

RATNAMIK
METAL (INDIA)



World Class

Engineering Products

Company Profile



We are **Stockiest and Suppliers of Stainless Steel Welded (ERW) Pipes in 304, 304L, 316, 316L & other qualities.** Which are required by your Industries, in all aspects of Projects Implementation, Maintenance, Modernizations, Expansion and Shut down Application etc.

RATNAMIK METAL (INDIA) is a company promoted by Highly experienced Technical personnel who are in the field of stocking & supplying Industrial raw material for more than **12 years.**

RATNAMIK METAL (INDIA) participates in the timely supply of raw-material to clients. We provide remedies in the critical time of troubleshooting so that the wheels of the customers industry keep moving and do not come to grinding halt.

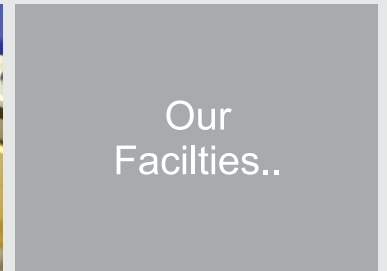
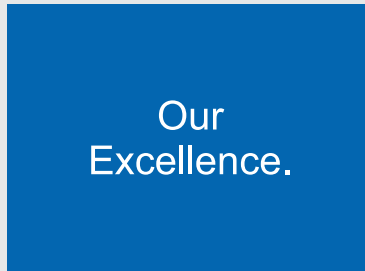
At **RATNAMIK METAL (INDIA)**, Quality of a product is always maintained, as quality is never an accident; it is outcome of High intention, sincere efforts, Intelligent direction & skillful execution; it represents the wise choice of many alternatives.

We will provide you material at **! Most Competitive Prices ! Right Time ! Right Quality !** with **EXCELLENT SERVICE** and most important Market Information and latest trend to facilitate you to take right Purchase decision.

Our company has responded to all & every need of industry as one of Top and the most reputed **Importers/Exporter & Stockiest of Stainless Steel Sheets, Plates, Coils, Strips, Pipes, Tubes and Pipe Fittings.**

Our Competitive Prices and full logical support will insure satisfaction to our customers .





OUR EXCELLENCE...

Quality is our prime concern. We are able to maintain high quality standards through our committed personnel and sound infrastructure. We ensure that finest quality material is used for our products. For ensure the quality of each material, we are providing Materials Test Certificate along with supply. Our team of experts maintain a vigil on the quality of the products. Every single piece is attached with test certificates and reports. We are continually improving our quality to serve our clients better.

OUR FACILITIES...

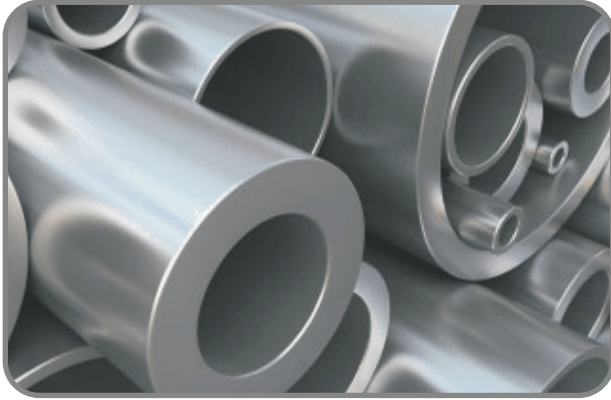
We have a sound infrastructure. Our spacious warehouse has the capacity to store large quantities of products. We possess a team of experts who are sourcing products of international standard to keep abreast with the global markets. Our quality professionals have served as a beacon not only for us but also for the entire industry in establishing top-notch quality standards.

"Our Philosophy is long-term, since we believe that the key to lasting success is the formatting of long-term RELATIONSHIP with our clients."





PIPES & TUBES



STAINLESS STEEL : ASTM / ASME SA 312 GR, TP 304, 304L, 304H, 309S, 309H, 310S, 310H, 316, 316Ti, 316H, 316LN, 317, 317L, 321, 321H, 347, 347H, 904L, ASTM / ASME SA 358 CL 1 % CL 3 GR. 304, 304L, 304H, 309S, 309H, 310S, 310H, 316, 316H, 321, 321H, 47.

DUPLEX STEEL : ASTM / ASME SA 790 UNS NO

CARBON STEEL : ASTM ASME A 53 GR. A & B, ASTM A 106 GR.

A, B & C. API 5L GR. B,

API 5L X 42, X 46, X 52, X 60, X 65 & X 70, ASTM / ASME A 691 GR

A, B & C

ALLOY STEEL : ASTM / ASME A 335 GR P1, P5, P9, P11, P12, P22, P23, P91, ASTM / ASME A 691 GR 1 CR, 11/4 CR, 21/ 4CR.

NICKEL ALLOY : ASTM/ASME SB 163 UNS 2200 (NICKEL200)
ASTM/ASME SB 163 UNS 2201 (NICKEL 201) ASTM/ASME SB 163 /
165 UNS 4400 (MONEL 400) ASTM/ASME SB 464 UNS 8020 (ALLOY
20 / 20 CB 3) ASTM / ASME SB 704/705 UNS 8825 INCONEL(825)A
ASTM / ASME SB 167 / 517 UNS 6600 (INCONEL 600) ASTM ASME
SB 167 UNS 6601 (INCONEL 601) ASTM / ASME SB 704 / 705 UNS
6625 (INCONEL 625) ASTM / ASME SB 619/622/626 UNS 10276
(HASTELLOY C276)

COPPER ALLOY : ASTM / ASME SB 111 UNS NO. C 10100, 10200,
10300. 10800, 12000, 12200, 70600, 71500.

ASTM / ASME SB 466 UNS NO. C 70600 (CU-NI-90/10), C 71500
CU-NI-70/30) BR & NON-IBR

TYPES : Round, Square, Rectangular.

SIZE : Up to 24" NB. (Seamless), up to 48" (Welded)

WALL THICKNESS : Sch. 5S to Sch. XXS





S S HEAT EXCHANGER TUBES



PIPES & TUBES

Specifications	: ASTM A-213, A-268, A-269, A-789 Equivalent to ASME, EN, JIS etc.
Stainless Steel Grade	: TP-304/304L, TP-304H, TP-316/316L, TP-316H, TP-316Ti, TP-317/317L, TP-321/321H, TP-347/347H, TP-405, TP-410, S31260, S31500, S31803, S32550, S32750, S32760.
Carbon Steel	: ASTM A 179, ASTM A210, Gr. A1 & ASTM A 192 with IBR Certificate
Alloy Steel	: ASTM A 213 Gr. T1, T2, T5, T11, T12, T22, T91 With IBR Certificate
Size	: 6.00 mm OD to 101.6 mm OD
Thickness	: 0.89 mm THK to 6.00 mm THK

CONDENSER & HEATER TUBES

Condenser And heater Tubes Product Range

Type	: OD Heat Exchanger / Condenser Tubes Straight or U- Bent
OD	: 5/8" to 2" (15.88 to 50.8mm)
WALL THICKNESS	: 0.5 to 4.0mm
LENGTH	: Upto 30 mtrs, U tubes as per customers' requirements
SPECIFICATION ETC	: ASTM A249, A269, DIN 17455 & 17457
WELDING METHOD TIG	: Laser Welding used
OTHER	: In Bright Annealed Condition. Finish BA; Polishing done on request.



SAW PIPES

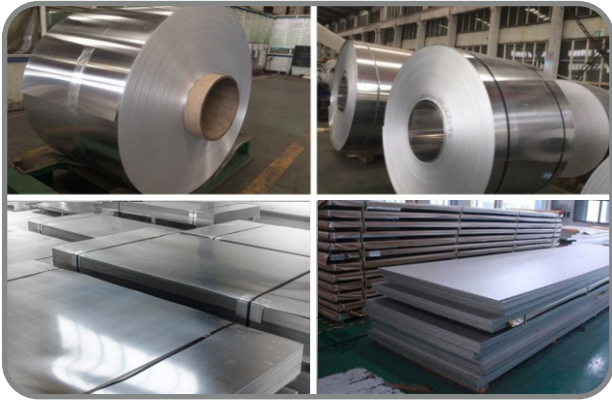


Spiral Submerged Arc Welded Pipes are available in API and other International Standards and also in commercial quality for application ranging from transportation of **OIL, GAS, WATER, SLURRY & SEWAGE** etc to Projects.

