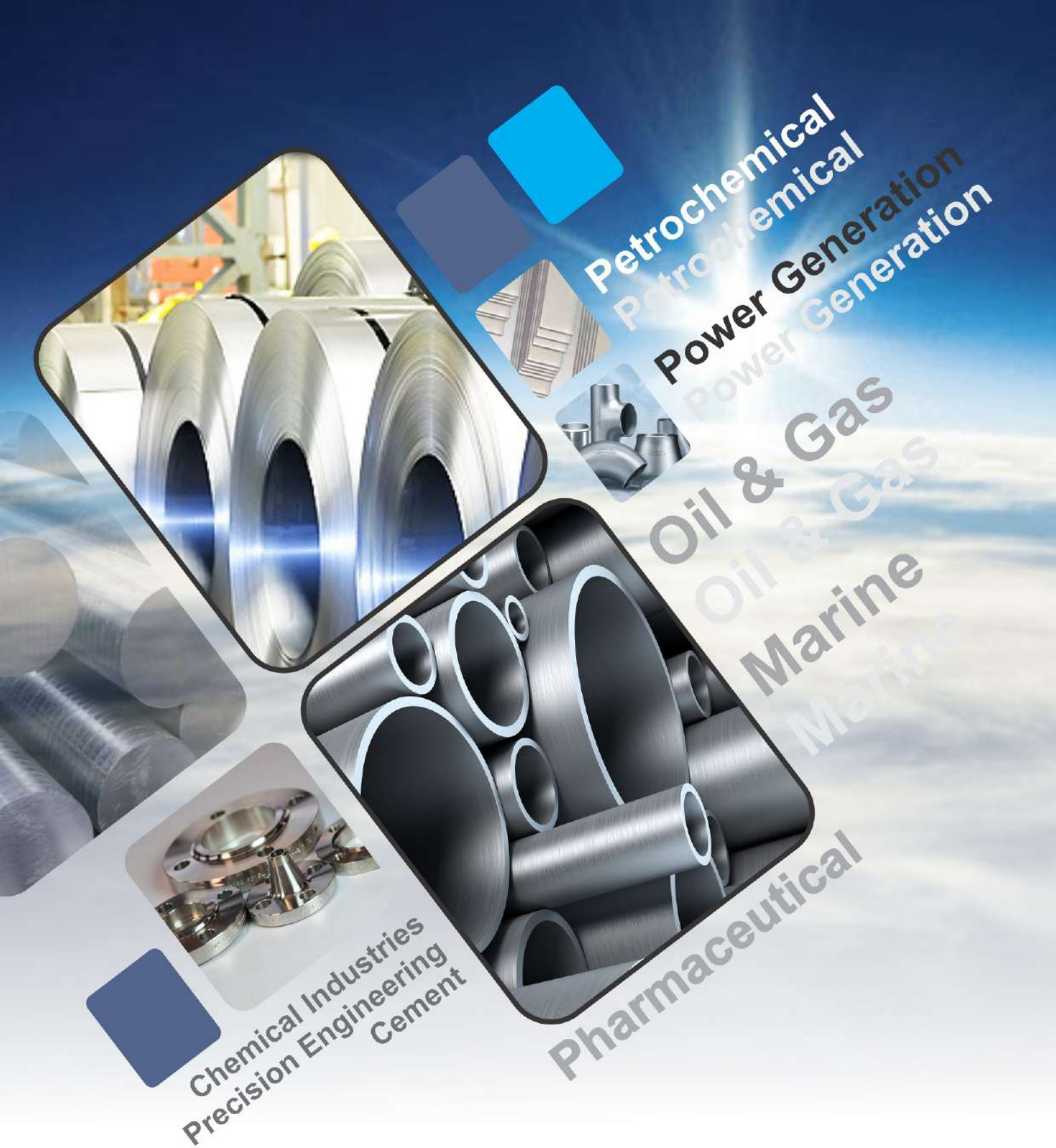

CRISIL RATINGS
NSIC - CRISIL SE 2B

Roopam Steel

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An ISO 9001 : 2015 Certified Co.

Roopam Steel is one of the biggest manufacturer, stockiest and supplier of Stainless Steel Pipes & Tubes, Welded Pipes, Seamless Pipes, Stainless Steel Sheet, Round Bar, Coils since last two decades. We are capable of providing a vast range of materials, from stock, to suit your needs. From highly specialized non-standard material to off the shelf items, from production to prototype, from low minimums to mill runs, Roopam Steel has the experience to solve your most difficult requirements. With our focus on Superior Customer Service, Premium Quality and Quick Turnaround we are sure you will agree that Roopam Steel is your best source for Steel.

We has been serving many industries in Piping, Petroleum & Refinery, Oil & Gas, Oilfield, Chemical, Power Plant ,Cement, Pharmaceuticals, Turbines, Shipbuilding, Naval, Aerospace for Current, New and Upcoming Projects in domestic and global market. Our highly knowledgeable and experienced technical & sales team works together to make sure you get the right product, at the right time, every time and fast as per requirements

Please give us opportunities to serve your best with our excellent quality of material by sending your all valuable enquiries. We will be highly obliged with your quick response to establish a mutually beneficial business Relationship with your esteemed organization.

Quality Management

A system comprises the way of Quality Control to be followed during each process of Pipes, Tubes, Pipe fittings, Flanges, Fasteners, Sheets, Plates, Wires, Tube Fittings, Etc. so that an audit mechanism is introduced during manufacturing itself to produce a product meeting the requirements of desired codes & specifications.

