



Jaydeep Metals

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Stainless Steel-Sheets, Plates, Rods, Flats, Pipes & Pipe Fittings etc. In 304, 304L, 316, 316L, 321, 310, 410, 420, 430 etc. Also Deals in Copper, Brass, Aluminium, Gl, MS, CS Pipe & Fittings.

Introduction



Formula For Calculating Weight



We are pleased to introduce ourselves as one of the leading Importers, Manufacturers & Stockists of Stainless Steel Items, Ferrous and Non-Ferrous Metals which are required by your company in all aspects of Project Implementation, Maintenance, Modernisation and Shut Down Application etc. Our Product line is as under:

STAINLESS STEEL PIPES, TUBES (SEAMLESS/WELDED) in ASTM A-3/2, ASTM A-2/3, ASTM A 269 in 304, 304L, 316, 321, 310, 347 etc.....

STAINLESS STEEL: Sheet, Plate, Coils, Checkered in 304/304L, 321, 410S, 316L, 310 grade

STAINLESS STEEL: Shaft/Rods/Bars/Angels/Channels/Flats/Pipe Fitting etc. in all grade

STAINLESS STEEL FITTINGS & FLANGES: Elbows/Bends/Tees/Reducers/Flanges in B/w, S/w, Forged in A-403, A-240, A-182 F in 304, 304L, 316, 316L, 321, 310, 347 etc.

MILD STEEL PIPES: In Class A. B. C as per IS-1239 & IS - 3589

MILD STEEL: Channels/Angles/Beams/Rounds/Chequered etc.

ALLOY STEEL/CARBON STEEL PIPES (SEAMLESS WELDED): ASTM A106 Gr.B/A53-Gr.B, API 5L

Gr. B etc With IBR Certificate

ALLOY STEEL PLATES: SA 387-11, 12, 22, SA 387-Gr. 5, SA387-Gr. 80

MILD STEEL PLATES: IS 2062 Gr. A/B, A36, SS 400.

BOILER QUALITY PLATES: 516Gr.60 / Gr. 70 IS 2002 Gr. 2

AS/CS FITTINGS & FLANGES: Elbows/Bends/Tees/Reducers/Flanges in B/w, S/w, Forged in A-234 WPB A-105 etc... Slipon/Blind/Lapjoint/Weldneck etc. Flanges available in ready stock.

We also stock Monel, Nickel, Hastelloy, Inconel 600/800, Copper, Brass Aluminum, Lead, Tin, Zinc and other Minor Metals in your required size and shape.

It is needless to mention that we have gained sufficient experience in the field and achieved substantial business from reputed concern of Chemical Industries, Petrochemical Corporations, Pharmaceuticals Companies, Pulp & Paper Mills, Sugar, Fabricators Plants, Oil Refineries, Nuclear & Thermal Power Station, Dairies, Breweries and many other small, medium & large org. concerns and other project of National Importance and also ISO 9002 organisations on repeated order basis.

We can submit Test Certificates from Govt. Approved Laboratory or Manufacturers and provide THIRD PARTY INSPECTION of UHDE, EIL, LLOYDS, TATA, PDIL, HGC, SIMON, CARVES, DAVY, POWER GAS, ICB, INTENG, BAXCOUNSEL, BUREAVERITAS...

(1)	S.S. Square / Rectangle Pipe
	Cum of All Four Sides Divide by 3.14 - OD of Direct

(2) Weight of S.S. Pipe:
OD (mm) - W Thick (mm) X.W. Thick(mm) x 0.0248=kg (Wt.per mtr.)
OD (mm) - W Thick(mm) X.W. Thick(mm) x 0.00756= kg (Wt.per feet)
For SO. Pipe OD = Sum of all sides ÷ 3.1 sides

(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. Hexazonal Bar: A/F (mm) X A/F (mm) X0.00680= (Wt. per Mtr.) A/F (mm) X A/F (mm) X0.002072=(Wt. per Feet)

(6) Weight of S.S. Flat Bar Width (mm) X Thick mm x 0.00798=Wt. per Mtr. Width (mm) X Thick mm x 0.00243=Wt. per Feet.

(7) Weight of Stainless Steel Sheets: Length (Mtrs): X Width (Mtrs): X Thick (mm): X 8 = kg per Sheet Length (Ft.) X Width (Ft.): X Thick (mm): X 3/4 = kg per Sheet

(8) Weight of S.S. Circle DIA (mm) x DIA (mm) x Thick (mm) + 160 = Gms Per pc. DIA (mm) x DIA (mm) x Thick (mm) x 0000063 = Kg. Per pc.

(9) Weight Brass Pipe / Copper Pipe
 O.D. (mm) -Thick (mm) x Thick (mm) 0.0263=Wt. per Mtr.

(10) Weight of Lead Pipe OD (MM) - Wt. (mm) x Wt. (mm) x 0.0345 = Wt. per Mtr.

(11) Weight of Aluminium Pipe O.D. (mm) -Thick (mm) x Thick (mm) X 0.0083=Wt. per Mtr.

(12) Weight of Aluminium Sheet
Length (Mtrs) X Width (Mtrs) X Thick (mm) =2.69= Wt. per Pc.

(13) Weight of Conversion of Mtr to Feet Weight of 1 Mtr. ÷ 3.2808 = Feet

(14) Width of Sheet required for making Pipe Outer DIA - Wall Thickness x 22/7= Width of Sheet.

(15) Weight of SS sheet, Plate, Pipe, Round, Hex, Circle, Square, Flat /3 = Aluminium Weight Approx

(16) Weight of SS sheet, Plate, Pipe, Round, Hex, Circle, Square, Flat x 9%= Brass Weight Approx

(17) Weight of SS sheet, Plate, Pipe, Round, Hex, Circle, Square, Flat x 15%= Copper Weight Approx