Grade	: API5L Gr.B/ ASTM A672/671/691
Outside Diameter	: 16" to 200"
Wall Thickness	: 5mm to 90mm
Length	: 4 meter to 12 Meter
Range - High Quality SAW Pipes in large diameters i.e. in the range of 16" to 200" diameters with IBR & Non- IBR	



SHEETS, PLATES & COILS



S. S. Sheets & Plates as per ASTM A240, Gr. TP 304, 304L, 304LN, 309, 309S, 309H, 310H, 316, 316L, 316H, 316LN, 316Ti, 317, 317L, 321, 321H, 347, 348, 3487H, 409, 410, 420, 430 etc.

Alloy Steel Plates : as per ASTM A387 Gr. 2, 5, 9, 11, 12 & 22 in class 1 & 2 ASTM A 204 Gr. A & B, DIN 17175 Gr. 15Mo3 & 16Mo3 with IBR Test Certificate.

Carbon Steel / Boiler Quality Plates : as per IS 2062/ASTM A36, Gr. A, B & C, IS 2002 Gr. 1 & 2 ASTM A 516 Gr. 60 & 70, ASTM A 515 Gr.70

Abrasion resistant / Wear resistant Plates : Sailhard, Hardox, Sumihard, Jee Raex, Fora, Abrazo, Abrex, Xar, Nicrodur, Dillidur 360, 400, 450, 500, 600, 700, 900 & 100 BHN.

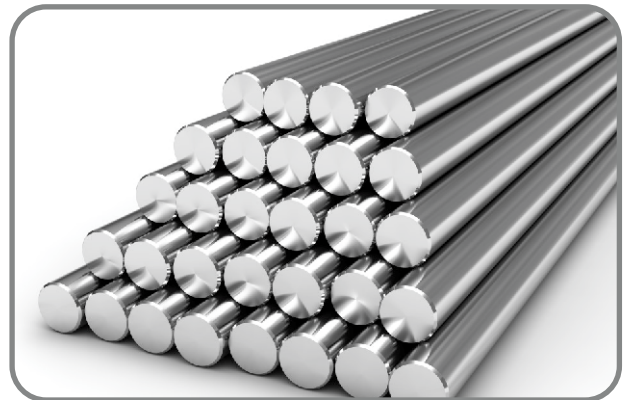
RODS, BARS & WIRES

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

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

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

Types : Rods, Hex, Square, Wires, Billets etc.



Copper / Brass / Aluminium Coils, Sheets, Plates, Flats, Pipes, Rods



Copper : DHP Copper, ETP Copper, DPA Copper, OFHC Copper tubes 2mm OD to 200 mm OD with wall thickness of 0.10mm to 15mm.

Brass : 63/37 Brass, 70/30 Brass, Admiralty Brass, Aluminium & Other Composition of Brass

Cupronickel : 95/5 Alloy & 70/30 Alloy

Bronze : Phosphorous Bronze A B1/ A B2, Aluminium Bronze & Gun Metal

IS Grades : (Aluminium)

19501, 19500, 19600, 19800, 19000, 24345, 24354, 31000, 43000, 46000, 51000, 52000, 53000, 54300, 55000, 65032, 63400, 644300, 62400, 63401, 74530 etc. Available in all Sizes & Thickness.

BUTTWELD FITTING



Specifications:

Stainless Steel : ASTM A403 WP 304/ 304L/ 304H/316/ 316L/ 317/ 317L/ 321/ 310/ 347/904L etc.

Carbon Steel : ASTM A234 WPB/A420 WPL3/A420 WPL6/ MSS-SP-75 WPHY 42/46/52 /56/60/65/70/A53GR. B/A106 GR.B / ASM 192 / A179 etc.

Alloy Steel : ASTM A234 WP1/ WP5/ WP9/ WP11/ WP22/ WP91 etc.

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

Size : 1/4" NB TO 32" NB. (Seamless & Welded)

Wall Thickness : Sch. 5S To Sch. XXS.

Type of Butt weld fittings: Tee, Elbow, Reducing Tee, Coupling, Long & Short Stub Bend, Reducer, Return Bends, Plug and Union, Cap, Collar, Cross, etc.

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

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

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

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

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

Types : Elbow, Tee, Union, Cross, Coup Bushing, Plug, Swage Nipple, Welding Boss, Hexagon Nipple, Barrel Nipple, Welding Nipple, Parraler Nipple, Street Elbow, Hexagon Nut, Hose Nipple, Bend, Adapter, Insert, Weldolet, Elbowlet, Sockolet, Thredolet, Nipolet, Letrolet, etc.

Size : 1/4" NB TO 4" NB. (Socketweld & Threaded)

Class : 3000#, 6000#, 9000#.

Pressure : 1000#, 2000#, 3000#, 6000#, 9000#

SOCKETWELD



FLANGES



Materials Grades Available:

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

Carbon Steel: ASTM A105/A694F42/46/52/56/60/65/70/ A350 Lf3/A350 LF2, etc.

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

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

Types: Our range of include PN , Plate Blank Flanges, Screwed Bars , Spectacle, Blind, Lapped, Reducing , Welded Socketweld , SORF , Threaded, Weldneck, Slipon, Blind, Socket Weld, Lap Joint, Spectacles, Ring Joint, Oriface, Long Weldneck, Deck Flange, RTJ Flange

Size: 1/2" NB TO 24" NB.

Class: 150#, 300#, 400#, 600#, 900#, 1500# & 2500#.

PIPE /HYDRAULIC CLAMP



PP / Aluminium / Hydraulic Clamps
 Light Series Pipe clamps
 Heavy series Pipe clamps
 Twin Series Pipe clamps
Clamp Material: - Polymer &
 Aluminium clamp bodies
Body Material: Steel plates & bolts

SYPHON, THERMOWELLS & SNUBBER



SYPHON Type : U & O Type Syphon
THERMOWELLS Type : Threaded, Flanged,
 Socket weld Thermo-wells
 Raised face, flat face and ring joint
SNUBBER VALVES : Pulsation Damper

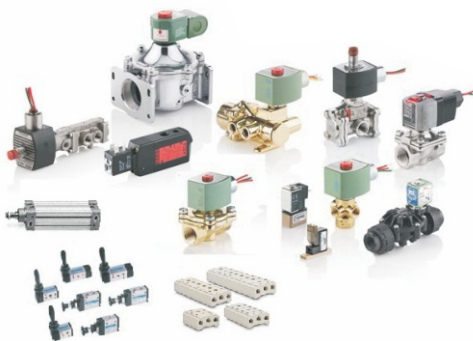
CONDENSATE POT SAMPLING CYLINDER



Heavy wall end connection
 All cylinders are hydrostatically proof tested
 Material: Stainless steel, Brass, MS, etc.
 End Connection: BSP / NPT / As per req.
 Sizes: 1/8 to 4 in.

Ports : Size - 1/4" / 1/2",
 Number of Ports - 6 / 8 / 10 / 12 / 16 / 20 Way
Material : Stainless steel, Carbon Steel, etc.
End Connection : BSP / NPT / As per req.
Outlet : Ball valve, Needle Valve, Plug, Nipple, etc.
Sizes : 1/8 to 2 in.

SOLENOID VALVE PNEUMATIC CYLINDER



SOLENOID VALVE
 Types & Sizes : 4V series, 3V series, 2W series, 4F
 series foot valve,
 JMJ series mechanical valve, HV hand valve, etc.
PNEUMATIC CYLINDER
 Types & Sizes : SC series, MAL/MA mini series,
 DNC standard series ,etc.

QUICK RELEASE COUPLING



- **Pressure Rating :** Up to 3500
- **Temperature Rating :** Up to 200 C
- **Lining:** Rubber, PTFE, Nylon, etc.
- **Various Series :** NY , YNL, QC , KS ,
 Camlock
- **Material:** Stainless steel, Brass, MS, etc.
- **Sizes:** 1/8 to 4 in.