Our Factory
Plot No. 2-KV, GIDC Manjusar, Vadodara - 391775. Gujarat, India.
Contact : +91 (0) 22 6636 2442

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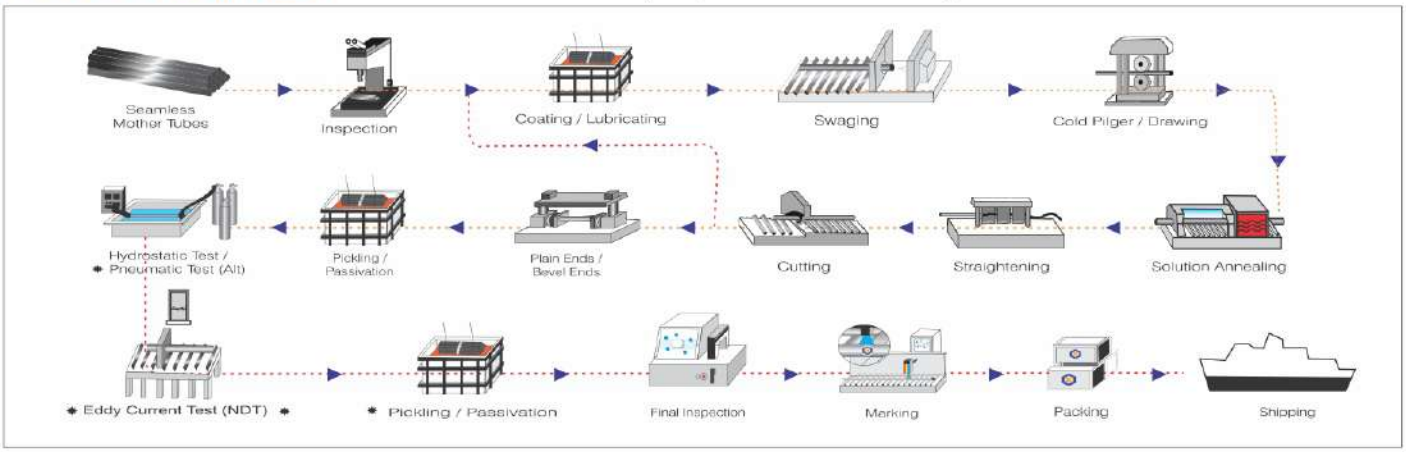
SEAMLESS PIPES & TUBES

Specifications	ASME/ ASTM A213 / A269 / A312, EN 10216-5 DIN 2391 / ASTM A 789 / ASTM A 803
O.D	3.175 mm to 406.4 mm
N.B	1/8" - 16"
Thickness	0.6 mm to 15 mm
Length	up to 30 Meters
Process Features	Bright Annealed or Solution Annealed - Pickled - Passivated
Surface Finish	Bright / Pickled / Polished (ID & OD)
Grade	304 / 304L / 304H / 316 / 316L / 317 / 317L / 309S / 310S / 310H / 321/ 321H / 347 / 347H / 316H / 316Ti / 904l / 254 SMO / 6MO / Alloy 2205 / 2507 / 32760 / Monel 400 / Inconel 625 / Inconel 825 / Alloy 20

" U " TUBES

Specifications	ASME / ASTM A213 / A 688 & TEMA R 23C
O.D	15.88 mm to 50.80 mm
Thickness	0.6 mm to 3.68 mm
Length	up to 14 meters Leg Length
Process Features	Bright Annealed or Solution Annealed - Pickled - Passivated
Surface Finish	Bright / Pickled / Polished (ID & OD)

Process of Seamless Stainless Steel Tube / Pipe Manufacturing



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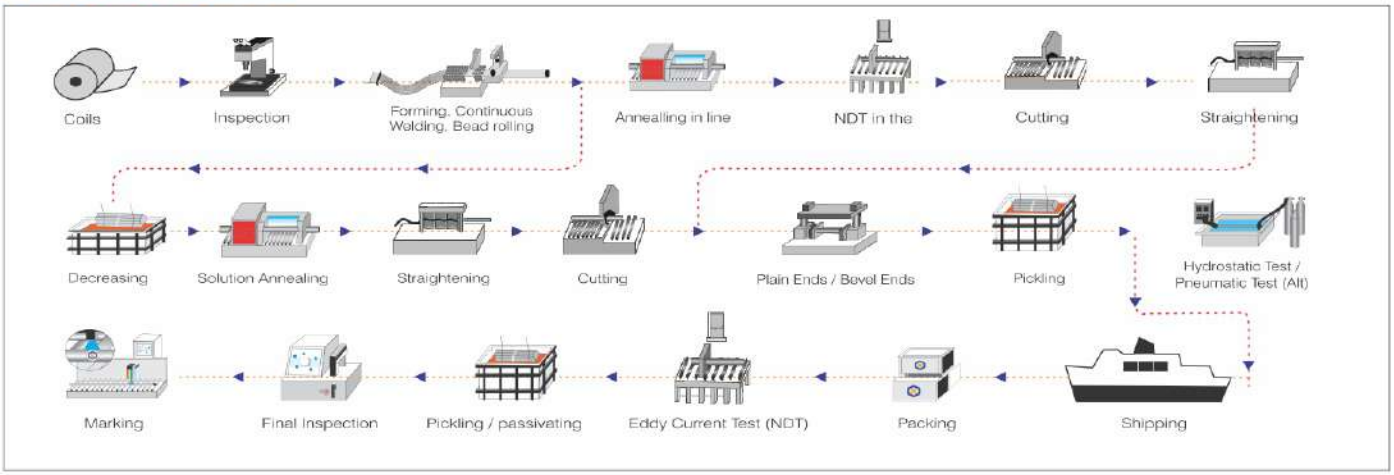
WELDED PIPES & TUBES

