3	25.4	155.0
300	12	323.9			6.35	49.7	8.4	65.2	9.53	73.8	10.31	79.73	14.30	109.0	12.7	97.4	17.5	132.0	21.4	160.0	25.4	187.0	28.6	208	33.3	238.7	25.4	187.0
350	14	355.6	6.35	54.6	7.92	67.9	9.53	81.3	9.53	81.3	11.13	94.55	15.10	126.4	12.7	107.4	19.0	158.0	23.8	195.0	27.8	224.0	31.8	253.5	35.7	281.7		
400	16	406.4	6.35	62.6	7.92	77.9	9.53	93.3	9.53	93.3	12.7	123.3	16.70	160.0	12.7	123.3	21.44	203.5	26.2	245.5	30.9	286.6	36.53	333	40.5	365.4		
450	18	457.0	6.35	70.5	7.92	87.7	11.13	122.4	9.53	105.0	14.27	156.0	19.05	206.0	12.7	139.0	23.8	254.6	29.36	309.6	34.9	363.6	39.7	408.3	45.2	459.4		
500	20	508.0	6.35	78.5	9.53	117.2	12.7	155.1	9.53	117.2	15.09	183.4	20.62	248.5	12.7	155.1	26.2	311.2	32.54	381.5	38.1	441.5	44.4	508	50.0	564.8		
550	22	559.0	6.35	86.5	9.53	129.0	12.7	171.0	9.53	129.0			22.20	294.0	12.7	171.0	28.6	373.8	34.9	451.4	41.3	527.0	47.6	600	54.0	672.0		
600	24	610.0	6.35	94.5	9.53	141.0	14.3	209.7	9.53	141.0	17.48	255.4	24.61	355.0	12.7	187.0	30.96	442.08	38.89	547.7	46.0	640.0	52.4	720.15	59.5	808.22		
650	26	660.0	7.92	127.0	12.7	203.0			9.53	153.0					12.7	202.7												
700	28	711.0	7.92	137.4	12.7	218.7	15.88	271.2	9.53	165.0					12.7	218.7												
750	30	762.0	7.92	147.3	12.7	234.6	15.88	292.18	9.53	176.8					12.7	234.7												
800	32	813.0	7.92	157.0	12.7	250.6	15.88	312.0	9.53	188.2	17.48	342.9			12.7	250.6												
850	34	864.0	7.92	167.0	12.7	266.6	15.88	332.1	9.53	200.3	17.48	364.9			12.7	266.6												
900	36	914.4	7.92	176.9	12.7	282.3	15.88	351.7	9.53	212.5	19.05	420.4			12.7	282.2												



CARBON STEEL, ALLOY STEEL, LOW TEMP, 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	50mm MIN Longitudinal	
ASTM A 53/A	AW	0.25MAX	0.95MAX	0.050	0.060	-	-	-	331MIN	207MIN	36	<u>Cr</u> <u>Mo</u> <u>Cu</u> <u>Ni</u> <u>Va</u> 0.40 0.15 0.40 0.40 0.08 Five elements not to exceed 1%
ASTM A 53/B	AW	0.30MAX	1.20MAX	0.050	0.060	-	-	-	413MIN	240MIN	29.5	
ASTM A 106/A	AW	0.25MAX	0.27-0.93	0.025	0.025	0.10MIN	0.40MAX	0.15MAX	330MIN	205MIN	35/28	
ASTM A 106/B	AW	0.30MAX	0.29-1.06	0.025	0.025	0.10MIN	0.40MAX	0.15MAX	415 MIN	240MIN	30/22	
ASTM A 106/C	AW	0.35MAX	0.29-1.06	0.025	0.025	0.10MIN	0.40MAX	0.15MAX	485MIN	275MIN	30/22	
ASTM A 179	MW	0.06-0.18	0.27-0.63	0.048	0.048	-	-	-	325MIN	180MIN	35.0	Hardness 72 HRB Max
ASTM A 214	MW	0.18MAX	0.27-0.63	0.050	0.050	-	-	-	385MIN	180MIN	35.0	Hardness 72 HRB Max
ASTM A 192	MW	0.06-0.18	0.27-0.63	0.048	0.048	0.25MAX	-	-	325MIN	180MIN	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	380MIN	205MIN	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	365MIN	195MIN	30/22	Hardness 81 HRB Max
ASTM A 209/T1B	MW	0.14MAX	0.30-0.80	0.045	0.045	0.10-0.50	-	0.44-0.65	415MIN	220MIN	30/22	Hardness 77 HRB Max
ASTM A 210/A-1	MW	0.27max	0.93max	0.048	0.058	0.10MIN	-	-	415MIN	255MIN	30/22	Hardness 79 HRB Max
ASTM A 210/C	MW	0.35MAX	0.29-1.06	0.048	0.058	0.10MIN	-	-	485MIN	275MIN	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	415MIN	205MIN	30/22	Hardness 85 HRB Max
ASTM A 213/T5	MW	0.15MAX	0.30-0.60	0.030	0.030	0.50MAX	4.00-6.00	0.44-0.65	415MIN	205MIN	30/22	Hardness 85 HRB Max
ASTM A 213/T11	MW	0.15MAX	0.30-0.60	0.030	0.030	0.50-1.00	1.00-1.50	0.44-0.65	415MIN	205MIN	30/22	Hardness 85 HRB Max
ASTM A 213/T12	MW	0.15MAX	0.30-0.61	0.045	0.045	0.50MAX	0.80-1.25	0.44-0.65	415MIN	205MIN	30/22	Hardness 85 HRB Max
ASTM A 213/T22	MW	0.15MAX	0.30-0.60	0.030	0.030	0.50MAX	1.90-2.60	0.87-1.13	415MIN	205MIN	30/22	Hardness 85 HRB Max
ASTM A 333/1	AW	0.30MAX	0.40-1.06	0.025	0.025	-	-	-	380MIN	205MIN	25/20	IMPACT AS -50F FOR 40X10J/18/14 -50F40X10J/18/14 90 HRB MAX
ASTM A 333/6	AW	0.30MAX	0.29-1.06	0.025	0.025	0.10MIN	-	-	415MIN	240MIN	30/22	
ASTM A 334/1	AW	0.30MAX	0.40-1.06	0.025	0.025	-	-	-	380MIN	205MIN	35/28	
ASTM A 334/6	MW	0.30MAX	0.29-1.06	0.025	0.025	0.10MIN	-	-	415MIN	240MIN	30/22	
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	380MIN	205MIN	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	380MIN	205MIN	30/22	
ASTM A 335/P5	AW	0.15MAX	0.30-0.60	0.025	0.025	0.50MAX	4.00-6.00	0.45-0.65	415MIN	205MIN	30/22	
ASTM A 335/P9	AW	0.15MAX	0.30-0.60	0.025	0.025	0.25-1.00	8.00-10.00	0.09-1.10	415MIN	172MIN	30/22	
ASTM A 335/P11	AW	0.15MAX	0.30-0.60	0.025	0.025	0.50-1.00	1.00-1.50	0.44-0.65	415MIN	205MIN	30/22	
ASTM A 335/P12	AW	0.15MAX	0.30-0.61	0.025	0.025	0.50MAX	0.80-1.25	0.44-0.65	415MIN	205MIN	50/22	
ASTM A 335/P22	AW	0.15MAX	0.30-0.60	0.025	0.025	0.50MAX	1.90-2.60	0.87-1.13	415MIN	205MIN	30/22	
BS/3059/1/33		0.15Max	0.30-0.70	0.050	0.050	-	-	-	324-441	186MIN	25	
BS/3059/2/33		0.15MAX	0.40-0.70	0.050	0.050	0.10-0.35	-	-	324-441	186MIN	21	
BS/3059/2/45		0.12-0.18	0.90-1.20	0.035	0.035	0.10-0.35	-	-	441-560	245MIN	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	235MIN	22	
DIN/17175/ST35.8		0.17MAX	0.40MIN	0.040	0.040	0.35MAX	-	-	340-441	235MIN	25	
DIN/17175/ST45.8		0.22MAX	0.45MIN	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	284MIN	21	
DIN/17175/13CrMO44		0.10-0.18	0.40-0.70	0.040	0.040	0.10-0.35	0.70-1.60	0.40-0.50	441-570	294MIN	22	
DIN/17175/10CrM910		0.15MAX	0.40-0.60	0.040	0.040	0.15-0.50	2.0-2.5	0.9-1.10	441-570	294MIN	22	
ASTM A 199/T5	MW	0.50-0.15	0.30-0.60	0.030	0.030	0.50MAX	4.00-6.00	0.45-0.65	415MIN	170MIN	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	415MIN	170MIN	30/22	HARDNESS 85 HRB MAX
ASTM A 199/T22	MW	0.05-0.15	0.30-0.60	0.030	0.030	0.50MAX	1.90-2.60	0.87-1.13	415MIN	170MIN	30/22	HARDNESS 85 HRB MAX
ASTM A 199/T4	MW	0.15MAX	0.30-0.60	0.030	0.030	0.50-1.00	2.15-2.85	0.44-0.65	415MIN	170MIN	30/22	HARDNESS 85 HRB MAX
ASTM A 199/T7	MW	0.15MAX	0.30-0.60	0.030	0.030	0.50-1.00	6.00-8.00	0.45-0.65	415MIN	170MIN	30/22	HARDNESS 85 HRB MAX
ASTM A 200/T5	MW	0.15MAX	0.30-0.60	0.030	0.030	0.50-1.00	4.00-6.00	0.45-0.65	415MIN	170MIN	30/22	HARDNESS 85 HRB 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	415MIN	170MIN	30/22	HARDNESS 85 HRB MAX
ASTM A 200/T22	MW	0.05-0.15	0.30-0.60	0.030	0.030	0.50MAX	1.90-2.60	0.87-1.13	415MIN	170MIN	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	415MIN	170MIN	30/22	HARDNESS 85 HRB MAX
ASTM A 200/T7	MW	0.15MAX	0.30-0.60	0.030	0.030	0.50-1.00	6.00-8.00	0.45-0.65	415MIN	170MIN	30/22	HARDNESS 85 HRB MAX
ASTM A 199/T9	MW	0.15MAX	0.30-0.60	0.030	0.030	0.25-1.00	8.00-10.0	0.90-1.10	415MIN	170MIN	30/22	HARDNESS 89 HRB MAX

Stainless Steel is essentially a low carbon steel which contains chromium at 10% or more by weight. It is this addition of chromium that gives the steel its unique stainless corrosion resisting Properties. The corrosion resistance and other useful properties of the steel are enhanced by increased chromium content and the addition of other elements such as molybdenum, nickel and nitrogen

Chemical Composition of Stainless Steel										Nearest Equivalent Specification		
USN NO.	AISI Grade	C Max	Mn Max	P Max	S Max	Si Max	Cr	Ni	Mo	Cu	I.S.	Other Element

Austenitic

S20100	201	0.15	5.5/7.5	0.06	0.03	1	16.0/18.0	3.5/5.5	-	-	-	-
S20200	202	0.15	7.5/10	0.06	0.03	1	17.0/19.0	4.0/6.0	-	-	-	-
S30100	301	0.15	2.0max	0.045	0.040	1.0	16.0/18.0	6.0/8.0	-	-	10Cr17Ni7	-
S30200	302	0.15	2.0	0.045	0.030	1.0	17.0/19.0	8.0/10.0	-	-	07Cr18Ni9	E-4-3-4%
S30300	303	0.15	2.0	0.045	0.15 min	1.0	17.0/19.0	8.0/10.0	-	-	15Cr18Ni9	E-4-1%Max
S30400	304	0.08	2.0	0.045	0.030	1.0	18.0/20.0	8.0/10.0	-	-	04Cr18Ni10	-
S30403	304L	0.030	2.0	0.045	0.030	1.0	18.0/20.0	8.0/12.0	-	-	02Cr18Ni11	-
S30453	304LN	0.030	2.0	0.045	0.030	0.75	18.0/20.0	8.0/11.0	-	-	-	-
S30409	304H	0.05	2.0	0.045	0.03	1	18.0/20.0	8.5/9.5	-	-	-	CU:-2-2.50
S30900	309	0.20	2.0 max	0.045	0.030	1.0	22.0/24.0	12.0/15.0	-	-	20Cr24Ni12	-
S30908	309S	0.08	2.0	0.045	0.030	1.0	22.0/24.0	12.0/15.0	-	-	-	-
S31009	310H ⁴	0.25	2.0	0.045	0.030	1.50	24.0/26.0	19.0/22.0	-	-	10Cr25Ni12	-
S31008	310S	0.08	2.0	0.045	0.030	1.50	24.0/26.0	19.0/22.0	-	-	-	-
S31600	316	0.08	2.0	0.045	0.030	1.0	16.0/18.0	10.0/14.0	2.0/3.0	-	04Cr17Ni12Mo2	-
S31603	316L	0.030	2.0	0.045	0.030	1.0	16.0/18.0	10.0/14.0	2.0/3.0	-	03Cr17Ni12Mo2	-
S31653	316LN	0.030	2.0	0.045	0.030	0.75	16.0/18.0	10.0/14.0	2.0/3.0	-	-	-
S31635	316Ti	0.080	2.0	0.045	0.030	1.0	16.0/18.0	10.0/14.0	2.0/3.0	-	-	Ti5xCmin
S31700	317	0.08	2.0	0.045	0.030	1.0	18.0/20.0	11.0/15.0	3.0/4.0	-	-	-
S31703	317L	0.030	2.0	0.045	0.030	1.0	18.0/20.0	11.0/15.0	3.0/4.0	-	-	N:0.10/0.22
S31753	317LN	0.03	2.0	0.045	0.03	1	18.0/20.0	11.0/15.0	3.0/4.0	-	-	N:0.10/0.22
S32100	321	0.08	2.0	0.045	0.030	1.0	17.0/19.0	9.0/12.0	-	-	04Cr18Ni10Ti20	Ti5xCmin
S34700	347	0.08	2.0	0.045	0.030	1.0	17.0/19.0	9.0/12.0	-	-	04Cr18Ni10Nb-40	Nb/Ta10xCmin
N08904	904L ⁶	0.02	2.0	0.045	0.035	1	19.0/23.0	23.0/28.0	4.0-5.0	-	-	CU : 1-2