HYDRAULIC HOSE & ASSEMBLY



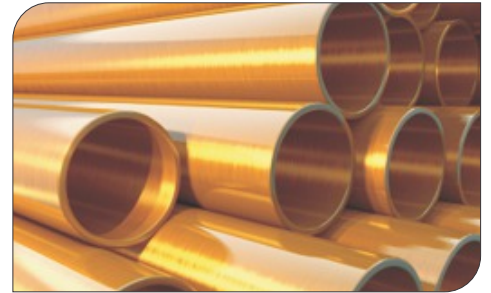
- **Application :** Pneumatic / hydraulic
 systems, chemicals, steam & water
- **Lining :** Rubber, PTFE, Nylon, etc.
- **Cover:** Braided, Corrugated, Plain, etc.
- **End connection sizes** from 1/4" to 12"
- **Standard and custom-length assemblies**



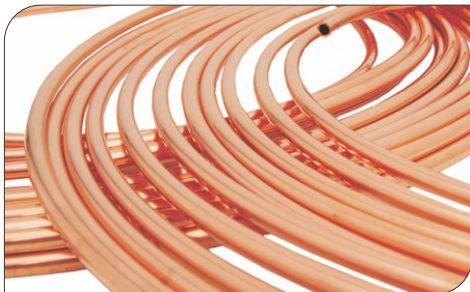
Non Ferrous Metals

Copper	DHP Copper, ETP Copper, DPA Copper OFHC Copper
BRASS	63 / 37 Brass, 70 / 30 Brass, Admiralty Brass, Aluminium Brass & other Compositions of Brass.
CUPRONICKEL	95 / 5 alloy, 90 / 10 alloy & 70 / 30 alloy.
BRONZES	Phosphorous Bronze Aluminium Bronze & Gun Metal, Phosphorous Bronze A B1 / A B2 Bush Round.

BRASS TUBES



COPPER TUBES



TUBES

2mm OD to 200mm OD with Wall thickness of
0.10 mm to 15 mm in length upto 10 mtrs straight

(in coils upto 25 mtrs) in copper, Brass & Curpronickel.

RODS

In all size upto 160mm diameter in Copper, Brass and Bronzes.

STRIPS / PROFILES

Copper Strips and sections as per clients specific requirements.

WIRES

Copper wires upto 42 swg in bright annealed condition.

S. E. WIRES

Super enamelled copper wires upto 42 swg.

BRASS RODS



SPECIFICATIONS

Indian Standard Specification (ISS)

British Standard Specification (BSS)

American Standard for Testing of Material (ASTM)

As per Parties Specific Specifiacion.

COPPER TUBE & SECTIONS



TESTING FACILITIES



- Chemical Analysis
- Physical Testing
- Hardness Testing
- Hydrostatic Testing
- Pneumatic Testing
- Stress Corrosion Testing
- Dimensional Inspection
- Destructive Testing- Flattening,
- Drift Test,
- Bend Test etc.
- NDT - Eddy Current Testing



Dairy EQUIPMENTS



Slight Glass



Cross Clamp End



3 Way ball valve



Butter Fly Valve

SMS, IDF, DIN UNIONS Etc.

Size : 1/2" OD to 4" OD

Thickness : 10 swg to 22 swg

DAIRY BUTTWELDED FITTINGS



The company offers comprehensive range of superior quality Dairy Fittings in which finest material are used. We have carved out a niche for ourself as <Dairy Steel> providers at reasonable prices.

This line consists of Tri-Clover parts with either Tri-weld ends suitable for use with orbital welding equipment or self-aligning Tri-clamp end connections.

Material of Construction : 304, 304L, 316, 316, 316L etc.,

Finsh : Mechanical polish as well as Electropolish finishes.

Types : Seamless & Welded

Items : Threaded Bevel Seat 90 Elbow 90 Reducing Elbow, Non Tapered 90 Elbow, Plain Bebel Seat 90 Elbow Short Outlet Tee 45 Elbow, Equal Tee, Reducing Tee, Instrument Tee, Short Outlet Reducing Tee Equal Cross, Long Weld Ferrule, Short Welded Ferrule, Ferrule for Expanding (Recessless)



IDF UNION



WYE LOOP



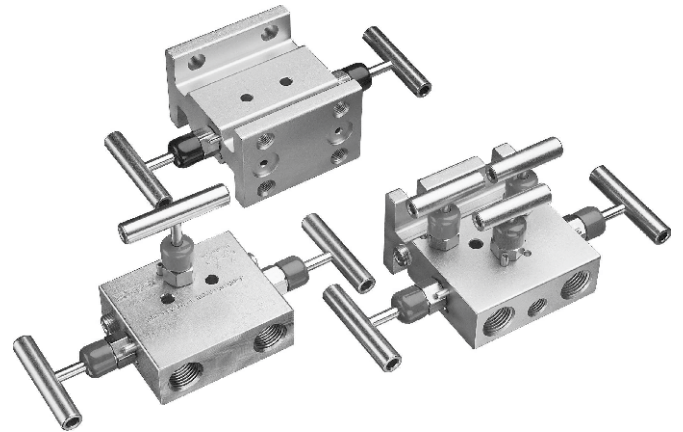
CONICAL STRAINER



PIPE HOLDER

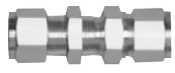


BUTTER FLY VALVE



FERRULE FITTING / TUBE FITTING

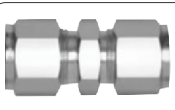
UNION



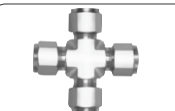
Blukhead Union



Reducing Union



Union



Union Cross



Union Elbow

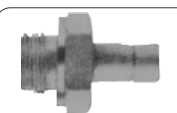


Male Elbow

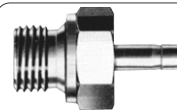


Female Elbow

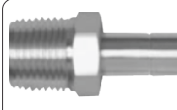
ADAPTER



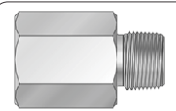
O-Seal Pipe



O-Seal Straight



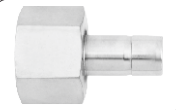
Male Adapter



Male/Female ISO Tapered



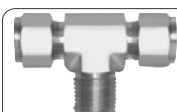
Male/Female ISO Parallel



Female Adapter



Female Branch Tee



Male Branch Tee



Male Run Tee

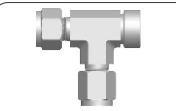


Plug

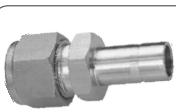
PLUG-REDUCER



Union Tee



Female Run Tee



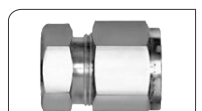
Reducer

CONNECTOR

Back Ferrule



Tube End Closure



Front Ferrule



Male Connector



Parker Ferrule



Female Connector



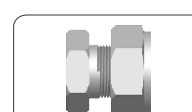
Coupling Cap/Nut



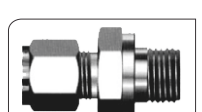
O-Seal Pipe Thread Connector



Fitting End Closure



O-Seal Straight Thread Connector



COUPLING

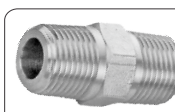


Hex Coupling



Hex Reducing Coupling

NIPPLE

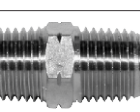


Hex Nipple

Pipe Cap



NPT Male/Female ISO Parallel



NPT Male/Female ISO Tapered

Long Redius Bend



Long Radius Bends From 2D, 3D, 5D, 10D, 12D, to 22D, Radius.

Angle : From 15 Deg to 360 Deg.

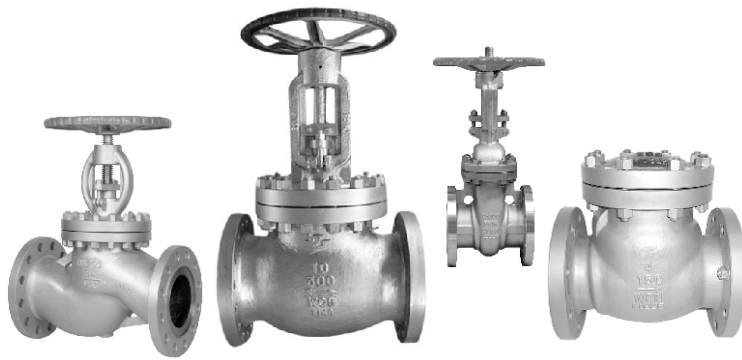
Size : From 2" to 24"

Thickness : From 5mm to 40mm.

Material : Titanium, Inconel, Monel, Cupro Nickel, Duplex, Carbon Steel, Stainless Steel, Alloy Steel, LTCS & other exotic materials,

Dimensions Standard : ASME / ASNI B16, MSS SP-44, DIN etc.