Specifications	ASME/ ASTM A213 / A269 / A312, EN 10216-5 DIN 2391 / ASTM A 789 / ASTM A 803
O.D	3.175 mm to 406.4 mm
N.B	1/8" - 16"
Thickness	0.6 mm to 25 mm
Length	up to 30 Meters
Process Features	Bright Annealed or Solution Annealed - Pickled - Passivated
Surface Finish	Bright / Pickled / Polished (ID & OD)
Grade	304 / 304L / 304H / 316 / 316L / 317 / 317L / 309S / 310S / 310H / 321/ 321H / 347 / 347H / 316H / 316Ti / 904l / 254 SMO / 6MO / Alloy 2205 / 2507 / 32760 / Monel 400 / Inconel 625 / Inconel 825 / Alloy 20

EFW (Electric Fusion Welded) PIPES

Specifications	ASME/ ASTM A409, A778
O.D	8"NB to 24"NB (219.1 to 609.6mm) 18 to 48" (457.2 to 1220 mm)
Thickness	2.5 to 32 mm & 2.5 to 14.0 mm
Length	6 mtrs. Double random lengths are possible with one circumferential joint 3.5 to 6 mtrs.
Process Features	In solutions annealed or As welded condition. Finish Pickled
Type	Bright Annealed or Solution Annealed - Pickled - Passivated
Welding Method	TIG, plasma, SWA welding used in insolation or any combination thereof TIG, plasma, GTAW welding used in insolation or any combination thereof

Process of Welded Stainless Steel Tube / Pipe



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CARBON STEEL PIPES

Carbon Steel Seamless Pipes	:	As Per ASTMA 106 Gr. B, A53 Gr. B, API 5L Gr.A,B, X42, X46, X52, X56, & X60 with IBR Test Certificate.
Carbon Steel Seamless Pipes & Tubes for Low Temperature Services	:	As Per ASTMA333 Gr. 1 & Gr.6 with IBR TC.
Carbon Steel ERW & Seamless Boiler Tubes	:	As Per BS 3059 Part I Gr.320, BS 3059 Part II Gr. 360, 440 & 620 with IBR Test Certificate
Carbon Steel Seamless Heat Exchangers Tubes	:	As Per ASTMA 179, ASTMA210 Gr. A1 & ASTMA 192 with IBR Test Certificate etc.
CDW & ERW Air Heater Tubes	:	As Per IS 3601, BS 1775 & BS 6323.
MS ERW & Hot Dipped Galvanised (G.L.) ERW Pipes	:	As Per IS 1239 & IS 3589 Gr. Fe330 & 410.
SAW / EFW Pipes	:	As Per ASTMA53 Gr.B, API 5L Gr. B & ASTMA 671, 672 & 691 in all Class with IBR Test Certificate.

ALLOY STEEL PIPES

Alloy Steel	:	ASTM / ASME A 335 GR P1, P5, P9, P11, P12, P22, P23, P91, ASTM / ASME A 691 GR 1 CR, 11/4 CR, 21/ 4CR.
Copper Alloy	:	ASTM / ASME SB 111 UNS no. C 10100, 10200, 10300, 10800, 12000, 12200, 70600, 71500. ASTM / ASME SB 466 UNS No. C 70600, (CU-NI-90/10), C 71500 CU-NI-70/30) BR & NON-IBR
Types	:	Round, Square, Rectangular, S.S. Bellow & Flexible Hose.
Size	:	Up to 24" NB (Seamless), up to 48" (Welded)
Wall Thickness	:	SCH. 5S to SCH. XXS

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BUTTWELD FITTING

Size	:	1/2" NB to 48" NB
Thickness	:	Sch. 5S to Sch. XXS
Type	:	Seamless / Welded / Fabricated
Form	:	Long Radius Bend, Elbows, Tee, Reducer, Caps, Crosses, Collar, Stub End, Nipple, Coupling, Customized Fitting
Standard	:	ASTM / BS / DIN / IS

Material Grade

Stainless Steel	:	ASTM A403 WP 304/L/H, 309S/H, 310S/H, 316/L/H, 317/L, 321/H, 347/H, 904L
Duplex Steel	:	ASTM A815 UNS NO S 31803, S 32205, S 32550, S 32750, S 32760
Carbon Steel	:	ASTM A234 WPB, WPC / ASTM A860 WPHY (Y42, Y52, Y60, Y65, Y70) / A420 WPL6, WPL3
Alloy Steel	:	ASTM A234 WP1, WP5, WP9, WP11, WP22, WP91
Nickel Alloy	:	Nickel, Monel, Inconel, Hastelloy, Copper, Brass, etc.

FLANGES & FORGED FITTINGS

FLANGES

Size	:	1/2" NB to 48" NB
Class	:	150 LBS, 300 LBS, 600 LBS, 900 LBS, 1500 LBS, 2500 LBS
Type	:	Slip On, Weld Neck, Blind, Socket Weld, Threaded, Lap Joint, Orifice, Spectacle, Ring Joint, Long Weld Neck
Face	:	Raised Face (RF), Flat Face (FF), Ring-Type Joint (RTJ), Tongue-and-Groove (T&G), Male-and-Female (M&F)
Standard	:	ASTM / BS / DIN / IS

FORGED FITTINGS

Size	:	1/4"NB to 4"NB
Class	:	3000 LBS, 6000 LBS, 9000 LBS
Type	:	Elbow, Tee, Union, Coupling, Cross, Cap, Nipple, Plug, Weldolet, Sockolet, Thredolet,Nipolet, Elbowlet, Letrolet, Swepolet

Material Grade

Stainless Steel	:	ASTM A182 F304/L/H, 309S/H, 310S/H, 316/L/H, 317/L, 321/H, 347/H, 904L
Duplex Steel	:	ASTM A182 F51, F60, F53, F55
Carbon Steel	:	ASTM A105 / ASTM A694 F42, F52, F60, F65, F70 / ASTM A350 LF2, LF3
Alloy Steel	:	ASTM A182 F1, F5, F9, F11, F22, F91
Nickel Alloy	:	Nickel, Monel, Inconel, Hastelloy, Copper, Brass, etc.