Ferritic

S41000	410	0.15	1.00	0.040	0.030	1.0	11.50-13.50	0.75	...	...	...	...
S41008	410S	0.08	1.00	0.040	0.030	1.0	11.50-13.50	0.60	...	...	...	...
S42900	429 ⁶	0.12	1.00	0.040	0.030	1.0	14.00-16.00	...	...	...	...	...
S43000	430	0.12	1.00	0.040	0.030	1.0	16.00-18.00	0.75	...	...	...	...
S43035	439	0.07	1.00	0.040	0.030	1.0	17.00-19.00	0.050	...	0.04	...	Ti 0.20 + 4 (C+N) min; 1.10 max Al 0.15max
S44400	444	0.025	1.00	0.040	0.030	1.0	17.5-19.5	1.00	1.75-2.50	0.035	...	Ti+Cb 0.20+4 (C+N min)
	409L	≤ 0.030	≤ 1.00	≤ 1.00	-	-	-	10.50~11.75	~	-	-	Ti 6 X C-0.75

Duplex & Super Duplex

S31803	---	0.030	2.00	0.030	0.020	1.0	21.0-23.0	4.5-6.5	2.5-3.5	---	0.08-0.20	---
S32550	255 ⁶	0.040	1.50	0.040	0.030	1.0	24.0-27.0	4.5-6.5	2.9-3.9	1.50-2.50	0.10-0.25	---
S32750	2507	0.030	1.20	0.035	0.020	0.8	24.0-26.0	6.0-8.0	3.0-5.0	0.50	0.24-0.32	---
S32760	---	0.030	1.00	0.030	0.010	1.0	24.0-26.0	6.0-8.0	3.0-4.0	0.50-1.00	0.20-0.30	W 0.50-1.00



SWG DIMENSIONS AND WEIGHTS (SWG WALL THICKNESS)

Outside Diameter		22 SWG 0.711 mm	20 SWG 0.914 mm	18 SWG 1.218 mm	18 SWG 1.625 mm	14 SWG 2.032 mm	12 SWG 2.641 mm	11 SWG 2.946 mm	10 SWG 3.257 mm
Inches	mm	Kg / m	Kg / m	Kg / m	Kg / m	Kg / m	Kg / m	Kg / m	Kg / m
1/4"	6.350	--	0.124	0.157	0.192	--	--	--	--
5/16"	7.950	--	0.161	0.205	0.257	--	--	--	--
3/8"	9.525	--	0.197	0.253	0.321	0.381	--	--	--
1/2"	12.700	0.213	0.270	0.350	0.451	0.543	0.665	0.720	--
5/8"	15.875	0.270	0.342	0.447	0.580	0.704	0.875	0.954	--
3/4"	19.050	--	0.415	0.544	0.709	0.866	1.090	1.190	1.290
7/8"	22.225	0.383	0.488	0.641	0.838	1.030	1.300	1.420	1.550
1"	25.400	0.440	0.560	0.738	0.967	1.190	1.510	1.660	1.800
1 1/4"	31.750	0.553	0.706	0.931	1.230	1.510	1.930	2.130	2.320
1 1/2"	38.100	0.666	0.851	1.130	1.480	1.840	2.350	2.590	2.840
1 3/4"	44.450	0.779	0.996	1.320	1.740	2.160	2.770	3.060	3.350
2"	50.800	0.892	1.140	1.510	2.000	2.480	3.190	3.530	3.870
2 1/2"	63.500	--	--	1.900	2.520	3.130	4.030	4.470	4.910
3"	76.200	--	--	2.290	3.030	3.770	4.870	5.400	5.640
3 1/2"	88.900	--	--	2.670	3.550	4.420	5.700	6.340	6.970
4"	101.600	--	--	3.060	4.070	5.070	6.540	7.280	8.010
5"	127.000	--	--	3.628	4.970	6.010	7.926	--	9.673
5 1/2"	139.700	--	--	4.000	5.481	6.624	8.736	--	10.675
6"	152.400	--	--	4.360	6.000	7.330	9.545	--	11.699
6 1/2"	161.100	--	--	4.720	6.480	7.840	10.419	--	12.720

TOLERANCE OF ASTM SPECIFICATION STAINLESS STEEL TUBES AND PIPES

Specification	Allowable Outside Diameter Variation in mm			Allowable wall Thickness Variation		Exact Length Tolerances in mm		Testing
	Diameter	Over	Under	Over %	Under%	Over	Under	
ASTM - 270 Seamless & Welded Sanitary Tubes	25.4 38.1 50.8 63.5 76.2 101.6	.05 .05 .05 .05 .08 .08	.20 .20 .28 .28 .30 .38	+12.5 +12.5 +12.5 +12.5 +12.5 +12.5	-12.5 -12.5 -12.5 -12.5 -12.5 -12.5	3.2 3.2 3.2 3.2 3.2 3.2	0 0 0 0 0 0	Reverse Flattering test 100% Hydrostatic test External polish on all tubes Refer to ASTM A-270
ASTM A - 249 Welded Boiler, Super heater, Heat Exchanger and Condenser Tubes	Under 25.4 25.4 - 38.1 incl. 38.1 - 50.8 excl. 50.8 - 63.5 excl. 63.5 - 76.2 excl. 76.2 - 101.6 incl.	0.1016 0.1524 0.2032 0.2540 0.3048 0.3810	0.1016 0.1524 0.2032 0.2540 0.3048 0.3810	+10 +10 +10 +10 +10 +10	-10 -10 -10 -10 -10 -10	3.175 3.175 3.175 3.76 4.76 4.76	0 0 0 0 0 0	Tension Test, Fletting test Flare Test * Reverse Bend Test Hardness Test 100% Hydrostatic Test *Reverse Flattering Test Refer to ASTM A-450 Whenever applicable
ASTM A - 312 Seamless & Welded Pipes Test	13.7 - 48.3 incl. 48.3 - 114.3 incl. 114.3 - 220 incl.	0.40 0.79 1.59	0.79 0.79 0.79	Minimum Wall tubes 12.5% under nominal wall Specified	6.4 6.4	0 0 6.4	Tension Test Fletting Test 0	100% Hydrostatic (Normally Random lengths ordered)
ASTM A - 269 Seamless & Welded Service	Upto 12.7 12.7 - 38.1 excl. 38.1 - 88.9 excl. 88.9 - 139.7 excl. 139.7 - 203.2 excl.	0.13 0.13 0.25 0.38 0.76	0.13 0.13 0.25 0.38 0.76	+15 +10 +10 +10 +10	-15 -10 -10 -10 -10	3.2 3.2 4.8 4.8 4.8	0 0 0 0 0	Tension Test Flange Test (Welded only) Hardness Test Reverse Flattering test (Welded only) 100% Hydrostatic Test Refer to ASTM A-269
ASTM A - 213 Seamless Boiler, Superheater and Heat Exchanger Tubes	Upto 25.4 25.4 - 38.1 incl. 38.1 - 50.8 excl. 50.8 - 63.5 incl. 63.5 - 73.2 excl. 76.2 - 101.6 incl.	0.1016 0.1524 0.2032 0.2540 0.3048 0.3810	0.1016 0.1524 0.2032 0.2540 0.3048 0.3810	+20 +20 +22 +22 +22 +22	-0 -0 -0 -0 -0 -0	3.175 3.175 3.176 3.760 4.760 4.760	0 0 0 0 0 0	Tension Test Flattening Test Hardness test 100% Hydrostatic Test Refer to ASTM A-450
ASTM A - 268 Seamless & Welded Fertic Stainless Steel tubes	Upto 12.7 12.7 - 38.1 excl. 38.1 - 88.9 excl. 88.9 - 168.9 excl.	0.13 0.13 0.25 0.38	0.13 0.13 0.25 0.38	+15 +10 +10 +10	-15 -10 -10 -10	3.2 3.2 4.8 4.8	0 0 0 0	Tension Test Flange Test CERW only Hardness Test Reverse Flattering Test 100% Hydrostate Test
ASTM A - 358 For Welded big Diameter Pipes	For all size	+0.5%	0.5%	No Limit	-0.3 mm	Customer's Specification		



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	3.25	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
 - 10 percent
 (2) **Seamless tubes** + Not Limited
 - 12.5 percent

(b) **Weight :**
 (1) **Single tube (light series)** + 10 percent
 - 8 percent
 (2) **Single tube (medium and heavy series)** + 10 percent

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

Nominal Bore mm	Maximum Permissible Pressure N/mm ²	Maximum Permissible Kg./cm ²	Maximum Permissible Temperature °C
Upto and Including 25 mm	1.20	12.24	260
Over 25 mm upto and Including 40 mm	1.03	10.50	260
Over 40 mm upto and Including 80 mm	0.86	8.77	260
over 80 mm upto and Including 100 mm	0.69	7.04	260
	0.83	8.47	177
Over 100 mm upto and Including 125 mm	0.69	7.04	171
Over 125 mm upto and Including 150 mm	0.50	5.10	160

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

Butt-weld Fittings

Stainless Steel & Duplex Steel

Stainless Steel : ASTM A 403 WP - 304/304H/304L/316/316H
316/316Ti, 309, 310, 317L, 321, 347, 904L

Duplex & Super Duplex : Standard
ASTM A815 - UNS S31803, S32205 (2205)
Lean
ASTM A815, 790 - UNS S32304 (2304)
Super Duplex
ASTM A815, 790 - UNS S32750 (2507)
UNS S32760 (Zeron 100)

Hi-Nickel & Titanium

Hi-Nickel

Nickel : ASTM B 366 N02200, N02201

Monel : ASTM B 366 N04400
DIN N05500

Inconel : ASTM B 366 N06600, N06601, N06617
ASTM B 366 N07718
ASTM B 366 N06625

Incoloy : ASTM B 366 N08800, N08810
ASTM B 366 N08825
ASTM B 366 N08020

Hastelloy : ASTM B 366 N10276, N06022
ASTM B 366 N10665
ASTM B 366 N06455

Titanium

Commercially : ASTM B 363

Pure Gr.1 R 56250 (CP4) Gr.2 R 50400 (CP3)
Gr.3 R 50550 (CP2) Gr.4 R 50700 (CP1)
Gr.7 R 52400 Gr.11 R 52250

Alloys : ASTM B 363
Gr.5 R 56400 (6Al-4V)
Gr.23 R 56401 (6Al-4V-ELI)
Gr.12 R 53400

Alloy Steel & Carbon Steel

Alloy Steel : ASTM A 234 WPB WP5, WP9, WP11,
WP12, WP91

Carbon Steel : ASTM A 234 WPB, IS 1239 PART II

Low Temp. CS : ASTM A-420 WPL6

Other Service : Hot Dip Galvanizing, Sand Blasting

Cupro Nickel

ASTM B 171 C70600 (90:10),

ASTM B 171 C71500 (70:30)

Size

Pipes : ½" to 30"

Schedule : Sch. 5 to Sch. XXS

Types

Stubend - (Long & Short)	Elbow (45 DEG, 90 DEG, 180 DEG)
U Bend	Tee - (Barred, Equal, Reducing)
End Cap	Reducer - (Concentric & Eccentric)
Laterals	Nipple - (Swage & Barrel)

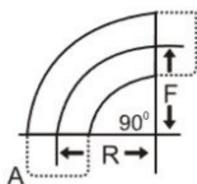
Specialize : EFW / EFSW Pipes with 100% Radiography



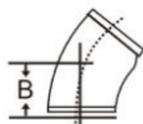


DIMENSIONS IN M.M. BUTT WELDING FITTINGS TO ANSI B16.9
STAINLESS STEEL ASTM A 403 / CARBON STEEL & ALLOY STEEL ASTM A 234