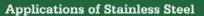
(18) Tensile Strength Conversion Table

1. Kg/mm2x9.81-N/mm2=Mpa

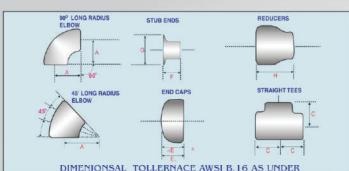
2. Psi x 0.0007=kg/mm2

3. Ksi x 1000 = Psi

4. Kg/mm2 x 1.422=Ksi







Nomnal Pipe	Outside Diametre	900 Elbows long radius	45 Elbo long r	WS	900 Elbows Short radius	Straight TEES	CAPS		STUB ENDS	1	Reducers concentric eccentric
Size	(00)	Centre to face (A)	Centre to face (B)	Radius (A)	Centre to face (A)	Centre to end (C)	Length (E)	Diameter (G)	Short Length (F)	Long Length (F)	Length (H) specified from large and
1/2	21.34	28.1	15.9	38.1		25.4	25.4	34.9	8	50.8	50.8
3/4	26.67	28.6	11.1	28.6	9	28.6	25.5	42.8	8	50.8	50.8
31	33.40	38.1	22.2	38.1	25.4	38.1	38.1	50.8	10	50.8	50.8
1 1/4	42.16	47.6	25.4	47.6	31.8	37.6	38.1	63.5	12	50.8	50.8
1 1/2	48.26	57.2	28.6	57.2	28.6	57.2	38.1	73.0	12	50.8	63.5
2	60.32	76.2	34.9	76.2	50.8	63.5	38.1	92.0	16	63.5	76.2
2 1/2	73.02	95.2	44.5	95.2	63.5	76.2	38.1	104.8	16	63.5	88.9
3	88.90	114.0	50.8	114.0	76.2	85.7	50.8	127.0	18	63.5	88.9
3 1/2	101.60	133.0	57.2	133.0	88.9	95.3	63.5	157.2	20	76.2	79.
4	114.30	152.0	63.5	152.0	101.6	104.8	63.5	157.2	20	76.2	101.6
5	141.30	191.0	82.6	191.0	127.0	123.8	76.2	185.7	25	76.2	127.0
6	168.27	228.6	95.3	228.6	152.4	142.8	88.6	215.9	25	88.9	140.0
В	219.07	304.8	127.0	304.8	203.2	177.8	101.6	270.0	30	101.6	152.0
10	273.05	381.0	158.7	381.0	254.0	215.9	127.0	324.0	35	127.0	178.0
12	323.85	457.2	190.5	457.2	305.0	254.0	152.4	381.0	40	152.4	203.0
14	355.60	533.4	222.2	533.4	356.0	280.0	165.1	412.8	40	152.4	356.0
16	406.40	609.6	254.0	609.6	406.0	304.8	177.8	470.0	50	152.4	356.0
18	457.20	685.8	285.7	685.8	457.0	343.0	203.2	533.4	50	152.4	381.0
20	508.00	762.0	317.6	762.0	508.0	381.0	228.6	584.2	50	152.4	508.0
24	609.60	914.4	381.0	914.4	610.0	432.0	266.7	692.2	50	152.4	508.0

*Subject to sufficient manufacturing quantities, we produce these products in nearly every alloy mentioned in this catalogue, either in seamless, pressed or welded, execution

SS 30d it is most widely used austenite stainless steel. It has excellent corrosion resistance and forming characteristics. Used inchemicals, petro-chemical and fertiliser industries, and as equipments in dairy, food processing, pharmaceutical industries in hospitals, households as kitchen wares, sinks, Cutlery, cryogenic vessels and as heat exchangers in air-conditioning, refrigeration, for machinery in paper, pulp, textile beverae sectors etc.

55 304L It is used in palace of SS304 for improved resistance to intere-granular corrosion. It is used for parts and structures which can not be heat treated for stress relieving after welding. Has less tendency to work harden.

55 31.05 These are austentic types with higher Chromium and Nickel content. Because of their relatively High creep strength and mechanical properties at high temperatures these steel find application for higher temperatures and server service conditions. Used for air heaters, anneealing boxes, ovens, carburising boxes fire box sheets furnace linings, furnanc stacks and dampers, gas turbine parts, heat exchanges king lining, nozzle diaphragm, mill equipment oil reefinery equipment, recuperators ten.

55.316 An austentic stainless steel with 2.0 to 3% Mo. Which improves corrosion resistance against haloens and imparts hot strength characteeristics. Used for applications requiring resistance to pitting corrosion and in halogen atmospherers. Typical applications, architectural trims, marine exteriors, chemical processing equipment, food processing equipment, petroleum refining equipment, pharmaceutical equipment, photographic equipment, pulp and paper processing equipment, textile finishing equipment, pollution controlets.

55 316L Recommended in place of 316 when weldability has to be improved.

SS 321 An austentic stainless steel similar to SS 304 but stabilizer with titanium to avoid inter-granular corrosion. Types SS 321 resist scaling and viberation fatigue. It is used for aircraft exhaust stacks and manifolds pressure vessels, large mufflers for stationery diesel enginers, carburetors, expansion bellows, steaks liners, fire wallIsm super heaters ets.

55.409 / 409M It is the lowest alloyer straight Chromium ferritic stainless steel. It replaces carbon steels and low alloy steel where some amount of heat or corrosion resistance and higher strength is required and where appearance in secondary. It is used for fins in heater tubes, automotive exhaust systems including mufflers, resonators, silencers, pipes and emission control units, high pressure agricultural spray tanks, culverts, shipping containers, farms equipment etc.

55410S sS410S is the most commonly used 12% Chromium Stainless Steel. Excellent combination of toughness and strength can be developed. It is a good choice when good formability and high strength are required and the end use demands resistance to mildly corrosive environment. It is used for furnace parts and burners operating below 650.0.c, micrometer parts, tray supports, caps & vaporises in petroleum fractionating towers, lining for reaction chambers, coal screens fishing tacklets, keys, a brackets, rules and tapes, wall screens, steam turbine buckets blades, bucket covers, pump parts, petro-chemical equipment, pressplates, etc.

S5.420 This steel contains min. 0.15% C and 12% Cr. It can be thermally hardened to develop very high strength, Extremely useful for cutlery. Other applications include vegetable shoppers, scissors, shears, tweezers, hand tools, dentalk surgical instruments etc.

55.430 SS 430 with 17% Cr. is inferior to SS304 as regards deep durability. Though it dose not have good corrosion resistance properties as the CR-Ni steels, It is used under less servere corrosive atomospheres for chemical processing equipment, furnace parts heat exchangers, oil burner parts, petroleum rolling equipment, pyrometers, protection tubes, recuperators, rubber plant machinery, scientific apparatus, storage vessels, tubing television cones, electrical appliances, solar water heaters, air conditioners, kitchenware, household appliances, deocative trims, parts for washing machines etc.

WELDING

Selection of Welding Processes

General guidelines for selection of appropriate method of welding for different types of stainless steels in different thickness, keeping in view the advantages and limitations of the welding processes are given below.





