SHRIRAM METAL

Manufacturer of Stainless Steel,
Carbon Steel, Duplex / Super Duplex,
High Alloy Nickel Pipes & Tubes

SRM

SINCE 1970

TÜV SÜD

(An ISO 9001:2015 Company)

CHOOSE STAINLESS STEEL.
CHOOSE A STRONGER TOMORROW.

CONTENTS

ABOUT US

SHRIRAM METAL is one of India's most trusted leading Manufacturer & Exporter of Stainless Steel, Carbon Steel, Duplex, Super Duplex & High Nickel Alloy Pipes & Tubes companies. SHRIRAM METAL was established in the year 1970 with a vision to provide Tubular solutions to the industry Promoted by Shri Parasmal Mehta with ample experience and expertise, sensed the opportunities in this fast emerging field and invested in the best available human resources, technology, infrastructure and materials.

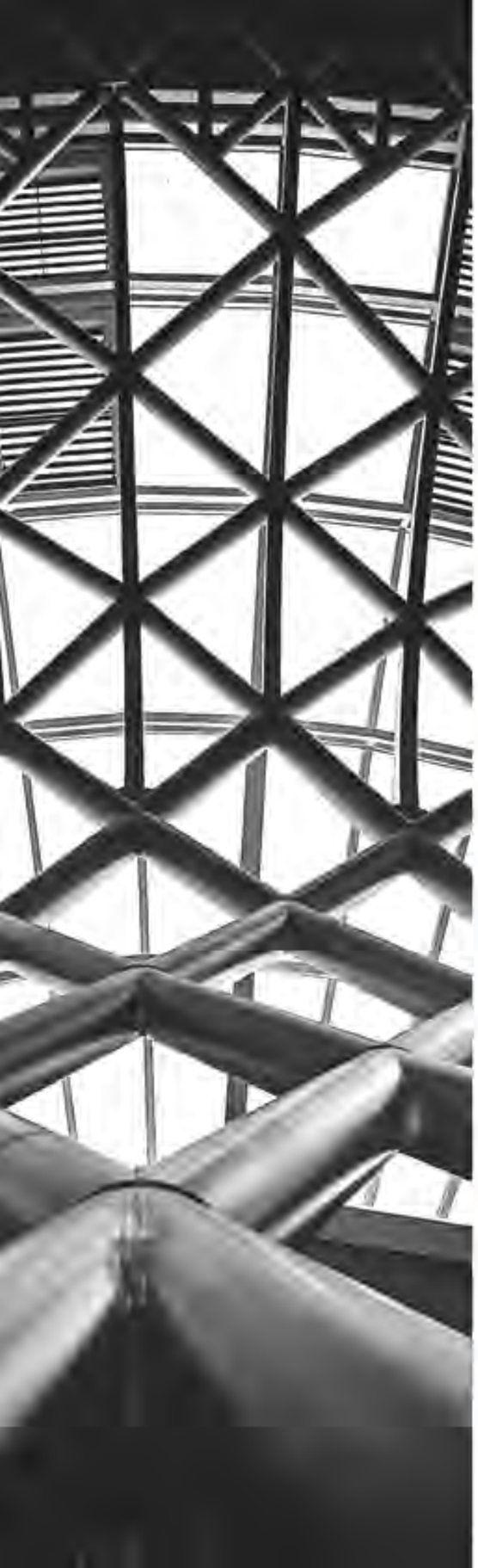
In the five decades since then, SHRIRAM METAL has steadily built up on a rock solid foundation of enterprise and business values and has grown in to a USD 20 Million company with 18,000 Sq. Mtrs area of manufacturing facilities capable to handle 8,000 MT material annually.

Today, SHRIRAM METAL offers a wide spectrum of pipes and tubes for use in a diverse range of industries including Oil & Gas, Power, Fertilizers, Heat-Exchangers, Paper & Pulp, Pharmaceuticals, Chemicals, Water Treatment, Dairy, Sugar & Food Processing, and the like.

With its modern production & quality assurance facilities, SHRIRAM METAL provides its customers with cost effective, reliable and qualitatively superior products which enjoy a lasting reputation and ensure total satisfaction of its customers.

Our another manufacturing unit is located at Rajasthan in the name of our sister concern company Angel Pipes & Tubes Pvt. Ltd.

> "A partner to the industry:
> Strong, realiable, experienced"



PRODUCT RANGE

STAINLESS STEEL, SEAMLESS / WELDED TUBES / PIPES

Size : 6mm to 219mm

Thickness : 0.5mm to 6mm

Length : Random Length - 4 to 7 MTR.
Fixed Length upto 28 MTR.

Condition : Hot Finish / Cold Finish, Annealed, Pickled & Passivated, Stress Relived, Bright Annealed

Standards : ASTM A213, A249, A268, A269, A270, A312, Equivalent DIN & BS standards

Grades : Austenitic Series, Ferritic Series - 410,430-446-1, Duplex Special Alloy, Super Duplex, Inconel, Monel & Titanium

Form : Round / Square / Rectangle

LARGE DIAMETER S.S. PIPES

Size : 200 mm OD to 600 mm OD

Thickness : 4mm to 16mm

Length : Random Length 4-6 MTR.
Fixed Length upto 6 MTR.

Condition : Annealed, Pickled & Passivated, Stress Relived

Standards : ASTM A312, A358 & DIN BS standards

Radius : Straight pipe only

Grade : Austentic series, Duplex

CARBON STEEL / ALLOYS STEEL SEAMLESS PIPE / TUBES

Size : 6mm OD to 406 mm OD

Thickness : 0.5mm to 22mm

Length : Random Length 4 to 12 MTR.
Standard Fixed Length upto 28 MTR.

Condition : Hot Finish / Cold Finish, Heat Treated & Stress Relived, Bright Annealed.

Standards : ASTM A53, A106, A179, A192, A210, A333, A334, A335, BS3059, P9, P11, P22, P91, BS6323, BS3059, Din17175, Din2391, JIS G 3461

Grade : Carbon Steel / Alloy Steel

CERTIFICATIONS & APPROVALS

Our excellent quality has gained us third party inspection and approvals from several companies, approval authorities and quality agencies who have accepted our quality

> “Staniless Steel,
> A metal we know best”

QUALITY CONTROL

The quality of our product is controlled during the manufacturing process. It starts with slitting the strip edges, continues with speed, temperature control during the high frequency induction welding and is followed by online non destructive eddy current testing directly after welding. Off-line, drift and flattening tests are conducted. This is all within our ISO 9000 quality management system.

QUALITY POLICY

We are committed to continuously upgrade our knowledge and skills to improve the efficiency of our organization and strive for outstanding quality of our products. We assure quality of our products by satisfying the customer's requirement and by perfecting our systems and procedures through involvement of our employees.

We promise to deliver, quality service at the most reasoable price, at the right time, at the right place and with right documents.

> “We know each of Our Pipes Personally”

BENEFITS OF STAINLESS STEEL

Corrosion resistance

All stainless steels have a high resistance to corrosion. Low alloyed grades resist corrosion in atmospheric conditions; highly alloyed grades can resist corrosion in most acids, alkaline solutions, and chloride bearing environments, even at elevated temperatures and pressures.

High and low temperature resistance

Some grades will resist scaling and maintain high strength at very high temperatures, while others show exceptional toughness at cryogenic temperatures.

Ease of fabrication

The majority of stainless steels can be cut, welded, formed, machined and fabricated readily.

Strength

The cold work hardening properties of many stainless steels can be used in design to reduce material thicknesses and reduce weight and costs. Other stainless steels may be heat treated to make very high strength components.

Aesthetic appeal

Stainless steel is available in many surface finishes. It is easily and simply maintained resulting in a high quality, pleasing appearance.

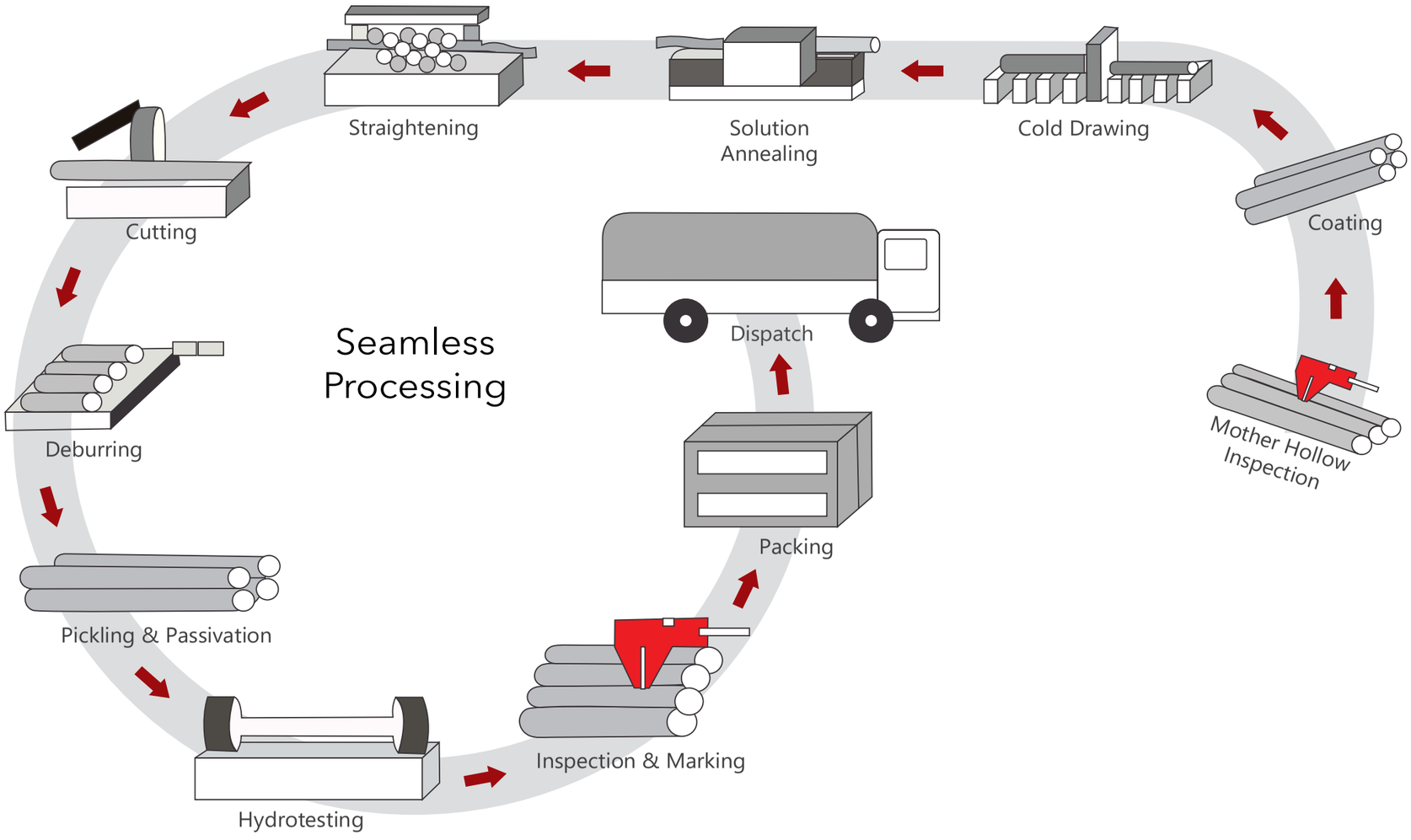
Hygienic properties

The cleanability of stainless steel makes it the first choice in hospitals, kitchens, food and pharmaceutical processing facilities.

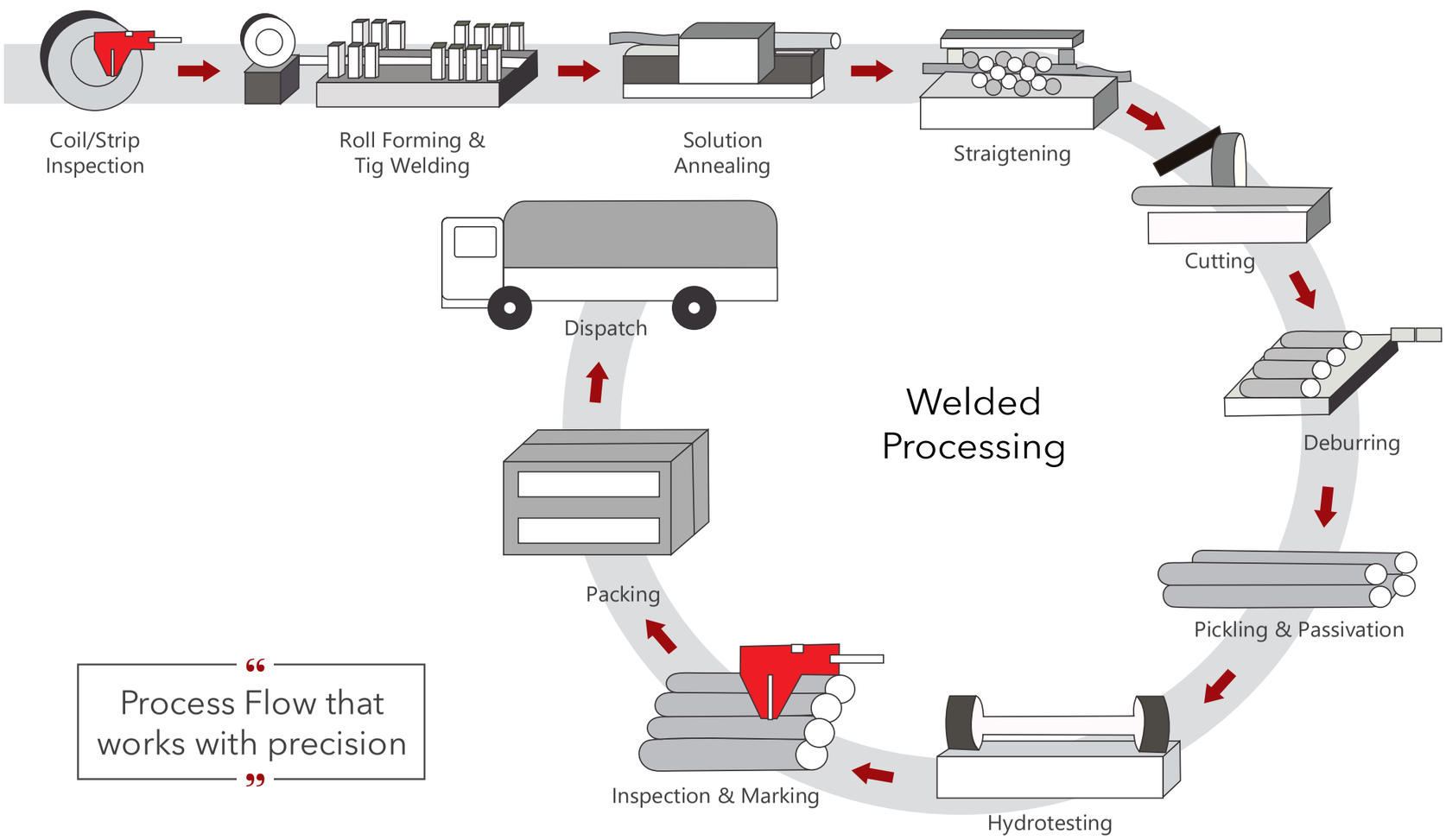
Life cycle characteristics

Stainless steel is a durable, low maintenance material and is often the least expensive choice in a life cycle cost comparison.