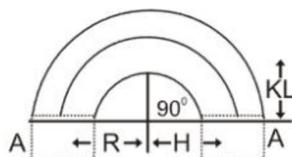
ELBOWS 90°



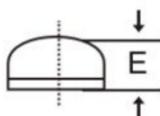
ELBOWS 45°



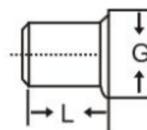
90° RETURN BENDS



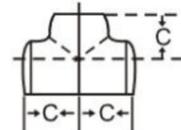
CAPS



LAP JOINT STUB ENDS



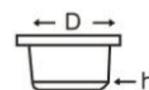
TEES



CONC. AND ECC. REDUCER



SHORT STUBENDS



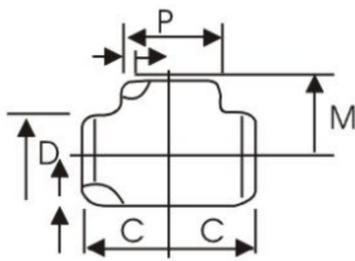
NOM. BORE	PIPE O.D.	WALL THICKNESS				RADIUS R				A	B	C	E	G	L		H	D	h
		5S	10S	40S	80S	1D	1.5D	2D	3D						SHORT	LONG			
1/2	21.3	1.65	2.11	2.77	3.75	12.7	19.05	25.4	38.1	12.7	15.9	25.4	25.4	34.9	50.8	76.2	50.8	42	8
3/4	26.7	1.65	2.11	2.87	3.91	19.05	28.57	38.10	57.15	19.06	11.1	28.6	25.4	42.8	50.8	76.2	50.8	52	8
1"	33.40	1.65	2.77	3.38	4.55	25.4	38.1	50.8	76.2	25.4	22.2	38.1	38.1	50.8	50.8	101.6	50.8	62	10
1 1/4"	42.2	1.65	2.77	3.56	4.85	31.75	47.6	63.5	95.25	31.75	25.0	47.6	28.1	63.5	50.8	101.6	50.8	72	12
1 1/2"	48.3	1.65	2.77	3.68	5.08	38.1	57.15	76.2	114.3	38.10	28.6	57.2	38.1	73.0	50.8	101.6	63.5	82	12
2"	60.30	1.65	2.77	3.91	5.54	50.8	76.2	101.6	152.4	50.8	34.0	63.5	38.1	92.0	63.5	152.4	76.2	98	16
2 1/2"	73.00	2.11	3.05	5.16	7.01	63.5	95.25	127.0	190.5	63.5	63.5	38.1	92.0	63.5	63.5	152.4	88.9	118	16
3"	88.90	2.11	3.05	5.49	7.62	76.2	114.30	152.4	228.6	76.2	50.8	85.7	50.8	127.0	63.5	152.4	88.9	130	18
3 1/2"	101.60	2.11	3.05	5.74	8.08	88.9	133.35	177.8	266.7	88.9	57.2	95.3	63.5	139.7	76.2	152.4	101.6	140	18
4"	114.30	2.11	3.05	6.02	8.56	101.6	152.4	203.2	304.8	101.6	63.5	104.8	83.5	157.2	76.2	152.4	101.6	168	20
5"	141.30	2.77	3.40	6.55	9.53	127.0	190.5	254.0	381.0	127.0	82.6	123.8	76.2	185.7	76.2	203.2	127.0	188	25
6"	168.30	2.77	3.40	7.11	10.97	152.4	228.6	304.8	457.2	152.4	95.3	158.7	88.9	203.2	139.7	212	25	215	25
8"	219.1	2.77	3.76	8.18	12.07	203.2	304.8	406.4	609.6	203.2	127.0	190.5	101.6	270.0	101.6	203.2	152.4	268	30
10"	273.1	3.40	4.19	9.27	15.08	254.0	381.0	508.0	762.0	254.0	158.7	215.9	127.0	324.0	127.0	254.0	177.8	330	35
12"	323.9	3.96	4.57	9.52	17.45	304.0	457.2	609.6	914.4	304.0	190.5	254.0	152.4	381.0	152.4	254.0	203.2	400	40
14"	355.60	3.96	4.78	11.13	19.05	355.6	533.4	711.2	1066.8	355.6	222.2	280.0	165.1	412.8	152.4	305.0	330.2	-	-
16"	406.40	4.19	4.78	12.7	21.41	406.4	609.6	812.8	1219.2	496.2	254.0	304.8	177.8	470.0	152.4	305.0	355.6	-	-
18"	457.20	4.19	4.78	14.27	23.8	457.2	685.8	914.4	1371.6	457.1	285.7	343.0	203.2	533.4	152.4	305.0	355.6	-	-
20"	508.00	4.76	5.54	15.09	26.19	508.0	762.0	1016.0	1524.0	508.0	317.6	281.0	228.6	584.2	152.4	305.0	508.0	-	-
24"	609.60	5.54	6.35	17.48	30.94	609.6	914.4	1219.0	1829.0	-	381.0	431.8	266.7	698.5	152.4	305.0	508.0	-	-

STANDARDS : All dimensions are in mm and confirm to ABSI B 16.9 and MSS SP-43 Where applicable - Dimensional tolerance are in accordance with ANSI B 16.9 M.S.S. SP 43 Where applicable.

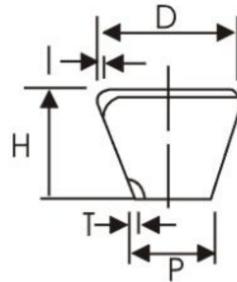
RADIUS : Radius of Short Radius Elbow is 1 times nominal pipe diameter, Radius of Long Radius Elbows is 1 1/2 time nominal pipe diameter



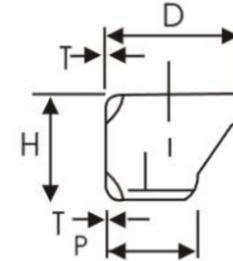
DIMENSION OF BUTT-WELD FITTINGS ANSI B-16.9 / B-16.28



REDUCING TEES



CONCENTRIC REDUCERS



ECCENTRIC REDUCERS

Nominal Pipe Size		Outside Diameter		Center to End		Length
INCH	MM	D	P	C	M	H
1/2 x 3/8	15 x 10	21.3	17.1	25	25	-
1/2 x 1/4	15 x 8	21.3	13.7	25	25	-
3/4 x 1/2	20 x 15	26.7	21.3	29	29	38
3/4 x 3/8	20 x 10	26.7	17.1	29	29	38
1 x 3/4	25 x 20	33.4	26.7	38	38	51
1 x 1/2	25 x 15	33.4	21.3	38	38	51
1 1/4 x 1	32 x 25	42.2	33.4	48	48	51
1 1/4 x 3/4	32 x 20	42.2	26.7	48	48	51
1 1/4 x 1/2	32 x 15	42.2	21.3	48	48	51
1 1/2 x 1 1/4	40 x 32	48.3	42.2	57	57	64
1 1/2 x 1	40 x 25	48.3	33.4	57	57	64
1 1/2 x 3/4	40 x 20	48.3	26.7	57	57	64
1 1/2 x 1/2	40 x 15	48.3	21.3	57	57	64
2 x 1 1/2	50 x 40	60.3	48.3	64	60	76
2 x 1 1/4	50 x 32	60.3	42.2	64	57	76
2 x 1	50 x 25	60.3	33.4	64	51	76
2 x 3/4	50 x 20	60.3	26.7	64	44	76
2 1/2 x 2	65 x 50	73.0	60.3	76	70	89
2 1/2 x 1 1/2	65 x 40	73.0	48.3	76	67	89
2 1/2 x 1 1/4	65 x 32	73.0	42.2	76	64	89
2 1/2 x 1	65 x 25	73.0	33.4	76	57	89
3 x 2 1/2	80 x 65	88.9	73.0	86	83	89
3 x 2	80 x 50	88.9	60.3	86	76	89
3 x 1 1/2	80 x 40	88.9	48.3	86	73	89
3 x 1 1/4	80 x 32	88.9	42.2	86	70	89
4 x 3 1/2	100 x 90	114.3	101.6	105	102	102
4 x 3	100 x 80	114.3	88.9	105	98	102
4 x 2 1/2	100 x 65	114.3	73.0	105	95	102
4 x 2	100 x 50	114.3	60.3	105	89	102
4 x 1 1/2	100 x 40	114.3	48.3	105	86	102
5 x 4	125 x 100	141.3	114.3	124	117	127
5 x 3 1/2	125 x 90	141.3	101.6	124	114	127
5 x 3	125 x 80	141.3	88.9	124	111	127
5 x 2 1/2	125 x 65	141.3	73.0	124	108	127
5 x 2	125 x 50	141.3	60.3	124	105	127
6 x 5	150 x 125	168.3	141.3	143	137	140
6 x 4	150 x 100	168.3	114.3	143	130	140
6 x 3 1/2	150 x 90	168.3	101.6	143	127	140
6 x 3	150 x 80	168.3	88.9	143	124	140
6 x 2 1/2	150 x 65	168.3	73.0	143	121	140

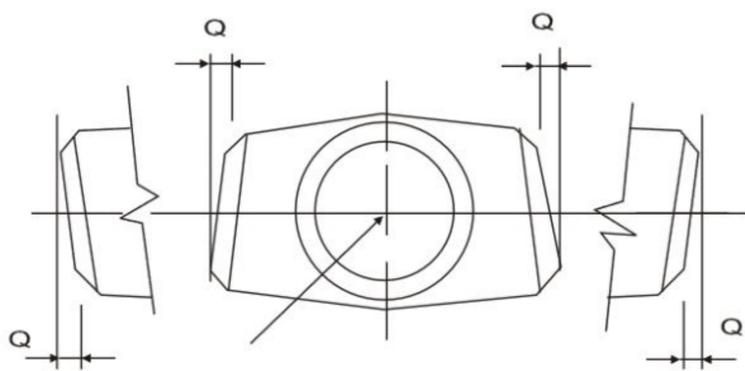
Nominal Pipe Size		Outside Diameter		Center to End		Length
INCH	MM	D	P	C	M	H
8 x 6	200 x 150	219.1	168.3	178	168	152
8 x 5	200 x 125	219.1	141.3	178	162	152
8 x 4	200 x 100	219.1	114.3	178	156	152
8 x 3 1/2	200 x 90	219.1	101.6	178	152	152
10 x 8	250 x 200	273.1	219.1	216	203	178
10 x 6	250 x 150	273.1	168.1	216	194	178
10 x 5	250 x 125	273.1	141.3	216	191	178
10 x 4	250 x 100	273.1	114.3	216	184	178
12 x 10	300 x 250	323.9	273.1	254	241	203
12 x 8	300 x 200	323.9	219.1	254	229	203
12 x 6	300 x 150	323.9	168.3	254	219	203
12 x 5	300 x 125	323.9	141.3	254	216	203
14 x 12	350 x 300	355.6	323.9	279	270	330
14 x 10	350 x 250	355.6	273.1	279	257	330
14 x 8	350 x 200	355.6	219.1	279	248	330
14 x 6	350 x 150	355.6	168.3	279	238	330
16 x 14	400 x 350	406.4	355.6	305	305	356
16 x 12	400 x 300	406.4	323.9	305	295	356
16 x 10	400 x 250	406.4	273.1	305	283	356
16 x 8	400 x 200	406.4	219.1	305	273	356
16 x 6	400 x 150	406.4	168.3	305	264	356
18 x 16	450 x 400	457.0	406.4	343	330	381
18 x 14	450 x 350	457.0	355.6	343	330	381
18 x 12	450 x 300	457.0	323.9	343	321	381
18 x 10	450 x 250	457.0	273.1	343	308	381
18 x 8	450 x 200	457.0	219.1	343	298	381
20 x 18	500 x 450	508.0	457.0	381	368	508
20 x 16	500 x 400	508.0	406.4	381	356	508
20 x 14	500 x 350	508.0	355.6	381	356	508
20 x 12	500 x 300	508.0	323.9	381	346	508
20 x 10	500 x 250	508.0	273.1	381	333	508
20 x 8	500 x 200	508.0	219.1	381	324	508
24 x 22	600 x 550	610.0	559.0	432	432	508
24 x 20	600 x 500	610.0	508.0	432	432	508
24 x 18	600 x 450	610.0	457.0	432	419	508
24 x 16	600 x 400	610.0	406.4	432	406	508
24 x 14	600 x 350	610.0	355.6	432	406	508
24 x 12	600 x 300	610.0	323.9	432	397	508
24 x 10	600 x 250	610.0	273.1	432	384	508

All Dimensions in Millimeters

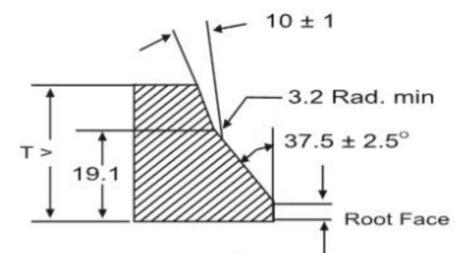
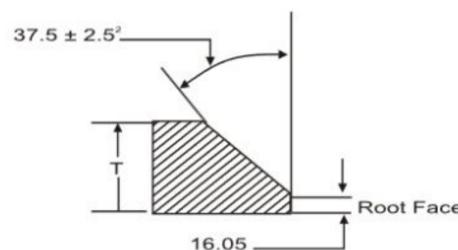
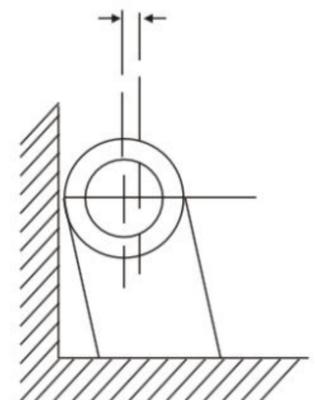
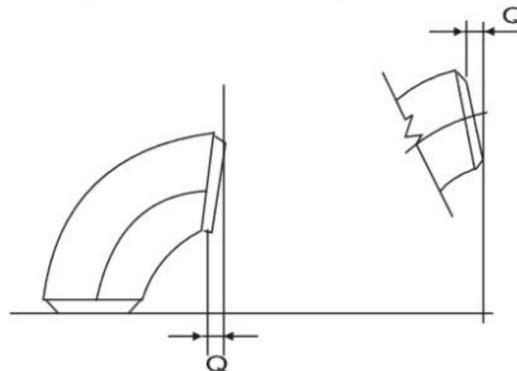
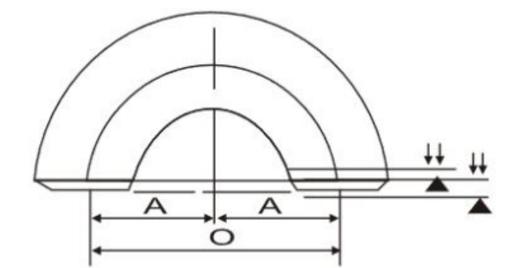
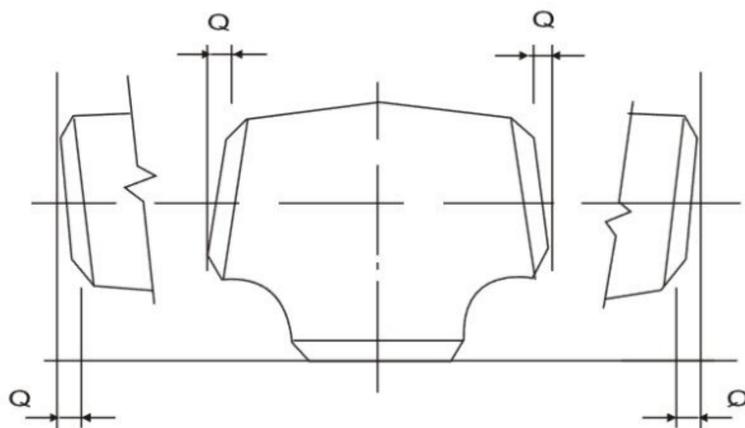