STAINLESS STEEL

Stainless Steel is in fact an umbrella term which covers a huge range of alloys, the varying properties of which make them suitable for use across a very broad spectrum and in a vast number of different industries. Stainless steel is not a single specific material. It is the name given to a group of corrosion resistant steel alloys which contain a minimum of 12% chromium.

The chromium in stainless steel reacts with oxygen in the air to produce a very thin, inert, chromium rich oxide film on the surface of the steel, it is the presence of this film which provides the corrosion resistance of stainless steel. This passive film is unlike coatings such as paint or galvanising in one very important way. If it is damaged by abrasion or mechanical means such as cutting It re-forms and continues to protect the steel.

We mainly deal in Sheets, plates, Tubes, Pipes, Rods, Wires, Strips and Pipe fitting like Ball Valves, Elbow, Bends, Stubend, Tees, Flanges, Reducer Bolt and Nuts, Screws in the grade of AISI 304, 304L, 316L, 310, 312, 410 and 420 etc.

NON FERROUS

Non-ferrous metals are metals that do not contain iron. Put in the simplest terms, ferrous metals are those which contain iron, whilst non ferrous metals don't have any iron content. There are, however, other differences between the two types of metal which have a strong bearing upon the tasks which they are usually called upon to perform.

There are two groups of metals; ferrous and non-ferrous. Ferrous metals contain iron, for example carbon steel, stainless steel (both alloys; mixtures of metals) and wrought iron. Non-ferrous metals don't contain iron, for example aluminum, brass, copper (which can be remembered as ABC) and titanium. You can also get non-ferrous metals as alloys eg, brass is an alloy of copper and zinc.

Non-ferrous metals are specified for structural applications requiring reduced weight, higher strength, nonmagnetic properties, higher melting points, or resistance to chemical and atmospheric corrosion. They are also specified for electrical and electronic applications.

We mainly deal in Copper, Brass, Aluminium, Phosphorus, Bronze, Gun Metal, Lead, Zinc, Tin Metal, Nickel, Monel, Inconel, Hastelloy in all shapes and sizes. We are also specialists in Copper Tubes Refrigeration quality of 50' and 100' coils in various sizes and thickness.

ALLOY STEELS

Alloy steels are made by combining carbon steel with one or several alloying elements, such as manganese, silicon, nickel, titanium, copper, chromium and aluminum. These metals are added to produce specific properties that are not found in regular carbon steel. The elements are added in varying proportions (or combination) making the material take on different aspects such as increased hardness, increases corrosion resistance, increased strength, improved formability (ductility); the weldability can also change,

Elements are added to improve strength and toughness, to decrease or increase the response to heat treatment, and to retard rusting and corrosion. Low alloy steel is generally defined as having a 1.5% to 5% total alloy content. Common alloying elements are manganese, silicon, chromium, nickel, molybdenum and vanadium. Low alloy steels may contain as many as four or five of these alloys in varying amounts.

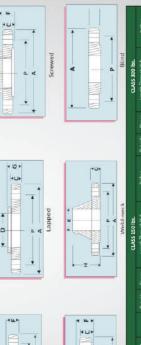
We mainly deal in EN-8, 9, 19, 24, 31, 36, 45, 47, 20, MN-CR5, SAE 8620, OHNS, HCHCR, HSS Manganese Strips in all shapes and

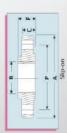
ITEMS	RANGE	FINISH
S. S. Flats	20mm to 150mm (Width) 5mm to 25mm (thick)	HR
S. S. Angles	20mm to 150mm (Width) 3mm to 10mm (thick)	HR
S. S. Circles	0.5mm to 50mm (thick) (Any Diameter)	HR, CR
S. S. Designer Sheets	1mm to 4mm (thick)	Various Design
S. S. Channel	50mm x 25mm x 3mm to 150mm x 50mm x 8mm	HR

ITEMS	CONDITION	SIZE RANGE
Rounds	As Rolled/Soln, Annealed	25 mm to 300 mm
Bright Bars	Cold Drawn/Peeled	3 mm to 150 mm
Hexagons / Squares	Cold Drawn/Soin Annealed	4 mm to 60 mm
Cold Heading Wires (CHQ)	Cold Drawn/Soln Annealed & Pickeld	5 mm to 17 mm
Wires Rods	As Rolled / Soln. Annealed	5.5 mm to 25 mm
Blooms / Billets	Concast	100 mm to 250 mm
RCS	Se Bollad	50 mm to 140 mm

STAINLESS STEEL FASTENERS

Bolt &	Specifications	Threaded Bars
Screw	ANSI, ASTM, JIS, DIN, ISO & IFI	& Nuts





							VVE	VVCTL3=1HPC.K					ı	ı	Simo	ı	ı
						3	CLASS 150 lbs.	š.					0	CLASS 300 lbs.	lbs.		
A CONTRACTOR	Tengris Th	ength Through Hub			Fange	Juni	Length Through H. b.			Delling		Flange	Bar	Length Through Hub			Cottling
Page Stre	Socker Socker Welding	Tapace D	Weiding Neck	Dia of Flange A		Third Sip-on & Societ Weigling	paddet)	Weiding Neck H	Mos. & Dia of Bot. Holes	Gree Gree	Dis of Funge A		Sipon & Socked Wedding	podden 9	Weiding Nack H	Nos. & Daoi Balt Hales	Berg B
3.70	222	22.9		68	11.5	36	15	47.5	4.16	103	25	345	11	122	775	4.15	299
3/4 20	27.8	28.2	15.8	8	13.0	16	16	52.4	4.16	0169	117	36.0	25	25	1772	02-6	82.5
2	345	34.9	20.8	300	145	13	O	925	4.15	194	171	17.5	27	11	6 79	4.20	20
1/4 32	43.3	43.7	366	217	160	11	77	57.1	416	88.9	H	395	17	27	65.1	8	4 85
1/2 40	49.5	50.0	35.1	117	17.5	22	22	679	4.16	116	156	210	30	30	68.1	4-23	1143
30	619	62.5	40.5	152	19.5	23	52	683	4.20	128.6	165	22.5	33	33	869	8-30	127.0
1/1	74.6	75.4	52.6	578	22.5	19	22	8.69	4-20	139.7	191	35.5	38	38	16.1	8-23	149.2
90		116	623	161	24.0	30	30	869	430	1524	002	290	43	43	194	8.23	1583
11/2	103.4	1841	17.9	216	24.0	315	32	71.4	8.30	177.8	525	30.5	#	7	81.0	8.23	184
100	116.1	116.8	90.1	529	240	33	33	76.2	W-4	1911.5	70	37.0	43	87	153	F23	2000
125		144.5	1023	254	24.0	9E	36	689	8.23	215.9	672	35.0	52	51	98.4	8.23	234.9
150	-	171.4	128.2	279	25.5	40	07	0.00	8-23	241.9	313	37.0	25	25	58.4	13.13	1693
200		222.2	154.1	343	290	42	17	191.5	8-23	238.4	186	41.5	29	29	1111	32.26	330.2
0 250		2774	202.7	405	300.5	49	62	101.5	31.16	901.9	245	48.0	63	56	1175	16.32	387
300	327.0	328.2	2845	483	320.	95	95	114.3	12.25	631.8	075	51.0	73	202	130.2	36-32	450.3
4 350	0.0	T-09E	304.8	533	35.0	37	en T-	127.0	12:19	176.2	38	54.0	75	=	142.9	20-32	\$143
5 400	410.4	411.2	- To be	595	37.0	14	7,80	127.0	16.29	538.7	059	575	83	123	1460	20.35	571.3
8 450	416.8	4623	Specified	635	40.0	29	46	139.7	16.32	577.8	730	603	68	E	158.7	24.35	628.9
20 500	1 5131	5143	À	200	43.0	73	103	144.5	20-32	635.0	775	63.5	95	140	161.9	24-35	685.3
24 600	6129	615.3	purchase	813	48.0	83	111	152.4	20-35	749.3	9118	70.0	126	151	1583	34.42	8123