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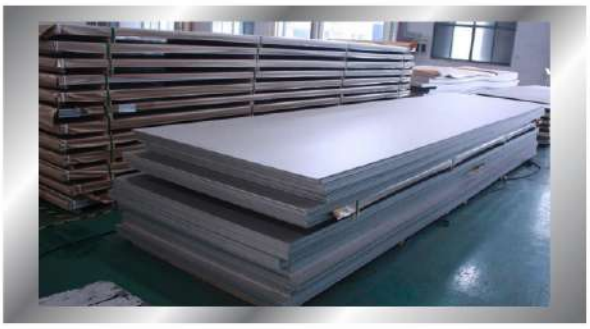

SHEET / PLATE

Size	:	0.5 mm to 200 mm thick in 1000 mm to 2500 mm width & 2500 mm to 12500 mm Length
Type	:	Sheet, Plates, Coils, Flat, Strips, Profile, Blank, Circle, Ring etc.
Form	:	Foils, Shim Sheet, Rolls, Perforated Sheet, Chequered Plate.
Finish	:	2B, 2D, BA NO (8), SATIN (Met with Plastic Coated), Hot rolled plate (HR), Cold rolled sheet (CR)
Hardness	:	Soft, Hard, Half Hard, Quarter Hard, Spring Hard, Etc.

Material Grade

Stainless Steel	:	ASTM A240 Gr. 304/L/H, 309S/H, 310S/H, 316/L/H, 317/L, 321/H, 347/H, 904L
Duplex Steel	:	ASTM A240 UNS NO S 31803, S 32205, S 32550, S 32750, S 32760
Carbon Steel	:	ASTM A516 / 517 GR. 60 / 70, IS 2062 Gr. A, B & C, IS 2002 Gr. 1 & 2
Alloy Steel	:	ASTM A387 Grades F1, F5, F9, F11, F22, F91 CL 1 & 2
Nickel Alloy	:	Nickel, Monel, Inconel, Hastelloy, Copper, Brass, etc.
Other Plates	:	Boiler & Pressure Vessel Steel Plates, Structural Steel Plates, Ship Building Steel Plates, Quenched & Tempered Steel Plates, Hardox Plates & Weldox Plates

Value Added Service :
o Rolling, Cutting, Bending, Forging, Minor Fabrication, Etc. o Annealed & Pickling, Polish & Buffing, Cladding, Heat Treatment.

ROUND BAR

Stainless Steel Bars :		as per ASTM A276, A314, A582, A582, A479 & A 484 Gr. TP 304, 304L, 304H, 304LN, 309, 309S, 309H, 310S, 310H, 316, 316H, 316LN, 316TI, 317, 317L, 321, 321H, 347, 347H, 348, 348H, 409, 410, 420, 430, 440 etc.
Alloy Steel Bars	:	as per ASTM A 182 Gr. F1, F2, F5, F9, F11, F12, F22, F91 etc.
Carbon Steel Bars	:	as per ASTM A 105 & IS 2062 Gr. A & B.
Nickel Alloy	:	Inconel 600/625 Incoloy 800/825, Monel Hastelloy C-276, C-22, B-2 Alloy - 20, Alloy - 904L, Titanium etc.
Size	:	0.5mm Dia to 500mm Dia.
Finish	:	Bright, Black, Polish
Type	:	Round, Squar, Hex, Rectangle, Flat, Bar, Wire, Wire mesh.

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SOCKETWELD FITTINGS

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

Carbon Steel : ASTM A105 / A694/F42/46/52/56/60/65 70/A 350 LF3 / A350 LF2

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

High Nickel Alloy : Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead, etc.

Types : Elbow, Tee, Union, Cross, Coup Bushing, 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#.

FASTENERS

Stainless Steel : AISI 304,304L,316,316L, 310, 317, 317L, 321, 347, 410, 420,904L 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 Head Screw, Fine Fasteners & Spares, Foundation Fasteners, etc.

WIRES / BARS

Material Grade : Stainless Steel, Nickel Alloys, Carbon Steel, Alloy Steel, IBR Non IBR.

High Nickel Alloy : Monel, Nickel, Inconel, Hastalloy, Copper, Barss, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead, etc.

Carbon Steel Bars : as per ASTM A105 & IS 2062 Gr. A & B.

Type : Round/ Square / Hexagonal / Rectangular

ANGLES / CHANNELS / BEAM / RAIL

Material : Stainless Steel, Carbon Steel, Alloy Steel, Aluminium Alloys, Inconel, Etc

Size : Any, as per requirement

Shapes : Equal, Un-Equal, or As per Client Requirements

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STAINLESS STEEL PIPE DIMENSION AS PER ASTM AND WEIGHT KG. PER MTR. (ANSI B 36.19 - 1965)

Nominal Bore		Outside Diameter	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	1.91	2.77	3.11	3.00	3.55	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	12.7	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	12.7	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	12.7	132.0	33.32	238.76	25.40	186.97
350	14	355.6	3.96	34.36	4.78	41.3	7.92	67.80	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	77.83	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	87.71	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	141.12	17.48	255.41	30.96	442.08	59.54	808.22	-	-