Valve



GLOBE VALVE BS 5352 / BS 6755 / BS 1873 /
BS 6755 / ASME B 16.34 / DIN 3356
STAINLESS STEEL (BAR STOCK)
RATING : 150# / 300#
SIZE : 8 MM TO 100 MM
**CAST CARBON STEEL / S. STEEL /
ALLOY STEEL**
RATING : 125# / 150#
SIZE : 25 MM TO 600 MM



**FORGED CARBON STEEL /
S. STEEL**
RATING : 150# / 300# /
800# / 1500#
SIZE : 15 MM TO 50 MM
CAST IRON
RATING : 150# / 300# /
600# / 900#
SIZE : 15 MM TO 400 MM

	FORGED RANGE	CAST RANGE
DESIGN (Mfg.) STD.	BS 5352	BS 1873 / DIN 3356
TEST (INSPECTION) STD.	BS 6755	BS 6755

STRAINER



CAST CARBON STEEL
DESIGN : Y TYPE (PN 40 / DIN 3356 / BS 1873)
SIZE : 15 MM TO 80MM

STAINLESS STEEL (BAR STOCK)
DESIGN : Y - TYPE (150#)
ENDS : SCREWED / SOCKET WELD
SIZE : 15 MM TO 80 MM

CAST IRON

DESIGN : Y-TYPE (150#) ENDS : FLANGED
ENDS : SCREWED / SIZE : 40 MM TO 300 MM
FLANGED DESIGN : T - TYPE (DIRT BOX)
SIZE : 15 MM TO 300 MM
DESIGN : POT TYPE ENDS : FLANGED
SIZE : 25 MM TO 300 MM

GATE VALVE BS 1414 / BS 5352 / API 600 / API 602
/ API 6D / ASME / B 16.34 / API 598



STAINLESS STEEL (BAR STOCK) **CAST IRON**
RATING : 150# / 300# RATING : 125# / 150#
SIZE : 8 MM TO 100 MM SIZE : 25 MM TO 600 MM
FORGED C. STEEL / S. STEEL **CAST C. S. / S. S. / A. S.**
RATING : 150# / 300# / 800# RATING : 150# / 300# /
/ 1500# 600# / 900#
SIZE : 15 MM TO 50 MM SIZE : 15 MM TO 600 MM

	FORGED RANGE	CAST RANGE
PRESSURE / TEMP. RATING	ANSI B 16.34 / API 6D	ANSI B 16.34
DESIGN (Mfg.) STD.	API 602 / BS 5352	API 600 / API 6D
TEST (INSPECTION) STD.	API 598 / BS 6755	API 598 / API 6D

BUTTERFLY VALVE



API 609 / BS 5155 / IS 13095

DESIGN : BS 5155 / BS 5155 504 / API 609 / IS 13095

CAST IRON

CAST C. STEEL
OPERATION : LEVER / MANUAL GEAR DESIGN : SURESEAL / REPLACEABLE /
DESIGN : SURESEAL / REPLACEABLE / RUBBER LINING
RUBBER LINING ENDS : WATER TYPE
ENDS : WATER TYPE SIZE : 40 MM TO 300 MM
SIZE : 40 MM TO 500 MM
DESIGN : OFFSET DISC
OPERATION : LEVER / GEAR (ISI MARKED) DESIGN : OFFSET DISC
ENDS : WATER TYPE / DOUBLE / OPERATION : LEVERMANUAL GEAR /
FLANGED / LUGGED TYPE MOTORISED GEAR
SIZE : 350 MM TO 1200 MM ENDS : WATER TYPE
SIZE : 40 MM TO 300 MM

NON RETURN VALVE



BS 6755 / BS 1868 / ASME B 16.34 / API 6D
STAINLESS STEEL (BAR STOCK) **CAST IRON**
RATING : 150# / 300# RATING : 125# / 150#
SIZE : 8 MM TO 100 MM SIZE : 25 MM TO 400 MM
FORGED C. STEEL / S. STEEL **CAST C.S. / S. S. / A.S.**
RATING : 150# / 300# / 800# RATING : 150# / 300# / 600# /
/ 1500# 900#
SIZE : 15 MM TO 50 MM SIZE : 15 MM TO 600 MM

	FORGED RANGE	CAST RANGE
DESIGN (Mfg.) STD.	BS 5352	BS 1868 / API 6D
TEST (INSPECTION) STD.	BS 6755	BS 6755 / API 6D

Also available

1. Check Valve
2. Plug Valve
3. Needle Valve
4. Safety Relief Valve
5. Sluice Valve
6. Pressure Reducing Valve





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

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

BIG DIAMETER ERW PIPES CONFIRMING TO IS 3589

Wall Thickness in mm	Nominal Bore 7" NB 193.7 mm OD	Nominal Bore 8" NB 219.1 mm OD	Nominal Bore 10" NB 273 mm OD	Nominal Bore 12" NB 323.7 mm OD	Nominal Bore 14" NB 355.6 mm OD	Nominal Bore 16" NB 406.4 mm OD	Nominal Bore 18" NB 457 mm OD	Nominal Bore 20" NB 508 mm OD
kg/mtr	kg/mtr	kg/mtr	kg/mtr	kg/mtr	kg/mtr	kg/mtr	kg/mtr	kg/mtr
4.85	22.59	25.62	32.07	38.13	-	-	-	-
5.20	24.17	27.43	34.34	40.85	-	-	-	-
5.60	26.00	29.28	36.93	43.93	48.11	-	-	-
6.00	27.88	31.53	39.50	47.02	51.49	61.00	69.00	-
6.35	29.34	33.28	41.73	49.67	54.43	62.35	70.50	78.50
7.01	32.27	36.76	46.43	55.45	61.82	69.04	-	-
7.94	-	41.00	50.95	61.85	67.98	77.92	87.80	-
8.18	-	42.56	53.42	65.12	-	-	-	-
9.53	-	51.50	60.24	73.75	81.21	93.13	105.00	117.00
12.70	-	-	-	-	107.28	123.30	139.00	155.00

Tolerance on Thickness and Weight : as per IS 1239

The following manufacturing tolerance shall be permitted on the tubes and sockets.

- (a) Thickness
- (1) Butt welded Light tubes + Not limited
- 8 percent
- Medium and Heavy tubes + Not Limited
- 10 percent
- (2) Seamless tubes + Not Limited
- 12.5 percent
- (b) Weight :
- (1) Single tube (light series) + 10 percent
- 8 percent
- (2) Single tube (medium and heavy series) + 10 percent

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

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

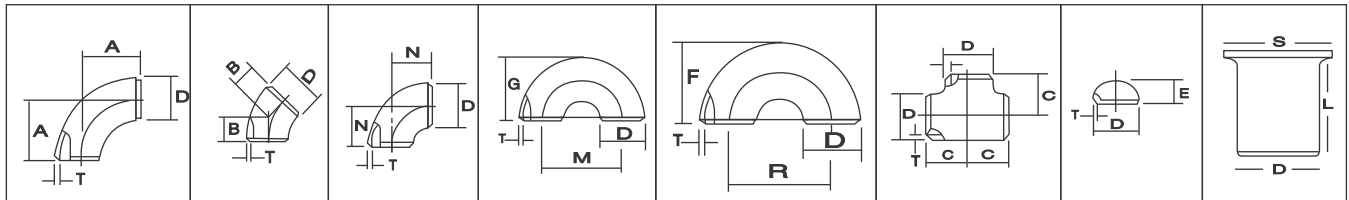
For tubes fitted with appropriate fittings of suitably butt welded together, the Max. permissible pressure shall be 21.00 Kg/cm² and Max. permissible temp. 260°C