N.B. Size	Table	Dia of flange	Bare of Slip on	Thickness of flange	Pitch circle holes	Dia of bolt holes	No. of bolts	N.B. Size	Table	Dia of flange	Bore of Slip on	Thickness of flange	Pitch circle holes	Dia of boll holes	No. of bolts
					D	E					В	С	D	E	
1/2	DEFH	3 3/4 3 3/4 3 3/4 4 1/2	88.0 88.0 88.0 88.0	3/16 1/4 3/4 1/2	2 5/8 2 5/8 2 5/8 3 1/4	9/16 9/16 9/16 11/16	4 4 4 4	5	DEFH	11 11 12 12	6.72 6.72 6.72 6.72	1/2 11/16 7/8 1 1/8	9 1/4 9 1/4 10 1/4 10 1/4	11/16 7/8 7/8 7/8 7/8	8 8 12 12
3/4	DEFH	4 4 4 4 1/2	1.09 1.09 1.09	3/16 1/4 3/4 1/2	2 7.8 2 7/8 2 7/8 3 1/4	9/16 9/16 9/16 11/16	4 4 4	8	DEFH	13 1/4 13 1/4 14 1/4 14 1/4	8.72 8.72 8.72 8.72	1/2 3.4 1 1 1/4	11 1/2 11 1/2 12 3/4 12 3/4	11/16 7/8 7/8 7/8	8 12 12
1	DEFH	4 1/2 4 1/2 4 3/4 4 3/4	1,36 1,36 1,36 1,36	3/16 9/32 3/8 9/16	3 1/4 3 1/4 3 7/16 3 7/16	9/16 9/16 11/16 11/16	4 4 4 4	10	DEFH	16 16 17 17	10.88 10.88 10.88 10.88	5/8 7/8 1 1/8 1 3/8	14 14 15 15	7/8 7/8 1	8 12 12 12
1 1/4	DEFE	4 3/4 4 3/4 5 1/4 5 1/4	1.70 1.70 1.70 1.70	1/14 5/16 1/2 11/16	3 7/16 3 7/16 3 7/8 3 7/8	9/16 9/16 11/16 11/16	4 4 4	12	D E H	18 18 19 1/4 19 1/4	12.88 12.88 12.88 12.88	3/4 1 1 1/4 1 5/8	16 16 17 1/4 17 1/4	7/8 1 1	12 12 16 16
11/2	DEFH	5 1/4 5 1/4 5 1/2 5 1/2	1.95 1.95 1.95 1.95	1/14 11/32 1/2 11/16	3 7/8 3 7/8 4 1/8 4 1/8	9/16 9/16 11/16 11/16	4 4 4	14	DEFH	20 3/4 20 3/4 20 3/4 20 3/4	14 14 14 14 14 14 14 14	7/8 1 1/8 1 3/4 1 7/8	18 1/2 18 1/2 19 1/2 19 1/2	1 1 1 1/8 1 1/8	12 12 16 16
2	DEFH	6 6 1/2 6 1/2	2,44 2,44 2,44 2,44	5/16 3/8 5/8 3/4	4 1/2 4 1/2 5	11/16 11/16 11/16 11/16	4 4 4	16	DEFH	22 3/4 22 3/4 24 26 1/2	16 16 16 16 16 16 16 16	7/8 1 1/4 1 5/8 2 3/4	20 1/2 20 1/2 21 3/4 24	1 1 1 1/8 1 1/4	12 12 20 20
21/2	DEFI	6 1/2 6 1/2 7 1/4 7 1/4	2.44 2.44 2.44 2.44	5/16 13/32 5/8 3/4	5 5 5 3/4 5 3/4	11/16 11/16 11/16 11/16	4 4 8 8	18	DEFT	25 1/4 25 1/4 26 1/2 26 1/2	18 18 18 18 18 18 18 18	7/8 1 1/4 1 5/8 2 3/4	23 23 24 24	1 1 1 1/4 1 1/4	12 16 20 20
3	DEFH	7 1/4 7 1/4 8 8	3.57 3.57 3.57 3.57	3/8 7/16 5/8 7/8	5 3/4 5 3/4 6 1/2 6 1/2	11/16 11/16 11/16 11/16	4 4 8 8	20	DEFH	27 3/4 27 3/4 29 29	20 20 20 20 20 20 20 20	1 1/8 1 1/2 2 2 5/8	25 1/4 25 1/4 26 1/2 26 1/2	1 1 1 1/4 1 1/4	12 16 24 24
31/2	DEFH	8 1/2 8 1/2	4.07 4.07 4.07 4.07	3/8 15/32 3/4 7/8	1/2 1/2 7	11/16 11/16 11/16 11/16	4 8 8	22	DEFH	30 30 31 31	22 22 22 22 22 22 22 22 22 22	1 1/8 1 3/4 2 1/8 2 3/8	27 1/2 27 1/2 27 1/2 27 1/2	1 1/8 1 1/8 1 1/4 1 1/4	16 16 24 24
4	DEFH	8 1/2 8 1/2 9	4.57 4.57 4.57 4.57	3/8 1/2 3/4 1	7 7 7 1/2 7 1/2	11/16 11/16 11/16 11/16	4 8 8	24	DEFH	32 1/2 32 1/2 33 1/2 33 1/2	24 25 24 25 24 25 24 25	1 1/4 1 7/8 2 1/4 3	27 1/2 27 1/2 27 1/2 27 1/2	1 1/8 1 1/4 1 3/8 1 3/8	16 16 24 24
5	DEFH	10 10 11 11	5.66 5.66 5.66 5.66	1/2 9/16 7/8 1 1/8	8 1.4 8 1/4 9 1/4 9 1/4	11/16 11/16 7/8 7/8	8 8 8 8	3	-	de			d		