SEAMLESS TUBES PROCESS FLOW CHART



WELDED PIPES PROCESS FLOW CHART



"Process Flow that works with precision"

MANUFACTURING PROCESS

RAW MATERIAL: STAINLESS STEEL STRIPS / HOLLOWS OF CARBON STEEL / ALLOY STEEL / STAINLESS STEEL

The company uses raw material from reputed suppliers from Indian and abroad. As per technical specification ASTM, Hot/Cold finished materials are checked for quality as per test certificate and then send for manufacturing process. We have two types of cold drawing process.

SEAMLESS PIPES & TUBES

PILGERING

- Cold pilgering process using full link die and tapper mandral
- To reduce the cross section bu upto90%, because the process relies on large number of small forming steps
- Cold pilgering are longitudinal cold rolling process that reduce the diameter and wall thickness of metal tube in one process step
- By cold pilgering process surface finish achieved matter than cold drawing finish (Less than 0.4 micron) and improved microstructure grain size.
- Our pilgering range are OD12 to 73mm and wall thickness 0.8 to 4mm

COLD DRAWING

- In cold drawing process raw material tubes are coated with some special chemical or applied some special lubricant oil.
- The tubes are pulled through tungsten carbide die and flotting /fixed plug inside the tubes, resulting in reduced tube diameter and wall thickness corresponding increase in tube length.
- Our capacity of drawing is OD 6 to 406mm & thickness are 0.8 to 22mm.

LARGE DIAMETER PIPES

Stainless Steel Pipe (welded) 10"NB to 24" NB in schedule 5, Schedule 10, Schedule 20, Schedule 40 and also special wall thickness is formed on 800 M.T. Press Brakes Hydraulic Press in length up to 6.0 to 7.0 meters. This section produces S.S. Pipes (welded) as per ASTMA-358 by TIG welding and filler materials is used. The large diameter pipe is then sized & straightened to meet ovality and dimensional requirements of the applicable specifications. Testing, according to specifications, is then performed by either X-ray or Hydrostatic method. Final marking to size, grade & specifications is done prior to final visual inspection before despatch. Chemical, Physical and Hydrostatic Testing are done regularly right from raw material stage, in process till despatching of finished product.

HEAT TREATMENT (SOLUTION ANNEALING)

After each process of manufacturing tubes & pipes are subjected to heat treatment in a continuous annealing furnace at the specified temperatures as per grade of materials and followed by rapidly quenching as per the grade to prevent carbide formation.

SOLUTION ANNEALING ENSURE

- Homogenous structure optimum inter - granular corrosion resistance
- Removal of residual stresses developed during the cold process
- Improve ductility and softness for further process
- Transformation of weld and heat affected zone to homogenous austenitic structure

BRIGHT ANNEALING

- We have bright annealing electric furnace which is run by protective atmosphere of cracked ammonia.
- Brightness on the tubes largely depend upon atmosphere prevailing is side furnace, due point and oxygen content
- We have provided due point meter oxygen analyzer for measurement of dryness of crack ammonia and oxygen content.
- By bright annealing tubes get exellent finish and uniform core properties in entire tube length.

VISUAL & DIMENSIONAL INSPECTION

Visual Inspections are carried out to detect any Dents, on the surface of tube the dimension inspetions are carried out with calibrated instruments.

HARDNESS TESTING

Hardness testing is carried out to measure hardness of finish & pipes.

(a) This HRB scale, is used to determines hardness by measuring the depth to which a hardened steel ball under specific load, penetrates the material. The hardness number is indicated on a scale accord-ing to the load applied. The Load is 100kgf and 1/16" Ball Indenter. This is hardness Rockwell "B" scale.

(b) Depending upon the thickness of the pipe / tube, the hardness scale is decided. This is called Rockwell Hardness Superficial "T" Scale.

TENSILE TEST

This is the destructive test carried out to measured mechanical properties of finish products.

FLATTENING TEST

This is usually applied to tube and involves flattening sample of tube between two parallel faces without showing flaws or cracks. The length of the test-piece and degree to which it is to be flat-tened is specified. The latter usually expressed in terms of the wall thickness and diameter of the tube / pipe.

EDDY CURRENT TESTING

This involves inducing eddy currents into the material by exciting a coil which surmounts two nar-row search coils surrounding the material. Any discontinuities in material are found by comparing the electrical conditions that exist in the two search coils. The fault signals are amplified and can be shown on a cathode ray tube or as an audible signal.

HYDROSTATIC TEST

100% Hydro test we are carried out for finish tubes & pipes to check any leakage under elevated under hydraulic water pressure as per specification and customer requirements.

AIR UNDER WATER TEST

All the Pipes / Tubes are tested using Air under water.
The Air pressure is given in Table below:

Standard	Type	Purpose	Test Air Pressure
A 213	Seamless	Special requirements	150PSI
A 249	Welded	Special requirements	150PSI
A 269	Seamless & Welded	General Purpose	150PSI
A 312	Seamless & Welded	General Purpose	150PSI
Din 17456	Seamless	General Purpose	6 Bar (87PSI)
Din 17457	Welded	Special requirements	6 Bar (87PSI)
Din 17458	Seamless	Special requirements	6Bar (87PSI)

COMPARISON: A 262 & DIN 50940

Test Description	ASTM A 262	DIN 50940
Practice A	Electroetch sample at 1 A/ sq.cm for 1.5 minutes and see the microstructure at 100X	
Practice C	65±% Nitric Acid, Five Boils each of 48hrs. Check weight loss of each boil and take average of five boils.	(Stauss Test): same as given in ASTM A262
Practice E	Copper - Copper Sulphate - 16% Sulfuric Acid, Boil 24 hours and do Flattening Test.	(Huey Test)

Intra granular structure is check by micro test equipment and chemical testing is done by spectrograph

TESTING EQUIPMENTS

INSPECTION & TESTING OFFERED BY SHRIRAM METAL ARE AS FOLLOWS:

- Mechanical Testing, Chemical Testing
- Fully equipped laboratory for Corrosion Testing, Chloride
- Contamination Testing, Residual Stress Measurement
- Micro Structure Examination / Analysis
- Laboratory Spectrometer
- Positive materail Identification (PMI) Tester
- Hydro Testing - Straight as well as U - Tubes
- Air Under Water Testing Straight Length upto 30Meters
- Ferrite Contant and Surface Finish

NON DESTRUCTIVE TESTING

- Eddy Current Testing
- Ultrasonic Testing
- Radiography Testing
- Dye - Penetrant Testing

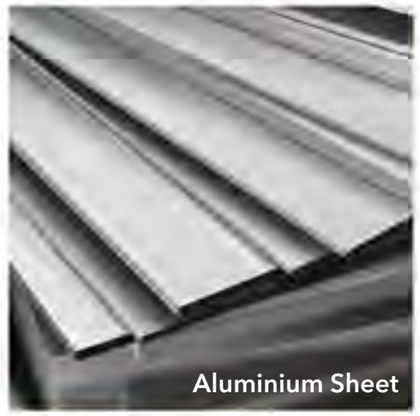

S S Fasteners


MS H BEAMS


CARBON STEEL ROD


C S FITTINGS


Hastelloy Round Bars


Aluminium Sheet


CS Flanges


Alloy Steel Fittings


Copper Pipes


Duplex Fittings


Aluminised Sheet


Aluminium Bar


S S Buttweld Fittings

WE CATER OTHERS PRODUCTS ALSO

SHRIRAM METAL also engaged in Trading & Export business of a wide range of Ferrous and Non Ferrous Products. We are committed to quality products, at competitive price, which has helped us in gaining a respectful market image and experience, making us one of the best in the business.

The wide range of products offered by us is manufactured using high grade steels, procured from trustworthy vendors. Thus, these are appreciated for their key features such as ability to work even in adverse conditions, sturdy construction and high tensile strength. We assure you the 'best' quality product with 'excellent' service, at most competitive' prices. It will be a pleasure for us to work with a totally professional and committed organization like yours.

Product range provided by us consists of Stainless Steel Products, Carbon Steel Products, and Alloy Steel Products. To meet the precise requirements of our valued clients, we are offering these products in various specifications. Moreover, clients can avail these products from us at nominal market price. We are a reputed supplier of Stainless Steel, Carbon Steel, Alloy Steel, Titanium, Nickel base products & other industrial raw materials under various sizes & grades.

Our team of procuring agents conducts proper research about the market stature of the clients before any business association. We have installed all the latest machines and tools for the safe loading and unloading of the products. After procuring products, our quality controllers carefully test the entire range on various parameters, to ensure the flawlessness of these. Further, for the packaging of these products, we use high grade material such as bubble wrapping material, cartons and wooden & plywood boxes.

We also have some stock available in our Warehouse. We have made arrangements with all our sources for faster deliveries.

TYPES OF STAINLESS STEEL

Stainless Steel is a name given to a group of steel alloys that contain more than 10.5% Chromium. Chromium has a high affinity for oxygen and forms a stable oxide film on the surface of stainless steel.

The film is called the "passive oxide layer" and forms instantaneously in ordinary atmospheres. The film is self-healing and rebuilds when it has been removed. It is this film that gives stainless steel its corrosion resistance.

AUSTENITIC GRADES

When nickel (Ni) is added to stainless steel in sufficient quantities the crystal structure is changed from ferrite to austenite, hence the term austenitic stainless steel. The basic composition of austenitic stainless steel is 18% chromium (Cr) and 8% nickel (Ni). This is called 304 grade, sometimes referred to as 18/8 or 18/10. If additional corrosion resistance is required 2% molybdenum (Mo) is added to form grade 316.

DESCRIPTIONS AND GENERAL USES

303 (INDENT ONLY)

Especially developed for machining - especially where it involves extensive machining in automatic screw machines. Sulphur or selenium is added to give excellent free machining and non-seizing properties. As sulphur or selenium is added corrosion resistance is lower than T304. T303 is not recommended for welding. Non-magnetic when annealed but becomes slightly magnetic when cold-worked.

304

The most widely used stainless steel with the best all round performance. Its carbon content is lower and its corrosion resistance after welding is higher than T302. It is less susceptible to intergranular corrosion after welding. Non-magnetic but slightly magnetic when cold worked.

304L

A low carbon stainless steel with general corrosion resistance like T304, but with superior resistance to intergranular corrosion following welding or stress relieving. Highly recommended for parts which are fabricated by welding and which cannot be annealed. Generally limited to temperatures up to 426°C. The physical properties and thermal treatments of T304L are similar but not identical to T304. Non-magnetic when annealed but slightly magnetic when cold-worked.

316

Also known as marine grade stainless steel. T316 has 2-3% molybdenum which improves corrosion resistance. T316 has superior corrosion resistance to other austenitic steels when exposed to many types of chemical corrodents as well as marine environments - T316 also has applications in the chemical, textile, and paper industries. It has better strength and creep resistance at high temperatures than T304 and greater work hardening properties. Non-magnetic but slightly magnetic when cold-worked.

316L

Has lower carbon than T316, with corrosion resistance similar to T316, but superior resistance to intergranular corrosion following welding or stress relieving. It is recommended for parts which cannot be subsequently annealed. Service temperatures up to 426°C. The physical properties and thermal treatments of type 316L are similar but not identical to type 316. Non-magnetic when annealed but slightly magnetic when cold-worked.

MARTENSITIC GRADES

This grade contains 12%-18% chromium and 0.08%-1.00% carbon. The high carbon content allows the stainless steel to respond well to heat treatment to give various mechanical strengths such as hardness. However the carbon is detrimental when welding and care must be taken. Grades 409, 410, 420 and 431 are typical martensitic grades.

FERRITIC GRADES

These are nickel free. They have varying chromium content of 12%-22% but a lower carbon content than the martensitic grades. The increased chromium increases corrosion resistance at elevated temperatures, however the lack of mechanical properties due to the fact that it cannot be heat-treated limits its application.

DESCRIPTIONS AND GENERAL USES

430

A corrosion and heat resisting stainless steel with superior corrosion and heat resistance compared to type 410. Type 430 is non hardenable and possesses only mild cold-working properties due to the high chromium content. Its weldability is excellent and does not require subsequent annealing. Magnetic in all conditions. Common uses include builders hardware, domestic appliances (driers, dishwashers) and automotive trim.

DUPLEX STAINLESS STEEL

Duplex stainless steels have a structure of approximately equal amounts of ferrite and austenitic and therefore may be referred to as ferritic-austenitic stainless steel. The chromium varies from 18%-28% and a nickel content of 4.5% to 8% is insufficient to develop a fully austenitic crystal structure. Most grades contain molybdenum in the 2.5%-4% range, plus a small nitrogen addition which enables both strength and pitting resistance. Common uses include applications such as heat exchanger panel and tubes, tanks and vessels where high chloride concentrations are present eg sea water cooling, desalination, food pickling plants and aggressive marine waters.