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

Nominal Bore		Outside Diameter	Schedule 5S		Schedule 10S		Schedule 20S		Schedule 40S		Schedule 80S		Schedule 160S		Schedule XXS	
mm	Inch	mm	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)	Wt mm	Weight (Kg/mt)
3	1/8	10.3	1.24	0.276	1.24	0.28	1.5	0.33	1.73	0.37	2.41	0.47	-	-	-	-
6	1/4	13.7	1.24	0.390	1.65	0.49	2.00	0.58	2.24	0.631	3.02	0.80	-	-	-	-
10	3/8	17.1	1.24	0.490	1.65	0.63	2.00	0.74	2.31	0.845	3.20	1.10	-	-	-	-
15	1/2	21.3	1.65	0.800	2.11	1.00	2.30	1.07	2.77	1.27	3.75	1.62	4.75	1.94	7.47	2.55
20	3/4	26.7	1.65	1.03	2.11	1.28	2.55	1.52	2.87	1.68	3.91	2.20	5.54	2.89	7.82	3.63
25	1	33.4	1.65	1.30	2.77	2.09	2.55	1.94	3.38	2.50	4.55	3.24	6.35	4.24	9.09	5.45
32	1.1/4	42.2	1.65	1.65	2.77	2.70	3.00	2.90	3.56	3.38	4.85	4.47	6.35	5.61	9.70	7.77
40	1.1/2	48.3	1.65	1.91	2.77	3.11	3.00	3.55	3.68	4.05	5.08	5.41	7.14	7.25	10.16	9.54
50	2	60.3	1.65	2.40	2.77	3.93	3.00	4.24	3.91	5.44	5.54	7.48	8.74	11.1	11.07	13.44
65	2.1/2	73.0	2.11	3.69	3.05	5.26	4.00	6.81	5.16	8.63	7.01	11.4	9.53	14.9	14.2	20.39
80	3	88.9	2.11	4.51	3.05	6.45	4.00	8.37	5.49	11.30	7.62	15.2	11.1	21.3	15.24	27.65
100	4	114.3	2.11	5.84	3.05	8.36	4.50	12.18	6.02	16.07	8.56	22.3	13.49	33.54	17.12	41.03
125	5	141.3	2.77	9.47	3.40	11.57	5.00	16.80	6.55	21.8	9.53	31.97	15.88	49.11	19.05	57.43
150	6	168.3	2.77	11.32	3.40	13.84	6.35	25.36	7.11	28.3	10.97	42.7	18.2	67.56	21.95	79.22
200	8	219.1	2.77	14.79	3.76	19.96	6.35	33.31	8.18	42.6	12.7	64.6	23.0	111.2	22.23	107.8
250	10	273.1	3.40	22.63	4.19	27.78	6.35	41.77	9.27	60.5	12.7	96.0	28.6	172.4	25.40	155.15
300	12	323.9	3.96	31.25	4.57	36.00	6.35	49.7	9.52	73.88	12.7	132.0	33.32	238.76	25.40	186.97
350	14	355.6	3.96	34.36	4.78	41.3	7.92	67.80	11.13	94.59	19.05	158.08	35.71	281.70	-	-
400	16	406.4	4.19	41.56	4.78	47.29	7.92	77.83	12.7	123.30	21.41	203.33	40.46	365.11	-	-
450	18	457.2	4.19	46.80	4.78	53.42	7.92	87.71	14.27	155.80	23.8	254.36	45.71	466.40	-	-
500	20	508.0	4.78	59.25	5.54	68.71	9.53	117.14	15.09	183.42	26.19	311.2	49.99	564.68	-	-
600	24	609.6	5.54	82.47	6.35	94.45	9.53	141.12	17.48	255.41	30.96	442.08	59.54	808.22	-	-



DIMENSIONS OF BUTT-WELDING FITTING ANSI B-16.9 / B-16.28



90 Elbow
Long Radius

45 Elbow

90 Elbow
Short Radius

180 Return
Short Radius

180 Return
Long Radius

Tee Equal Tee

Caps

Stub-End

Nominal Pipe Size		Outside Diameter	Center to Face				Back to Face			Center to Center			Length 'L'	
INCH	MM	D	A R=1.5D	B	C	N R=1D	E	F	G	R	M	S	Short L	Long L
1/2	15	21.3	38.00	16.0	25.0	-	25.0	48.0	-	76.0		35.0	50.8	76.2
3/4	20	26.7	29.00	11.0	29.0	-	25.0	43.0	-	57.0		43.0	50.8	76.2
1	25	33.4	38.00	22.0	38.0	25.0	38.0	56.0	41.0	76.0	51.0	51.0	50.8	101.6
1.1/4	32	42.2	48.00	25.0	48.0	32.0	38.0	70.0	52.0	95.0	64.0	64.0	50.8	101.6
1.1/2	40	48.3	57.15	29.0	57.0	38.0	38.0	83.0	62.0	114.0	76.0	73.0	50.8	101.6
2	50	60.3	76.00	35.0	64.0	51.0	38.0	106.0	81.0	152.0	102.0	93.0	63.5	152.4
2.1/2	65	73.0	95.25	44.0	76.0	64.0	38.0	132.0	100.0	191.0	127.0	105.0	63.5	152.4
3	80	88.9	114.30	51.0	86.0	76.0	51.0	159.0	121.0	229.0	152.0	127.0	63.5	152.4
3.1/2	90	101.6	133.35	57.0	95.0	89.0	64.0	184.0	140.0	267.0	178.0	140.0	76.2	152.4
4	100	114.3	152.0	64.0	105.0	102.0	64.0	210.0	159.0	305.0	203.0	157.0	76.2	152.4
5	125	141.3	190.0	79.0	123.0	127.0	76.0	262.0	197.0	381.0	254.0	186.0	76.2	203.2
6	150	168.3	229.0	95.0	143.0	152.0	89.0	313.0	237.0	457.0	305.0	218.0	88.9	203.2
8	200	219.1	305.0	127.0	178.0	203.0	102.0	414.0	313.0	610.0	406.0	270.0	101.6	203.2
10	250	273.1	381.0	159.0	216.0	254.0	127.0	515.0	391.0	762.0	508.0	324.0	127.0	254.0
12	300	323.8	457.0	190.0	254.0	305.0	152.0	619.0	467.0	914.0	610.0	381.0	152.4	254.0
14	350	355.6	533.0	222.0	279.0	356.0	165.0	711.0	533.0	1067.0	711.0	413.0	152.4	305.0
16	400	406.4	610.0	254.0	305.0	406.0	178.0	813.0	610.0	1219.0	813.0	470.0	152.4	305.0
18	450	457.2	686.0	286.0	343.0	457.0	203.0	914.0	686.0	1372.0	914.0	533.0	152.4	305.0
20	500	508.0	762.0	318.0	381.0	508.0	229.0	1016.0	762.0	1524.0	1016.0	584.0	152.4	305.0
22	550	559.0	838.0	343.0	419.0	559.0	254.0	1118.0	838.0	1676.0	1118.0	614.4	152.4	305.0
24	600	610.0	914.0	381.0	432.0	610.0	267.0	1219.0	914.0	1829.0	1219.0	692.0	152.4	305.0
26	650	660.0	991.0	405.0	495.0	660.0	267.0							
28	700	711.0	1067.0	438.0	521.0	771.0	267.0							
30	750	762.0	1143.0	470.0	559.0	762.0	267.0							
32	800	813.0	1219.0	502.0	597.0	813.0	267.0							
34	850	864.0	1295.0	533.0	635.0	864.0	267.0							
36	900	914.4	1372.0	565.0	673.0	914.0	267.0							

All Dimensions in Millimeters



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

ASTM GRADE	C	Mn	Si	S	P	Cr	Ni	Mo	Other	Hardness	Tensile Psi(MPa)	Yield Psi(MPa)	Elongation in Area%	Redu
A193 B8-B8A AISI Type 304	0.08	2.00 Max	1.00 Max	0.030 Max	0.045 Max	18.00 20.00	8.00 10.50	-	-	223HB	75000(515)	30000(205)	30	50
A193B8-B8MA AISI Type 316	0.08 Max	2.00 Max	1.00 Max	0.030 Max	0.045 Max	16.00 18.00	10.00 14.00	2.00 3.00	-	223HB	75000(515)	30000(205)	30	50
A193B8T-B8TA AISI Type 321	0.08 Max	2.00 Max	1.00 Max	0.030 Max	0.045 Max	17.00 19.00	9.00 12.00	-	Ti>5xC <0.70	223HB	75000(515)	30000(205)	30	50
A193 B8C-B8CA AISI Type 347	0.08 Max	2.00 Max	1.00 Max	0.030 Max	0.045 Max	17.00 19.00	9.00 13.00	-	Cb+7a>10 xC<51.10	192HB	75000(515)	30000(205)	30	50
A193B6-B6X AISI Type 410	0.15 Max	1.00 -	1.00 Max	0.03 Max	0.040 Max	11.50 13.50	-	-	-	-	110000(760)	85000(585)	15	50
A193 B7-B7M Alloy Steel (Cr, Mo)	0.37 0.49	0.65 1.10	0.15 0.35	0.040 Max	0.035 Max	0.75 1.20	-	0.15 0.25	-	-	125000(860)	105000(720)	16	50
A193B5	0.10	1.00	1.00	0.030	0.040	4.00	-	0.40	-	-	100000(690)	80000(550)	16	50

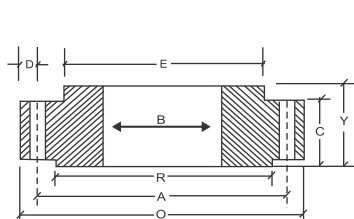
ASTM A 194/ 194 M CARBON STEEL, ALLOY STEEL & STAINLESS STEEL NUTS, BOLTS FOR HIGH PRESSURE & HIGH TEMPERATURE SERVICE