ASTM SPECIFICATIONS	ALLOWABLE OUT VARIATION	State of the last		ALLOWABLE WALL THICKNESS VARIATIONS	TESTING
ASTM A-213 Seamless Feffitic	Nominal Diameter	OVER	UNDER	%	
and austentic tubes	under 25.4 mm	.1016	.1016	+20%	
10003	25.4 - 38.1 inclu	.1524	.1524	-0 +20%	Refer to
	38.1 - 50.8 exclu	.2032	.2032	- 0 +22%	ASTM A 450
	50.8 - 63.5 exclu	.254	.254	-0 +22%	
	63.5 - 76.2 exclu	.3048	.3048	-0 +22%	
	76.2 - 101.6 inclu	.381	.381	-0	
ASTM A-249 Welded Heat exchanger and condenser tubes	under 25.4 mm 25.4 - 38.1 inclu 38.1 - 50.8 inclu 50.8 - 63.5 inclu 63.5 - 76.2 inclu 76.2 - 101.6 inclu	.1016 .1524 .2032 .254 .304 .381	.1016 .1524 .2032 .254 .304 .381	± 10% ± 10% ± 10% ± 10% ± 10%	Refer to ASTM A 450
ASTM A-269 Seamless and welded austentic S.S.tubes	Up to 12.7 mm 12.7 to 38.1 mm 38.1 to 88.9 mm 88.9 to 139.7 mm 139.7 to 203.2 mm	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%	Refer to ASTM A 450
ASTM A-312 Seamless and welded austentic Pipe	13.72-48.26 mm 60.33-114.3 141.3219.08 168.28-219.08 273.05-373.85	± 0.7 ±1.59 ± 1.5	0-0.79 9-0.79 10 79 9-0.79 8-0.79	-12.5%	Refer to ASTM A 450





Second 11 Second 210 210-110 240	Grade	District NO	1000		MUNN	ANSI	2	Alty Bestgration	UNS	BS	German Material Standard	DAN Standard	Brand Norse
1,100-6/14 2,100-6 239 2,100-10 249 2,100-10 249 240-10 2	1021	ASSAUTE10	\$ 30400	200	ZECNTRO	338	2048 55	No.64220	MESSON	Systam	2.40%	18.812	E
Communication State 232 Storing 204 State	9000	a 100Ai 18.0	0.30000	2349	21009 800	200	303838	Newson	NAMES OF TAXABLE PARTY.	HTWKIT	2.000	HECTI	
Commercial State 2014 21	1000	11-30-41-11-11	\$ 30400	202	22 000 100	300	201812	Aller 200	- Senatura	447,81416		- HOUSE	tenent am
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Combon 1913 Signer Signe	1011	x 20:134s 17:13.2	\$21600	2348	21/11 (NO.22	340.	218842	Alby E00	6130019	SUMME	14875	31BIC-ATIZE	NODLOY 335
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STOCHARD 11 STOCH	1014	a SCHAME IT U.S.	\$ 21100	1343	24 CHB (T.12)	218	21.55 15	ANY DS 0009	SCORE N	30140AT?	1188	STEND BRITE	
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Material	100	x 8C4686.27 S	\$ 12900	2334			632	409 522	NOMO!		2100	acust ₆	MCONELED!
Part	201	1 DOMESTIC 22 S	3.31665		901208032			Alby 425	Nome25	47.	2488	NCCORNEL	RECORD EDS.
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	958	NC/58/m			(1)		3338KW1	10	*	9101		-	}