DIMENSION TOLERANCE ANSI B 16.9 / B16.28 / MSS SP - 43

ALL FITTINGS				90°/60°/45° /30° ELBOWS & TEES		REDUCERS		180° RETURNS				CAPS		ANGULARITY TOLERANCE							
Nominal Pipe Size Inch/mm	Outside Diameter at Level		Inside Dia meter	Wall Thickness at End		Centre to End		Overall Length Dimensions		Centre to End		Back to Face Dimensions		Alignment of End Dimensions		Overall length		Nominal Pipe Size	Off Angle Inch/mm		Off Plane
	D			T		A,B,C,M		H		O		K		U		E			Q		P
	(1) B16.9	MSS SP43	(2) B16.9	B16.9	MSS SP43	B16.9	MSS SP43	B16.9	MSS SP43	B16.9	MSS SP43	B16.9	MSS SP43	B16.9	MSS SP43	B16.9	MSS SP43		B16.9	MSS SP43	B16.9
1/2" - 2 1/2" 15 - 65	±1.6 - 0.8		±0.8			FROM 1/2" TO 18" 15 TO 600	FROM 3/4"	FROM 1/2"-24" 15 - 600	FROM 1/2" - 8" 15 - 200							±3	±3.17	1/2" - 4" 15 - 100	±1		±2
3" - 3 1/2" 80 - 90	±1.6	±0.80	±1.6			±2	±1.60	±2	±1.60	±6	±6.35	±6.0	±6.4	±1	±0.8	±7	±6.35	5" - 8" 125 - 200	±2	16" - 24" 400 - 600	±4
4" 100																		10" - 12" 250 - 300	±3		±5
5" - 6" 125 - 150	+2.4 -1.6	+1.60		Not Less Than 87.5% Nominal Thk.														14" - 16" 350 - 400	±3		±7
8" 200		-0.80																	18" - 24" 450 - 600	±3	1.6	±10
10" - 18" 250 - 450	+4 -3.2	+2.38 -0.80	±3.2				±2.40		10"-24" +2.38	±10"	±10			±2.0"	±1.60			26" - 30" 650 - 750	±4	26" - 36" 650 - 900	±10
20" - 24" 500 - 600	+6.4 -4.8	3.17 0.79																32" - 42" 800 - 1050	±5	2.4	±13
26" - 30" 650 - 750	+6.4 -4.8	±4.8	±4.8			±3		FROM 26" - 48" 650NB - 701200 NB ±5								±10		44" - 48" 1100 - 1200	±5	38" - 48" 950 - 1200	±20
32" - 48" 800 - 1200	+6.4 -4.8					±5												42" - 48" 1050 - 1200	±5	3.2	±20



This End Flush Against Square





Forged Fittings

Stainless Steel & Duplex Steel

Stainless Steel : ASTM A 182F - 304/304H/304L/316/316H
316/316Ti, 309, 310, 317L, 321, 347, 904L

Duplex & Super Duplex : ASTM A 182 - F51, F53, F55

Hi-Nickel & Titanium

Hi-Nickel

- Nickel : ASTM B 564 N02200, N02201
- Monel : ASTM B 564 N04400, DIN N05500
- Inconel : ASTM B 564 N06600, N06601, N06617
ASTM B 564 N07718
ASTM B 564 N06625
- Incoloy : ASTM B 564 N08800, N08810
ASTM B 564 N08825
ASTM B 564 N08020
- Hastelloy : ASTM B 564 N10276, N06022
ASTM B 564 N10665
ASTM B 564 N06455

Titanium

- Commercially Pure : ASTM B 381
Gr.1 R 56250 (CP4) Gr.2 R 50400 (CP3)
Gr.3 R 50550 (CP2) Gr.4 R 50700 (CP1)
Gr.7 R 52400 Gr.11 R 52250

- Alloys : ASTM B 381
Gr.5 R 56400 (6Al-4V)
Gr.23 R 56401 (6Al-4V-ELI)
Gr.12 R 53400

Alloy Steel & Carbon Steel

Alloy Steel : ASTM A 234 WPB WP5, WP9, WP11,
WP12, WP91

Carbon Steel : ASTM A 234 WPB, IS 1239 PART II

Low Temp. CS : ASTM A-420 WPL6

Other Service : Hot Dip Galvanizing, Sand Blasting

Cupro Nickel

ASTM B 171 C70600 (90:10),
ASTM B 171 C71500 (70:30)

Size

- Size : 1/2"NB to 4"NB (Socket Weld & Threaded)
- Class : 3000#, 6000#, 9000#, in ANSI B 16.11

Types

- | | |
|---------------------|----------|
| Elbow (45 & 90 Deg) | Coupling |
| Tee | Cap |
| Union | Plug |
| Cross | Bushing |
| Swage Nipple | Boss |

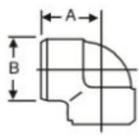
Inconel®, Incoloy®, Monel®, Hastelloy®, Duplex® are Registered Trade Marks of their Respective Owners.



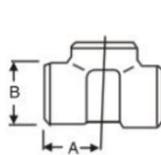


FORGED SCREWED & SOCKET WELD

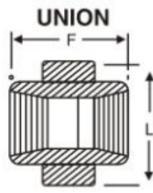
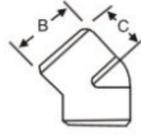
90° ELBOWS



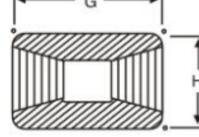
TEE



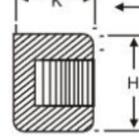
45° ELBOW



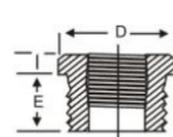
COUPLING



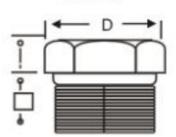
PIPE CAP



BUSHING



HEX HEAD PLUG

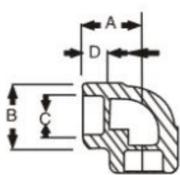


HALF COUPLING = G/2

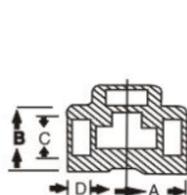
DIMENSION IN MM OF FORGED SCREWED FITTINGS TO ANSI B-16.11 THREADED TO ASA B 2.1

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	3	6	32	29	33	22	35	25	27
3/8"	17.2	29	33	22	38	22	25	17.5	13	48	4	8	38	33	38	25	38	32	27
1/2"	21.3	33	38	25	48	29	32	22	15	51	5	8	46	38	46	29	48	38	33
3/4"	26.7	38	46	29	51	35	37	27	16	57	6	10	51	44	56	33	51	44	38
1"	33.4	44	56	33	60	44	41	35	19	64	6	10	60	51	62	35	60	57	43
1 1/4"	42.2	51	62	35	67	57	44	44.5	21	70	7	14	72	60	75	43	67	64	46
1 1/2"	48.3	60	75	43	79	64	44	51	21	79	8	16	80	64	84	44	79	76	48
2"	60.3	64	84	45	86	76	48	63.5	22	88	9	17	94	83	102	52	86	92	51
2 1/2"	73.02	83	102	52	92	92	60	76	27	118	10	21	122	95	121	64	92	108	64
3"	89.0	95	121	64	108	108	65	89	29	121	10	25	140	106	146	79	108	127	68
4"	114.5	114	152	79	121	140	68	117.5	32	150	13	25	180	114	152	79	121	159	75

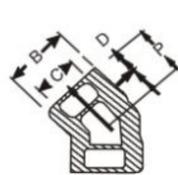
90° ELBOWS



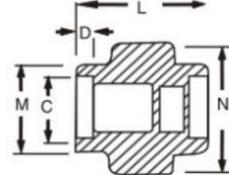
TEE



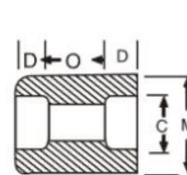
45° ELBOW



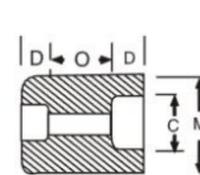
UNION



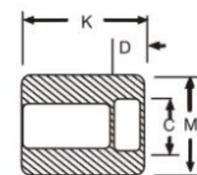
COUPLING



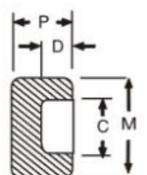
REDUCER



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	

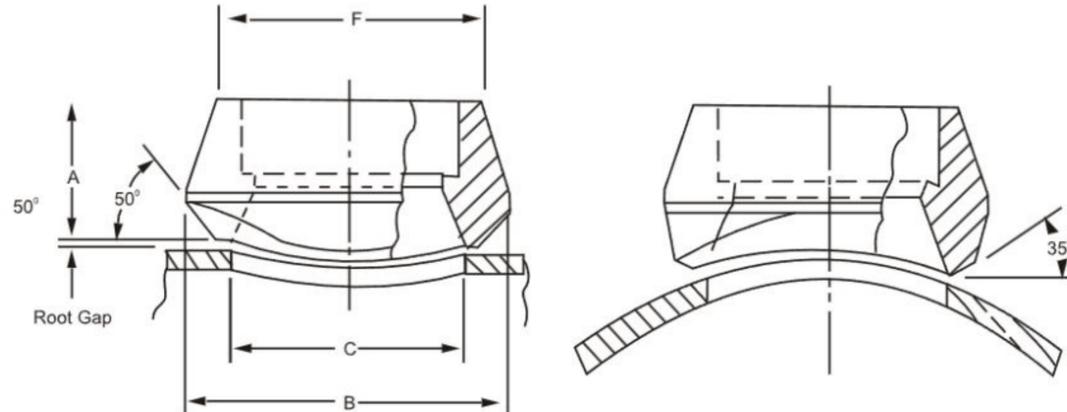
DIMENSIONS AND OTHERS SPECIFICATIONS AS PER CUSTOMERS REQUIREMENTS ARE AVAILABLE ON REQUEST



FORGED STEEL OUTLET FITTINGS

Sockolets

3000# 6000#

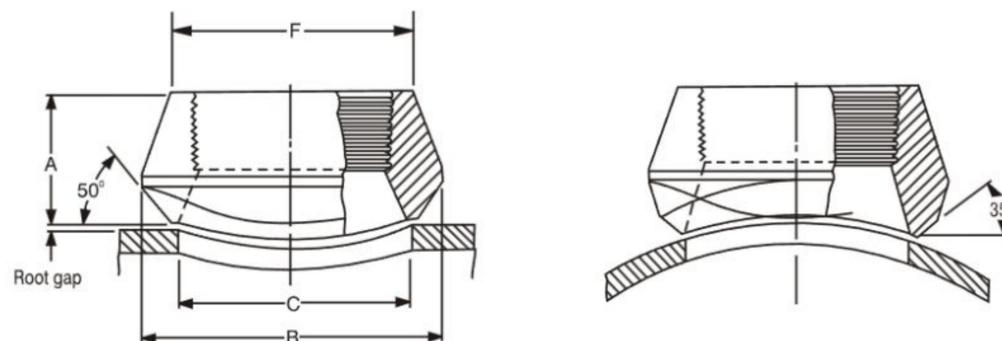


Outlet Size	A		B		C	
	3000#	6000#	3000#	6000#	3000#	6000#
1/2	25.4	31.8	34.9	44.5	23.8	19.1
3/4	27.0	36.5	44.5	50.8	30.2	25.4
1	33.3	39.7	54.0	61.9	36.5	33.3
1 1/4	33.3	41.3	65.1	69.9	44.5	38.1
1 1/2	34.9	42.9	73.0	82.6	50.8	49.2
2	38.1	58.7	88.9	103.2	65.1	58.7
2 1/2	46.0	-	103.2	-	76.2	-
3	50.8	-	122.2	-	93.7	-
4	57.2	-	152.4	-	120.7	-

FORGED STEEL OUTLET FITTINGS

Thredolets

3000# 6000#



Outlet Size	A		B		C	
	3000#	6000#	3000#	6000#	3000#	6000#
1/2	25.4	31.8	34.9	44.5	23.8	19.1
3/4	27.0	36.5	44.5	50.8	30.2	25.4
1	33.3	39.7	54.0	61.9	36.5	33.3
1 1/4	33.3	41.3	65.1	69.9	44.5	38.1
1 1/2	34.9	42.9	73.0	82.6	50.8	49.2
2	38.1	52.4	88.9	103.2	65.1	69.9
2 1/2	46.0	-	103.2	-	76.2	-
3	50.8	-	122.2	-	93.7	-
4	57.2	-	152.4	-	120.7	-

Applicable Run Pipe Sizes are From out-Let to 36"

For the 3000# and 6000# Sockolets and Thredolets, Inside Bore, Thread, Socket Bore and Socket depth Dimensions are According to ANSI B16.11

Pipe Schedule Numbers and Weight Designation are in Accordance With ANSI B36.10

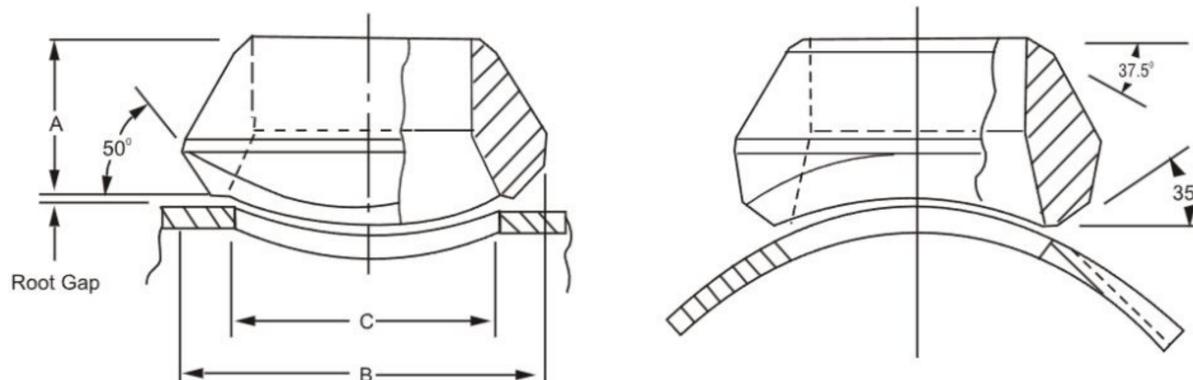
When Ordering Sockolets and Thredolets, Include The Quantity, Run and Out-Let Size, Item And Rating(or Schedule Number)and Material



FORGED STEEL OUTLET FITTINGS

Weldolets

STD(Sch40), XS(Sch 80)