STAINLESS STEEL ROUND BAR

MATERIAL TO A276

SIZE		GRADE		TOLER-ANCE	APPROX KG/M
DIAMETER MM	DIAMETER (INCH)	304	316		
3.18	1/8″	S18R*	-	H9	0.06
4.00	-	SM4R*	-	H9	0.10
4.76	3/16″	S316R*	S316R6	H9	0.14
5.00		SM5R*	SM5R6*	H9	0.16
6.00		SM6R*	SM6R6*	H9	0.23
6.35	1/4″	S14R*	S14R6*	H9	0.25
7.92	5/16″	S516R*	S516R6*	H9	0.39
8.00		SM8R*	SM8R6*	H9	0.40
9.00			SM9R6	H9	0.51
9.53	3/8″	S38R*	S38R6*	H9	0.57
10.00		SM10R*	SM10R6*	H9	0.63
11.10	7/16″	S716R	S716R6*	H9	0.77
12.00		SM12R*	SM12R6*	H9	0.90
12.70	1/2″	S12R*	S12R6*	H9	1.01
14.27	9/16″		S916R6*	H9	1.28
15.00			SM15R6	H9	1.41
15.88	5/8″	S58R* S	58R6*	H9	1.58
16.00		SM16R*	SM16R6*	H9	1.61
18.00		SM18R*	SM18R6*	H9	2.03
19.05	3/4″	S34R*	S34R6*	H9	2.28
20.00		SM20R*	SM20R6*	H9	2.51
22.23	7/8″	S78R	S78R6*	H9	3.10
25.00		SM25R*	SM25R6*	H9	3.93
25.40	1″	S1R*	S1R6*	H9	4.05
28.58	1 1/8″	S118R	S118R6*	H9	5.13
30.00		SM30R*		H9	5.65
31.75	11/4″	S114R*	S114R6*	H9	6.33
34.93	13/8″		S138R6	H9	7.66
38.10	11/2″	S112R*	S112R6*	H9	7.66
40.00		SM40R*	SM40R6*	H9	9.12
41.28	15/8″		S158R6	H9	10.70
44.45	13/4″	S134R	S134R6*	H9	12.41
45.00		SM45R*		H9	12.72
50.00		SM50R*	SM50R6*	H9	15.70
50.80	2″	S2R*	S2R6*	H9	16.21
57.15	21/4″	S214R	S214R6	H9	20.51
60.00		SM60R*	SM60R6*	H9	22.61
63.50	21/2″	S212R*	S212R6*	H9	25.32
65.00		SM65R*		H9	26.53

SIZE		GRADE		TOLER-ANCE	APPROX KG/M
DIAMETER MM	DIAMETER (INCH)	304	316		
70.00		SM70R*	SM70R6*	H9	30.77
75.00		SM75R*		H9	35.33
76.20	3″	S3R*	S3R6*	H9	36.46
80.00		SM80R*	SM80R6*	H9 4	0.19
85.00		SM85R		H9	45.37
88.90	31/2″	S312R*	S312R6	H9	49.63
90.00		SM90R*	SM90R6*	K12	50.87
100.00		SM100R*	SM100R6*	K12	62.80
101.60	4″	S4R	S4R6	K12	64.83
114.30	41/2″	S412R		K12	82.04
120.00		SM120R*	SM120R6*	K12	90.43
125.00		SM125R*	SM125R6	K12	98.13
130.00		SM130R	SM130R6	K12	106.13
140.00		SM140R		K12	123.09
150.00		SM150R*	SM150R6*	K12	141.30
152.00	6″	S6R	S6R6	K12	145.86
170.00		SM170R	SM170R6*	K12	181.49
200.00			SM200R6	K12	251.20
203.20	8″		S8R6	K12	259.30

DIAMETER TOLERANCE OF STAINLESS ROUND BAR

DIAMETER MM	H9	H11
< 3mm	+0, -0.025	+0, -0.060
3 - 6mm	+0, -0.030	+0, -0.075
>6 - 10mm	+0, -0.036	+0, -0.090
>10 - 18mm	+0, -0.043	+0, -0.110
>18mm - 30mm	+0, -0.052	+0, -0.130
>30 - 50mm	+0, -0.062	+0, -0.160
>50 - 80mm	+0, -0.074	+0, -0.190
>80 - 120mm	+0, -0.087	+0, -0.220

Notes:
- Other sizes, grades and finishes available upon request.
- Length: Standard lengths 4 metres.
- Finishes:
  - Diameter 25mm (1″) and under – ASTM A276, cold-drawn/ polished.
  - Diameter greater than 25mm (1″) – ASTM A276, smooth-turned, improved machining abilities.
- Minimum cut lengths and cutting charges may apply.

* Denotes normal stock items.

Note:
- Due to availability some diameters > 55mm may be stocked to a 'H' or 'K' tolerance.

STAINLESS STEEL FLAT BAR

MATERIAL TO ASTM A276

WIDTH MM	THICKNESS MM	GRADE / FINISH						APPROX KG/M
		304			316			
		SRE (#1)	POLISHED	HRAP (#1)	SRE (#1)	POLISHED	HRAP (#1)	
13	3		S133FP*					0.31
20	3	S203FS*	S203FP*					0.48
20	5	S205FS*	S205FP					0.80
20	6	S206FS*						0.96
25	3	S253FS*	S253FP*		S253FS6*	S253FH6		0.60
25	5	S255FS* S	255FP*	S255FH	S255FS6			1.00
25	6	S256FS*			S256FS6*			1.20
25	10			S2510FH*			S2510FH6	2.00
25	12			S2512FH*			S2512FH6	2.40
30	3	S303FS*						0.72
30	5	S305FS*	S305FP		S305FS6			1.20
30	6	S306FS*			S306FS6			1.44
30	10			S3010FH*			S3010FH6	2.40
40	3	S403FS*	S403FP*		S403FS6*			0.96
40	5	S405FS*	S405FP*	S405FH*	S405FS6*	S405FP6		1.60
40	6	S406FS			S406FS6*			1.92
40	10			S4010FH*			S4010FH6*	3.20
40	12			S4012FH*			S4012FH6*	3.84
50	3	S503FS*	S503FP*		S503FS6*			1.20
50	5	S505FS*	S505FP*		S505FS6*	S505FP6		2.00
50	6	S506FS*	S506FP*	S506FH*	S506FS6*	S506FP6*		2.40
50	9			S509FH*				3.60
50	10		S5010FP*	S5010FH*	S5010FS6		S5010FH6*	4.00
50	12	S5012FS		S5012FH*	S5012FH6*			4.80
50	16			S5016FH*				6.40
50	19			S5019FH				7.60
50	20			S5020FH*				8.00
50	25			S5025FH			S5025FH6	10.00
60	10			S6010FH*				4.80
65	6	S656FS*			S656FS6*		S656FH6	3.12
65	10			S6510FH*			S6510FH6*	5.20
65	12			S6512FH*			S6512FH6	6.24

* Denotes normal stock items.

Note:
- Polished (POL): cold-formed with smooth satin finish and square edges.

STAINLESS STEEL FLAT BAR

MATERIAL TO ASTM A276

WIDTH MM	THICKNESS MM	GRADE / FINISH						APPROX KG/M
		304			316			
		SRE (#1)	POLISHED	HRAP (#1)	SRE (#1)	POLISHED	HRAP (#1)	
75	5	S755FS*						3.00
75	6	S756FS*	S756FP		S756FS6*			3.60
75	9			S759FH*				5.40
75	10			S7510FH*			S7510FH6*	6.00
75	12			S7512FH*			S7512FH6*	7.20
75	15			S7515FH				9.00
75	16			S7516FH*				9.60
75	25			S7525FH*				15.00
80	10			S8010FH*				6.40
100	5	S1005FS*						4.00
100	6		S1006FS*		S1006FS6*			4.80
100	9			S1009FH*				7.20
100	10			S10010FH*			S10010FH6*	8.00
100	12			S10012FH*			S10012FH6	9.60
100	19			S10019FH				15.20
100	20			S10020FH*				16.00
100	25			S10025FH*				20.00
150	5	S1505FS						6.00
150	6	S1506FS*						7.20
150	10			S15010FH*				12.00
150	12			S15012FH				14.40
200	6	S2006FS						9.60

* Denotes normal stock items.

Note:

- Other sizes, grades and finishes available upon request.
- Length: Standard lengths 4 metres. 6 metre lengths available on enquiry, minimum order quantities may apply. Minimum cut-lengths and cutting charges may apply.
- Finishes:
  - SRE = Slit Rolled Edge, hairline finish = between 120 - 240 grit.
  - HRAP = Hot-rolled annealed and pickled.
- Additional Services: Polishing available - lead times may apply.

BAR – ANGLE, SQUARE AND CHANNEL

STAINLESS STEEL SQUARE BAR MATERIAL TO ASTM A276

SIZE (WIDTH X THICKNESS) MM	304		316		APPROX KG/M
	HRAP	CD	HRAP	CD	
4 x 4		S4SQC			0.13
5 x 5		S5SQC		S5SQC6	0.20
6 x 6		S6SQC*		S6SQC6	0.29
8 x 8		S8SQC*	S8SQH6	S8SQC6	0.50
10 x 10		S10SQC*	S10SQH6	S10SQC6	0.80
12 x 12		S12SQC*	S12SQH6	S12SQC6	1.15
16 x 16	S16SQH	S16SQC*	S16SQH6	S16SQC6	2.05
20 x 20	S20SQH	S20SQC*	S20SQH6	S20SQC6	3.20
25 x 25	S25SQH*	S25SQC*	S25SQH6		5.11
32 x 32	S32SQH*	S32SQC*	S32SQH6		8.19
38 x 38	S38SQH				11.55
40 x 40	S40SQH	S40SQC*			12.80
50 x 50	S50SQH*	S50SQC*	S50SQH6		20.00

* Denotes normal stock items.

Notes:

- Other sizes and finishes also available upon request.
- Length: Standard lengths 3 metres. Minimum cut-lengths and cutting charges may apply.
- Finishes:
  - CD = Cold-drawn.

STAINLESS STEEL ANGLE MATERIAL TO ASTM A276

SIZE (WIDTH X THICKNESS) MM	304		316	APPROX KG/M
	HRAP	CD	HRAP	
20 x 20 x 3	S203AH*		S203AH6	0.89
25 x 25 x 3	S253AH*	S253AP*	S253AH6*	1.13
25 x 25 x 5	S255AH*			1.80
25 x 25 x 6			S256AH6*	2.11
30 x 30 x 3	S303AH*	S303AP*	S303AH6	1.37
30 x 30 x 5	S305AH*		S305AH6	2.20
40 x 40 x 3	S403AH*	S403AP*	S403AH6*	1.85
40 x 40 x 5	S405AH*		S405AH6*	3.00
40 x 40 x 6	S406AH*		S406AH6*	3.55
50 x 50 x 3	S503AH*	S503AP*	S503AH6*	2.33
50 x 50 x 5	S505AH*			3.80
50 x 50 x 6	S506AH*		S506AH6*	4.51
65 x 65 x 6	S656AH*		S656AH6*	5.95
75 x 75 x 6	S756AH		S756AH6*	6.91
75 x 75 x 9	S759AH*		S759AH6*	10.15
100 x 100 x 6	S1006AH*		S1006AH6*	9.31
100 x 100 x 10	S10010AH*		S10010AH6*	15.20

* Denotes normal stock items.

Notes:

- Other sizes and finishes also available upon request.
- Length: Standard lengths 4 metres for CF and 6 metres for HRAP. Minimum cut-lengths and cutting charges may apply.
- Finishes:
  - CF = Cold-formed smooth brightfinish/edge with radius external corner.
  - HRAP = Hot-rolled annealed and pickled.

STAINLESS STEEL CHANNEL MATERIAL TO ASTM A276

SIZE (WIDTH X THICKNESS) MM	304	316	APPROX KG/M
	HRAP	HRAP	
80 x 40 x 5	S8040C*		6.10
100 x 50 x 6	S10050C*	S10050C6*	9.15
150 x 75 x 6	S15075C*		14.10

* Denotes normal stock items.

Notes:

- Other sizes and finishes also available upon request.
- Length: Standard lengths 6 metres. Minimum cut-lengths and cutting charges may apply.
- Finishes: HRAP = Hot-rolled annealed and pickled.

STAINLESS STEEL SCHEDULE PIPE & DIMENSION

SHRIRAM METAL

DESIGNATION OF DIAMETER		O/D DIA	NOMINAL WALL THICKNESS														
			SCH.5S		SCH.5		SCH.10S.		SCH.10		SCH.20S.		SCH.30		SCH.40S		SCH.40
(A)	(B)	METER MM	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK
6	1/8	10.30					1.2	0.27			1.5	0.33			1.73	0.37	
8	1/4	13.72					1.65	0.49			2.00	0.58			2.24	0.64	
10	3/8	17.20					1.65	0.63			2.00	0.74			2.31	087	
15	1/2	21.34	1.65	0.81	1.65	0.81	2.11	1.02	2.11	1.02	2.5	1.15			2.77	1.29	
20	3/4	26.67	1.65	1.03	1.65	0.81	2.11	1.02	2.11	1.30	2.5	1.49			2.87	1.71	
25	1	33.40	1.65	1.31	1.65	1.31	2.77	2.12	2.77	2.12	3.00	2.24			3.38	2.54	
32	1-1/4	42.16	1.65	1.67	1.65	1.67	2.77	2.73	2.77	2.73	3.00	2.90			3.56	3.44	
40	1-1/2	48.26	1.65	1.93	1.65	1.93	2.77	3.15	2.77	3.15	3.00	3.35			3.68	4.11	
50	2	60.32	1.65	2.42	1.65	2.42	2.77	3.90	2.77	3.99	3.5	4.90			3.91	5.52	
65	2-1/2	73.02	2.11	3.75	2.11	3.75	3.05	5.34	3.05	5.34	3.5	6.00			5.16	8.77	
80	3	88.90	2.11	4.59	2.11	4.59	3.05	6.56	3.05	6.56	4.00	8.37			5.49	11.50	
90	3-1/2	101.68	2.11	5.25	2.11	5.25	3.05	7.53	3.05	7.53	4.00	9.62			5.74	13.78	
100	4	114.30	2.11	5.93	2.11	5.93	3.05	8.50	3.05	8.50	4.5	12.18			6.02	16.32	
125	5	141.30	2.77	9.61	2.77	9.61	3.40	11.74	3.40	11.74	5.00	16.80			6.55	22.10	
150	6	168.27	2.77	11.47	2.77	11.47	3.40	14.04	3.40	14.04	5.5	22.08			7.11	28.69	
200	8	219.1	2.77	15.00	2.77	15.00	3.76	20.27	3.76	20.27	6.35	33.82	7.04	37.38	8.18	43.20	
250	10	273.1	3.40	22.95	3.40	22.95	4.19	28.20	4.19	28.20	6.35	42.41	7.80	51.81	9.27	61.22	
300	12	323.9	3.96	31.72	4.19	33.60	4.57	36.54	4.57	36.54	6.35	50.48	8.38	66.20	9.53	75.01	10.31
350	14	355.6	3.96	34.66			4.78	41.99	6.35	55.53	7.092	68.95	9.53	82.56	9.53	82.58	11.13
400	16	457.2	4.19	42.20			4.78	48.07	6.35	63.61	7.92	79.03	9.53	94.70	9.53	94.70	12.70
450	18	457.2	4.19	47.46			4.78	54.15	6.35	71.69	7.92	89.10	11.13	124.32	9.53	106.83	14.27
500	20	508.0	4.78	60.23			5.54	69.70	6.35	79.76	9.53	118.93	12.70	157.51	9.53	118.93	15.06
550	22	558.8	4.78	65.95			5.54	76.75	6.35	79.76	9.53	118.93	12.70	157.51	9.53	118.93	15.06
600	24	609.6	5.54	83.60			6.35	95.92	6.35	95.92	9.53	143.20	14.27	212.72	9.53	143.20	17.45
650	26	660.4	5.54	90.00					7.92	129.40	12.70	205.97			9.53	155.32	
700	28	711.2	5.54	96.97					7.92	139.47	12.70	222.13	15.88	276.48	9.53	167.44	
750	30	762.0	6.35	120.15			7.92	149.55	7.92	149.55	12.70	238.28	15.88	296.68	9.53	179.56	
800	32	812.8	6.35						7.92	159.62	12.70	254.44	15.88	316.88	9.53	191.69	17.48
850	34	863.6	6.35						7.92	169.64	12.70	270.50	15.88	336.96	9.53	203.74	17.48
900	36	914.4	6.35						7.92	179.77	12.70	286.75	15.88	357.28	9.53	215.93	19.05