	MINAL IZE	Outside Diameter	SCH	EDULE 5		EDULE 10		EDULE 40		EDULE 80		EDULE 20		EDULE 60	-	EDULE XS
WW	INCH	M/M	WM	WEIGHT KG/M	WT	WEIGHT KG/M	WM	WEIGHT KG/M	WT	WEIGHT KG/M	WT MM	WEIGHT KG/M	WT	WEIGHT KG/M	WI	WEIGH KG/M
3	1/8	10.3	22	- 18	1.24	0.278	1.73	0.365	2.41	0.469	12	12	100	892	\$2	20
6	1/4	13.7	21	R	1.66	0.491	2.24	0.633	3.02	0.494	12	9	1620	1657	20	50
8	1/4	13.7	*	- 5	*	-	-	-		3		-	10	(e)	**	
10	3/8	17.1	+:	8	1.65	0.631	2.31	0.845	3.20	1.10	-	-	190	(e)	*:	+3
15	1/2	21.3	1.65	0.801	2.11	0.999	277	127	3.75	1.62	64	ii.	4.75	1.94	7.47	2.55
20	3/4	26.7	1.65	1.02	2.11	1.28	2.87	1.68	3.91	2.20	(2	.0	5.54	2.89	7.82	3.64
25	7	33.4	1.65	1.29	2.77	2.09	3.38	2.50	4.55	3.24		-	8.35	4.24	9.09	5.45
32	11/4	42.2	1.65	1,65	2.77	2.69	3.56	3.38	4.85	4.46	-	+	5.35	5.61	9.70	7.77
40	11/2	48.3	1.65	1.90	2.77	3.11	3.68	4.05	5.08	5.41	92	9	7.14	7.25	10.1	9.54
50	2	60.3	1.65	2.40	277	3.92	3.91	5.44	5.54	7.48	(2	9	8.74	11.1	11.07	13.44
65	21/2	73.0	2.11	3.69	3.05	5.26	5.16	8.63	7.01	11.4	127	=	9,53	14.9	14.02	20,39
80	3	88.9	2.11	4.51	3.05	6.45	5.49	11.3	7.62	15.3			11.1	21.3	15.24	27.68
90	31/2	101.6	2.11	5.18	3.05	7.41	5.74	13.6	8.08	18.6	174	2	100	37	40	\$5
100	4	114.3	2.11	5.84	3.05	8.38	6.02	16.1	8.56	22.3	11.13	28.75	13.49	33.6	17.12	41.03
125	5	141.3	2.77	9.47	3.40	11.6	6.55	21.8	9.53	31.0	12.7	40.9	(10.11	49.2	19.05	57.43
150	6	168.3	2.77	11.3	3.40	13.6	7.11	29.1	11.0	42.7	14.27	55.03	18.2	67.8	21.95	79.22
200	8	219.1	2.77	14.8	3.76	19.96	8.18	42.8	12.7	64.6	18.24	91.73	23.0	111.2	22.23	107,92
250	10	273.1	3.40	22.6	4.19	27.8	9.27	62.3	15.7	96.0	21.41	134.9	28.6	172.4	25.40	155.15
300	12	323.9	3.96	31.25	4.57	36.17	9.52	72.8	17.45	132.0	25.4	159.82	33.32	240.0	25.40	186.97
350	14	355.6	3.96	34.36	4.78	41.6	11.13	94.49	19.05	158.08	27.76	227.88	35.71	283.26	801	*
400	16	406.4	4.19	41.78	4.78	47.6	12.7	124.0	21.41	204.4	30.94	290.88	40.46	367.4	23	- 13
450	18	457.2	4.19	46.81	4.78	53.625	14.27	156.73	23.8	255.77	34.93	369.34	45.71	456.4		
500	20	508.0	4.78	59.65	5.54	69.0	15.06	184.08	26.19	312.9	38.1	448.3	49.99	567.75	*1	-61
550	22	558.8	10	8	6.35	87.84	15.88	216.04	28.57	379.7	41.27	535.17	53.97	682.57	¥11	- 63
600	24	610	5.54	82.98	6.35	94.98	17.45	256.22	30.34	435.9	46.02	649.44	54.52	811.85	28	150
650	26	660.4			7.92	129.4								0.50		
700	28	711.2			7.92	139.47	+		12.7	222.13					*2	*
750	30	762	-	8	7.92	149.55	4	- 60	12.7	238.28	124		(4)		*0	-
800	32	812.8	20	Si	7.92	159.62	17.48	348.11	12.7	254.44	32	2	9723	120	28	28
850	34	863.6	*	-	7.92	169.64	17.48	370.22	12.7	270.5		151	17.5	(82.0)	20	711
900	36	914.4	*	-	7.92	179.77	19.05	427.09	12.7	286.75	14			197	¥2	*0

Specification of Mild Steel Pipes



Chemical Composition of Stainless Steel



		Mile	steel pipes	confirming	to IS: 1239	(PART 1) -	1979		
	minal ore		side neter	Thicknes	ght ss Weight kness	Me	dium Weight	Hea Thickness	vey Weight
Inch	In mm	Inch	In mm	mm	kg/mtr.	mm	kg/mtr.	mm	kg/mtr.
1/8" 1.4" 3.8" 1/2" 3/4" 1" 1.1/4" 1.1/2" 2" 2.1/2" 3**	3mm 6mm 10mm 15mm 25mm 25mm 32mm 40mm 50mm 65mm 80mm	0.406 0.532 0.872 0.844 1.094 1.312 1.656 1.906 2.375 3.004 3.500 4.500	10.32 13.49 17.10 21.43 27.20 33.80 42.90 48.40 60.30 76.20 88.90 114.30	1.80 1.80 1.80 2.00 2.35 2.65 2.65 2.90 2.90 3.25 3.26 3.66	0.361 0.517 0.674 0.952 1.410 2.010 2.580 3.250 4.110 5.840 6.810 9.890	2.00 2.35 2.35 2.65 2.65 3.25 3.25 3.25 3.65 4.05 4.50	0.407 0.650 0.852 1.580 1.580 2.440 3.140 3.610 5.100 6.610 8.470 12.10	2.65 2.90 2.90 3.25 3.25 4.05 4.05 4.05 4.47 4.47 4.47 4.85 5.40	0.493 0.769 1.02 1.45 1.90 2.97 3.84 4.43 6.17 7.90 10.1
4" 5" 6"	125mm 150mm	5.500 6.500	139.70 165.10			4.85 4.85	16.20 19.20	5.40 5.40	17.8 21.2

BIG DIAMETER ERW PIPES CONFIRMING TO IS: 3589

Wall Thickness in mm	Nominal Bore 7" N8 193.7 mm OD	Nominal Bore 8" NB 219.1 mm OD	Nominal Bore 10" NB 273 mm OO	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 408 mm OD
	Kg/mtr.	Kg/mtr.	Kg/mtr.	Kg/mtr.	Kg/mtr.	Kg/mtr.	Kg/mtr.	Kg/mtr.
4.85	22.59	25.62	32.07	38.13	-	0.50		*:
5.20	24.17	27.43	34.34	40.85	1			- 10
5.60	26.00	29.28	36.93	43.93	48.11	2.50	10	**
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	9.04		-3
7.94	N. State Co.	41.00	50.95	61.85	67.98	77.92	87.80	7.0
8.18		42.56	53.42	65.12	-	1001	*	+3
9.53	-	51.50	60.24	73.75	81.21	93.13	105.00	117.00
12.7			//0.0000000	-	107.28	123.30	139.00	155.00

Tolerance on Thickness and Weight: as per IS 1239

he tubes and sockets	
a) Thickness	
1) Butt Welded Light Tubes	+ Not limited
	- 8 percent
	+ Not limited
Medium and Heavy Tubes	- 10 percent
	+ Not limited
2) Seamless tubes	- 12.5 percent
b) Weight:	
1) Single Tube (light series)	+ 10 percent
	- 8 percent
2) Single Tube (medium and heavy	series)

MAXIMUM PERMISSIBLE PRESSURE AND TEMPERATURE AND TUBES The following manufacturing tolerance shall be per mitted on WITH STEEL COUPLINGS OR SCREWED AND SOCKETED JOINTS.