Outlet Size	A		B		C	
	STD	XS	STD	XS	STD	XS
1/2	19.1	19.1	34.9	34.9	23.8	23.8
3/4	22.2	22.2	44.5	44.5	30.2	30.2
1	27.0	27.0	54.0	54.0	36.5	36.5
1 1/4	31.8	31.8	65.1	65.1	44.5	44.5
1 1/2	33.3	33.3	73.0	73.0	50.8	50.8
2	38.1	38.1	88.9	88.9	65.1	65.1
2 1/2	41.3	41.3	103.2	103.2	76.2	76.2
3	44.5	44.5	122.2	122.2	93.7	93.7
4	50.8	50.8	152.4	152.4	120.7	120.7
5	57.2	57.2	179.4	179.4	141.3	141.3
6	60.3	77.8	215.9	225.4	169.9	169.9
8	69.9	98.5	263.5	292.1	220.7	220.7
10	77.8	93.7	322.3	323.9	274.7	265.1
12	85.7	103.2	377.8	379.4	325.4	317.5
14	88.9	100.0	409.6	431.8	357.2	350.8
16	93.7	106.4	463.6	466.7	408.0	403.2
18	96.8	111.1	520.7	523.9	458.8	455.6
20	101.6	119.1	571.5	582.6	508.0	509.6
24	115.9	139.7	689.0	708.0	614.4	638.2
26	119.1	146.1	738.2	765.2	666.8	692.2

Applicable Run Pipe Sizes are From out-Let to 36"

Standard Weight Fittings are the Same as Schedule 40 Fittings Until 10" and Extra Strong Fittings are the Same as Schedule 80 Until 8"

Pipe Schedule Numbers and Weight Designations are in Accordance With ANSI B36.10

When Ordering Weldolet, Include The Quantity, Size (Run and Out-Let) Description (Weldolets, Schedule Number) And Material

Flanges

Stainless Steel & Duplex Steel

Stainless Steel : ASTM A 182F - 304/304H/304L/316/316H
316/316Ti, 309, 310, 317L, 321, 347, 904L

Duplex & Super Duplex : ASTM A 182 - F51, F53, F55

Hi-Nickel & Titanium

Hi-Nickel

Nickel : ASTM B 564 N02200, N02201

Monel : ASTM B 564 N04400
DIN N05500

Inconel : ASTM B 564 N06600, N06601, N06617
ASTM B 564 N07718
ASTM B 564 N06625

Incoloy : ASTM B 564 N08800, N08810
ASTM B 564 N08825
ASTM B 564 N08020

Hastelloy : ASTM B 564 N10276, N06022
ASTM B 564 N10665
ASTM B 564 N06455

Titanium

Commercially Pure : ASTM B 861, 862, 338 Gr.1 R 56250 (CP4)
Gr.2 R 50400 (CP3) Gr.3 R 50550 (CP2)
Gr.4 R 50700 (CP1) Gr.7 R 52400
Gr.11 R 52250

Alloys : ASTM B 861, 862, 338 Gr.5 R 56400 (6Al-4V)
Gr.23 R 56401 (6Al-4V-ELI)
Gr.12 R 53400

Types

Weldneck	Screwed / Threaded
Socketweld	Long Weldneck
Slip on	Lapped Joint
Blind	Spectacle Blind

Alloy Steel & Carbon Steel

Alloy Steel : ASTM A 234 WPB WP5, WP9, WP11,
WP12, WP91

Carbon Steel : ASTM A 234 WPB, IS 1239 PART II

Low Temp. CS : ASTM A-420 WPL6

Other Service : Hot Dip Galvanizing, Sand Blasting

Cupro Nickel

ASTM B 171 C70600 (90:10),

ASTM B 171 C71500 (70:30)

Size

1/2"NB to 48"NB, ANSI B 16.5

Class

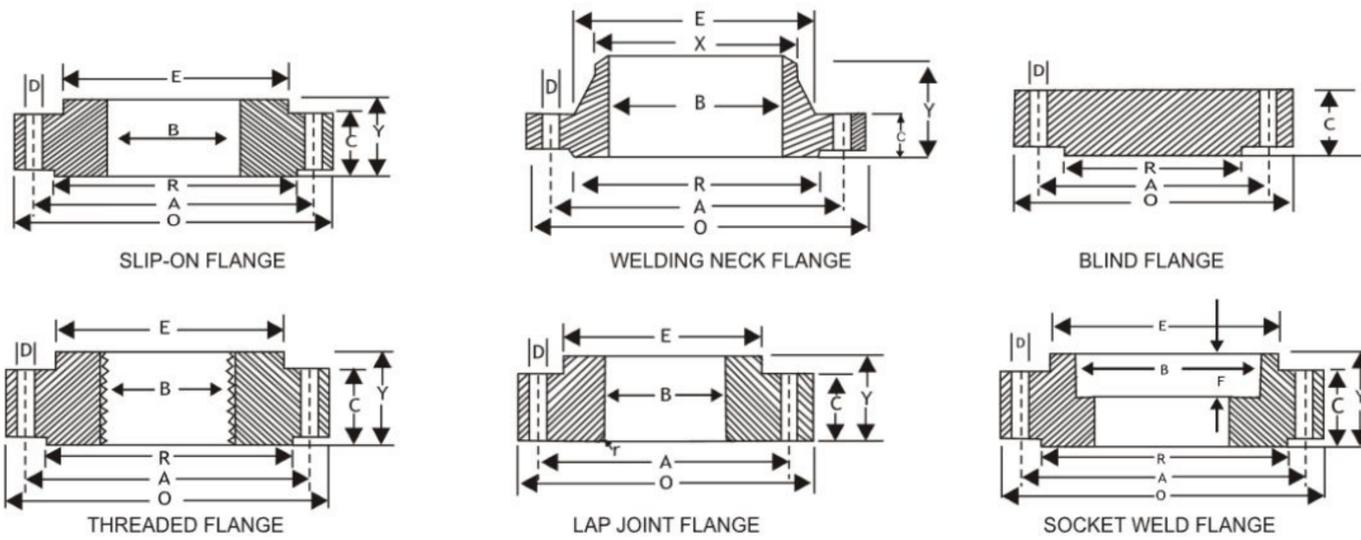
150#, 300#, 600#, 900#, 1500#, 2500#,
in ASA 150 & ASA 300

Specializing in:

Hi-Nickel & Stainless Steel Series

Inconel®, Incoloy®, Monel®, Hastelloy®, Duplex®
are Registered Trade Marks of their Respective Owners.



FLANGES CLASS 150 & 300

DIMENSIONS OF CLASS 150 FLANGES AS PER B16.5

Nominal Pipe Size	Flange Dia O	Dia of Bolt Circle A	No. Of Bolt Holes D	No. Of Holes	Thk of Flange C	Dia of Hub E	Length through Hub			Dia Bore		Dia of R/F R	Depth of Socket F	Pipe Dia X
							S/O & S/W Y	W/N Y	L/J Y	S/O & S/W B	L/J B			
15	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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

DIMENSIONS OF CLASS 300 FLANGES AS PER B16.5

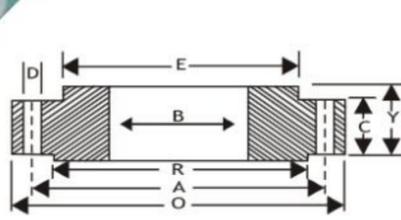
Nominal Pipe Size	Flange Dia O	Dia of Bolt Circle A	No. Of Bolt Holes D	No. Of Holes	Thk of Flange C	Dia of Hub E	Length through Hub			Dia Bore		Dia of R/F R	Depth of Socket F	Pipe Dia X
							S/O & S/W Y	W/N Y	L/J Y	S/O & S/W B	L/J B			
15	95.2	66.7	15.9	4	14.3	38.1	22.2	52.4	22.2	22.3	22.9	34.9	9.5	21.33
20	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	711.2	628.5	34.9	24	60.3	533.4	88.9	158.7	130.2	461.8	462.3	533.4	-	457.20
500	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	914.4	812.8	41.3	24	69.8	701.7	106.4	168.3	152.4	615.9	615.9	692.1	-	609.60

Metric values are direct conversion from Inches table of B16.5

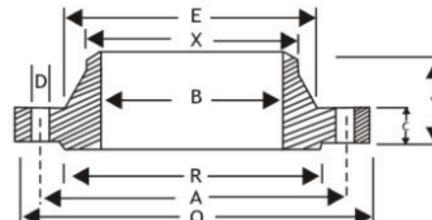
Flanges except Lap Joint will be furnished with (1.6 mm) raised face, Which is included in "Thickness" (C) and Length Through Hub (Y).



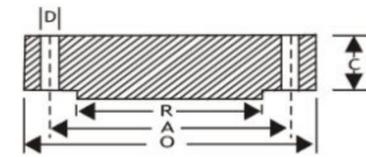
FLANGES CLASS 600 & 900



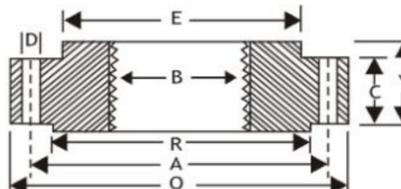
SLIP-ON FLANGE



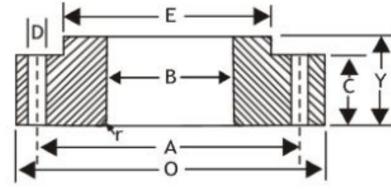
WELDING NECK FLANGE



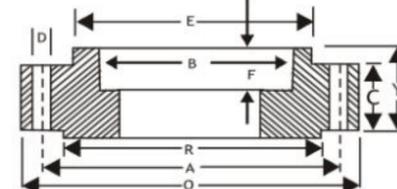
BLIND FLANGE



THREADED FLANGE



LAP JOINT FLANGE



SOCKET WELD FLANGE

DIMENSIONS OF CLASS 600 FLANGES AS PER B 16.5

Nominal Pipe Size	Flange Dia O	Dia of Bolt Circle A	No. of Bolt Holes D	No. of Holes	Thk of Flange C	Dia of Hub E	Length through Hub			Dia Bore		Dia of R/F 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	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	141.5	185.7	-	141.30
150	355.6	292.1	28.6	12	47.6	222.2	66.7	117.5	66.5	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	277.3	323.8	-	273.05
300	558.8	488.9	34.9	20	66.7	400.0	92.1	155.6	117.3	327.1	328.1	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	462.2	533.4	-	457.20
500	812.8	723.9	44.4	24	88.9	609.6	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

DIMENSIONS OF CLASS 900 FLANGES AS PER B 16.5

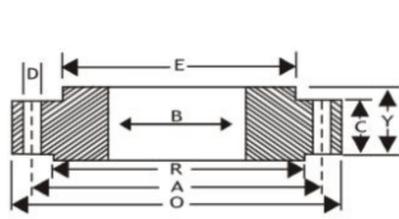
Nominal Pipe Size	Flange Dia O	Dia of Bolt Circle A	Dia of Bolt Holes D	No. of Holes	Thk of Flange C	Dia of Hub E	Length through Hub			Dia Bore		Dia of R/F R	Depth of Socket F	Pipe Dia X
							S/O & S/W	W/N	L/J	S/O & S/W	L/J			
							Y	Y	Y	B	B			
15	120.6	82.5	22.2	4	22.2	38.1	31.7	60.3	31.7	22.3	22.8	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	157.1	-	114.30
125	349.2	279.4	35.0	8	50.8	190.5	79.3	127.0	79.2	143.7	114.5	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	269.8	-	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

Metric values are direct conversion from Inches table of B16.5

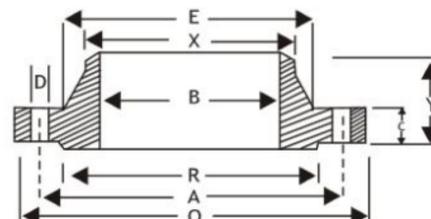
RF Thickness 6.3 mm Extra to be provided (Except Lap Joint Flange & FF Flanges).



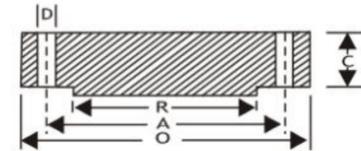
FLANGES CLASS 1500 & 2500



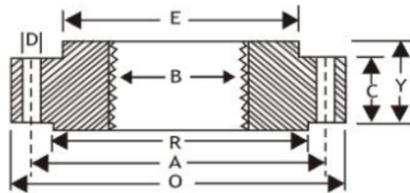
SLIP-ON FLANGE



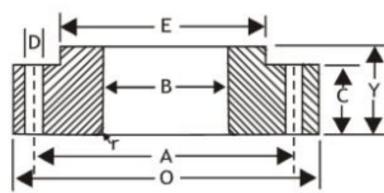
WELDING NECK FLANGE



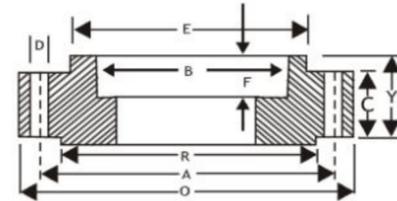
BLIND FLANGE



THREADED FLANGE



LAP JOINT FLANGE



SOCKET WELD FLANGE

DIMENSIONS OF CLASS 1500 FLANGES AS PER B16.5

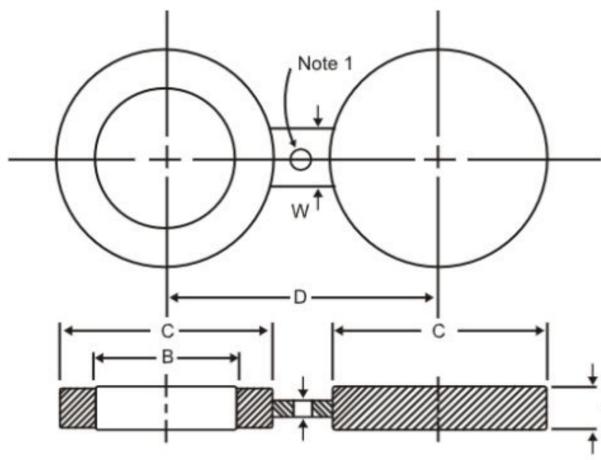
Nominal Pipe Size	Flange Dia O	Dia of Bolt Circle A	Dia of Bolt Holes D	No. Of Holes	Thk of Flange C	Dia of Hub E	Length through Hub			Dia Bore		Dia of R/F R	Depth of Socket F	Pipe Dia X
							S/O & S/W Y	W/N Y	L/J Y	S/O & S/W B	L/J B			
15	120.6	82.5	22.2	4	22.2	38.1	31.7	60.3	31.7	22.3	22.8	34.9	9.5	21.33
20	130.2	88.9	22.2	4	25.4	44.4	34.9	69.8	34.9	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	41.3	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	41.3	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	62.0	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	266.7	203.2	31.7	8	47.6	133.3	73.0	117.5	73.0	90.7	91.4	127.0	-	88.90
100	311.1	241.3	34.9	8	54.0	161.9	90.5	123.0	90.4	116.1	116.8	157.2	-	114.30
125	374.6	292.1	41.3	8	73.0	196.8	104.8	155.6	104.8	143.8	144.5	185.7	-	141.30
150	393.7	317.5	38.1	12	82.6	228.6	119.1	171.4	119.1	170.7	171.4	215.9	-	168.27
200	482.6	393.7	44.4	12	92.1	292.1	142.9	212.7	142.8	221.5	222.2	269.9	-	219.07
250	584.2	482.6	50.8	12	107.9	368.3	158.7	254.0	177.8	276.3	277.3	323.8	-	273.05
300	673.1	571.5	54.0	16	123.8	450.8	181.0	285.5	218.9	327.1	328.1	381.0	-	323.85