WALL THICKNESS & WEIGHT / METER

SHRIRAM METAL

NOMINAL WALL THICKNESS																	
	SCH.60		SCH.80S.		SCH.80		SCH.100		SCH.120		SCH.140		SCH.160		SCH.XXS		
WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	WALL THK	WEIGHT KG/MTR	
			2.41	0.47													
			3.02	0.82													
			3.20	1.12													
			3.73	1.64													
			3.91	2.23													
			4.55	3.29													
			4.65	4.53													
			5.08	5.49													
			5.54	7.60													
			7.01	11.60													
			7.62	15.51													
			8.08	18.92													
			8.56	22.66					11.13	28.75			13.49	34.05	17.12	41.66	
			9.53	31.44					12.70	40.90			15.88	49.87	19.05	58.31	
			10.97	43.21					14.27	55.03			18.26	68.59	21.95	79.2	
	10.81	53.90	12.70	65.63			15.06	76.93	18.24	91.73	20.62	102.47	23.01	112.97	22.23	108.00	
	12.20	62.80	12.70	82.80	15.06	97.27	18.24	116.38	21.41	134.90	25.40	155.50	28.58	174.95	25.40	155.5	
80.94	14.27	110.62	12.70	98.95	17.45	133.88	21.41	162.14	25.40	189.82	28.58	211.31	33.32	242.40	25.40	189.62	
96.00	15.06	128.42	12.70	109.04	19.05	160.54	23.80	197.74	27.76	227.88	31.75	257.47	35.71	286.04			
125.20	16.66	162.59	12.70	125.20	21.41	206.40	26.19	249.34	30.94	290.88	36.53	338.32	40.46	370.74			
158.27	19.05	209.00	12.70	141.35	23.80	258.29	29.36	314.54	34.93	369.34	39.67	414.74	45.24	466.67			
185.89	20.62	251.65	12.70	157.51	26.19	315.97	32.54	387.41	38.10	448.30	44.45	515.94	49.99	573.31			
216.04	22.23	298.88	12.70	173.66	28.51	379.70	34.92	457.83	41.278	535.17	47.62	609.30	53.97	682.57			
258.74	24.59	360.21	12.70	189.82	30.94	448.30	38.89	555.76	46.02	649.44	52.37	730.72	59.51	819.70			
			12.70	205.97													
			12.70	222.13													
			12.70	238.28													
348.11			12.70	254.44													
370.22			12.70	270.50													
427.09			12.70	286.75													

24.66D-t) t
1000
Wt/pam + formula
Weight stainless stell pipe
OD (mm) - W.T. (mm) x W.T. (mm) x 0.02466 = Kg. per mtr.

ASTM STANDARDS STAINLESS STEEL SEAMLESS WELDED TUBES & PIPES

SHRIRAM METAL

Specification	Allowable Outside Diameter Variations in mm			Allowable Wall Thickness Variations		Exact Length Tolerances in mm		Testing
	Nominal Diameter	Over	Under	Over %	Under %	Over %	Under %	
ASTM A - 213 Seamless Boiler Superheater and Heat Exchanger Tubes	Under 25.4 25.4-38.1 Incl. 38.1-50.8 excel. 50.8-63.5 excel. 63.5-76.2 excel. 76.2-101.6 Incl.	0.10 0.15 0.20 0.25 0.30 0.38	0.10 0.15 0.20 0.25 0.30 0.38	+20 +20 +22 +22 +22 +22	-0 -0 -0 -0 -0 -0	3.17 3.17 3.17 3.76 4.76 4.76	0 0 0 0 0 0	Tension Test Flattening Test Flare Test Hardness Test 100% Hydrostatic 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 excel. 50.8-63.5 excel. 63.5-76.2 excel. 76.2-101.6 Incl.	0.10 0.15 0.20 0.25 0.30 0.36	0.10 0.15 0.20 0.25 0.30 0.36	+10 +10 +10 +10 +10 +10	-10 -10 -10 -10 -10 -10	3.17 3.17 3.17 4.76 4.76 4.76	0 0 0 0 0 0	Tension Test Flattening Test Flare Test/Flange Test *Reverse Bend Test Hardness Test 100% Hydrostatic Test * Reverse Flattening Test Refer to ASTM A - 450 *Wherever Applicable
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 Flange Test (Welded Only) Hardness Test Flattening Test, Reverse Flattening 100% Hydrostatic
ASTM A - 312 Seamless & Welded Pipe	13.70-48.3 incl. 48.3-114.3 incl. 114.3-220 incl.	0.40 0.79 1.60	0.79 0.79 0.79	+12.5	-12.5	6.4 6.4 6.4 (Normaly Random Lengths Ordered)	0 0 0	Tension Test Flattening Test 100% Hydrostatic Test Refer to ASTM A-530
ASTM - 358 Welded Pipe for High Temperature Service.	For all Size 5" NB & Above	+0.5%	-0.5%	-	-0.3mm	Customers Requirements		Transvers Tension Test Transverse guided bend test. Hydrostatic test, radiographic (optional.)
ASTM A - 409 welded austenitic pipe	355.6-750mm	±0.2 to +0.4		-0.46		As per Customer Requirement		Refer to ASTM A 530
ASTM A - 554 Mechanical Steel Tubing	Upto 5" 127 mm	0.1 to 0.5	0.1 to 0.5	+10	-10	1.6 to 4.88	0	As per Customer Requirement

TECHNICAL INFORMATION AND USAGE OF MOST COMMON STAINLESS STEELS

SHRIRAM METAL

SAE GRADE	TYPE	EUROPEAN NORM	HARDNESS* Rockwell (Brinell)	HARDENING/ MAGNETISM	DESCRIPTION	APPLICATIONS
301	Austenitic	18/8 (X10CrNi18-8)	41C (382)	Cold only / Non-magnetic	Corrosion resistance is similar to 304. Lower heat resistance & strength than higher 3-series grades, but cheaper.	Toaster springs, screen frames, car wheel covers, often roll formed. Lower quality kitchen pots and silverware.
303	Austenitic	18/9 (X8CrNi18-9)	B96 (228)	Cold only / Non-magnetic	Addition of sulphur makes 303 the best machinable austenitic, But it makes it less corrosion resistant than 301, 304 and 316.	Any component that is heavily machined and where lower corrosion reistance is ok, e.g. nuts and bolts, gears.
304	Austenitic	18/10 or 18/0 (X5CrNi18-10)	B92 (200)	Cold only / Non-magnetic	Accounts for more than half of the stainless steel produced. The larger amount of nickel than 301 make it more suitable for complex forms.	Kitchen sinks & appliances, architectual paneling, truck trailers, food processing equipment - beer brewing, milk processing, wine making. Ok for utensils but too soft for good kinfe blades.
316	Austenitic	12/2 (X5CrNiMo17-12-2)	B95 (217)	Cold only / Non-magnetic	Most expensive austentic and 2nd most used after 304. The addition of molybdenum gives it better corrosion resistance.	Food preparation pharmaceuticals marine applications, architectual, medical implants, chemical containers, Good for utensils other than knife blades.
430	Ferritic	X8Cr17	B89 (183)	Can not be hardened / Magnetic	Most widely used ferritic. Its ability to resist nitric acid attack permits its use in specific chemical applications. Lower corrosion Resistance than 304 and 316	Car trims, fridge doors, cold headed fasteners, fridge covers, inside of dish washers. Also used for low quality cutlery.
409	Ferritic	X8CrTi12	B95 (207)	Can not be hardened / Magnetic	Cheapest stainless steel. Suitable for high temperatures but not very corrosion resistant (low content of chromium).	Mufflers and low quanlity kitchen utensils.
410	Marten-sitic	X12Cr13	C38-C41 (285 to 321)	Thermal hardening / Magnetic	Most widely used martensitic steel due to low-cost. Harder than the austensitic steels, but they corrode easier. Softer than 416 or 420, but more machinable.	Bots, nuts, screws, busings, car parts, industrial products.
420	Marten-sitic	X20Cr13	C26-C50 (262-444)	Thermal hardening / Magnetic	420 stainless steel is a high carbon version of 410, and therefore harder.	Better quality cutlery and knife blades, Medium quality tools, surgical instruments.
420	Marten-sitic	X20Cr13	C26-C50 (262-444)	Thermal hardening / Magnetic	420 stainless steel is a high carbon version of 410, and therefore harder.	Better quality cutlery and knife blades, Medium quality tools, surgical instruments.
440	Marten-sitic	X90CrMoV18 or X105CrMo17	C56-C57 (555-647)	Thermal hardening / Magnetic	High hardness combined with good corrosion resistance make it a highest priiced stainless steel	Highest quality for knife blades, tools, chisels, surgical instruments.
2205	Duplex	X2CrNiMoN 22-5-3	C31 (293)	Cold only / Magnetic	Most used duplex. 50% ferrite and 50% austenitic results in high strength, hardness, and resistance to erosion, fatigue and corrosion.	Marine, chemical and petrochemical industries. Oil and gas exploration.

*approximate highest harness. Hardness varies by producer and exact tratment during production.

CARBON / ALLOY STEEL SEAMLESS PIPE & DIMENSION

SHRIRAM METAL

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	inch	mm	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	kg/m	mm	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	2.21	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	23.4							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	11.07	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	15.27	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									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			6.36	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	33.2	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	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		
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	12.70	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	153.0					12.7	218.7												
750	30	762.0	7.92	147.5	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.	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												