A194/8A AISI Type 304	0.08 Max	2.00 Max	1.00 Max	0.03 Max	0.045 Max	18.00 20.00	8.00 10.50	-	-	126 - 300 Grade 8 126 - 182 Grade 8 A
A 194 8M/MA AISI Type 316	0.08 Max	2.00 Max	1.00 Max	0.03 Max	0.045 Max	16.00 18.00	10.00 14.00	2.00 3.00	-	126 - 300 Grade 8m 126 - 192 Grade 8 MA
A194/ 8T/8TA AISI Type 321	0.08 max	2.00 12.00	1.00 max	0.03 0.78 Min	0.045	17.00 19.00	9.00 12.00	-	Ti>5 x C <0.70	126 - 300 Grade 8T 126 - 192 Grade 8 TA
A194/ 8C/8CA AISI Type 347	0.08 Max	2.00 Max	1.00 Max	0.03 Max	0.045 Max	17.00 19.00	9.00 13.00	-	Cb+7ax10 xC<1.10	126 - 300 Grade 8CA 126 - 192 Grade 8 CA
A194-6 AISI Type 410	0.15 Max	1.00 Max	1.00 Max	0.03 Max	0.040 Max	11.50 13.50	-	-	-	228 271HRC-20-28
A194 2 2HM & 2H Carbon Steel	0.4 min	1 Max	0.4 Max	1.050 Max	0.040 Max	-	-	-	-	159-352GR.2 248 -352GR.2H
A194-7/7M Alloy Steel	0.37 0.49	0.65 1.1	0.15 0.35	0.04 Max	0.4 Max	0.75 1.2	-	0.15 0.25	-	159-237GR.2HM 248-352GR.7 159-237GR.7M

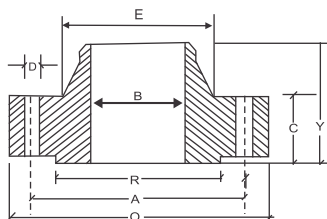




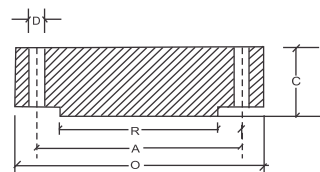
DIMENSIONS OF FORGED FLANGES ANSI B 16.5



SLIP-ON FLANGE



WELDING NECK FLANGE



BLIND FLANGE

ASA 150 CLASS

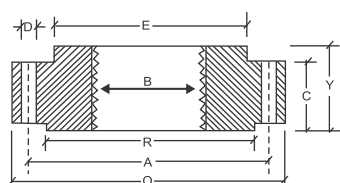
Nominal Pipe Size		Flange Dia	Dia of Bolt Circle	Dia of Bolt Holes	No. of Holes	Thk of Flange	Dia of Hub	Lenght through Hub			Dia of Bore		Dia of R/F	Depth of Socket	Pipe Dia
								S/O & S/W	W/N	L/J	S/O & S/W	L/J			
(MM)	(INCH.)	O	A	D		C	E	Y	Y	Y	B	B	R	F	X
15	1/2	88.9	60.3	15.9	4	11.1	30.2	15.9	47.6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

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

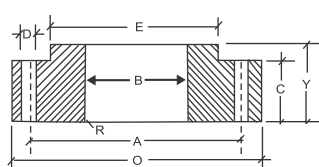
ASA 300 CLASS

Nominal Pipe Size		Flange Dia	Dia of Bolt Circle	Dia of Bolt Holes	No. of Holes	Thk of Flange	Dia of Hub	Lenght through Hub			Dia of Bore		Dia of R/F	Depth of Socket	Pipe Dia
								S/O & S/W	W/N	L/J	S/O & S/W	L/J			
(MM)	(INCH.)	O	A	D		C	E	Y	Y	Y	B	B	R	F	X
15	1/2	95.2	66.7	15.9	4	14.3	38.1	22.2	52.4	22.2	22.3	22.9	34.9	9.5	21.33
20	3/4	117.5	82.5	19.0	4	15.9	47.6	25.4	57.1	25.4	27.7	28.2	42.9	11.1	26.67
25	1	123.8	88.9	19.0	4	17.5	54.0	27.0	61.9	27.0	34.5	35.0	50.8	12.7	33.40
32	1 1/4	133.3	98.4	19.0	4	19.0	63.5	27.0	65.1	27.0	43.2	43.7	63.5	14.3	42.16
40	1 1/2	155.6	114.3	22.2	4	20.6	69.8	30.2	68.3	30.2	49.5	50.0	73.0	15.9	48.26
50	2	165.1	127.0	19.0	8	22.2	84.1	33.3	69.8	33.3	62.0	62.5	92.1	17.5	60.31
65	2 1/2	190.5	149.2	22.2	8	25.4	100.0	38.1	76.2	38.1	74.7	75.4	104.8	19.0	73.02
80	3	209.5	168.3	22.2	8	28.6	117.5	42.9	79.4	42.9	90.7	91.4	127.0	20.6	88.90
100	4	254.0	200.0	22.2	8	31.8	146.0	47.6	85.7	47.6	116.1	116.8	157.2	23.8	114.30
125	5	279.4	234.9	22.2	8	34.9	177.8	50.8	98.4	50.8	143.8	144.5	185.7	-	141.30
150	6	317.5	269.9	22.2	12	36.5	206.4	52.4	98.4	52.4	170.7	171.4	215.9	-	168.27
200	8	381.0	330.2	25.4	12	41.3	260.3	61.9	111.1	61.9	221.5	222.2	269.9	-	219.07
250	10	444.5	387.3	28.6	16	47.6	320.7	66.7	117.5	95.2	276.3	277.4	323.8	-	273.05
300	12	520.7	450.8	31.7	16	50.8	374.6	73.0	130.2	101.6	327.1	328.2	381.0	-	323.85
350	14	584.2	514.3	31.7	20	54.0	425.4	76.2	142.9	111.1	359.1	360.2	412.7	-	355.60
400	16	647.7	571.5	34.9	20	57.2	482.6	82.5	146.0	120.6	410.5	411.2	469.9	-	406.40
450	18	711.2	628.5	34.9	24	60.3	533.4	88.9	158.7	130.2	461.8	462.3	533.4	-	457.20
500	20	774.7	685.8	34.9	24	63.5	587.4	95.2	161.9	139.7	513.1	514.3	584.2	-	508.00
600	24	914.4	812.8	41.3	24	69.8	701.7	106.4	168.3	152.4	615.9	615.9	692.1	-	609.60

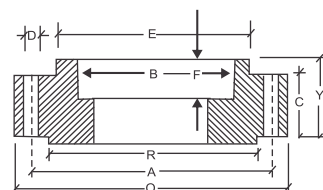
All Dimensions are in Millimeters • Flanges except Lap Joint will be furnished with (1.6mm) Raised Face, which is included in Thickness(C) and Lenght through Hub(Y).


DIMENSIONS OF FORGED FLANGES ANSI B 16.5


THREADED FLANGES



LAP JOINT FLANGES



SOCKET WELD FLANGES

ASA 600 CLASS

Nominal Pipe Size (MM)	Flange Dia O	Dia of Bolt Circle A	Dia of Bolt Holes D	No. of Holes	Thk of Flange C	Dia of Hub E	Lenght through Hub			Dia of Bore		Dia of R/F R	Depth of Socket F	Pipe Dia X
							S/O & S/W Y	W/N Y	L/J Y	S/O & S/W B	L/J B			
15	95.2	66.7	15.9	4	14.3	38.1	22.2	52.4	22.3	22.3	22.8	34.9	9.5	21.33
20	117.5	82.5	19.0	4	15.9	47.6	25.4	57.1	25.4	27.7	28.1	42.9	11.1	26.67
25	123.8	88.9	19.0	4	17.5	54.0	27.0	61.9	26.9	34.5	35.0	50.8	12.7	33.40
32	133.3	98.4	19.0	4	20.6	63.5	28.6	66.7	28.4	43.2	43.6	63.5	14.2	42.16
40	155.6	114.3	22.2	4	22.2	69.8	31.7	69.8	31.7	49.5	50.0	73.0	15.8	48.26
50	165.1	127.0	19.0	8	25.4	84.1	36.5	73.0	36.5	62.0	62.4	92.1	17.4	60.31
65	190.5	149.2	22.2	8	28.6	100.0	41.3	79.4	41.1	74.7	75.4	104.8	19.0	73.02
80	209.5	168.3	22.2	8	31.8	117.5	46.0	82.5	45.9	90.7	91.4	127.0	-	88.90
100	273.0	215.9	25.4	8	38.1	152.4	54.0	101.6	53.8	116.1	116.8	157.2	-	114.30
125	330.2	266.7	28.6	8	44.4	188.9	60.3	114.3	60.4	143.8	144.5	185.7	-	141.30
150	355.6	292.1	28.6	12	47.6	222.2	66.7	117.5	66.5	170.7	171.4	215.9	-	168.27
200	419.1	349.2	31.7	12	55.6	273.0	76.2	133.3	76.2	221.5	222.2	269.9	-	219.07
250	508.0	431.8	34.9	16	63.5	342.9	85.7	152.4	111.2	276.3	277.4	323.8	-	273.05
300	558.8	488.9	34.9	20	66.7	400.0	92.1	155.6	117.3	327.1	328.2	381.0	-	323.85
350	603.2	527.0	38.1	20	69.9	431.8	93.7	165.1	127.0	359.1	360.1	412.7	-	355.60
400	685.8	603.2	41.3	20	76.2	495.3	106.4	177.8	139.7	410.5	411.2	469.9	-	406.40
450	742.9	654.0	44.4	20	82.6	546.1	117.5	184.1	152.4	461.8	462.3	533.4	-	457.20
500	812.8	723.9	44.4	24	88.9	609.9	127.0	190.5	165.1	513.1	514.3	584.2	-	508.00
600	939.8	838.2	50.8	24	101.6	717.5	139.7	203.2	184.1	615.9	615.9	692.1	-	609.60