DIMENSIONS OF CLASS 2500 FLANGES AS PER B16.5

Nominal Pipe Size	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 Bore		Dia of R/F R	Depth of Socket F	Pipe Dia X
							S/O & S/W Y	W/N Y	L/J Y	S/O & S/W B	L/J B			
15	133.3	88.9	22.2	4	30.2	42.9	39.7	73.0	39.7	22.3	22.3	34.9	-	21.33
20	139.7	95.2	22.2	4	31.7	50.8	42.9	79.4	42.9	27.7	27.7	42.9	-	26.67
25	158.7	107.9	25.4	4	34.9	57.1	47.7	88.9	47.7	34.5	34.5	50.8	-	33.40
32	184.1	130.2	28.6	4	38.1	73.0	52.4	95.2	52.4	43.2	43.2	63.5	-	42.16
40	203.2	146.0	31.7	4	44.4	79.4	60.3	111.1	60.3	49.5	49.5	73.0	-	48.26
50	234.9	171.4	28.6	8	50.8	95.2	69.8	127.0	69.8	62.4	62.0	92.1	-	60.31
65	266.7	196.8	31.7	8	57.1	114.3	79.4	142.9	79.4	74.7	74.7	104.8	-	73.02
80	304.8	228.6	34.9	8	66.7	133.3	92.1	168.3	92.1	90.7	90.7	127.0	-	88.90
100	355.6	273.0	41.3	8	76.2	165.1	107.9	190.5	107.9	116.1	116.1	157.2	-	114.30
125	419.1	323.8	47.6	8	92.1	203.2	130.0	228.6	130.0	143.8	143.8	185.7	-	141.30
150	482.6	368.3	54.0	8	107.9	234.9	152.4	273.0	152.4	170.7	170.7	215.9	-	168.27
200	552.4	438.1	54.0	12	127.0	304.8	177.8	317.5	177.8	221.5	221.5	269.9	-	219.07
250	673.1	539.7	66.7	12	165.1	374.6	228.6	419.1	228.6	276.3	276.3	323.8	-	273.05
300	762.0	619.1	73.0	12	184.1	441.3	254.0	463.5	254.0	327.1	327.1	381.0	-	323.85

Metric values are direct conversion from Inches table of B16.5

RF Thickness 6.3 mm Extra to be provided (Except Lap Joint Flange & FF Flanges).



SPECTACLE BLINDS
CLASS 150
CLASS 300
CLASS 600

CLASS 150

Nominal Pipe Size		OUTSIDE DIAMETER OF PIPE	INSIDE DIAMETER	OUTSIDE DIAMETER	CENTRE LINE SPACING	THICKNESS	WEB WIDTH	Nominal Pipe Size	
mm	(in)	A	B	C	D	t	W	mm	(in)
15	(1/2")	21.3	16	44	60	3	38	15	(1/2")
20	(3/4")	26.7	21	54	70	3	38	20	(3/4")
25	(1)	33.4	27	64	79	3	38	25	(1)
32	(1 1/4)	42.2	42	73	89	6	38	32	(1 1/4)
40	(1 1/2)	48.3	48	83	99	6	38	40	(1 1/2)
50	(2)	60.3	60	102	121	6	51	50	(2)
65	(2 1/2)	73	73	121	140	6	51	65	(2 1/2)
80	(3)	88.9	89	133	152	6	64	80	(3)
100	(4)	114.3	114	171	190	10	64	100	(4)
125	(5)	141.3	141	194	216	10	76	125	(5)
150	(6)	168.3	168	219	241	13	76	150	(6)
200	(8)	219.1	219	276	298	13	76	200	(8)
250	(10)	273.1	273	337	362	16	102	250	(10)
300	(12)	323.8	324	406	432	19	108	300	(12)
350	(14)	355.6	356	448	476	19	108	350	(14)
400	(16)	406.4	406	511	540	22	108	400	(16)
450	(18)	457	457	546	578	25	114	450	(18)
500	(20)	508	508	603	635	28	121	500	(20)
600	(24)	610	610	714	749	32	140	600	(24)

CLASS 300

Nominal Pipe Size		OUTSIDE DIAMETER OF PIPE	INSIDE DIAMETER	OUTSIDE DIAMETER	CENTRE LINE SPACING	THICKNESS	WEB WIDTH	Nominal Pipe Size	
mm	(in)	A	B	C	D	t	W	mm	(in)
15	(1/2")	21.3	16	44	60	3	38	15	(1/2")
20	(3/4")	26.7	21	54	70	3	38	20	(3/4")
25	(1)	33.4	27	64	79	3	38	25	(1)
32	(1 1/4)	42.2	42	73	89	6	38	32	(1 1/4)
40	(1 1/2)	48.3	48	83	99	6	38	40	(1 1/2)
50	(2)	60.3	60	102	121	6	51	50	(2)
65	(2 1/2)	73	73	121	140	6	51	65	(2 1/2)
80	(3)	88.9	89	133	152	6	64	80	(3)
100	(4)	114.3	114	171	190	10	64	100	(4)
125	(5)	141.3	141	194	216	10	76	125	(5)
150	(6)	168.3	168	219	241	13	76	150	(6)
200	(8)	219.1	219	276	298	13	76	200	(8)
250	(10)	273.1	273	337	362	16	102	250	(10)
300	(12)	323.8	324	406	432	19	108	300	(12)
350	(14)	355.6	356	448	476	19	108	350	(14)
400	(16)	406.4	406	511	540	22	108	400	(16)
450	(18)	457	457	546	578	25	114	450	(18)
500	(20)	508	508	603	635	28	121	500	(20)
600	(24)	610	610	714	749	32	140	600	(24)

CLASS 600

Nominal Pipe Size		OUTSIDE DIAMETER OF PIPE	INSIDE DIAMETER	OUTSIDE DIAMETER	CENTRE LINE SPACING	THICKNESS	WEB WIDTH	Nominal Pipe Size	
mm	(in)	A	B	C	D	t	W	mm	(in)
15	(1/2")	21.3	16	44	60	3	38	15	(1/2")
20	(3/4")	26.7	21	54	70	3	38	20	(3/4")
25	(1)	33.4	27	64	79	3	38	25	(1)
32	(1 1/4)	42.2	42	73	89	6	38	32	(1 1/4)
40	(1 1/2)	48.3	48	83	99	6	38	40	(1 1/2)
50	(2)	60.3	60	102	121	6	51	50	(2)
65	(2 1/2)	73	73	121	140	6	51	65	(2 1/2)
80	(3)	88.9	89	133	152	6	64	80	(3)
100	(4)	114.3	114	171	190	10	64	100	(4)
125	(5)	141.3	141	194	216	10	76	125	(5)
150	(6)	168.3	168	219	241	13	76	150	(6)
200	(8)	219.1	219	276	298	13	76	200	(8)
250	(10)	273.1	273	337	362	16	102	250	(10)
300	(12)	323.8	324	406	432	19	108	300	(12)
350	(14)	355.6	356	448	476	19	108	350	(14)
400	(16)	406.4	406	511	540	22	108	400	(16)
450	(18)	457	457	546	578	25	114	450	(18)
500	(20)	508	508	603	635	28	121	500	(20)
600	(24)	610	610	714	749	32	140	600	(24)

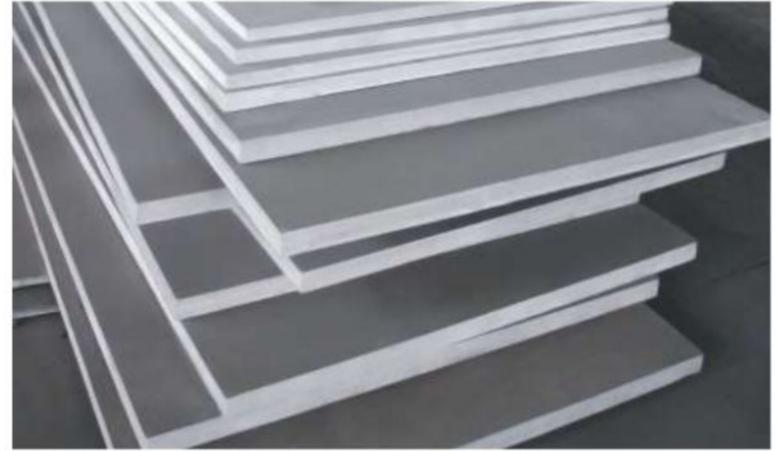
NOTES: 1. HOLE SIZE SHALL BE THE SAME AS THE FLANGE BOLT HOLE
 2. THE THICKNESS OF WEB SHALL BE THE LEAST OF 't' OR 6.4 mm 3. ALSO AVAILABLE IN LARGER SIZES & RING TYPE JOINT FACING

Stainless Steel & Duplex Steel

Stainless Steel : ASTM A240 304/304L/316/316L/316Ti/
309/310/317/317L/321/347/409/410/
430/904L/SMO 254 / AL6XN

Duplex & Super Duplex : Standard
ASTM A240 - UNS S31803/S32205 (2205)
Lean
ASTM A240 - UNS S32304 (2304)
Super Duplex
ASTM A240 - UNS S32750 (2507)
ASTM A240 - UNS S32760 (Zeron 100)

Sheets & Plates



Quenched & Tempered

ASTM A537 CL.1 & 2

Boiler Quality

SA 516 Gr. 70

Hardox

Hardox 400 / 500

Hi-Nickel & Titanium

Hi-Nickel

Nickel : ASTM B162 N02200, N02201
Monel : ASTM B127 N04400, DIN N05500
Inconel : ASTM B 168 N06600, N06601, N06617
ASTM B 670 N07718
ASTM B 443 N06625
Incoloy : ASTM B 409 N08800, N08810
ASTM B 424 N08825
ASTM B 462 N08020
Hastelloy : ASTM B 575 N10276, N06022
ASTM B 333 N10665

Alloy Steel, Carbon Steel / Mild Steel

Alloy Steel Pipe : ASTM A387 Gr. 11, 12, 22, 5, 91 (CL 1/2)
Carbon Steel : ASTM A 36, S275 JR, IS 2062 Gr. A/B

Aluminium

ASTM B 928
5083 (A95083), 5086 (A95086),
5052 (A95052) T6061 (A96061)

Cupro Nickel

ASTM B171 C70600 (90:10),
C71500 (70:30)

Titanium

Commercially : ASTM B 265
Pure : Gr.1 R 56250 (CP4) Gr.2 R 50400 (CP3)
Gr.3 R 50550 (CP2) Gr.4 R 50700 (CP1)
Gr.7 R 52400 Gr.11 R 52250
Alloys : ASTM B 265
Gr.5 R 56400 (6Al-4V)
Gr.23 R 56401 (6Al-4V-ELI)
Gr.12 R 53400

Rods & Bars



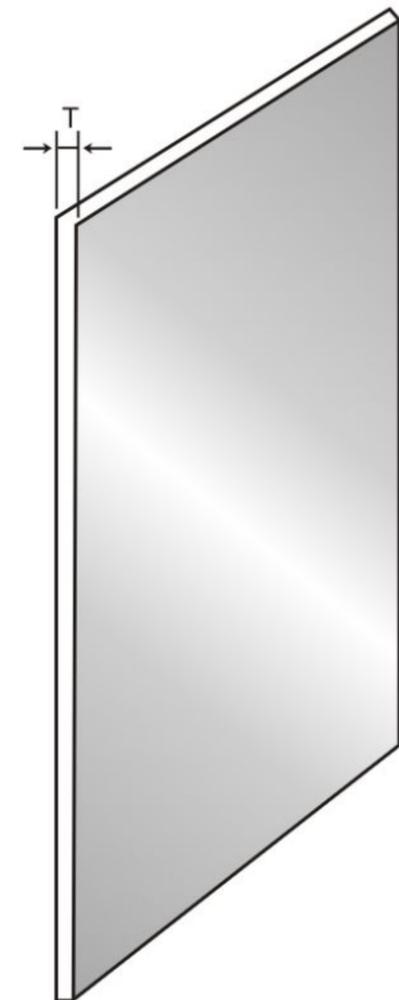
Stainless Steel Bar : ASTM A-479 / 276, A182 F 304 / 304H /
304L, 316 / 316L / 316Ti, 309, 310,
317L, 321, 347, 409, 410, 420, 430, 440,
(A, B, C) 446, 904L etc.
Other Grade Bar : 17-4PH, 15.5 PH, 4122 etc.
Duplex Steel Bar : A 182 F51, F53, F55
Carbon Steel Bar : A 105, LF 2
Alloy Steel Bar : ASTM A -182 F11, F12, F22, FF5, F9, F91
Cu-Ni Bar : C70660 (90:10), C71500 (70:30), C71640
Nickel Bar : UNS N02200, N02201
Monel Bar : UNS N06600, N06601, N06625,
Inconel Bar : UNS N06600, N06601, N06625,
UNS N08800, N08810, N08825
Form : Round, Square, Hex (A/F), Rectangle,
Flat etc.