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STANDARD TYPES OF STANILESS STEEL GAUGE PIPES

Size	O.D in mm	10G (3.25) (0.120")	12G (2.64) (0.104")	14G (2.03) (0.080")	16G (1.65) (0.065")	18G (1.21) (0.049")	20G (0.91) (0.0.35")	22G (0.71) (0.028")
1/4"	6.35	0.075	0.070	0.065	0.058	0.046	0.037	0.030
5/16"	7.93	0.114	0.105	0.089	0.079	0.060	0.048	0.038
3/8"	9.52	0.152	0.135	0.113	0.097	0.080	0.058	0.046
1/2"	12.7	0.226	0.200	0.157	0.134	0.105	0.079	0.063
5/8"	15.87	0.310	0.264	0.212	0.174	0.134	0.103	0.081
3/4"	19.05	0.386	0.326	0.256	0.215	0.161	0.124	0.097
7/8"	22.25	0.465	0.390	0.310	0.252	0.192	0.145	0.113
1"	25.4	0.541	0.450	0.351	0.294	0.218	0.167	0.131
1 1/4"	31.750	0.696	0.580	0.448	0.375	0.275	0.200	0.162
1 1/2"	38.1	0.851	0.700	0.542	0.452	0.332	0.250	0.196
1 3/4"	44.45	1.020	0.832	0.646	0.530	0.390	0.294	0.230
2"	50.8	1.161	0.960	0.733	0.607	0.447	0.336	0.263
2 1/4"	57.15	1.315	1.085	0.828	0.687	0.504	-	
2 1/2"	63.5	1.472	1.210	0.924	0.792	0.562		
2 3/4"	69.85	1.630	1.338	1.022	0.847	0.619		
3"	76.2	1.782	1.460	1.115	0.924	0.676		
3 1/2"	88.9	2.092	1.718	1.306	1.082	0.791		
4"	101.6	2.403	1.971	1.497	1.239	0.905		
4 1/2"	114.3	2.713	2.224	1.608	1.397	1.020		
5"	127.0	3.023	2.477	1.879	1.554	1.134		
5 1/2"	139.7	3.336	2.730	2.070	1.713	1.250		
6"	152.4	3.654	2.983	2.261	1.875	1.364		

All Schedule size pipes are availbale in (+-) Tolerance Thickness Length as requirement and gauges pipes & tubes also available in various outside diameter & thickness & length as requirement

Finishing : Aluminium, Bright, Polished, Matt, EP as requirement.

ANSI SPECIFICATION & TOLERANCE FOR TUBING & PIPING

Specification	Allowable Outside Diameter Variation in mm			Allowable wall Thickness Variation		Exact Length Tolerences in mm		Testing
ASTM A - 213 Seamless Boiler, Superheater and Heat Exchanger Tubes	NominalDiameter Upto 25.4 25.4 - 38.1 incl. 38.1 - 50.8 incl. 50.8 - 63.5 incl. 63.5 - 73.2 incl. 76.2 - 101.6 incl.	Over 0.1016 0.1524 0.2032 0.2540 0.3048 0.3810	Under 0.1016 0.1524 0.2032 0.2540 0.3048 0.3810	Over % +20 +20 +22 +22 +22 +22	Under% -0 -0 -0 -0 -0 -0	Over 3.175 3.175 3.176 3.760 4.760 4.760	Under 0 0 0 0 0 0	Macro Test Flattening Test Tension Test Flare Test Hardness Test 100%Hydrostati Test Refer to ASTM A-450
ASTM A - 249 Welded Boiler, Superheater, 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 Minimum Wall tubes + 18%0 available on request	-10 -10 -10 -10 -10 -10	3.175 3.175 3.175 3.760 4.760 4.760	0 0 0 0 0 0	Tension Test, Flattening Test Flare Test Reverse Bend Test Hardness Test 100% Hydrostatic Test
ASTM A - 269 Seamless & Welded Tubing for General 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	Flare Test (Seamless only) Flange Test (Welded only) Hardness Test Reverse Flattening test (Welded only) 100% Hydrostatic Test Refer to ASTM A-269
ASTM A - 312 Seamless & Welded ERW Pipes	13.7 - 48.3 incl. 38.1 - 1016 incl. 114.3 - 220 incl.	0.40 0.79 1.59	0.79 0.79 0.79	Minimum Wall tubes 12.5% under wall nominal Specification	6.4	6.4 6.4 6.4	0 0 0 (Normally Random Lengths ordered)	Tension Test Flattening Test 100% Hydrostatic Test
ASTM A - 358 ERW Welded Pipe	219.08 - 750mm or 0.01 inch	+0.5%		-0.3			6.0	Refer to ASTM A - 530
ASTM A - 409 Welded ERW	355.6 - 750mm	+0.2% to + 0.4%			-0.46			Refer to ASTM A - 530