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

ASA 900 CLASS

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

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

Class 1500 & 2500 Flanges are available as per customer requirement



SUMMARY OF THE MAIN ASTM STANDARDS GENERALLY USED FOR SHEETS / PLATES

ASTM	Grade	Chemical requirements percent (%)										Mechanical requirements				
		C max	Mn max	P max	S max	Si max	Ni	Cr	Mo	Cu	Others	Tensile Strength mini-MPa	Yield Strength mini-MPa	Elong mini %	Brinell	Hardness Rockwell
A240	304	0.08	2.00	0.045	0.030	0.75	8.00-10.5	18.00-20.0				515	205	40	201	92
	304L	0.03	2.00	0.045	0.030	0.75	8.00-12.0	18.00-20.0				485	170	40	201	92
	310	0.08	2.00	0.045	0.030	1.50	19.0-22.0	24.0-26.0				515	205	40	217	95
	316	0.08	2.00	0.045	0.030	0.75	10.0-14.0	16.0-18.0	2.00-3.00			515	205	40	217	95
	316L	0.03	2.00	0.045	0.030	0.75	10.0-14.0	16.0-18.0	2.00-3.00			485	170	40	217	95
	317L	0.03	2.00	0.045	0.030	0.75	11.0-15.0	18.0-20.0	3.00-4.00			515	205	40	217	95
	321	0.08	2.00	0.045	0.030	0.75	9.00-12.0	17.0-19.0			Ti-500<1.0 Cb+Ta-100<1.0	515	205	40	217	95
	347	0.08	2.00	0.045	0.030	0.75	9.00-13.0	17.0-19.0				515	205	40	201	92
A 367 Class1 Class2	2	0.05-0.21	0.55-0.80	0.035	0.040	0.15-0.40		0.50-0.80	0.45-0.60			Class 1 Class 2	Class 1 Class 2			
	5	0.15	0.30-0.60	0.04	0.030	0.050		4.00-6.00	0.45-0.65			380 486	230 310	22	max201HB	max92HRB
	7	0.15	0.30-0.60	0.030	0.030	1.00		6.00-8.00	0.45-0.65			415 515	205 310	18	max202HB	max92HRB
	9	0.15	0.30-0.60	0.030	0.030	1.00		8.00-10.0	0.90-1.10			415 515	205 310	18	max217HB	max95HRB
	11	0.04-0.17	0.40-0.65	0.035	0.04	0.50-0.80		1.00-1.50	0.45-0.65			415 515	240 310	22	max217HB	max95HRB
	12	0.04-0.17	0.40-0.65	0.035	0.04	0.15-0.40		0.80-1.15	0.45-0.60			380 450	230 275	22	max217HB	max95HRB
	21	0.04-0.17	0.30-0.60	0.035	0.035	0.50		2.75-3.25	0.90-1.10			415 515	205 310	18	max201HB	max92HRB
	22	0.05-0.17	0.30-0.60	0.035	0.035	0.50		2.00-2.50	0.90-1.10			415 515	205 310	18	max201HB	max92HRB
	55	0.22	0.90	0.035	0.04	0.15-0.40						380-515	205	27		
	60	0.27	0.90	0.035	0.04	0.15-0.40						415-550	220	25		
A 515	65	0.31	0.90	0.035	0.04	0.15-0.40						450-585	240	23		
	70	0.33	1.20	0.035	0.04	0.15-0.40						485-620	260	21		
	55	0.20	0.60-1.20	0.035	0.04	0.15-0.40						380-515	205	27		
	60	0.23	0.85-1.20	0.035	0.04	0.15-0.40						415-550	202	25		
	65	0.26	0.85-1.20	0.035	0.04	0.15-0.40						450-585	240	23		
A 516	70	0.28	0.85-1.20	0.035	0.04	0.15-0.40						485-620	260	21		
	Class 1	0.24	0.70-1.35	0.035	0.040	0.15-0.40		0.80 max	0.35 max			485-620	345	22		
A 537	Class 2	0.24	0.70-1.35	0.035	0.040	0.15-0.40		0.25 max	0.35 max			550-690	415	22		

Out side diameter of pipe complies with ISO recommendation R64

IS-2002-62 STEEL PLATES FOR BOILERS

Designation	c max	Si max	P max	S max	Tensile strength Mpa		Yield Strength Mpa		Elongation	
					Tensile strength Mpa	%min	Yield Strength Mpa	Test Piece	%min	Test Piece
IS 2002-1	0.18	0.10-0.35	0.040	0.040	362-442	26	540	5.65So	26	5.65So
IS 2002-2A	0.20	0.10-0.35	0.050	0.050	412-491	25	491	5.65So	25	5.65So
IS 2002-2B	0.22	0.10-0.35	0.050	0.050	510-608	20	491	5.65So	20	5.65So

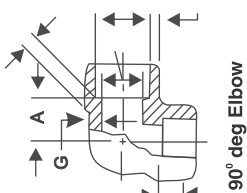
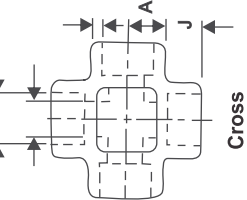
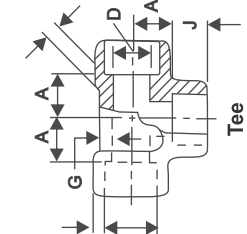
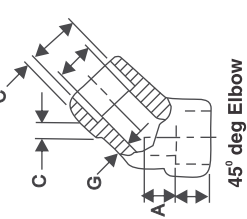
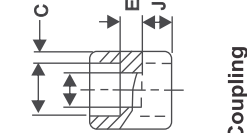
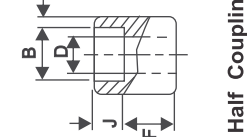
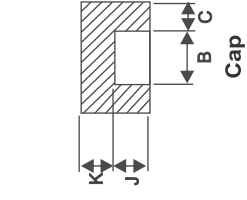
IS-2062-92 STEEL FOR GENERAL STRUCTURAL PURPOSES

Grade	Designation	% Chemical Composition					Tensile strength (N/mm ²)	Yield Strength (Min) Mpa	%EL in gauge length 5.65So	Bend Test	Stk test Piece Charpy V Notch Impact Energy Joule min
		C max	MN max	S max	P max	Si max					
A	FE410 WA	0.23	1.5	0.050	0.050	0.42	41.8	250	23	3t	-
B	FE410 WB	0.22	1.5	0.045	0.045	0.40	41.8	250	23	t<25mm	21 for 27 3t for t>25mm
C	FE410 WC	0.20	1.5	0.040	0.040	0.36	41.8	250	23	2t	27

Formula - Weight of Stainless Steel Sheets/Plates = Length (mm) x Width (mm) x Thickness (mm) x 7.86 = Kg./Sheet.