Inconel®, Incoloy®, Monel®, Hastelloy®, Duplex® are Registered Trade Marks of their Respective Owners.

SWG (STANDARD WIRE GAUGE) & WEIGHT (W) OF STAINLESS STEEL SHEET IN KG.

Direct Formula for
 Stainless steel Sheet :
 $T \times 7.85 \text{ Kg/m}^2$
 $T \times 0.733 \text{ Kg/ft}^2$
 T = Thickness

Thickness (T)		1250 x 2500 mm mm	1500 x 3000 mm mm	1500 x 6000 mm mm
S. No.	mm			
1	0.5	12.5	18	-
2	0.6	15	21.6	-
3	0.8	20	28.8	-
4	1	25	36	-
5	1.2	30	43.2	-
6	1.5	37.5	54	-
7	2	50	72	-
8	2.5	62.5	90	-
9	3	75	108	216
10	4	100	144	288
11	5	125	180	360
12	6	150	216	432
13	8	200	288	576
14	10	250	360	720
15	12	300	432	864
16	14	700	840	1008
17	15	750	900	1080
18	16	800	960	1152
19	18	900	1080	1296
20	20	1000	1200	1440
21	22	1100	1320	1584
22	24	1200	1440	1728
23	28	1400	1680	2016
24	30	1500	1800	2160
25	32	1600	1920	2304
26	35	1750	2100	2520
27	36	1800	2160	2592
28	38	1900	2280	2736
29	40	2000	2400	2880
30	42	2100	2520	3024
31	45	2250	2700	3240
32	50	2500	3000	3600
33	55	2750	3300	3960
34	56	2800	3360	4032
35	60	3000	3600	4320
36	65	3250	3900	4680
37	70	3500	4200	5040



Weight of Following Metal's Sheet

- Copper : $W \times 1.135$
- Aluminium : $W \times 0.349$
- Brass : $W \times 1.090$
- P.B. : $W \times 1.139$

W = Weight of same size of steel Sheet from table

Example
 Copper Sheet of Thickness 10 SWG
 having size of 4' x 8'

$$76.400 \times 1.135 = 86.714$$

Answer
 Weight of 10 SWG
 4ft x 8ft copper sheet is 86.714 kg.


WEIGHTS OF ROUND, SQUARE & HEXAGON BAR - (in kg. per meter)

Size mm	Round	Square	Hexagon
5	0.154	0.196	0.170
6	0.222	0.283	0.245
7	0.302	0.385	0.333
8	0.395	0.502	0.435
9	0.499	0.636	0.551
10	0.617	0.785	0.680
11	0.746	0.950	0.823
12	0.888	1.130	0.979
13	1.042	1.327	1.149
14	1.208	1.539	1.332
15	1.387	1.766	1.530
16	1.578	2.010	1.740
17	1.782	2.269	1.965
18	1.998	2.543	2.203
19	2.226	2.834	2.454
20	2.466	3.140	2.719
21	2.719	3.462	2.866
22	2.984	3.799	3.290
23	3.261	4.153	3.596
24	3.551	4.522	3.916
25	3.853	4.906	4.249
26	4.168	5.307	4.596
27	4.495	5.723	4.956
28	4.834	6.154	5.330
29	5.185	6.602	5.717
30	5.549	7.065	6.118
31	5.925	7.544	6.533
32	6.313	8.038	6.961
33	6.714	8.549	7.403
34	7.127	9.075	7.859
35	7.553	9.616	8.328
36	7.990	10.174	8.810
37	8.440	10.747	9.307
38	8.903	11.335	9.817
39	9.378	11.940	10.340
40	9.865	12.560	10.877
41	10.364	13.196	11.428
42	10.876	13.847	11.992
43	11.400	14.515	12.570
44	11.936	15.198	13.161
45	12.485	15.896	13.766
46	13.046	16.611	14.385
47	13.619	17.341	15.017
48	14.205	18.086	15.663
49	14.803	18.848	16.322
50	15.413	19.625	16.996
51	16.04	20.42	17.682
52	16.67	21.23	18.382
53	17.32	22.05	19.096
54	17.98	22.89	19.823
55	18.65	23.75	20.564
56	19.34	24.62	21.319

Size mm	Round	Square
57	20.03	25.51
58	20.74	26.41
59	21.46	27.33
60	22.20	28.26
61	22.94	29.21
62	23.70	30.18
63	24.47	31.16
64	25.25	32.15
65	26.05	33.17
66	26.86	34.20
67	27.68	35.24
68	28.51	36.30
69	29.35	37.37
70	30.21	38.47
71	31.08	39.57
72	31.96	40.69
73	32.86	41.83
74	33.76	42.99
75	34.68	44.16
76	35.61	45.34
77	36.56	46.54
78	37.51	47.76
79	38.48	48.99
80	39.46	50.24
81	40.45	51.50
82	41.46	52.78
83	42.47	54.08
84	43.50	55.39
85	44.55	56.72
86	45.60	58.06
87	46.67	59.42
88	47.75	60.79
89	48.84	62.18
90	49.94	63.59
91	51.06	65.01
92	52.18	66.44
93	53.32	67.90
94	54.48	69.36
95	55.64	70.85
96	56.82	72.35
97	58.01	73.86
98	59.21	75.39
99	60.43	76.94
100	61.65	78.50
105	67.97	86.55
110	74.60	94.99
115	81.54	103.82
120	89.78	113.04
125	96.33	122.66
130	104.19	132.67
135	112.36	143.07
140	120.84	153.86

Size mm	Round	Square
145	129.63	165.05
150	138.72	176.63
155	148.12	188.60
160	157.83	200.96
165	167.85	213.72
170	178.18	226.87
175	188.81	240.41
180	199.76	254.34
185	211.01	268.67
190	222.57	283.39
195	234.44	298.50
200	246.61	314.00
205	259.10	329.90
210	271.89	346.19
215	284.99	362.87
220	298.40	379.94
225	312.12	397.41
230	326.13	415.27
235	340.48	433.52
240	355.13	452.16
245	370.08	471.20
250	385.34	490.63
255	400.90	510.45
260	416.78	530.66
265	432.96	551.27
270	449.46	572.27
275	466.26	593.66
280	483.37	615.44
285	500.78	637.62
290	518.51	660.19
295	536.54	683.15
300	554.88	706.50
310	592.49	754.39
320	631.33	803.84
330	671.41	854.87
340	712.72	907.46
350	755.26	961.63
360	799.03	1017.36
370	844.04	1074.67
380	890.28	1133.54
390	937.75	1193.99
400	986.46	1256.00
410	1036.40	1319.59
420	1087.57	1384.74
430	1139.98	1451.47
440	1193.62	1519.76
450	1248.49	1589.63
460	1304.59	1661.06
470	1361.93	1734.07
480	1420.50	1808.64
490	1480.31	1884.79
500	1541.34	1962.50



STAINLESS STEEL BRIGHT BARS (PEELED/TURNED)

We, within a short span has become a major source for Stainless Steel Rolled / Forged / Peeled Rounds, Rcs, Blooms & Billets. We have huge stocks for our quality products which are supplied on time at lowest possible rates meeting most of our customer's requirement.

Product Range

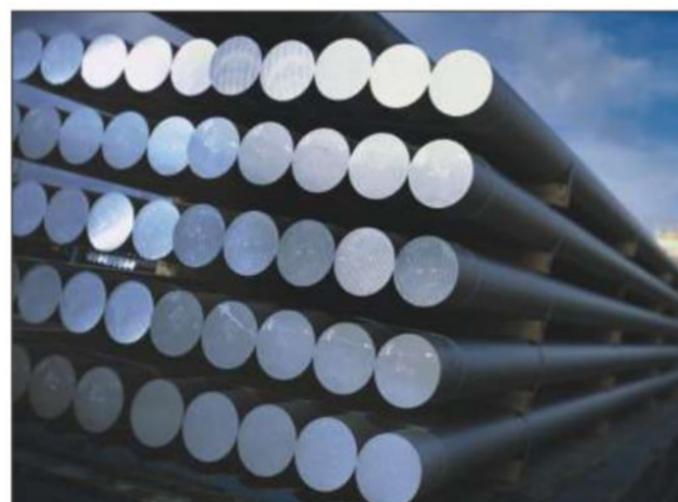
Condition	Peeled, Centreless & Polished	Peeled & Polished	Peeled (Rough Turned)	Forged, Rough Turned
Grades	201, 202, 301,303, 304, 304L, 310, 316, 316L, 321, 410, 416, 420,430, 431, 430F & others		304, 304L, 316L, 410, 416, 420, 430	303, 304, 304L, 316, 316L, 410, 416, 420, 431
Diameter (Size)	20mm to 85mm (3/4" to 3-1/4")	85mm to 140mm (3-1/4" to 5 - 1/2")	25mm to 140mm (1" to 5-1/2")	150mm to 400mm (6" to 16")
Diameter Tolerance	h9 (Din 671) (ASTM A484)	h 11	K 12/K 13 (Din 1013)	-0mm to +3mm (-0"/+0.12")
Length	3/4/5, 6/6 meter (12/14ft/20 feet)	3/4/5, 6/6 meter (12/14ft/20 feet)	3/4/5,6/6 meter 10 feet, 16 feet	3 meter - 5 meter
Length Tolerance	-0/+200mm of + 100mm to + 50mm (-0"/1 feet or +4" or 2")	-0/+ 200mm or +100mm or +50mm (-0"/+1 feet or +4" or 2")	-0/+ 100mm or 500mm (-0"/+3 feet or+2 feet)	-0/+2 meter - (-0/+6 feet)

Stainless Steel Wires

Diameter (Size)	Thick/Medium Wire - 1mm to 8mm (0.039" to 0.314")	
Grade	201, 202, 204Cu, 302, 302HQ, 303, 304, 304L, 304HC, 310, 316, 316L, 321, 304LER, 308LER, 316LER, 420, 430L	
Surface Finish	Matt, Bright Drawn, Bright Shiny, EPQ, Coated, De-coated	
Diameter Tolerance	Diameter	Tolerance
	0.80 mm (0.0314") to < 1.50 mm (0.0590")	+/-0.013 mm (0.0005")
	1.50 mm (0.0590") to < 2.00 mm (0.0787")	+/-0.013 mm (0.0006")
	2.00 mm (0.0787") to < 4.00 mm (0.1574")	+/-0.025 mm (0.0009")
	4.00 mm (0.1574") to < 6.00 mm (0.236")	+/-0.030 mm (0.0011")
Tensile Strength	Type	Tensile In Kg/mm ²
	Soft	60-75
	1/4 Hard	75-90
	1/2 Hard	90-140
	Full Hard	140-200 or ASTM A313 / DIN 17224
Packing	<ul style="list-style-type: none"> - HDPE wrapped coils of 20 kg. to 250 kg. - Pattern laid coils on MS Carriers / spiders (200 Kg. to 1000 kg.) - Coils on wooden pallets (100 kg to 800 kg) - Cheese coils (500 kg -1000 kg) - Drum Packing - Fine wire in Spools from Din 80 to Din 250 	

Stainless Steel Bright Bars (Cold Drawn)

Condition	Cold Drawn and Polished	Cold Drawn, Center less Ground & Polished	Cold Drawn, Center less Ground and Polished (Strain Hardened)
Grades	201, 202, 303, 304, 304L, 310, 316, 316L, 321, 410, 420, 416, 430, 431, 430F, & others		304, 304L, 316, 316L
Diameter (Size)	2mm to 5mm (1/8" to 3/16")	6mm to 22mm (1/4" to 7/8")	10mm to 40mm (3/8" to 1-1/2")
Diameter Tolerance	h9 (Din 671), h11 ASTM A 484	h9 (Din 671) ASTM A 484	h9 (Din 671), h11 ASTM A 484
Length	3/4/5, 6/6 meter (12/14ft/20 feet)	3/4/5, 6/6 meter (12/14ft/20 feet)	3/4/5, 6/6 meter (12/14/20 feet)
Length Tolerance	-0/+ 200mm of +100mm or+50mm (-0"/+1 feet or+ 4" or 2")	-0/+200mm or +100mm or +50mm (-0"/+1 feet or+4" or 2")	-0/+200mm (-0"/+1 feet)



Stainless Steel Hexagon & Square Bars

Type	Cold Drawn and Polished(Squares)	Cold Drawn and Polished (Hexagons)
Grades	304, 304L, 316, 316L	304, 304L, 316, 316L
Diameter	5mm to 40mm (1/4" to 1-1/2")	10mm to 40mm (3/8" to 1-1/2")
Diameter Tolerance	h 11 (ASTM A 484)	h 11 (ASTM A 484)
Length	3/4/6 meter (12/14ft/20feet)	3/4/6 meter (12/14ft/20 feet)
Length Tolerance	-0/+500mm (-0"/+2 feet)	-0/+500mm or+ 100mm or +50mm

Stainless Steel Cold Heading Wires

Condition	Cold drawn, Annealed and Pickled
Diameter	1.6 mm to 17 mm (1/16" to 11/16")
Tensile Strength	65kg / mm2 max
Packing	HDPE wrapped coils of 300 kg to 500 kg
Grades	202, 304, 304L, 316, 316L, 304HC, 302HQ

FASTENERS**FASTENERS DETAILS**

We hold expertise in offering Fasteners, such as nuts, bolts washers to anchor, Fastener, stud bolts, Threaded Rod, our clients. These are manufactured utilizing high grade, such as Stainless Steel, Carbon Steel, Duplex Steel, Monel, Inconel, Hastelloy, Titanium and nickel alloy, which assure their high tensile strength and corrosion resistance. Our range applications in numerous industries and is sizes ranging from M10 TO M100, Length up to 5 meters as per the client's requirements.

Salient Features :

Severe vibration under impulse pressure

Static pressure

High tolerance

Dimensional preciseness

Corrosion resistance

Perfect installation & application

Long service life

Study construction

Fast performance

Stainless Steel : AISI 304, 304L, 316, 316L, 310, 317, 317L, 321, 347, 410, 420, 904L ,
ASTM A193 Gr. 6, 6F, 8, 8A, 8C, 8CA, 8M, 8MA, 8T, 8TA, 8F, 8FA, 8S, 8SA, etc.