Nominal Bore M	Saximum Permis	sible Ma	ximum Permissible
	Pressure		Temperature
	N/mm2	Kg/Cm2	3C
upto and including 25 mm	1.20	12.24	260
Over 25 mm upto and including 40 m	nm 1.03	10.50	260
Over 40mm upto and including 80 m	m 0.86	8.77	260
Over 90mm upto and including 100 r	mm 0.69	7.04	260
	0.83	B.47	177
Over 100mm upto and including 125		7.04	171
Over 125mm upto and including 150		5.10	160
For tubes fitted with appropriate fittie	ngs of suitably be	att welded to	igether, the max
permissible pressure shall be 21.00 l	kg/cm2 and mar	c. permissib	le temp 260°C

Specific	eation	Max	Max.	Max	Max	Max			Chemical C	omposition		
JIS	AISI	c	81	Mo	P	8	NI	Cr	Mo	Cu	- 11	Other
505400	403	0.15	0.70	1.00	0.046	0.000	(1)	11.50-13.00			-	0.0
BUE-410	440	0.15	1.00	1.00	0.040	8.630	(7)	11.50-13.50	-		- 12	
SUS410J1	110	0.08-0.18	0.60	1.00	0.040	0.030	(1)	11.50-14.00	II.30-0.60			
SUBSTITUTE	-	0.19	1.00	1.00	0.040	0.030	(1)	11.50-13.50	-			P9 0.05-0.30
BUS416	410	0.15	1.00	1.25	0.000	Min. 0.15	(1)	12.00-14.00	(2)	-		-
SUS42071	420	0.16-0.28	1.00	1.00	0.040	0.030	(2)	12.00-14.00				- 4
SUS42013	430	0.06-0:40	9,000	1.00	0.000	0.030	(1)	12.00-14.00		1.4	-	-
5US420F	420F	0.25-0.40	1.00	1.25	0.080	1600 D.15	(1)	12.00-14.00	(3)	-	14	
0U8420F2	1.50	0.20-0.40	1.00	1.00	0.040	0.000	(2)	12.00-14.00				Ps 0.05-0.00
BUS401	431	0.30	1.00	1.00	0.040	0.030	1.25-2.50	15.00-17.00				-
SERVICOR	440A	0.60.0.79	1.00	1.00	0.000	0.030	49)	16.00=18.00	(3)	-01	14	100
51,15,4408	4408	0.75-0.93	1.00	1:00	0.040	0.030	(2)	10.00-10.00	(3)		CA.	-
BUS440C	4400	0.95-1.20	1.00	1.00	0.040	0.030	(3)	16.00-18.00	(3)			95
SU6440F	544020	0.95-1.20	1.00	1.25	0.060	Min. 0.15	(1)	16.00-18.00	(3)			
SUS-405	306	0.08	1.00	1.00	0.040	8.630	-	11.50-14.50		- 4	- 11	AT 0.10-0.30
5U3410L		0.03	1.00	1.00	0.046	0.000	-	11.00-13.50		7.9	1.5	3
BUS430	430	0.12	0.75	1.00	0.040	0.030		10.00-18.00				
SUB430F	430F	0.12	1.00	1.25	0.060	Min. 0.15	-:	16.00-18.00	(2)			- 90
50,054,34	436	0.12	1.00	1.00	0.040	0.030	4.1	16.00=18.00	0.75-1.25	-		-
30344771	:	0.01	0.40	9.40	9.050	0.020	*:	28.50-32.00	1.50-2.50	Ç1	Marc 0.015	-
SUBXM27	100	0.01	0.40	0.40	0.000	0.020	-	25.00-27.50	0.76-1.50		Mac 0.015	-
50522071	320	0.08	1,00	1.50	0.040	0.030	3.00-6.00	33.00-28.00	1.00~3.00			-
SUB329/3L	SAMIN	0.03	1.00	2.00	0.040	0.030	4.50-6.50	2100-24.00	2.00-3.50	(4	0.08-0.70	
5U5528UIL	531200	0.00	1.00	1.50	0.040	0.000	5.50-7.50	24.00-26.00	2.00-0.00	7-4	0.05-0.30	-
BUS201	201	0.16	1.00	5.90-7.60	0.000	0.000	0.50-5.50	16.00-18.00			0.2577	-
8US202	202	0.19	1.00	7.50~10.00	0.060	0.030	4-00-6 (K)	17.00-19.00	100		May. 0.25	- 1
305301	301	0.15	1.00	2.00	0.945	11.030	6/00-K-00	16.00-18.00				-
905302	302	0.15	1.00	2.00	0.046	0.030	8.00-10.00	17.00-19.00		- 29	7	
BU9303	203	0.15	1,00	2.00	0.200	Min. 0.15	8.00-10.00	17.00-19.00	(2)	4	-	
S1.0530035m	3035e	0.19	1.00	2.00	9.209	0.060	8.00~10.00	17.00-19.00				Se Min. g 15
81/8/30/900	-	0.18	1.100	3.00	0.200	Min. 0.15	6 00-10 00	17.00-19.00	(2)	1.50-3.50	1.5	-
BU8304	504	0.08	1.00	2.00	0.045	0.030	8-00-10-50	10.00-20.00			(*	-
SUB304L	3041	0.03	1.00	2.00	0.045	0.030	9.00-13.00	18.00-20.00				- 35
SUSDOIN1	MODE	0.00	1.00	3.60	o non-	-0:030	7.00-10.50	18.00-20.00			0.10+0.25	in a second
SUBSOHNE	(1,0)	0.08	1.00.	7.50	9.045	8:030	7.50~10.50	tn.00-20.00		- 1	0.15-0.30	No Max 0.15
SUB304LN	304LN	0.03	1.00	2.00	0.045	0.030	8.50-11.50	17.00-19.00		1.4	0.12-0.22	-
50530473		0.08	1,00	2.00	0.945	0.030	8.00-10.50	17.00-19.00	-	1.00-3.00		
SUBSTITUTE	3,00	0.12	1.00	2:00	0.04%	0.030	10.50-13.00	17:00-19:00		1.4	17	- 0
SU53095	3098	0.08	1.00	2.00	0.045	0.030	12.00-15.00	22.00-24.00		- 4	1.6	14
8083108	2108	0.08	1.50	2:00	0.046	0.030	10.00-22.00	24.00-26.00				
SUS316	316	.0.011	1.00	2.00	0.045	0.030	10.00-14.00	18.00=18.00	2.00-0.00			- 0
SUSTRIE.	3361.	0.03	9.00	2.00	0.045	11.030	12 00-15 00	10.00-10.00	2.06-0.80			
50/5310N	310N	0.00	1.00	2.00	0.045	0.030	10.00-14.00	16.00-18.00	2.00-3.00		0.10-0.22	-
SUSSIBLN	516LN	0.03	1,00	2.00	0.045	0.630	10 50-14 50	16.50+18.50	2.00−3.00		0.12-0.22	
SU6316T1	Comme	0.00	1,00	2.90	0.046	0.030	10.00-14.00	te.00-18.00	2.00-5.00			TI MAIN, SWC76
50531671		0.00	1.100	2.00	0.045	0:000	10.00-14.00	FF.00-19.00	1.20-2.75	1-00-2-30	99	-
5U5316J1L	-	0.03	1.00	2.00	0.048	0.030	12.00-10.00	17.00-19.00	1.20-2.76	1.00+2.00		-
SUS310F	-	0.110	1.00	2.00	0.045	Min. 0.10	10.00-14.00	16.00-18.00	2.00-3.00	-	-	18
606317	317	0.00	1.00	2:00	o oos	-0.030	11.00+15.00	10.00-20.00	3.00-4.00	-	1.6	-
SUB317L	3171	0.03	1.00	7.00	9.045	0:030	11.00-15.00	18.00-20.00	3.00-4.00			
5US317LN		0.03	1.00	2:00	0.046	0.000	11.00-15.00	18.00-20.00	3.00+4.00		0.10-0.22	12
SUS317J1	-	0.04	1.00	2.50	0.045	0.030	15.00-17.00	16.00-19.00	4.00-0.00		. 7	
SUBJOR.	-	0.03	1.00	2:00	0.046	0.030	24.00-26.00	19.00-24.00	5.00-7.00		May 0.25	
SUSERIO.	14	0.02	1.00	2.00	0.045	0.030	25.00-25.00	10.00-23.00	4.00-5.00	1.00+2.00		
BU8321	321	0.00	1.00	2:00:	0.046	0.000	9 00-13 00	17,00-19.00				Ti MinuseCS
SU9347	347	0.08	1.00	2.00	0.045	0.030	0.00-13.00	FF.D0=19.00		1.0	-	File Min TilleC1
SUSERMY	WIACH	0.00	9.00	2.00	0.045	11.030	8.50-10.58	17.00-19.00		3.00-8.00		-
SUBORNITSJI		0.08	3 00-5 00	7.00	0.045	0.000	11.50~15.00	15.00-20.00				2
BUS630	517400	0.07	1,00	1.00	0.040	0.030	3.00-5.00	19.00-17.60		3.00-5.00		No 0.15-0.45
606631	\$17700	0.09	1.00	1.00	0.040	-0.030	6.50-7.75	16.00-18.00				A10 75-1.50