Dimensions of Socket-welding Fittings ANSI B 16.11

Nominal Pipe Size			Socket Bore Diameter B	Bore Fitting D [Note(1)]		Socket Wall Thickness, C [Note (2)]						Body wall G			Min. Depth of Socket J	Center to Bottom of Socket, A				Laying Lengths		Tolerances			End Wall Thickness K Min. Class Designation				
NB	INCH	Class Designation		Class Designation						Class Designation			Class Designation				Couplings E	Half Couplings F	A	E	F	3000	6000	9000					
		3000		6000	9000	Avg.	Min.	Avg.	Min.	3000	6000	9000	3000	6000		9000									90° Elbows, Tees & Crosses	45° Elbows,			
Avg. Min.																													
																													
																													
																													
																													
																													
																													
																													
6	1/8	11.2	7.6	4.8	...	3.18	3.18	3.96	3.43	...	...	2.41	3.15	...	9.5	11.0	11.0	...	8.0	8.0	...	6.5	16.0	1.0	1.5	1.0	4.8	6.4	...
8	1/4	14.6	10.0	7.1	...	3.78	3.30	4.60	4.01	...	...	3.02	3.68	...	9.5	11.0	13.5	...	8.0	8.0	...	6.5	16.0	1.0	1.5	1.0	4.8	6.4	...
10	3/8	18.0	13.3	9.9	...	4.01	3.50	5.03	4.37	...	...	3.20	4.01	...	9.5	13.5	15.5	...	8.0	11.0	...	6.5	17.5	1.5	3.0	1.5	4.8	6.4	...
15	1/2	22.2	16.6	12.5	7.2	4.67	4.09	5.97	5.18	9.35	8.18	3.73	4.78	7.47	9.5	15.5	19.5	25.5	11.0	12.5	15.5	9.5	22.5	1.5	3.0	1.5	6.4	7.9	11.2
20	3/4	27.6	21.7	16.3	11.8	4.90	4.27	6.96	6.04	9.78	8.56	3.91	5.56	7.82	12.5	19.0	22.5	28.5	13.0	14.0	19.0	9.5	24.0	1.5	3.0	1.5	6.4	7.9	12.7
25	1	34.3	27.4	21.5	16.0	5.69	4.98	7.92	6.93	11.38	9.96	4.55	6.35	9.09	12.5	22.5	27.0	32.0	14.0	17.5	20.5	12.5	28.5	2.0	4.0	2.0	9.6	11.2	14.2
32	1 1/4	43.1	35.8	30.2	23.5	6.07	5.28	7.92	6.93	12.14	10.62	4.85	6.35	9.70	12.5	27.0	32.0	35.0	17.5	20.5	22.5	12.5	30.0	2.0	4.0	2.0	9.6	11.2	14.2
40	1 1/2	49.2	41.6	34.7	28.7	6.35	5.54	8.92	7.80	12.70	11.12	5.08	7.14	10.15	12.5	32.0	38.0	38.0	20.5	25.5	25.5	12.5	32.0	2.0	4.0	2.0	11.2	12.7	15.7
50	2	61.7	53.3	43.6	38.9	6.93	6.04	10.92	9.50	13.84	12.12	5.54	8.74	11.07	16.0	38.0	41.0	54.0	25.5	28.5	28.5	19.0	41.0	2.0	4.0	2.0	12.7	15.7	19.0
65	2 1/2	74.4	64.2	...	...	8.76	7.67	...	...	...	...	7.01	...	...	16.0	41.0	...	...	28.5	...	...	19.0	43.0	2.5	5.0	2.5	15.7	19.0	...
80	3	90.3	79.4	...	...	9.52	8.30	...	...	...	...	7.62	...	...	16.0	57.0	...	...	32.0	...	...	19.0	44.5	2.5	5.0	2.5	19.0	22.4	...
100	4	115.7	103.8	...	...	10.69	9.35	...	...	...	...	8.56	...	...	19.0	66.5	...	...	41.0	...	...	19.0	48.0	2.5	5.0	2.5	22.4	28.4	...

(1) All Dimensions Are In Millimeters

(2) Upper and lower values for each size are the respective maximum and minimum dimensions.

(3) Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

**FORMULAE**

- 1) WEIGHT OF STAINLESS STEEL PIPES & TUBES (OD (mm) - W.T. (mm) X W.T. (mm) X 0.02466 = Kg. per Mtr.)
- 2) WEIGHT OF STAINLESS STEEL SHEETS (Length (mtr.) x Wdth (mtr.) X Thk (mm) X 8 = Kg Per Sheet)
- 3) WEIGHT OF STAINLESS STEEL CIRCLE & BLANKS (O.D. (mm) X O.D.> (mm) X Thk (mm) /160/1000 = Kg Per Pcs.)
- 4) WEIGHT OF STAINLESS STEEL ROUNDS (Dia. (mm) X Dia. (mm) X 0.00623 = Per Mtr.)
- 5) WEIGHT OF STAINLESS STEEL HEXAGONAL RODS (Dia. (mm) X Dia. (mm) X 0.00679 = Per Mtr.)
- 6) WEIGHT OF STAINLESS STEEL SQUARE BARS (Dia. (mm) X Dia. (mm) X 0.00787 = Kg Per Mtr.)
- 7) WEIGHT OF CARBON STEEL PIPES & TUBES (O.D. (mm) - W.T. (mm) X W.T. (mm) X 0.02466 = Kg. Per Mtr.)
- 8) WEIGHT OF CARBON STEEL SHEETS - PLATES (Length (mtr.) X Width (mtr.) X Thk (mm) X 7.85 = Kg. Per Sheet)
- 9) WEIGHT OF COPPER PIPES (O.D. (mm) - W.T. (mm) X W.T. (mm) X 0.0256 = Kg. Per Mtr.)
- 10) WEIGHT OF LEAD PIPES (approx.) (O.D. (mm) - W.T. (mm) X W.T. (mm) X 0.0345 = Per Mtr.)
- 11) WEIGHT OF LEAD SHEETS (approx.) (Length (mtr.) X Width (mtr.) X Thk (mm) X 11.2 = Kg. Per Sheet)
- 12) WEIGHT OF ALLUMINIUM PIPES (approx.) (O.D. (mm) - W.T. (mm) X W.T. (mm) X 0.0082 = Kg. Per Mtr.)
- 13) WEIGHT OF ALLUMINIUM SHEETS (approx.) Length (mtr.) X Width (mtr.) X Thk (mm) X 2.66 = Kg Per Sheet
- 14) MAKING OF PIPE FROM SHEET OR PLATE (OD - Thickness x 3.14 = Width of Sheet or Plate)

1 Feet = 0.3048 Meter / 304.8mm

1 Meter = 3.2808 Fit

1Inch = 25.4mm

1Puond = 6.544 (45359243 Kg)

Gauge	Inch	MM	Gauge	Inch	MM	Gauge	Inch	MM
0	0.324	8.229	14	0.080	2.032	28	0.0148	0.375
1	0.300	7.620	15	0.072	1.828	29	0.0136	0.345
2	0.276	7.010	16	0.064	1.625	30	0.0124	0.314
3	0.252	6.400	17	0.056	1.422	31	0.0116	0.294
4	0.232	5.892	18	0.048	1.219	32	0.0106	0.274
5	0.212	5.384	19	0.040	1.016	33	0.0100	0.254
6	0.192	4.876	20	0.036	0.914	34	0.0092	0.233
7	0.176	4.470	21	0.032	0.812	35	0.0084	0.213
8	0.160	4.064	22	0.028	0.711	36	0.0076	0.193
9	0.144	3.657	23	0.024	0.609	37	0.0068	0.172
10	0.128	3.151	24	0.022	0.558	38	0.0060	0.152
11	0.116	2.946	25	0.020	0.508	39	0.0052	0.132
12	0.104	2.641	26	0.018	0.457	40	0.0048	0.121
13	0.092	2.336	27	0.0164	0.416	41	0.0044	0.111

APPLICATION INDUSTRIES

- PHARMACY INDUSTRIES
- FOOD INDUSTRIES
- CHEMICAL & FERTILIZERS
- CEMENT INDUSTRIES
- AUTOMOBILE INDUSTRIES
- MARINE INDUSTRIES
- CONSTRUCTION



- REFINERY PLANTS
- OIL & GAS INDUSTRIES
- BEVERAGE INDUSTRIES
- ENGINEERING



Third Party Inspection



DET NORSKE VERITAS



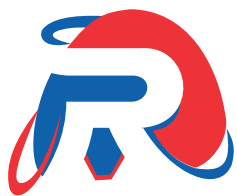
BUREAU VERITAS



Nuclear Power Corp. of India Ltd.



TATA Project



RATNAMIK METAL (INDIA)

STOCKISTS & SUPPLIERS OF : Stainless Steel, Pipe & Pipe Fitting, Plate, Sheet, Coil, 304, 304L, 316, 316L, 310, 321, 317, 317L, etc.

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