Alloy Steel : 4.6, 5.6, 6.6, 8.8, 10.9 & 12.9/'R', 'S', 'T' Conditions.

Carbon Steel : Bare Condition, Galvanized, Phosphetised, Cadium Plated, Hot Deep Galvanized, Bloodied, Nickel Chrome Plated etc.

Non Ferrous Metal : Copper, Brass, Aluminium, Titanium, Nichrome, Al. Bronze Phosphorous Bronze etc.

Types : Bolts, Nuts, Washers, Anchor Fasteners, Stud Bolts, Eye Bolt, Stud, Threaded Rod, Cotter Pin, Socket, Fine Fasteners & Spares, Foundation Fasteners etc.





Bolt

Hex Head Bolt, Allen Cap, Socket Head, Allen CSK, J-Bolt, U Bolt, Eye Bolt, Linear Bolt, Foundation Bolt, Special Bolt

- Diameter Range : M8 to M80 diameter and length up to 500 mm long
 Thread Type : MM, BSW, BSF, UNC, UNF and Fine Pitch
 Material : Stainless Steel { 6 (410), 6F (416), 8, 8A(304), 8C, 8CA (347), 8M, 8MA(316), 8T, 8TA(321), 8F, 8FA(303), 8S, 8SA(Nitronic 60) etc.} Alloy Steel (4.6, 5.6, 8.8, 10.9, 12.9, B7) and Nickel Alloys as per customer requirements
 Standard : ISO, DIN, IS, BS, ANSI, ASTM



Nuts

Hex Nut, Lock Nut, Nylock Nut, Breakaway Nut, Dom Nut, Long Nut

- Diameter Range : M8 to M80 diameter
 Thread Type : MM, BSW, BSF, UNC, UNF and Fine Pitch
 Material : Stainless Steel { 6 (410), 6F (416), 8, 8A(304), 8C, 8CA (347), 8M, 8MA(316), 8T, 8TA(321), 8F, 8FA(303), 8S, 8SA(Nitronic 60) etc.} Alloy Steel (Gr 4, 8, 10, 12, 2H) and Nickel Alloys as per customer requirements
 Standard : ISO, DIN, IS, BS, ANSI, ASTM



Threaded Bars/Stud

Stud, Full Thread Stud, Half Thread, Double ended Stud, Special Stud

- Diameter Range : M8 to M80 diameter
 Thread Type : MM, BSW, BSF, UNC, UNF and Fine Pitch
 Material : { 6 (410), 6F (416), 8, 8A(304), 8C, 8CA(347), 8M, 8MA(316), 8T, 8TA(321), 8F, 8FA(303), 8S, 8SA(Nitronic 60) etc.} Alloy Steel (4.6, 5.6, 8.8, 10.9, 12.9, B7) and Nickel Alloys as per customer requirements
 Standard : ISO, DIN, IS, BS, ANSI, ASTM



Washers

Plain Washer, Spring Washer, Flat Washer, Punch Washer, Square Washer

- Diameter Range : M8 to M80 diameter
 Material : { 6 (410), 6F (416), 8, 8A(304), 8C, 8CA(347), 8M, 8MA(316), 8T, 8TA(321), 8F, 8FA(303), 8S, 8SA(Nitronic 60) etc.} Alloy Steel and Nickel Alloys as per customers requirements
 Standard : ISO, DIN, IS, BS, ANSI, ASTM





ASTM SPECIFICATION FOR FASTENERS

**ASTM A 193/A 193M ALLOY STEEL, CARBON STEEL & STAINLESS STEEL
BOLTING FOR HIGH TEMPERATURE SERVICE**

ASTM GRADE	C	Mn	Si	S	P	Cr	Ni	Mo	Other	Hardness	Tensile Psi(MPa)	Yield Psi(MPa)	Elongation in Area %	Redu
A193 B8-B8A AISI Type 304	0.08 Max	2.00 Max	1.00 Max	0.030 Max	0.045 Max	18.00 20.00	8.00 10.50	- -	- -	223HB	75000(515)	30000(205)	30	50
A193 B8-B8MA AISI Type 316	0.08 Max	2.00 Max	1.00 Max	0.030 Max	0.045 Max	16.00 18.00	10.00 14.00	2.00 3.00	- -	223HB 223HB	75000(515)	30000(205)	30	50
A193B8T-B8TA AISI Type 321	0.08 Max	2.00 Max	1.00 Max	0.030 Max	0.045 Max	17.00 19.00	9.00 12.00	- -	Ti5xC 0.70Min	223HB	75000(515)	30000(205)	30	50
A193 B8C-B8CA AISI Type 347	0.08 Max	2.00 Max	1.00 Max	0.030 Max	0.045 Max	17.00 19.00	9.00 13.00	- -	CbxPTA= 1.10cMin	192HB	75000(515)	30000(205)	30	50
A193B6-B6X AISI Type 410	0.15 Max	1.00 -	1.00 Max	0.03 Max	0.040 Max	11.50 13.50	-	-	-	-	110000(760)	85000(585)	15	50
A193 B7-B7M Alloy Steel (Cr. Mo)	0.37 0.49	0.65 1.10	0.15 0.35	0.040 Max	0.035 Max	0.75 1.20	- -	0.15 0.25	- -	- -	125000(860)	105000(720)	16	50
A193B5 A.S.-5%Cr.AISI501	0.10 min	1.00 Max	1.00 Max	0.030 Max	0.040 Max	4.00 6.00	-	0.40	-	-	100000(690)	80000(550)	16	50

**ASTM A 194/ 194 M CARBON STEEL, ALLOY STEEL & STAINLESS STEEL NUTS, BOLTS FOR HIGH PRESSURE &
HIGH TEMPERATURE SERVICE**

ASTM GRADE	C	Mn	Si	S	P	Cr	Ni	Mo	Other	Hardness	Tensile Psi(MPa)	Yield Psi(MPa)	Elongation in Area %	Redu
A194/8A AISI Type 304	0.08 Max	2.00 Max	1.00 Max	0.03 Max	0.045 Max	18.00 20.00	8.00 10.50	-	-	-	126 - 300 Grade 8 126 - 182 Grade 8A	30000(205)	30	50
A194 8M/MA AISI Type 316	0.08 Max	2.00 Max	1.00 Max	0.03 Max	0.045 Max	16.00 18.00	10.00 14.00	2.00 3.00	-	-	126 - 300 Grade 8m 126 - 192 Grade 8 MA	30000(205)	30	50
A194/8T/8TA AISI Type 321	0.08 19.00	2.00 12.00	1.00 -	0.03 0.78 Min	0.045	17.00	9.00	9.00	-	Ti5xC	126 - 300 Grade 8T 126 - 192 Grade 8 TA	30000(205)	30	50
A194/8C/8CA AISI Type 347	0.08 Max	2.00 Max	1.00 Max	0.03 Max	0.045 Max	17.00 19.00	9.00 13.00	9.00 13.00	-	CbxTa= 1.10Cmin	126 - 300 Grade 8CA 126 - 192 Grade 8 CA	30000(205)	30	50
A194-6 AISI Type 410	0.15 Max	1.00 Max	1.00 Max	0.03 Max	0.040 Max	11.50 13.50	-	-	-	1.10 Cmin	228 271HRC-20-28	80000(550)	16	50
A194 2.2HM & 2H Carbon Steel	0.4 min	1 Max	0.4 Max	1.050. Max	0.040 Max	-	-	-	-	-	159-352GR.2 248-352GR.2H 159-237GR.2HM 248-352GR.7 159-237GR.7M 248-352 (HRC-24-38)	80000(550)	16	50
A194-7/7M Alloy Steel	0.37 0.49	0.65 1.1	0.15 0.35	0.04 Max	0.4 Max	0.75 1.2	0.75 1.2	- -	0.15 0.25	- -	-	30000(205)	30	50
A194-30.10 A.S.-5%Cr.AISI501	0.10 Max	1.00 Max	1.00 Max	0.030 Max	0.040 Max	4.00 6.00	-	0.40	-	-	100000(690)	80000(550)	16	50



REFRACTORY ANCHOR SYSTEMS

We are manufactures a wide range of refractory anchor fixings to suit any particular application for retaining cantabile and brick installations.

- Refractory Anchors
- Refractory Brick Fixings
- Special Fixings and Special Fabrications

Manufactured from round bar or plate section, the anchors are available in a number of standard shapes. They are fixed with a thread or a weld, and can be supplied with a weld foot. The fixings are available in the full range of stainless steels and alloys, and can be made to suit any depth of lining.

V' Anchors

Manufactured from bar diameter 5-12mm. The anchor legs can be supplied to individual requirements with odd lengths, with bends or crimps, and with plastic end caps.

Crook Anchors

Crook anchors are manufactured from 5-12mm diameter bar. The crook is available with a span of 75mm, 100mm or 125mm. Crook anchors can be supplied with a plain end, weld leg, thread or bent to fit a pre-welded cleat.

CAST-IN ANCHORS

'Y' Anchors

These anchors are manufactured from 5-12mm diameter bar or from plate section. 'Y' anchors made from round bar can be supplied open to any angle, with a plain end, weld leg or thread.

The tips can be fitted with plastic caps to enable expansion of the tips at temperature. 'Y' anchors from plate section can be supplied open to any angle, or supplied closed for installation of pre-drilled fibreboard or other initial layers prior to opening on site.

Anchors can also be supplied pre-welded to a mild steel base plate for ease of installation on site.

"V" Anchors



Crook Anchors



"Y" Anchors





AISI 316/316L/304 DAIRY PHARMA FOOD PROCESS VALVES & FITTINGS



SMS / DIN / IDF Union



SMS Bend



SMS Tee



Pipe Holder



Cone Reducer



45° Bend Plain



90° Bend Plain



Tee Plain



Cross Tee Plain



Y Bend Plain



Tri-Clover Fitting



Ferrule



Dairy Fitting

Formulae

<p>1) WEIGHT OF STAINLESS STEEL PIPES $O.D. (mm) - W.T. (mm) \times W.T. (mm) \times 0.0248 = \text{Kg. per Mtr.}$ $O.D. (mm) - W.T. (mm) \times W.T. (mm) \times 0.00756 = \text{Wt. Per Feet.}$</p>	<p>8) WEIGHT OF BRASS PIPE / COPPER PIPE $O.D. (mm) - \text{Thick (mm)} \times \text{Thick (mm)} \times 0.0260 = \text{Wt. Per Mtr.}$</p>
<p>2) WEIGHT OF STAINLESS STEEL ROUND BAR $DIA (mm) \times DIA (mm) \times 0.00623 = \text{Wt. Per Mtr.}$ $DIA (mm) \times DIA (mm) \times 0.00623 = \text{Wt. Per Feet.}$</p>	<p>9) WEIGHT OF LEAD PIPE $O.D. (mm) - Wt. (mm) \times Wt. (mm) \times 0.0345 = \text{Wt. Per Mtr.}$</p>
<p>3) WEIGHT OF STAINLESS STEEL SQUARE BAR $DIA (mm) \times DIA (mm) \times 0.00788 = \text{Wt. Per Mtr.}$ $DIA (mm) \times DIA (mm) \times 0.0024 = \text{Wt. Per Feet.}$</p>	<p>10) WEIGHT OF ALUMINUM PIPE $\text{Length (Mtr.)} \times \text{Width (Mtr.)} \times \text{Thick (mm)} \times 0.0083 = \text{Wt. Per Mtr.}$</p>
<p>4) WEIGHT OF STAINLESS STEEL SQUARE BAR $A/F (mm) \times A/F (mm) \times 0.00680 = \text{Wt. Per Mtr.}$ $A/F (mm) \times A/F (mm) \times 0.002072 = \text{Wt. Per Feet.}$</p>	<p>11) WEIGHT OF ALUMINUM SHEET $\text{Length (Mtr.)} \times \text{Width (Mtr.)} \times \text{Thick (mm)} \times 2.69 = \text{Wt. Per PC}$</p>
<p>5) WEIGHT OF STAINLESS STEEL FLAT BAR $\text{Width (mm)} \times \text{Thick (mm)} \times 0.00798 = \text{Wt. Per Mtr.}$ $\text{Width (mm)} \times \text{Thick (mm)} \times 0.00243 = \text{Wt. Per Feet.}$</p>	<p>12) WEIGHT OF CONVERSION OF MTR. TO FEET $\text{Weight of 1 Mtr.} \div 3.2808 = \text{Feet}$</p>
<p>6) WEIGHT OF STAINLESS STEEL SHEETS & PLATES $\text{Length (Mtrs)} \times \text{Width (Mtrs)} \times \text{Thick (mm)} \times 8 = \text{Kg. Per Sheet}$ $\text{Length (Ft)} \times \text{Width (Ft)} \times \text{Thick (mm)} \times 3/4 = \text{Kg. Per Sheet}$</p>	<p>13) WEIGHT OF CALCULATING WIDTH OF SHEET FOR MAKING PIPE $\text{Outer DIA} - \text{Wall Thickness} \times 22/7 \text{ Width of Sheet}$</p>
<p>7) WEIGHT OF STAINLESS STEEL CIRCLE $DIA (mm) \times DIA (mm) \times \text{Thick (mm)} \div 160 = \text{Gms. Per PC}$ $DIA (mm) \times DIA (mm) \times \text{Thick (mm)} \times 0.0000063 = \text{Kg. Per PC}$</p>	<p>14) FORMULA FOR HEALTHY BUSINESS Honesty + Quality of Goods + Quick Service + Reasonable Rate = Good Health of Business</p>

Third Party Inspection

List of thirds party inspection agency with whom we regularly work





CHIRAG STEEL

AN ISO 9001:2015 CERTIFIED CO.

Importers & Stockiest, Suppliers of : Stainless Steel, Carbon Steel & Alloys Steel Pipes
Fittings, Flanges, Round Bars, Sheets etc. In All Size & Grade
Stainless Steel, Carbon Steel, Nickel & Alloy Steel Fittings In All Size & Grade

B-6, Haji Allarakhia Building, 9th Khetwadi, Mumbai - 400 004.

Tel.: 022 - 6615 7012 / 6615 7021 **Tel/Fax :** 022 - 2385 0329
E-mail : mehta@chiragsteel.com • **Web.:** www.chiragsteel.com