CARBON STEEL & ALLOY STEEL PIPE DIMENSIONS ANSI B 36.10

Nominal Pipe size		O/D	Schedule 10		Schedule 20		Schedule 30		Schedule STD		Schedule 40		Schedule 60		Schedule XS		Schedule 80		Schedule 100		Schedule 120		Schedule 140		Schedule 160		Schedule XXS	
MM	INCH	MM	W.T.	KG/M	W.T.	KG/M	W.T.	KG/M	W.T.	KG/M	W.T.	KG/M	W.T.	KG/M	W.T.	KG/M	W.T.	KG/M	W.T.	KG/M	W.T.	KG/M	W.T.	KG/M	W.T.	KG/M	W.T.	KG/M
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							5.56	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	1¼	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	1½	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	11.1	13.4
65	2½	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	15.3	7.62	15.3							11.13	21.35	15.24	27.7
90	3½	101.6							5.74	13.57	5.74	13.57			8.08	18.63	8.08	18.63							-			
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	42.5	10.31	53.1	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	60.3	12.7	81.5	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	323.8			6.35	49.7	8.4	65.2	9.53	73.8	10.31	79.7	14.27	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	54.7	7.92	68.1	9.53	81.3	9.53	81.3	11.13	94.6	15.09	126.0	12.7	107.0	19.0	158.0	23.8	195.0	27.8	224.0	31.8	253.5	35.7	281		
400	16	406.4	6.35	62.6	7.92	77.9	9.53	93.3	9.53	93.3	12.7	123.0	16.66	160.0	12.7	123.0	21.44	203.0	26.2	245.0	30.9	286.0	36.53	333	40.5	366.0		
450	18	457.2	6.35	70.6	7.92	87.7	11.13	122.0	9.53	105.0	14.20	156.0	19.05	206.0	12.7	139.0	23.8	254.6	29.36	310.0	34.0	363.0	39.7	408.3	45.2	459.0		
500	20	508.0	6.35	78.5	9.53	117.2	12.7	155.1	9.53	117.2	15.09	183.0	20.62	248.0	12.7	155.1	26.2	311.0	32.5	381.0	38.1	441.0	44.4	508	50.0	564.0		
550	22	558.8	6.35	86.6	9.53	129.0	12.7	171.0	9.53	129.0			22.2	294.0	12.7	171.0	28.6	373.0	34.9	451.0	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	210.0	9.53	141.0	17.48	255.0	24.61	355.0	12.7	187.0	30.9	442.08	38.8	547.7	46.0	640.0	52.4	720.15	59.5	808.22		
650	26	660.0	7.92	127.3	12.7	203.0			9.53	153.0					12.7	202												
700	28	711.0	7.92	137.4	12.7	218.0	15.88	272.0	9.53	165.0					12.7	218												
750	30	762.0	7.92	147.9	12.7	234.6	15.88	292.2	9.53	176.0					12.7	235												
800	32	812.8	7.92	157.9	12.7	250.6	15.88	312.0	9.53	188.2	17.48	342.0			12.7	251												
850	34	863.6	7.92	167.9	12.7	266.5	15.88	331.7	9.53	200.0	17.48	364.9			12.7	266												
900	36	914.4	7.92	176.9	12.7	282.4	15.88	352.2	9.53	212.0	19.05	420.6			12.7	282												

All Dimensions in millimeters. W.T. = Wall Thickness. KG/M = Kilograms per Meter.

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CHEMICAL COMPOSITION OF STAINLESS STEEL

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		
UNS NO.	EN	BS	AISI Grade	C Max	Mn Max	P Max	S Max	Si Max	Cr	Ni	Mo	Cu	I.S.
Austentic													
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	-	301S21	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	17.0/190	8.0/10.0	-	-	07Cr18Ni9
S30300	-	303S31	303	0.15	2.0	0.045	0.15 min	1.0	17.0/19.0	8.0/10.0	-	-	15Cr18Ni9
S30400	1.4301	-	304	0.08	2.0	0.045	0.030	1.0	18.0/20.0	8.0/10.0	-	-	04Cr18Ni10
S30403	1.4307	304S11	304L	0.030	2.0	0.045	0.030	1.0	18.0/20.0	8.0/12.0	-	-	02Cr18Ni11
S30453	1.4306	304S61	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	-	-	-
S30900	-	309S16	309	0.20	2.0max	0.045	0.030	1.0	22.0/24.0	12.0/15.0	-	-	20Cr24Ni12
S30908	1.4833	-	309S	0.08	2.0	0.045	0.030	1.0	22.0/24.0	12.0/15.0	-	-	-
S31009	-	-	310H	0.25	2.0	0.045	0.030	1.50	24.0/26.0	19.0/22.0	-	-	10Cr25Ni12
S31008	1.4845	-	310S	0.08	2.0	0.045	0.030	1.50	24.0/26.0	19.0/22.0	-	-	-
S31600	-	316S31	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	1.4404	316S11	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	-	316S61	316LN	0.030	2.0	0.045	0.030	0.75	16.0/18.0	10.0/14.0	2.0/3.0	-	-
S31635	1.4571	320S31	316Ti	0.080	2.0	0.045	0.030	1.0	16.0/18.0	10.0/14.0	2.0/3.0		-
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	-	317S12	317L	0.030	2.0	0.045	0.030	1.0	18.0/20.0	11.0/15.0	3.0/4.0	-	-
S31753	-	-	317LN	0.03	2.0	0.045	0.03	1	18.0/20.0	11.0/15.0	3.0/4.0	-	-
S32100	1.4541	321S31	321	0.08	2.0	0.045	0.030	1.0	17.0/19.0	9.0/12.0	-	-	04Cr18Ni10Ti20
S34700	-	347S31	347	0.08	2.0	0.045	0.030	1.0	17.0/19.0	9.0/12.0	-	-	04Cr18Ni10Nb-40
N08904	1.4539	-	904L	0.02	2.0	0.045	0.035	1	19.0/23.0	23.0/28.0	4.0-5.0	-	-
Ferritic													
S41000	-	410S21	410	0.15	1.00	0.040	0.030	1.0	11.50-13.50	0.75	...	...	...
S41008	1.4000	403S17	410S	0.08	1.00	0.040	0.030	1.0	11.50-13.50	0.60	...	...	...
S42900	-	-	429[@]	0.12	1.00	0.040	0.030	1.0	14.00-16.00	...	...	...	...
S43000	1.4016	430S17	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	...
S44400	-	-	444	0.025	1.00	0.040	0.030	1.0	17.5-19.5	1.00	1.75-2.50	0.035	...
			446	0.20	1.50	0.040	0.030	0.50	11.40 / 13.00	-			
	-	-	409L	≤ 0.030	≤1.00	≤1.00	-	-	-	10.50~11.75	~	-	-
Duplex & Super Duplex													
S31803	1.4462	-	---	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[@]	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	1.441	-	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