A106 - GR B

APL - 5L - GR B

A 333 - GR 6

A 333 - P 5

CARBON STEEL, ALLOY STEEL PIPE & TUBE SPECIFICATION

SHRIRAM METAL

CHEMICAL									MECHANICAL PROPERTIES			SPECIFIC REQUIREMENT
									TENSILE STRENGTH	YIELD STRESS	ELON-GATION	
SPECIFICATION	WT	C%	Mn%	P % MAX	S % MAX	Si %	Cr %	Mo %	Mpa	Mpa	50mm MIN Longitudinal	
ASTM A53/A	AW	0.25MAX	0.95MAX	0.050	0.045	-	-	-	30MIN	205MIN	36	
ASTM A53/B	AW	0.30MAX	1.20MAX	0.050	0.045	-	-	-	415MIN	240MIN	29/5	Cr Mo Cu Ni V a
ASTM /A 106/A	AW	0.25MAX	027-0.93	0.035	0.025	0.10MIN	0.40MAX	0.15MAX	330MIN	205MIN	35/2	40 15 40 40 08
ASTM A106/B	AW	0.35MAX	0.29-1.06	0.035	0.035	0.10MIN	0.40MAX	0.15MAX	415MIN	240MIN	30/22	Five elements not to exceed 1%
ASTM A 106/C	AW	0.35MAX	0.29-1.06	0.035	0.035	0.10MIN	0.40MAX	0.15MAX	485MIN	275MIN	30/22	
ASTM A179	MW	0.06-018	0.27-0.63	0.035	0.035	-	-	-	325MIN	180MIN	35.0	Hardness 72 HRB Max
ASTM A214	MW	0.18MAX	0.27-0.63	0.035	0.035	-	-	-	325MIN	180MIN	35.0	Hardness 72 HRB Max
ASTM A192	MW	0.06-0.18	0.27-0.63	0.035	0.035	0.25MAX	-	-	325MIN	180MIN	35.0	Hardness 77 HRB Max
ASTM A2019/T1	MW	0.10-0.20	0.30-0.80	0.025	0.025	0.10-0.50	-	0.44-0.65	380MIN	205MIN	30/22	Hardness 80 HRB Max
ASTM A209/Tia	MW	0.15-0.25	0.30-0.80	0.025	0.025	0.10-0.50	-	0.44-0.65	365MIN	195MIN	30/22	Hardness 81 HRB Max
ASTM A209/T1b	MW	0.14MAX	0.30-0.80	0.025	0.025	0.10MIN	-	0.44-0.65	415MIN	220MIN	30/22	Hardness 77 HRB Max
ASTM A210/A-1	MW	0.27MAX	0.93MAX	0.035	0035	0.10MIN	-	-	415MIN	255MIN	30/22	Hardness 79 HRB Max
ASTM A210/C	MW	0.35MAX	0.23-1.06	0.035	0.035	0.10MIN	-	-	485MIN	275MIN	30/22	Hardness 89 HRB Max
ASTM A213/T2	MW	0.10/0.20	0.30-0.61	0.025	0.025	0.10-0.30	0.50-0.81	0.44-0.65	415MIN	205MIN	30/22	Hardness 85 HRB Max
ASTM A213/T5	MW	0.10/0.20	0.30-0.61	0.025	0.025	0.10-0.30	0.50-0.81	0.44-0.65	415MIN	205MIN	30/22	Hardness 85 HRB Max
ASTM A213/T11	MW	0.15MAX	0.30-0.60	0.025	0.025	0.50MAX	1.00-1.50	0.44-0.65	415MIN	205MIN	30/22	Hardness 85 HRB Max
ASTM A213/T12	0.05	0.15MAX	0.30-0.61	0.025	0.025	0.50MAX	0.80-1.25	0.44-0.65	415MIN	220MIN	30/22	Hardness 85 HRB Max
ASTM A213/T22	0.05	0.15MAX	0.30-0.60	0.025	0.025	0.50MAX	1.90-2.60	0.87-1.13	415MIN	205MIN	30/22	Hardness 85 HRB Max
ASTM A333/3	AW	0.19MAX	0.31-0.64	0.025	0.025	0.18-0.37	Ni	3.18-3.82	380MIN	205MIN	35/25	
ASTM A333/6	AW	0.30MAX	0.29-1.06	0.025	0.025	0.10MIN	-	-	415MIN	240MIN	30/22	IMP ACT AS-50f
ASTM A334/3	AW	0.19MAX	0.31-0.64	0.025	0.025	0.18-0.37	Ni	3.18-3.82	380MIN	205MIN	35/28	FOR 40X10/18/1490 HRB MAX
ASTM A334/6	MW	0.30MAX	0.9-1.06	0.025	0.025	0.10MIN	-	-	415MIN	240MIN	30/22	50f 40X10/18/14
ASTM A335/P1	AW	0.10-0.20	0.30-0.80	0.025	0.025	0.10-0.50	-	0.40-0.65	380MIN	205MIN	30/22	
ASTM A335/P2	AW	0.10-0.20	0.30-0.61	0.025	0.025	0.10-0.30	0.50-0.81	0.40-0.65	380MIN	205MIN	30/22	
ASTM A335/P5	AW	0.15MAX	0.30-0.60	0.025	0.025	0.50-1.00	4.00-6.00	0.40-0.65	415MIN	205MIN	30/22	
ASTM A335/P11	0.05	0.15MAX	0.30-0.60	0.025	0.025	0.50-1.00	1.00-1.50	0.400-65	415MIN	205MIN	30/22	
ASTM A335/P12	0.05	0.15MAX	0.30-0.61	0.025	0.025	0.50MAX	0.80-1.25	0.40-0.65	415MIN	205MIN	50/22	
ASTM A335/P22	0.05	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/3059/245		0.15MAX	0.400.70	0.050	0.050	0.10-0.35	-	-	324-441	186MIN	21	
BS/3059/245		0.120.18	0.90-1.20	0.035	0.035	0.10-0.35	-	-	441-580	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	411-618	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	255MIN	25	
DIN/17175/15M03		0.12-0.20	0.50-0.80	0.040	0.040	0.10-0.35	-	0.250-0.35	441-540	284MIN	21	
DIN/17175/13CrMo44		0.10-0.18	0.40-0.60	0.040	0.040	0.15-0.35	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	0.90-1.10	441-570	249MIN	22	
ASTM A199/T5	MW	0.15MAX	0.30-0.60	0.025	0.025	0.50MAX	4.00-6.00	0.45-0.65	415MAX	170MIN	30/22	
ASTM A199/T1	MW	0.05-0.15	0.30-0.60	0.025	0.025	0.50-1.00	1.00-1.50	0.44-0.65	415MIN	170MIN	30/22	
ASTM A199/T22	MW	0.15-0.15	0.30-0.60	0.025	0.025	0.50MAX	1.90-2.60	0.87-1.13	415MIN	170MIN	30/22	Hardness 89 HRB MAX
ASTM A199/T4	MW	0.15MAX	0.30-0.60	0.025	0.025	0.50-1.00	2.15-2.85	0.44-0.65	415MIN	170MIN	30/22	Hardness 89 HRB MAX
ASTM A199/T7	MW	0.15MAX	0.30-0.60	0.025	0.025	0.50-1.00	6.00-8.00	0.45-0.65	415MIN	170MIN	30/22	Hardness 89 HRB MAX
ASTM A199/T5	MW	0.15MAX	0.30-0.60	0.025	0.025	0.50MAX	4.00-6.00	0.45-0.65	415MIN	170MIN	30/22	Hardness 89 HRB MAX
ASTM A199/T11	MW	0.05-0.15	0.30-0.60	0.025	0.025	0.50-1.00	1.00-1.50	0.44-0.65	415MIN	170MIN	30/22	Hardness 89 HRB MAX
ASTM A199/T22	MW	0.05-0.15	0.30-0.60	0.025	0.025	0.50MAX	1.90-2.60	0.87-1.13	415MIN	170MIN	30/22	Hardness 89 HRB MAX
ASTM A199/T4	MW	0.05-0.15	0.30-0.60	0.025	0.025	0.50-1.00	2.15-2.852	0.44-0.85	415MIN	170MIN	30/22	Hardness 89 HRB MAX
ASTM A199/T7	MW	0.15MAX	0.30-0.60	0.025	0.025	0.50-1.00	6.00-8.00	0.45-0.65	415MIN	170MIN	30/22	Hardness 89 HRB MAX
ASTM A199/T9	MW	0.15MAX	0.30-0.60	0.025	0.025	0.25-1.00	8.00-10.00	0.90-1.10	415MIN	170MIN	30/22	Hardness 89 HRB MAX
ASTM A335/P9	MW	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	Hardness 89 HRB MAX
ASTM A178A	MW	0.06-0.18	0.30-0.60	0.035	0.035	-	-	-	325MIN	180MIN	35	Hardness 89 HRB MAX
ASTM A178C	MW	0.35MAX	0.27-0.63	0.035	0.035	-	-	-	415MIN	170MIN	30	Hardness 89 HRB MAX
ASTM A178B	MW	0.27MAX	0.80MAX	0.030	0.015	0.10MIN	-	-	485MIN	275MIN	30	Hardness 89 HRB MAX

CARBON STEEL, ALLOY STEEL, SEAMLESS PIPES & TUBES

SHRIRAM METAL

Size
Output Diameter : 6.00mm to 406mm
Wall Thickness : 0.5mm to 22mm
Length : Random Length 4-7 MTR
Fixed Length max 28MTR

Conditio : Heat Treated, Hard Drawn, Stress Relived
Standards : ASTM A-53, A-106, A-179, A-192, A-210, A-213, A-333, ASTM A-334, A-335, BS-3059, BS-6323, DIN-17175, DIN-2391

STANDARD	SIZE RANGE OC	OD TOLERANCE	W.T. TOLERANCE	FIXED LENGTH TOLERANCE
ASTM A 106 Pipes for high temprature service	1/8"-1-1/2"NB incl. 1-12"-4"NB incl. 4"-8" NB incl.	+/-0.40mm +/-0.80mm +1.60/-0.80mm	-12.5% (Weight tolerance +10%, -3.5%)	+/-5%
ASTM A 179 Seamless low carbon H.E % Condenser Pipes ASTM A 19250 8-6335 mmincl. Seamless carbon Steel Boiler & H.E Tubes	Upto 25.4 mm 25.40-38.10mm incl. 38.10-50.8 mm incl. +/-0.25mm 63.5-76.0 mm incl.	+/-0.10mm +/-0.15mm +/-0.20mm +22/-0% +/-0.30mm	+20/-0% +20/-0% +22/-0% +5/-0mm +22/-0%	+3/-0mm +3/-0mm +3/-0mm +5/-0mm
BS 3059 Steel Boiler & Super Heater Tubes DIN 2391 Seamless & Precsion Steel Tubes 39.98-50.01mm	 Part I CF Part II S1 Part II S2 Upto 29.97mm 29.97-40.64mm +/-0.20mm 50.10-60.00mm	+/-0.5%min ≥+/-0.10mm +/-.75%min ≥+/-0.30mm +/0.76mm +/-0.152mm +/-10% +/-0.249mm	 +/-7.50% +/-10% +/-10% +/-10% +/-10%	 +3.0/-mm Up to 6Mtr.
BS 6323 (Part4) Seamless Tubes for automobile, Mechincal & general engg. purpose	Upto 30mm 31-50mm 51-70mm 71-90mm 91-1100mm 111-130mm 131-160mm	+/-0.10mm +/-0.15mm +/-0.25mm +/-0.25mm +/-0.30mm +/-0.35mm +/0.45mm	 +/-10% (min+/-0.10mm)	+2/-0mm (upto 500mm) +3/-0mm (500-2000mm) +5/-0mm (2001-5000mm) +10/-0mm (5001-10000mm)

STANDARD	PRODUCT	TENSILE	FLATTENNING	FLARING	HARDNESS	HYDROSTATIC	NON DESTUTIVE ELECTRIC TEST
ASTM A106							On request
ASTM A179							On request
ASTM A192							On request
ASTM A210							On request
ASTM A333							On request
ASTM A334							On request
BS 3059							On request
DIN 2391							On request
BS 6323						On request	On request

MATERIAL COMPARISON DIN / EN / ASTM

SHRIRAM METAL

FINISHED PARTS

Pipes / Tubes			
Material Number	**DIN**	**EN**	**ASTM**
Non-alloy			
1.0254	ST 37.0	P235TR1	A 53 Grade A
1.0570	St 52-3	S355J2H (1.0576)	
1.0305	St 35.8/I	P235GH TC1 (1.0345)	A 106 Grade A
1.0305	ST 35.8/III	P235GH TC2 (1.0345)	
1.0405	ST 45.8/I	P265GH TC1 (1.0425)	A 106 Grade B
1.0405	St. 45.8/III	P265GH TC2 (1.0425)	
Alloyed heat-resistant			
1.5415	15 Mo3	16Mo3	
1.7335	13 CrMo 4 4	13CrMo4-5	A 335 Grade P11, P12
1.7380	10 CrMo 9 10	10CrMo9-10	A 335 Grade P22
1.7362	12 CrMo 19 5	X11CrMo5	A 335 Grade P5
			A 335 Grade Pg
1.4903		X10CrMoVNb9-1	A 335 Grade Pg1
Low temperature			
1.5637	10 Ni 14	X12Ni14	A 333 Grade 3
1.0356	TTSt 35 N	P215NL (1.0451)	A 333 Grade 1
1.0356	TTSt 35 V	P255Ql (1.0452)	
		P265NL (1.0453)	A 333 Grade 6
Fine grain steels			
1.0486	StE 285		API 5L Grade X42
1.0562	StE 355	P355N	API 5L Grade X52
1.8902	StE 420	P420N	API 5L Grade X60
1.8905	StE 460	P460N	APL 5L Grade X70
High yield steels			
1.0457	StE 240.7	L245NB/L245NE	APL 5LGrade B
1.0484	StE 290.7	L290NB/L290NE	API 5L Grade X42
1.0582	StE 360.7	L360NB/L360NE	API 5L Grade X52
1.8972	StE 415.7	L415NB/L415NE	API Grade X60
Stainless steel			
1.4307		X2CrNi18-9	A 312 Grade TP304L
1.4306	X 2 CrNi 19 11	X2CrNi19-11	A 312 Grade TP304L
1.4301	X 5 CrNi 18 10	X5CrNi18-10	A 312 Grade TP304
1.4541	X 6 CrNiTi 18 10	X6CrNiTi18-10	A 312 Grade TP321
1.4550	X 6 CrNiNb 18-10	X6CrNiNb18-10	A 312 Grade TP347
1.4404	X 2 CrNiMo17 13 2	X2CrNiMo17-12-2	A 312 Grade TP316L
1.4401	X 5 CrNiMo 17 12 2	X5CrNiMo17-12-2	A 312 Grade TP316
1.4571	X 6 CrNiMoTi 17 12 2	X6CrNiMoTi17-12-2	A 312 Grade TP316Ti
1.4429	X 2 CrNiMoN 17 13 3	X2CrNiMoN17-13-3	A 312 Grade TP316LN
1.4436	X 5 CrNiMo 17 13 3	X3CrNiMo17-13-3	A 312 Grade TP316
1.4435	X 2 CrNiMo 18 14 3	X2CrNiMo 18-14-3	A 312 Grade TP316L
1.4439	X 1 NiCrMoCuN 25 20 5	X1NiCrMoCu25-20-5	UNS N 08904 (904L)
1.4547		X1CrNiMoCuN20-18-7	UNS S 31254
1.4529	X 1 NiCrMoCuN 25 20 6	XiNiCrMoCuN25-20-7	UNS N 08926
1.4462	X 2 CrNiMoN 22 5 3	X2CrNiMoN22-5-3	UNS S 31803 (Duplex)
1.4410		X2CrNiMoN25-7-4	UNS S 32750 (Superduplex)

CHEMICAL COMPOSITION (%) OF S.S. PIPES

SHRIRAM METAL

Grade AISI	C	Mo	P	S	Si	Cr	Ni	Mo	Other
201	≤ 0.15	5.50-7.50	≤ 0.060	≤ 0.030	≤ 1.00	6.00-18.00	3.50-5.50	-	N ≤ 0.25
202	≤ 0.15	7.50-10.00	≤ 0.060	≤ 0.030	≤ 1.00	17.00-19.00	4.00-6.00	-	N ≤ 0.25
301	≤ 0.15	≤ 2.00	≤ 0.045	≤ 0.030	≤ 1.00	16.00-18.00	6.00-8.00	-	-
302	≤ 0.15	≤ 2.00	≤ 0.045	≤ 0.030	≤ 1.00	17.00-19.00	8.00-10.00	-	-
303	≤ 0.15	≤ 2.00	≤ 0.20	≤ 0.15	≤ 1.00	17.00-19.00	8.00-10.00	-	-
303 Se	≤ 0.15	≤ 2.00	≤ 0.20	≤ 0.060	≤ 1.00	17.00-19.00	8.00-10.00	-	Se ≤ 0.15
304	≤ 0.08	≤ 2.00	≤ 0.040	≤ 0.030	≤ 0.75	18.00-20.00	8.00-11.00	-	-
304 L	≤ 0.035	≤ 2.00	≤ 0.040	≤ 0.030	≤ 0.75	18.00-20.00	8.00-13.00	-	-
304 H	0.04-0.10	≤ 2.00	≤ 0.040	≤ 0.030	≤ 0.75	18.00-20.00	8.00-11.00	-	-
305	≤ 0.12	≤ 2.00	≤ 0.045	≤ 0.030	≤ 1.00	17.00-19.00	10.50-13.00	-	-
308	≤ 0.08	≤ 2.00	≤ 0.045	≤ 0.030	≤ 1.00	19.00-21.00	10.00-12.00	-	-
309	≤ 0.20	≤ 2.00	≤ 0.045	≤ 0.030	≤ 1.00	22.00-24.00	12.00-15.00	-	-
309 S	≤ 0.08	≤ 2.00	≤ 0.045	≤ 0.030	≤ 1.00	22.00-24.00	12.00-15.00	-	-
310	≤ 0.025	≤ 2.00	≤ 0.045	≤ 0.030	≤ 1.50	24.00-26.00	19.00-22.00	-	-
310 S	≤ 0.08	≤ 2.00	≤ 0.040	≤ 0.030	≤ 1.50	24.00-26.00	19.00-22.00	-	-
314	≤ 0.25	≤ 2.00	≤ 0.045	≤ 0.030	1.50-3.00	23.00-26.00	19.00-22.00	-	-
316	≤ 0.08	≤ 2.00	≤ 0.040	≤ 0.030	≤ 0.75	16.00-18.00	10.00-14.00	2.00-3.00	-
316L	≤ 0.035	≤ 2.00	≤ 0.040	≤ 0.030	≤ 0.75	16.00-18.00	10.00-14.00	2.00-3.00	-
316 H	0.04-0.10	≤ 2.00	≤ 0.040	≤ 0.030	≤ 0.75	16.00-18.00	11.00-14.00	2.00-2.50	-
316 Ti	≤ 0.08	≤ 2.00	≤ 0.045	≤ 0.030	≤ 1.00	16.00-18.00	10.00-14.00	2.00-2.50	Ti5*C. Min
317	≤ 0.08	≤ 2.00	≤ 0.040	≤ 0.030	≤ 0.75	18.00-20.00	11.00-14.00	3.00-4.00	-
317 L	≤ 0.035	≤ 2.00	≤ 0.045	≤ 0.030	≤ 0.75	18.00-20.00	11.00-15.00	3.00-40..	-
321	≤ 0.08	≤ 2.00	≤ 0.040	≤ 0.030	≤ 0.75	17.00-20.00	9.00-13.00	-	Ti≤ 5xC%
321 H	0.04-0.10	≤ 2.00	≤ 0.040	≤ 0.030	≤ 0.75	17.00-20.00	9.00-13.00	-	Ti≤ 5xC%
347	≤ 0.08	≤ 2.00	≤ 0.040	≤ 0.030	≤ 1.00	17.00-20.00	9.00-13.00	-	Nb+Ta≤ 10xC%
347 H	0.04-0.10	≤ 2.00	≤ 0.040	≤ 0.030	≤ 1.00	17.00-20.00	9.00-13.00	-	Nb+Ta≤ 10xC%
410	≤ 0.15	≤ 2.00	≤ 0.045	≤ 0.030	≤ 1.00	11.50-1350	-	-	-
420	≤ 0.15	≤ 2.00	≤ 0.045	≤ 0.030	≤ 1.00	12.00-14.00	-	-	-
402 F	≤ 0.15	≤ 1.25	≤ 0.060	≤ 0.15	≤ 1.00	12.00-14.00	-	≤ 0.60*	-
429	≤ 0.12	≤ 1.00	≤ 0.040	≤ 0.030	≤ 1.00	14.00-16.00	-	-	-
430	≤ 0.12	≤ 1.00	≤ 0.040	≤ 0.030	≤ 1.00	16.00-18.00	-	-	-
430 F	≤ 0.12	≤ 1.25	≤ 0.060	≤ 0.15	≤ 1.00	16.00-18.00	-	≤ 0.60*	-
430 Fse	≤ 0.12	≤ 1.25	≤ 0.060	≤ 0.060	≤ 1.00	16.00-18.00	-	-	Se ≤ 0.15
431	≤ 0.20	≤ 1.00	≤ 0.040	≤ 0.030	≤ 1.00	15.00-17.00	1.25-2.50	-	-