SIZE inch	O.D. (mm) Kg./Ft.	22G (0.71) Kg./Ft.	20G (0.91) Kg./Ft.	18G (1.12) Kg./Ft	16G (1.62) Kg./Ft	14G (2.03) Kg./Ft	12G (2.64) Kg./Ft	10G (3.25) Kg./Ft
1/4"	6.35	0.030	0.037	0.046	0.058	0.065	0.070	0.075
5/16"	7.93	0.038	0.048	0.060	0.079	0.089	0.105	0.114
3/8"	9.52	0.046	0.058	0.080	0.097	0.113	0.135	0.152
1/2"	12.7	0.063	0.079	0.105	0.134	0.157	0.200	0.226
3/4"	19.05	0.097	0.124	0.161	0.215	0.256	0.326	0.386
1"	25.4	0.131	0.167	0.218	0.294	0.351	0.450	0.541
11/4"	31.82	#	0.200	0.275	0.375	0.448	0.580	0.696
11/2"	38.1	100		0.332	0.452	0.542	0.700	0.851
13/4"	44.45	22	-	0.390	0.530	0.646	0.832	1.020
2"	50.8	177		0.447	0.607	0.733	0.960	1.161
21/4"	57.15	4	1941	0.504	0.687	0.828	1.085	1.315
21/2"	63.5	a	(2)	0.562	0.792	0.924	1.210	1.472
23/4"	69.85	*	140	0.619	0.847	1.022	1.338	1.630
3"	76.2	2	121	0.676	0.924	1.115	1.460	1.782
31/2"	88.9	ig.	120	0.791	1.082	1.306	1.718	2.092
4"	101.6	Ħ	123	0.905	1.239	1.497	1.971	2.403
41/2"	114.3	9	190	1.020	1.397	1.608	2.224	2.713
5"	127.0	Ħ	323	1.134	1.554	1.879	2.477	3.023
51/2"	139.7	**	-	1.250	1.713	2.070	2.730	3.336
6"	152.4	×	328	1.364	1.875	2.261	2.983	3.654
61/2"	165.1	œ	828	1.478	2.028	2.452	3.256	3.975

	Spec	Specification	GR	GRADE 304 KG/MTR	ITR	GR.	GRADE 316L KG/MTR	/MTR
Type				Weight			Weight	
	00	Groove	1.2	1.5	2.0	1.2	1.5	2.0
	25.4	14x14	0.933	1.166	1.554	0.938	1,173	1.564
	30	14x17	1.142	1.427	1.903	1.149	1.436	1,915
	38,1	15x15	1.332	1.665	2.220	1.341	1.676	2.234
	42.4	24x24	1.608	2.010	2.680	1.618	2 023	2.697
	48.3	27x30	1.903	2.379	3.172	1.915	2.394	3.192
State Classed	50.8	15x15	1,694	2.117	2.823	1,705	2.131	2.841
nannic aifilic	50.8	20x20	1.779	2.224	2.965	1.779	2.224	2.965
1	50.8	25x25	1.846	2.307	3.076	1.846	2.307	3.076
	09	20x20	2.094	2.617	3.489	2.107	2.633	3.511
	09	24x24	2.170	2.712	3.616	2.183	2.729	3.639
	60.3	34x34	2.350	2.938	3.917	2.365	2.957	3.942
	63.5	20x20	2.179	2.724	3.632	2.193	2.741	3.655
	101.6	26.7x30x26.7	3.464	4.330	5.773	3.486	4.357	5.809
Oval Slotted	60x30	24x24	1.808	2.260	3.013	1.819	2.274	3.032
(80x40	24x24	2.246	2.807	3.743	2.260	2.825	3.767
	80x40	33x26	2.255	2.819	3.759	2.270	2.837	3.783
	40x110	33x26	2.769	3,461	4.615	2.787	3.483	4.644
Rectangular	25x21	14x14	1.047	1.308	1.745	1.053	1.317	1.756
Slotted	40x30	24x24	1.684	2.105	2.807	1.695	2.119	2.825
	60x40	24x24	2.255	2.819	3.759	2.270	2.837	3.783
	40×40	24x24	1.856	2 320	3 093	1867	2 334	3 112