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Super Austenitic Stainless

904L	8904	1.4500	0.02	19.0-23.0	23.0-28.0	4.0-5.0	0.1 Max	Cu : 1.0-2.0
254SMo	31254	1.4547	0.02	19.5-20.5	17.5-18.5	6.0-7.0	0.18-0.22 Max	Cu : 0.5-1.0
6Mo	8926	1.4529	0.02	19.0-21.0	24.0-26.0	6.0-7.0	0.15-0.25 Max	Cu : 0.5-1.5

Nickel Alloys

MONEL 400	4400	2.4360	0.30	-	63.0 Min	-	-	Cu : 28.0-34.0 Fe : 2.5 Max
INCONEL 625	6625	2.4865	0.01	20.0-23.0	58.0 Min	8.0-10.0	-	Fe : 5 Max Nb + Ta : 3.15-4.15
INCONEL 825	8825	2.4858	0.05	19.5-23.5	38.0-46.0	2.5-3.5	-	Fe : 22.00 Min Cu : 1.5-3.0
ALLOY 20	8020	2.4460	0.07	19.0-21.0	32.0-38.0	2.0-3.0	-	Cu : 3.0-4.0 Nb + W : 1.0 Max

ASTM	American Society for Testing of Materials	**ASME**	American Society for Mechanical Engineers	**SAE**	Society of Automotive Engineers
DIN	Deutsches Institute for Normung	**JIS**	Japan Industrial Standards	**UNS**	United Numbering System
GOST	Gosudarstvenil Standards	**TEMA**	Tubular Exchanger Manufacturers Association	**PED**	Pressure Equipment Directive

CARBON STEEL STEEL

SPECIFICATION	C%	Mn%	P%	S%	Si%	Cr%	Cu%	Mo%	Ni%	Va%
Standard Specification for Carbon Steel Seamless Tubes/Pipes for High Temperature Services										
ASTMA 106/A	0.25 Max	0.27-0.93	0.035 Max	0.035 Max	0.10 Max	0.40 Max	0.4 Max	0.15 Max	0.4 Max	0.08 Max
ASTMA106/B	0.30 Max	0.29-1.06	0.035 Max	0.035 Max	0.10 Max	0.40 Max	0.4 Max	0.15 Max	0.4 Max	0.08 Max
ASTMA 106/C	0.35 Max	0.29-1.06	0.035 Max	0.035 Max	0.10 Max	0.40 Max	0.4 Max	0.15 Max	0.4 Max	0.08 Max
Standard Specification for Carbon Steel Seamless Tubes/Pipes for Heat Exchangers and Condensers										
ASTMA 179	0.06-0.18	0.27-0.63	0.035 Max	0.035 Max	-	-	-	-	-	-
Standard Specification for Carbon Steel Seamless Boiler Tubes/Pipes for High Pressure Services										
ASTMA 192	0.06-0.18	0.27-0.63	0.035 Max	0.035 Max	0.025 Max	-	-	-	-	-
Standard Specification For Carbon Steel Seamless Boiler and Super Heater Tubes										
ASTMA 210/A1	0.27 Max	0.93 Max	0.035 Max	0.10 Min	-	-	-	-	-	-
ASTMA 210/C	0.5 Max	0.29-1.06	0.035 Max	0.10 Min	-	-	-	-	-	-
Standard Specification For Seamless Carbon Steel Pipes for Low Temp. Service										
ASTMA 333/1	0.30 Max	0.40-1.06	0.025 Max	0.025 Max	-	-	-	-	-	-
ASTMA 333/6	0.30 Max	0.29-1.06	0.25 Max	0.025 Max	0.10 Min	-	-	-	-	-
Standard Specification For Seamless Carbon & Alloy Steel Tubes for Low Temp. Services										
ASTMA 334/1	0.30 Max	0.40-1.06	0.025 Max	0.025 Max	-	-	-	-	-	-
ASTMA 334/6	0.30 Max	0.29-1.06	0.025 MaX	0.025 Max	0.10 Min	-	-	-	-	-
Standard Specification For Seamless Carbon Steel Boiler and Superheater Tubes										
BS 3059/1/320	0.16 Max	0.30-0.70	0.04 Max	0.04 Max	0.1-0.35	-	-	-	-	-
BS 3059/2/360	0.17 Max	0.40-0.80	0.035 Max	0.035	0.10-0.35	-	-	-	-	-

ALLOYS STEEL

SPECIFICATION	C%	Mn%	P%	S%	Si%	Cr%	Cu%	Mo%	Ni%	Va%
Standard Specification for Seamless Carbon Steel Boiler and Superheater Tubes										
ASTMA213/T2	0.10-0.20	0.30-0.61	0.025 Max	0.025 Max	0.10-0.30	0.50-0.81	-	0.44-0.65	-	-
ASTMA213/T11	0.05-0.15	0.30-0.60	0.025 Max	0.025 Max	0.50-1.00	1.0-1.5	-	0.44-0.65	-	-
ASTMA213/T12	0.05-0.15	0.30-0.61	0.025 Max	0.025 Max	0.50 Max	0.80-1.25	-	0.44-0.65	-	-
ASTMA213/T22	0.05-0.15	0.30-0.60	0.025 Max	0.025 Max	0.50 Max	1.9-2.0	-	0.87-1.13	-	-
Standard Specification for Seamless Ferrite Carbon & Alloy Steel Pipes for Low Temp. Services										
ASTMA335/P11	0.05-0.15	0.30-0.60	0.025 Max	0.025 Max	0.50-1.00	1.00-1.50	-	0.44-0.65	-	-
ASTMA335/P12	0.05-0.15	0.30-0.61	0.025 Max	0.025 Max	0.50 Max	0.80-1.25	-	0.44-0.65	-	-
ASTMA335/P22	0.05-0.15	0.30-0.60	0.025 Max	0.025 Max	0.50 Max	1.90-2.60	-	0.87-1.13	-	-
Std. Spec. for Seamless Ferrite Carbon & Alloy Steel Tube for Boiler, Pipelines, Pressure Vessels for Temp upto 600° C										
BS 3059/2/440	0.12-0.18	0.90-1.20	0.035 Max	0.035 Max	0.10-0.35	-	-	-	-	-
BS 3059/2/620	0.10-0.15	0.40-0.70	0.03 Max	0.03 Max	0.10-0.35	0.70-1.10	-	0.45-065	-	-
Std. Spec. for Seamless Ferrite Carbon & Alloy Steel Tube for Boiler, Pipelines, Pressure Vessels for Temp upto 600° C										
DI/17175/ST35.8	0.17 Max	0.4-1.20	0.04 Max	0.04 Max	0.10-0.35	-	-	-	-	-
DI17175/ST45.8	0.21 Max	0.4-1.2	0.04 Max	0.04 Max	0.10-0.35	-	-	-	-	-
DI/17175/15Mo3	0.12-0.20	0.4-0.8	0.035 Max	0.035 Max	0.10-0.35	-	-	0.295-0.35	-	-
DI/17175/13CrMo44	0.10-0.18	0.40-0.70	0.04 Max	0.10-0.18 Max	0.10-0.35	0.70-1.10	-	0.45-0.65	-	-
DI/17175/10CrMo910	0.08-0.15	0.40-0.70	0.035 Max	0.035 Max	0.50 Max	2.00-2.5	-	0.90-1.20	-	-