CHEMICAL COMPOSITION OF NICKEL ALLOYS IN%

SHRIRAM METAL

Grade Names	Ni Min	Co Max	Cr	Mo	W	Fe Max	Si Max	Mn Max	C Max	Cu Max	Al Max	Ti Max	S Max	P Max
Nickel 200	99.0	-	-	-	-	0.4	0.35	0.35	0.01	0.25	-	-	0.01	-
Niclel 201	99.0	-	-	-	-	0.4	0.35	0.35	0.02	0.25	-	-	0.01	-
Monel 400	63.0	-	-	-	-	2.5	0.5	2.0	0.30	28-34	-	-	0.024	-
Monel K500	63.0	-	-	-	-	2.0	0.5	1.5	0.25	27.33	2.3-3.2	0.4-0.9	0.01	-
Inconel 600	72.0	-	14-17	-	-	6-10	0.5	1.0	0.15	0.5	-	-	0.015	-
Inconel 601	58.63	-	21.25	-	-	Rest	0.5	1.0	0.10	1.0	1.0-1.7	-	0.015	-
Inconel 625	58.0	1.0	20-23	8-10	-	5.0	0.5	0.5	0.10	-	0.4	0.4	0.015	0.015
Incolloy 800	30-35	-	19-23.5	-	-	Rest	1.0	1.5	0.10	0.75	0.15-0.6	0.15-0.6	0.015	-
Incolloy 800H	30-35	-	19-23.5	-	-	Rest	1.0	1.5	0.05-0.1	0.75	0.15-0.6	0.15-0.6	0.015	-
Incolloy 825	38-46	-	19-23.5	2.5-3.5	-	Rest	0.5	1.0	0.05	1.5-3	0.2	0.5-1.2	0.03	-
Hastalloy B-2	Rest	1.0	1.0	26-30	-	2.0	0.10	1.0	0.02	-	-	-	0.03	0.04
Hastalloy C276	Rest	2.5	14-16.5	15-17	3-4.5	4-7	0.08	1.0	0.01	-	-	-	0.03	0.04
Hastolloy C-4	Rest	2.0	14-18	14-17	-	3.0	0.08	1.0	0.015	-	-	0.7	0.03	0.04
Hastolloy G3	Rest	5.0	21-23.5	6-8	1.5	18-21	1.0	1.0	0.015	1.5-2.5	-	-	0.03	-
Incolloy DS	34.5-41	17-19	-	-	-	Rest	1.9-2.6	0.8-1.5	0.1	0.5	-	0.2	0.03	-
Alloy 20	32-38	-	19-21	2.3	-	Rest	1.0	2.0	0.07	3.4	-	-	0.035	0.045

[1]Nb/Ta 3.15-4.15 [2]V 0.36 [3]Nb/Ta 0.5 max., Mb6.8, Ph 0.04 [4]Cb & Ta8xc min. 1.0max.

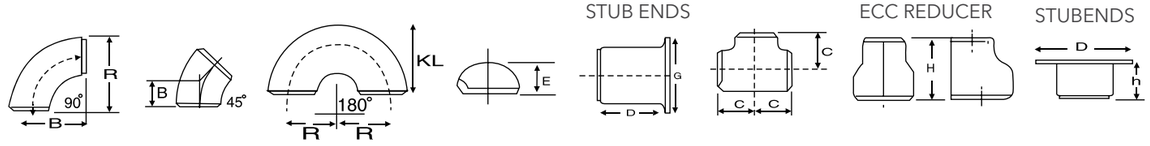
NICKEL ALLOY DENSITY (KG/DM3.)			
NICKEL 200	8.89 Kg/dm^3	ALLOY 800 H	7.95 Kg./dm^3
NICKEL 201	8.89 Kg/dm^3	ALLOY 825	7.95 Kg./dm^3
ALLOY 400	8.83 Kg/dm^3	ALLOY DS	7.92 Kg./dm^3
ALLOY K500	8.46 Kg/dm^3	ALLOY B - 2	9.22 Kg./dm^3
ALLOY 600	8.42 Kg/dm^3	ALLOY C - 276	8.88 Kg./dm^3
ALLOY 601	8.06 Kg/dm^3	ALLOY C - 4	8.64 Kg./dm^3
ALLOY 625	8.44 Kg/dm^3	ALLOY G3	8.30 Kg./dm^3
ALLOY 800	7.95 Kg/dm^3	ALLOY 20	8.06 Kg./dm^3

BUTT WELD FITTINGS TO ANSI B 16.9

SHRIRAM METAL

STAINLESS STEEL ASTM A 403 / CARBON STEEL ASTM A 23

ELBOWS RETURN BENDS CAPS LAP JOINT STUB ENDS EQUAL 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			
½	21.34	1.65	2.11	2.77	3.73	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
¾	26.67	1.65	2.11	2.87	3.91	19.05	28.57	38.10	57.15	19.05	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
1¼	42.16	1.65	2.77	3.56	4.85	31.75	47.6	63.5	92.25	31.75	25.0	47.6	38.1	63.5	50.8	101.6	50.8	72	12
1½	48.26	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	60.32	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
2½	73.02	2.11	3.05	5.16	7.01	63.5	95.25	127.0	190.5	63.5	44.0	76.2	38.1	104.8	63.5	152.4	88.9	118	16
3	88.9	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
3½	101.6	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	114.3	2.11	3.05	6.02	8.56	101.6	152.4	203.2	304.8	101.6	63.5	104.8	63.5	157.2	76.2	152.4	101.6	168	20
5	141.3	2.77	3.40	6.55	9.52	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	168.27	2.77	3.40	7.11	10.97	152.4	228.6	304.8	457.2	152.4	95.3	142.7	88.9	215.9	88.9	203.2	139.7	215	25
8	219.07	2.77	3.76	8.18	12.7	203.2	304.8	406.4	609.6	203.2	127.0	177.5	101.6	270.0	101.6	203.2	152.4	270	30
10	273.05	3.40	4.19	9.27	12.7	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	323.85	3.96	4.57	9.52	12.7	304.8	457.2	609.6	914.4	304.8	190.5	254.0	152.4	381.0	152.4	254.0	203.2	400	40
14	355.60	3.96	4.76	9.52	12.7	355.6	533.4	711.2	1066	355.6	222.2	280.0	165.1	412.8	152.4	305.0	330.2	-	-
16	406.4	4.19	4.76	9.52	12.7	406.4	609.6	812.8	1219	406.4	254.0	304.8	177.8	470.0	152.4	305.0	355.6	-	-
18	457.2	4.19	4.76	9.52	12.7	457.2	685.8	914.4	1372	457.2	285.7	343.0	203.2	533.4	152.4	305.0	381.0	-	-
20	508.0	4.76	5.54	9.52	12.7	508.0	762.0	1016	1524	508.0	317.6	381.0	228.6	584.2	152.4	305.0	508.0	-	-
24	609.6	5.54	6.35	9.5	12.7	609.6	914.4	1219	1829	-	381	431.8	266.7	698.5	152.4	305.0	508.0	-	-

STANDARDS: All dimesnsions are in mm and confirm to ANSI B 16.9 and MSS, SP-43

RADIUS: Radius of short Radious Elbows in 1 times nominal pipe diameter, Radius of Long Radius Elbows in 1.1/2 time nominal pipe diaeter.

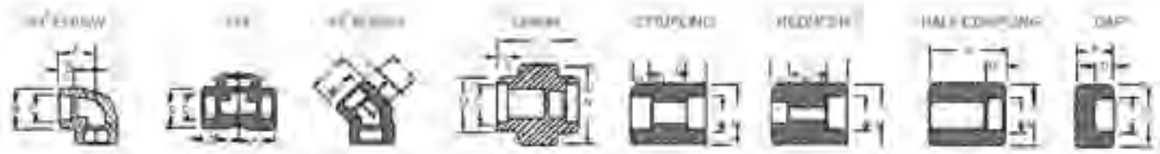
MATERIAL OF CONSTRUCTION: S.S. 304/304L/316L/321 Carbon Steel and Alloy Steel

FORGED SCREWED FITTING TO ANSI-B-16.11 3000/6000 LBS THREAD TO ASA B 2.1

SHRIRAM METAL

NOM BORE	PIPE O.D.	3000 LBS.						COMMON FACTORS						6000 LBS.					
		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	45	-	6	-	25	25	19	32	22	-
1/4"	13.7	25	25	19	35	19	25	16	11	43	3	6	32	29	22	22	35	25	27
3/8"	17.2	29	33	22	38	22	25	17.5	13	48	4	8	38	22	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
11/4"	42.2	51	62	35	67	57	44	44.5	21	70	7	14	72	60	75	43	67	64	46
11/2"	48.3	60	75	43	79	64	44	51	21	79	8	16	80	64	84	44	79	76	48
2"	603	64	84	45	86	76	48	63.5	22	88	9	17	97	83	102	52	86	92	51
21/2"	73.02	83	102	52	92	92	60	76	27	118	10	21	122	95	121	64	92	108	64
2"	603	64	84	45	86	76	48	63.5	22	88	9	17	94	83	102	52	86	92	51
21.2"	73.02	83	102	52	92	92	60	76	27	118	10	21	122	95	121	64	92	108	64
3"	80.0	95	121	64	108	108	65	89	29	121	10	65	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

SOCKET WELD FITTING TO SNDI B-16.11



NOM BORE	PIPE O.D.	3000 LBS.									COMMON FACTORS				6000 LBS.				
		A max.	B max.	K	J	L	M	N	P	Q	C min.	D min.	O min.	O max.	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
1"	33.4	37	46	40	25	64	45.2	60	27	13	33.8	13	9	17	42	50	50	40	94
11/4"	42.2	42	56	40	29	70	55	70	30	13	42.6	13	9	17	47	59	58	41	100
11/2"	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	54	83	55	-
21/2"	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"	114.5	88	138	58	-	150	136.9	-	48	19	115.5	19	14	24	-	152	-	64	-

Dimensions and others specifications as per customers requirement are available on request

WN FLANGE

BLIND FLANGE

SLIP ON FLANGE

SOCKET WELD FLANGE

LAP JOINT FLANGE

THREADED FLANGE

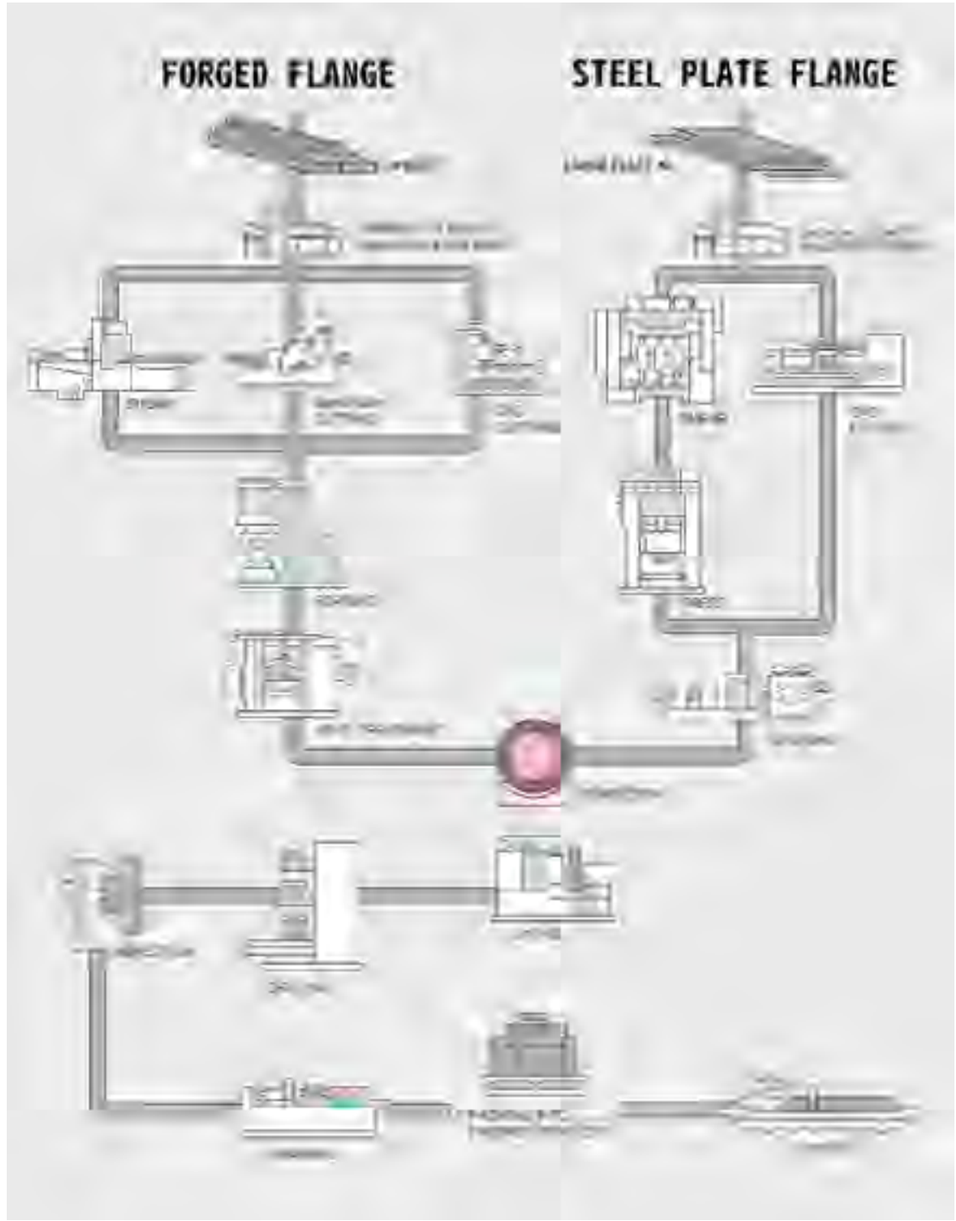
ORIFICE FLANGE

SPECTACLE BLIND FLANGE

WHAT IS A FLANGE?

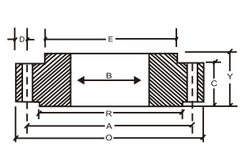
A flange connects piping and components in a piping system by use of bolted connections and gaskets. Most commonly used flanges are weld neck flange, slip on flange, blind flange, socket weld flange, threaded flange and lap joint flange. This type of connection in a flange allows for ease of disassembly and separation for repair and regular maintenance. Most common specification for carbon steel and stainless steel flange is ANSI B16.5 / ASME B16.5.

Metal flanges are commonly used for industrial, commercial, and institutional application. Steel flanges are available in variety of styles and pressure classes. In addition to specifying pressure class, certain flanges such as weld neck flange & socket weld flange also require specifying the pipe schedule. This ensures the pipe bore will match the bore of the weld neck or socket weld flange.

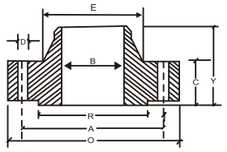


FORGED FLANGES TO ANSI B 16.5*
(ASA 150/300 LBS)

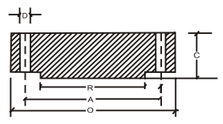
SHRIRAM METAL



SLIP-ON FLANGE



WELDING NECK FLANGE



BLIND FLANGE

(Dimensions in MM)

150 LBS	Common Sizes to 150 lbs flanges							WELDING-NECK 150 lbs		SLIP-ON 150 lbs		LAP-JOINT 150 lbs			Thread Length T	s/w Depth P
Nominal Bore	Diam. D	Thick E	Diam. F	Diam. B	DRILLING Nbre	DRILLING Hole Diam.	DRILLING PDC C	d1	(1) Height H	(1) Height H	Diam. A	(1) Height H	Diam. A	Redius R		
1/2	89	11	34.9	30	4	16	60.3	21.3	47.6	16	22.4	16	22.9	3.1	15.7	9.7
3/4	98.5	12.7	42.9	38	4	16	69.9	26.7	52.4	16	27.7	16	28.2	3.1	15.7	11.2
1	108	14.3	50.8	49	4	16	79.4	33.4	55.6	17.5	34.5	17.5	35.1	3.1	17.5	12.7
11/4	117.5	15.9	63.5	59	4	16	88.9	42.2	57.2	20.5	43.2	20.5	43.7	4.7	20.6	14.2
11/2	127	17.5	73	65	4	16	98.4	48.3	61.5	22	49.5	22	50.0	6.3	21.5	15.7
2	152.5	19.0	92.1	78	4	19	120.6	60.3	63.5	25.5	62	25.5	62.5	7.9	25.4	17.5
21/2	178	22.2	104.8	90.5	4	19	139.7	73	70	28.5	74.7	28.5	75.4	7.9	28.4	19
3	190.5	23.8	127	108	4	19	152.4	88.9	70	30	90.7	30	91.5	9.5	30.3	20.6
31/2	216	23.8	139.7	122	8	19	177.8	101.6	71.5	32	103.4	32	104.2	9.5	-	-
4	228.5	23.8	157.2	135	8	19	190.5	114.3	76.2	33.5	116.1	33.5	116.9	11.1	36.6	-
5	254	23.8	185.7	163.5	8	23	215.9	141.3	88.9	36.5	143.8	36.5	144.5	11.1	39.6	-
6	279.5	25.4	215.9	192	8	23	215.9	141.3	88.9	36.5	143.8	36.5	144.5	11.1	39.6	-
8	343	28.6	269.9	192	8	23	241.3	168.3	88.9	39.5	170.7	39.5	171.5	12.7	44.5	-
10	406.5	30.2	323.9	305	12	25	362	273.0	102	49	276.4	49	277.4	12.7	55.6	-
12	482.5	31.8	381	365	12	25	431.8	323.9	114.3	55.5	327.2	55.5	328.2	12.7	-	-
14	533.5	35	412.8	400	12	29	476.3	355.6	127	57	359.3	79.4	360.2	12.7	-	-
16	597	36.5	469.9	457	16	29	539.8	406.4	127	63.5	410.5	87.3	411.2	12.7	-	-
18	635	39.7	533.4	505	16	32	577.9	457.2	139.7	68.5	461.8	96.8	462.3	12.7	-	-
20	698.5	42.9	584.2	559	20	32	635	508	144.5	73	513.1	103.2	514.4	12.7	-	-
24	813	47.6	692.2	663.5	20	35	749.3	609.9	152.4	82.5	616	111.1	616	12.7	-	-

300 LBS

300 LBS	Common Sizes to 300 lbs flanges							WELDING-NECK 300 lbs		SLIP-ON 300 lbs		LAP-JOINT 300 lbs			Thread Length T	s/w Depth P
Nominal Bore	Diam. D	Thick E	Diam. F	Diam. B	DRILLING Nbre	DRILLING Hole Diam.	DRILLING PDC C	d1	(1) Height H	(1) Height H	Diam. A	(1) Height H	Diam. A	Redius R		
1/2	95	14.5	34.9	38	4	16	67	21.3	52.5	22	22.4	22.2	22.9	3.1	15.7	9.7
3/4	117.5	16	42.9	48	4	19	83	26.7	57	25.5	27.7	25.4	28.2	3.1	15.7	11.2
1	124	17.5	50.8	54	4	19	89	33.4	62	27	34.5	27	35.1	3.1	17.3	12.7
11/4	133.5	19	63.5	63	4	19	98.5	42.2	65	27	43.5	27	43.7	4.7	20.6	14.2
11/2	156	20.5	73	70	4	22.2	114.5	48.3	68.5	30	49.5	30.5	50.0	6.3	21.5	15.7
2	165	22	92.1	84	8	19	127	60.3	70	33.5	62	33.3	62.5	7.9	28.4	17.5
21/2	190.5	25.5	104.8	100	8	22.2	149	73	76	38	74.7	38.1	75.4	7.9	31.8	19.00
3	209.5	28.5	127	117	8	22.2	168.5	88.9	79.5	43	90.7	42.9	91.5	9.5	31.8	20.6
31/2	229	30	139.7	133	8	22.2	184	101.6	81	44.5	103.4	44.5	104.2	9.5	11.1	36.6
4	254	31.5	157.2	146	8	22.2	200	114.3	85.5	47.5	116.1	47.6	116.9	11.1	43	-
5	279	35	185.7	178	8	22.2	235	141.3	98.5	50.5	143.8	50.8	144.5	11.1	46	-
6	317.5	36.5	215.9	206	12	22.2	270	168.3	98.5	52.5	170.7	52.4	171.5	12.7	50.80	-
8	381	41.5	269.9	260	12	25.4	330	219.1	111	62	221.5	61.9	222.3	12.7	-	-
10	444.5	47.5	323.9	321	16	29	387.5	273	117.5	66.5	276.4	95.3	277.4	12.7	-	-
12	520.5	51	381	375	16	32	451	323.9	130	73	327.2	101.6	328.2	12.7	-	-

ASA 150 LBS / 300 LBS Height of raised face of 1/16" is included in E & H

* Bore of Weldneck Flanges as per party requirement in schedule 10, 40, 80 and 160s

FORGED FLANGES TO ANSI B 16.5*
(ASA 600/1500/2500 LBS)

SHRIRAM METAL

600 LBS	Common Sizes to 600 lbs flanges							WELDING-NECK 600 lbs		SLIP-ON 600 lbs		LAP-JOINT 600 lbs			Thread Length T	s/w Depth P
Nominal Bore	Diam. D	Thick E	Diam. F	Diam. B	DRILLING Nbre	DRILLING Hole Diam.	DRILLING PDC C	d1	(1) Height H	(1) Height H	Diam. A	(1) Height H	Diam. A	Redius R		
1/2	95.0	14.3	34.9	38	4	16	67.0	21.3	52.4	22.2	22.4	22.2	22.9	3.1	15.9	9.5
3/4	117.5	15.9	42.9	48	4	19	83.0	26.7	57.2	25.4	27.7	25.4	28.2	3.1	15.9	11.1
1	124.0	17.5	50.8	54	4	19	89	33.4	61.9	27.0	34.5	27.0	35.1	3.1	17.5	12.7
11/4	133.5	20.6	63.5	63	4	19	98.5	42.2	66.7	28.6	40.2	28.6	43.7	4.7	20.6	14.3
11/2	156.0	22.2	73.0	70	4	23	114.5	48.3	69.9	31.8	49.5	31.8	50.0	6.3	22.2	15.9
2	165.0	25.4	92.1	84	8	19	127.0	60.3	73.0	36.5	62.0	36.5	62.5	7.9	28.6	17.5
21/2	190.5	28.6	104.8	100	8	23	149.0	73.0	79.4	41.3	74.7	41.3	75.4	7.9	31.8	19.1
3	209.5	31.8	127.0	117	8	23	168.5	88.9	82.5	46.0	90.7	46.0	91.5	9.5	34.9	20.7
31/2	229.0	34.9	139.7	133	8	25	184.0	101.6	85.7	49.2	103.4	49.2	104.2	9.5	39.7	-
4	273.0	38.1	157.2	152	8	25	216.0	114.3	101.6	54.0	116.1	54	116.9	11.1	41.1	-
5	330.0	44.5	185.7	189	8	29	267.0	141.3	114.3	60.3	143.8	60.3	114.5	11.1	41.1	-
6	355.5	47.6	215.9	222	12	29	292.0	168.3	117.5	66.7	170.7	66.7	171.5	12.7	50.8	-
8	419.0	55.6	269.9	273	12	32	349.0	219.1	133.4	76.2	221.5	76.2	222.3	12.7	57.1	-
10	508.0	63.5	323.9	343	16	35	432.0	273.0	152.4	85.7	276.4	111.1	277.4	12.7	65.0	-
12	559.0	66.7	381.0	400	20	35	489.0	323.9	155.6	92.1	327.2	117.5	323.8	12.7	69.9	-

1500 LBS Nominal Bore	Common Sizes to 1500 lbs flanges							WELDING-NECK 1500 lbs		SLIP-ON 1500 lbs		LAP-JOINT 1500 lbs			Thread T	s/w Depth P
								d1	H	H	A	H	A	R		
1/2	121.0	22.2	34.9	38	4	22.2	82.5	21.3	60.3	31.8	22.4	31.8	22.9	3.1	22.2	9.5
3/4	130.0	25.4	42.9	44.5	4	22.2	89.0	26.7	69.9	34.9	24.7	34.9	28.2	3.1	25.4	11.1
1	149.0	28.6	50.8	25.5	4	25.4	101.5	33.4	73.0	41.3	34.5	41.3	35.1	3.1	28.6	12.7
11/4	159.0	28.6	63.5	63.5	4	25.4	111.0	42.2	73.0	41.3	43.2	41.3	43.7	4.7	30.2	14.3
11/2	178.0	31.8	73.0	70.0	4	29.0	124.0	48.3	82.5	44.5	49.5	44.5	50.0	6.3	31.8	15.7
2	216.0	38.1	92.1	105.0	8	25.4	165.0	60.3	101.6	57.2	62.0	57.2	62.5	7.9	38.1	17.5
3	266.5	47.6	127.0	133.5	8	32.0	203.0	88.9	117.5	73.0	90.7	73.0	91.5	9.5	50.8	-
4	311.0	54.0	157.2	162.0	8	35.0	241.5	114.3	123.8	90.5	116.1	90.5	116.9	11.1	57.1	-
5	374.5	73.0	185.7	197.0	8	42.0	292.0	141.3	155.6	104.8	143.8	104.8	144.5	11.1	63.4	-
6	394.0	82.5	215.9	229.0	12	38.0	317.5	168.3	171.5	119.1	170.7	119.1	171.5	12.7	69.9	-

2500 LBS Nominal Bore	Common Sizes to 2500 lbs flanges							WELDING-NECK 2500 lbs		SLIP-ON 2500 lbs		LAP-JOINT 2500 lbs			Thread T	s/w Depth P
								d1	H	H	A	H	A	R		
1/2	133.5	30.2	34.9	43.0	4	22.2	89.0	21.3	73.0	39.7	22.4	39.7	22.9	3.1	28.4	-
3/4	140.0	31.8	42.9	51.0	4	22.2	95.0	26.7	79.4	42.9	27.7	42.9	28.2	3.1	31.2	-
1	159.0	34.9	50.8	57.0	4	25.4	108.0	33.4	88.9	47.6	34.5	47.6	35.1	3.1	35.0	-
11/4	184.0	38.1	63.5	73.0	4	29.0	130.0	42.2	95.3	52.4	43.2	52.4	43.7	4.7	38.1	-
11/2	203.0	44.5	73.0	79.5	4	32.0	146.0	48.3	111.1	60.3	49.5	60.3	50.0	6.3	44.5	-
2	235.0	50.8	92.1	95.0	8	29.0	171.5	60.3	127.0	69.9	62.0	69.9	62.5	7.9	50.8	-
21/2	267.0	57.2	104.8	114.5	8	32.0	197.0	73.0	142.9	79.4	74.4	79.4	75.4	7.9	57.2	-
3	305.0	66.7	127.0	133.5	8	35.0	228.5	88.9	168.3	92.1	90.7	92.1	91.5	9.5	63.5	-
4	356.0	76.2	157.2	165.0	8	42.0	273.0	114.3	190.5	108.0	116.1	108.0	116.9	11.1	69.9	-
5	419.0	92.1	185.7	203.0	8	48.0	324.0	141.3	228.3	130.2	143.8	130.2	144.5	11.1	76.2	-
6	483.0	108.0	215.9	235.0	8	54.0	368.5	168.3	273.0	152.4	170.7	152.4	171.5	12.7	82.6	-

ASA 600-900-1500-2500 LBS. Height of raised face of 6.4 mm is NOT included in H & E

*Bore o Weldneck Flanges as per party requirement is schedule 10.40, 80 and 160s

WEIGHT OF COPPER TUBES IN VARIOUS SIZES & GAUGES-EXTERNAL DIAMETER

Wall Thickness

I.S.W.G.	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	I.S.W.G.
Millimeters	4.877	4.470	4.064	3.658	3.251	2.946	2.642	2.337	20.032	1.829	1.626	1.422	1.219	1.016	0.914	0.813	0.711	0.610	0.559	0.508	0.457	0.4166	0.3759	0.315	Millimeters
Inches	0.192	0.176	0.160	0.144	0.128	0.116	0.104	0.092	0.080	0.072	0.064	0.056	0.048	0.040	0.036	0.032	0.028	0.024	0.022	0.020	0.018	0.0164	0.0148	0.0124	Inches

Weight in Kg./Mtr.