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FORMULAE OF CALCULATING WEIGHT

1) **WEIGHT OF STAINLESS STEEL & CARBON STEEL PIPES & TUBES**
O.D. (mm) - W. Thick (mm) X W. Thick (mm) X 0.0248= Wt. Per Mtr. /
O.D. (mm) - W. Thick (mm) X W. Thick (mm) X 0.00756= Wt. Per Feet

2) **WEIGHT OF S. S. SHEETS & PLATES**
Length (Mtrs) X Width (Mtrs) X Thick (mm) X 8 = Wt. Per PC / Length (Fit) X Width (Fit) X Thick (mm) X 3/4 = WL Per PC

3) **WEIGHT OF S. S. ROUND BAR**
Dia (mm) X Dia (mm) X 0.00623 = Wt. per Mtr. / Dia (mm) X Dia (mm) X 0.0019 = Wt. per Feet

4) **WEIGHT OF S. S. SQUARE BAR**
Dia (mm) X Dia (mm) X 0.00788 = Wt. per Mtr. / Dia (mm) X Dia (mm) X 0.0024 = Wt. per Feet

5) **WEIGHT OF S. S. HEXAGONAL BAR**
A/F (mm) X A/F (mm) X 0.00680 = Wt. per Mtr. / A/F (mm) X A/F (mm) X 0.002072 = Wt. per Feet

6) **WEIGHT OF S. S . FLAT BAR**
Width (mm) X Thickness (mm) X 0.00798 = Weight per Mtr. / Width (mm) X Thickness (mm) X 0.00243 = Weight per Feet

7) **WEIGHT OF S. S. CIRCLE**
Dia (mm) X Dia (mm) X Thick (mm) / 160000 =Weight. per PC / Dia (mm) X Dia (mm) X Thick (mm) X 0.0000063 = Kg. per PC

8) **WEIGHT OF BRASS PIPES / COPPER PIPES**
O.D. (mm) - Thick (mm) X Thick (mm) X 0.0260 = Wt. Per Ft. / O.D. (mm) - Thick (mm) X Thick (mm) X 0.0079 = Wt. Per Ft

9) **WEIGHT OF LEAD PIPE**
O.D. (mm) - Wt. (mm) X Wt. (mm) X 0.0345 = Wt. Per Mtr.

10) **WEIGHT OF ALUMINIUM PIPE**
O.D. (mm) - Thick (mm) X Thick (mm) X 0.0083 = Wt. per Mtr

11) **WEIGHT OF ALUMINIUM SHEET**
Lenght (Mtrs) X Width(Mtrs) X Thick (mm) X 2.69 = Wt. per PC

12) **FORMULA FOR MAKING OF PIPE FROM SHEET**
O.D. - Wt. X Thick (mm) X 22/7 = Width of Sheet

13) **WEIGHT CONVERSION OF MTR. TO FEET**
Wt. of 1 mtr. + 3.2808 Wt. Per Feet

14) **WEIGHT OF CARBON STEEL SHEETS**
Lenght (Mtr.) X Width(Mtr.) X Thick (mm) X 7.85 = KG/SHEET

15) **WEIGHT OF COPPER PIPES**
O.D. (mm) - WT. (mm) X WT. (mm) X 0.0285 = KG/MTR.

16) **WEIGHT OF LEAD SHEET**
Lenght (mtr.) X Width(mtr.) X Thick (mm) X 11.2 = KG/SHEET

17) **SHEET WIDTH REQD FOR ROLLED & WELDED PIPES**
O.D. (mm) - Thick (mm) X 3.14 =SHEET WIDHT (mm)

18) **WEIGHT FOR SQUARE / RECTANGLES PIPES**
Lenght From 4 Angle (O.D.) 3.14 - Thik. (mm) X Thik (mm) X 0.00758 = KG/PER SHEET

19) **BARLOW'S FORMULA FOR CALCULATING BURSTING PRESSURE**
P = 2ST/D or t-DP/2S or S-DP/2t or D=2st/p
P = Bursting Pressure P Si.,
S = Tensile Strenght of tube,
T = Wall Thickness (in inches)
D = Outside Diameter (in inches)

20) **FORMULA FOR HEALTHY BUSINESS**
Honesty + Quality of Goods + Quick Service +Reasonable Rate = Good Healthy Business

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