External Diameter In.	mm																								External Diameter In.	mm
1/4	-	-	-	-	-	-	-	0.273	0.262	0.245	0.231	0.214	0.196	0.175	0.151	0.139	0.126	0.112	0.098	0.090	0.083	0.076	0.069	0.063	0.053	1/4	0.250
5/16	-	-	-	-	-	-	-	0.390	0.365	0.335	0.312	0.286	0.259	0.229	0.196	0.179	0.162	0.143	0.125	0.115	0.106	0.096	0.088	0.080	0.067	5/16	0.313
3/8	-	-	0.631	0.619	0.599	0.569	0.541	0.507	0.469	0.425	0.393	0.358	0.322	0.283	0.241	0.220	0.198	0.175	0.152	0.140	0.128	0.116	0.106	0.096	0.081	3/8	0.375
7/16	-	-	0.829	0.799	0.761	0.713	0.671	0.624	0.572	0.515	0.474	0.430	0.385	0.337	0.286	0.260	0.234	0.206	0.179	0.165	1.151	0.137	0.125	0.113	0.095	7/16	0.438
1/2	12.700	1065	0.027	0.979	0.93	0.857	0.802	0.742	0.676	0.605	0.555	0.501	0.448	0.391	0.331	0.301	0.270	0.238	0.206	0.189	0.173	0.157	0.144	0.130	1.109	1/2	0.500
9/16	14.288	1.281	1.225	1.160	1.085	1.001	0.993	0.859	0.779	0.895	0.636	0.574	0.511	0.445	0.376	0.341	0.306	0.269	0.233	0.214	0.196	0.177	0.162	0.147	0.123	9/16	0.563
5/8	15.875	1.497	1.423	1.340	1.247	1.145	1.063	0.976	0.883	0.785	0.717	0.646	0.574	0.499	0.421	0.382	0.342	0.301	0.260	0.239	0.219	0.796	0.161	0.163	0.138	5/8	0.625
11/16	17.462	1.713	1.621	1.520	1.409	1.289	1.194	1.093	0.986	0.875	0.798	0.718	0.637	0.553	0.466	0.422	0.378	0.332	0.287	0.264	0.242	0.216	0.199	0.180	0.152	11/16	0.688
3/4	19.050	1.929	1.819	1.700	1.571	1.354	1.324	1.210	1.090	0.965	0.879	0.790	1.700	0.607	0.511	0.463	0.414	0.365	0.314	0.288	0.264	0.238	0.218	0.197	1.160	3/4	0.750
13/16	20.638	2.145	2.017	1.880	1.733	1.578	1.455	1.327	1.193	1.055	0.960	0.863	0.763	03661	0.556	0.503	0.450	0.395	0.341	0.313	0.287	0.259	0.236	0.214	0.180	13/16	0.813
7/8	22.225	2.361	2.215	2.060	1.895	1.722	1.585	1.444	1.297	1.45	1.0141	0.935	0.826	0.715	0.601	0.544	0.486	0.427	0.368	0.338	0.310	0.279	0.255	0.230	0.194	7/8	0.875
15/16	23.812	2.577	2.413	2.240	2.057	1.866	1.716	1.5+61	1.401	1.235	1.122	1.007	0.889	0.769	0.646	0.584	0.522	0.459	0.395	0.363	0.332	0.299	0.273	0.247	0.208	15/16	0.938
1	25.400	2.793	2.611	2.420	2.219	2.010	1.846	1.678	1.504	1.325	1.203	1.079	0.952	0.823	0.691	0.625	0.558	0.490	0.422	0.387	0.355	0.320	0.292	0.264	0.222	1	1.000
1-1/8	28.575	3.255	3.004	2.780	2.543	2.298	2.107	1.912	1.711	1.505	1.365	1.228	1.078	0.931	0.781	0.706	0.630	0.553	0.476	0.437	1.400	0.361	1.329	0.297	0.250	1-1/8	1.125
1-1/4	31.750	3.657	3.403	3.140	2.868	2.586	2.368	2.146	1.918	1.685	1.527	1.367	1.204	1.039	0.871	0.787	0.702	0.616	0.530	0.486	0.445	0.401	0.366	0.331	0.278	1-1/4	1.250
1-3/8	34.925	4.090	3.799	3.500	3.192	2.874	2.630	2.380	2.125	1.865	1.689	1.511	1.330	1.147	0.961	0.868	0.774	0.679	0.584	0.536	0.490	0.442	0.403	0.364	0.306	1-3/8	1.375
1-1/2	38.100	4.522	3.245	3.860	3.516	3.162	2.891	2.614	2.332	2.045	1.851	1.309	1.456	1.255	1.051	0.949	0.846	0.742	0.638	0.585	0.536	0.483	0.440	0.398	1.334	1-1/2	1.500
1-5/8	41.275	4.954	4.592	4.220	3.840	3.450	3.152	2.848	2.539	2.225	2.018	1.799	1.582	1.363	1.42	1.030	0.918	0.805	0.683	0.635	0.581	0.525	0.477	0.431	0.362	1-5/8	1.625
1-3/4	44.450	5.386	4.988	4.580	4.164	3.738	3.413	3.082	2.746	2.405	2.175	1.943	1.708	1.471	1.232	1.111	0.990	0.868	0.746	0.684	0.626	0.564	0.515	0.465	0.391	1-3/4	1.750
1-7/8	47.625	5.818	5.384	4.941	4.488	4.026	3.674	3.316	2.953	2.586	2.337	2.087	1.834	1.579	1.322	1.192	1.062	0.931	0.800	0.734	0.671	0.605	0.552	0.498	0.418	1-7/8	1.875
2	50.800	6.250	5.780	5.301	4.812	4.314	3.935	3.550	3.161	2.766	2.499	2.231	1.960	1.687	1.412	1.273	1.134	0.994	0.854	0.784	0.717	0.546	0.589	0.532	0.446	2	2.00
2-1/8	53.975	6.682	6.176	5.661	5.136	4.602	4.196	3.784	3.368	2.946	2.661	2.375	2.086	1.795	1.502	1.354	1.206	1.054	0.908	0.833	0.762	0.687	0.626	0.565	0.474	2-1/8	2.125
2-1/4	57.150	7.114	6.572	6.021	5.460	4.890	4.457	4.018	3.575	3.126	2.823	2.519	2.212	1.903	1.592	1.435	1.278	1.120	0.962	0.883	0.807	0.727	0.663	0.599	0.502	2-1/4	2.250
2-3/8	60.325	7.547	6.968	6.381	5.784	5.179	4.718	4.252	3.782	3.306	2.986	2.663	2.338	2.011	1.682	1.516	1.350	1.183	1.019	0.932	0.852	0.768	0.700	0.635	0.530	2-3/8	2.375
2-1/2	63.500	7.979	7.364	6.741	6.108	5.467	4.979	4.487	3.989	3.486	3.148	2.807	2.464	2.119	1.772	1.597	1.422	1.246	1.070	0.982	0.898	0.809	1.737	0.666	0.558	2-1/2	2.500
		1.327	1.116	0.922	0.747	0.590	0.485	0.389	0.305	0.230	0.187	0.148	0.113	0.083	0.057	0.047	0.037	0.028	0.021	0.017	0.015	0.012	0.010	0.008	0.006		

To calculate the weight when internal diameter is given and fidure at the bottom of column to the corresponding figure for the weight of external diameter of size required.

FORMULAE OF WEIGHT

- WEIGHT OF STAINLESS STEEL PIPES & TUBES
  O.D. (mm) - W.T. (mm) x W.T. (mm) x 0.02466 = kg. per meter
- WEIGHT OF STAINLESS STEEL SHEETS
  Length (Mtr.) x Width (Mtr.) Thk (mm) x8 = kg. Per Sheet
- WEIGHT OF STAINLESS STEEL CIRCLE & BLANKS
  O.D. (mm) - O.D. (mm) x Thk (mm) ÷ 160 ÷ 1000 = Kg. Per Pcs.
- WEIGHT OF STAINLESS STEEL ROUNDS
  Dia. (mm) x O.D. (mm) x 0.00623 = Kg. Per Meter
- WEIGHT OF STAINLESS STEEL HEXAGONAL RODS
  Dia. (mm) x Dia. (mm) x 0.00679 = Kg. Per Meter
- WEIGHT OF STAINLESS SQUARE BARS
  Dia. (mm) x Dia. (mm) x 0.00787 = Kg. Per Meter
- WEIGHT OF CARBON STEEL PIPES & TUBES
  O.D. (mm) - W.T. (mm) x W.T. (mm) x 0.02466 = Kg. Per Meter
- WEIGHT OF CARBON STEEL SHEETS & PLATES
  Length (Mtr.) x Width (Mtr.) x Thk (mm) x 7.85 = Kg. Per Sheet
- WEIGHT OF CARBON PIPES
  O.D. (mm) - W.T. (mm) x W.T. (mm) x 0.0256 = Kg. Per Meter
- WEIGHT OF LEAD PIPES (approx)
  O.D. (mm) - W.T. (mm) x W.T. (mm) x 0.0345 = Kg. Per Meter
- WEIGHT OF LEAD SHEETS (approx)
  Length (Mtr.) x Width (Mtr.) x Thk (mm) x 11.2 = Kg. Per Meter
- WEIGHT OF ALUMINIUM PIPES (approx)
  O.D. (mm) - W.T. (mm) x W.T. (mm) x 0.0082 = Kg. Per Meter
- WEIGHT OF ALUMINIUM SHEETS (approx)
  Length (Mtr.) x Width (Mtr.) x Thk (mm) x 2.66 = Kg. Per Meter
- SHEET WIDTH REQUIRED FOR ROLLED AND WELDED PIPES
  O.D. (mm) - Thk. (mm) x 3.14 = Sheet Width

Tensile Strength Conversion Table

1) Kg/mm^2 x 9.81 = N/mm^2=Mpa
2) PSi x 0.0007 = kg/mm^2
3) KSi x 1000 = PSi
4) Kg/mm2 x 1.422 = KSi

FABRICATION

We operate on a commitment to a quality experience from the time of our first contact with you, to the time your product is complete and in your possession. It is the goal of our highly skilled and experienced staff, to provide you with products of the highest quality in a timely manner in order to meet and exceed your project's requirements and your expectations.

We are dedicated to providing you outstanding customer service, working personally with you individually to determine the best and most efficient way to meet your needs. We work with you, answering your questions and concerns, while offering experience based suggestions tailored to each project. Our goal is your satisfaction, both with the products you receive, and the process by which your product is developed and produced.

> "Strengthening our roots in Innovation & Integration"

GOING THE EXTRA SERVICE MILE

For you, the right material in the very best quality is absolutely essential. This is what you get with our pipes, flanges, fittings and pipe accessories. We go the extra service mile to ensure that you are thoroughly satisfied at every stage of the order.

In addition to a large stock and product range, we stands for the very best quality standards, careful testing and meticulous inspections, for personal contacts, experienced project teams and a tailored service for your project. For us this is a matter of course.

APPLICATION INDUSTRIES

Power Industries
Engineering
Ship Building Industries

Pharmaceuticals Industries
Paper & Pulp Industries
Refinery / Petrochemical Industries

Sugar Industries
Cement Plant
Textile Industries

Dairy / Beverage Industries
Infra Structure Industries
Chemical & Fertilizers Industries

Oil & Gas Industries
Rail Transport
Food Industries

OUR PRESTIGIOUS CLIENTELE

Bharat Petroleum
NPCIL NUCLEAR POWER CORPORATION OF INDIA
ONGC एमआरपीएल MRPL
हिन्दुस्तान पेट्रोलियम HP
LARSEN & TOUBRO
CRODA
TENNECO
Coromandel
KRIBHCO
ESSAR STEEL
INDIAN RAILWAYS
BARC
CHEMICAL FERTILISERS AND CHEMICAL LTD.
आर सी एफ
TOYO ENGINEERING
FACT PIONEERS IN PROGRESS
Linde
CAIRN
ZUARI AGRO CHEMICALS LTD.
GNFC

Notice : This catalogue is published only as an advertisement.
Shriram Metal reserves the right to amend its content without notice.
The sales department is at your disposal to supply
any information on the product.

SHRIRAM METAL

(An ISO 9001:2015 Company)

Corporate Office: 28, C. P. Tank,Near Null Bazar, Mumbai - 400 004, INDIA.
T: +91-22-2386 6395 / 2385 0123
Manufacturing Unit: 172, Tokersy Jivraj Wadi, Sewri, Mumbai - 400 015, INDIA.
E: sales@shrirammetal.com
www.shrirammetal.com