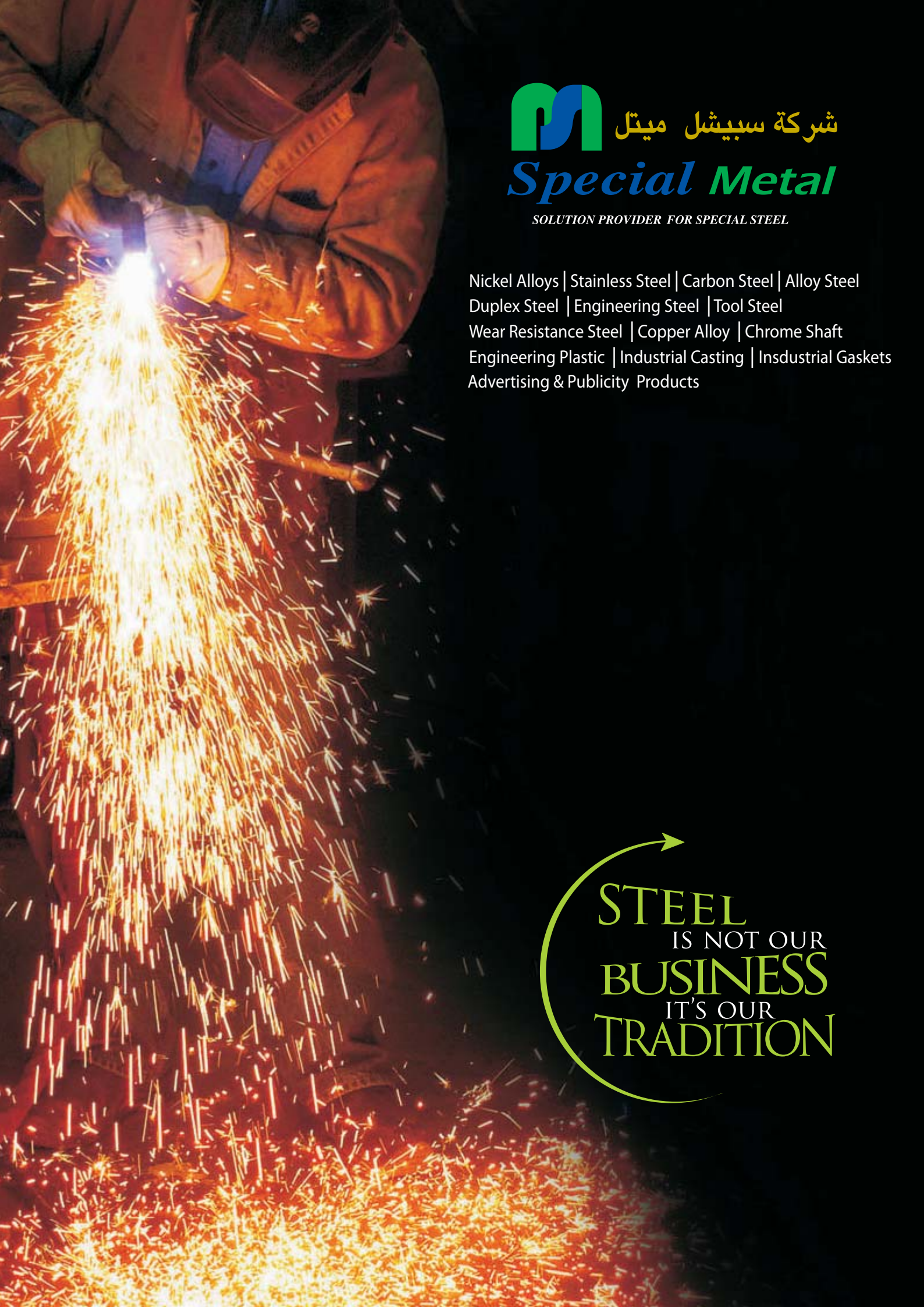


شركة سبيشل ميتل

Special Metal

SOLUTION PROVIDER FOR SPECIAL STEEL

Nickel Alloys | Stainless Steel | Carbon Steel | Alloy Steel
Duplex Steel | Engineering Steel | Tool Steel
Wear Resistance Steel | Copper Alloy | Chrome Shaft
Engineering Plastic | Industrial Casting | Insdustrial Gaskets
Advertising & Publicity Products

STEEL
IS NOT OUR
BUSINESS
IT'S OUR
TRADITION

Wouldn't you trust a supplier who has painstakingly mastered the Art of Customer Service by

Having a **vision** for big **enterprise**

An attitude to go that extra mile to **deliver** on **demand**

Challenges or threats always welcoming with **open arms**

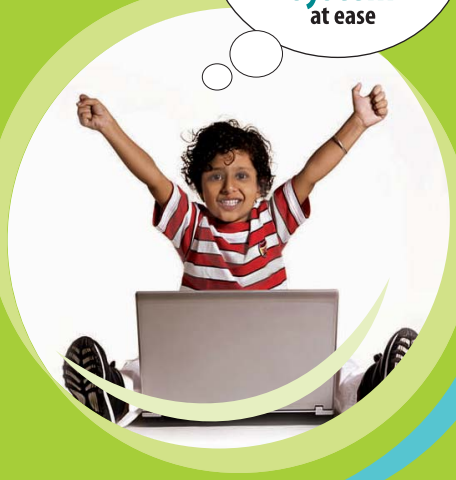
An eagles eye for **perfection** & **quality**

Though old school thought but listen to **customers requirement**

شركة سبيشل ميتل

Special Metal

supply chain or order processing having an **IT enabled system** at ease



Passsion for excellence and meeting **customer expectations** at any cost

Having sound financial cover against **global turmoil**

---and a casual & flexible approach in dealing without loosing the seriousness of **committments**

شركة سبيشل ميتل
Special Metal

Profile:-
Partners in progress

Introduction Letter

Special Metal, prides itself as one of the leaders in supplying of Stainless steel and Alloy Steel product. With 15 years of market experience and in-depth understanding of the product and the industry, we can cater all your requirement of Stainless Steel and Alloy Steel Products. Quick responses to inquires and rapid delivery of small quantities of hard-to-find materials are our specialty.

We have become the most dependable and reliable source for many of the Middle East leading Manufacturing, Engineering, Fabrication, Decoration and Shop Fittings Companies. Industries we serve are Rolling Mills, Atomizing Plant, Smelters, Fertilizing plant, Oil and Gas Industries, Electricity and Water, Food and Beverage Industries, Acid and Chemical industries and Interior Decoration.

Products we deal in are Stainless Steel, Duplex Steel, Engineering Steel, Engineering Plastic, Brass, Bronze, Copper, Aluminum, Carbon Steel, Tool Steel, Wear Resistance Steel, Nickel Products, Inconel, Monel, Titanium, Hastelloy and Copper Nickel in forms of Flat Products, Long Products, Tubular Products, Fittings and Fasteners.

Apart from supplying wide range of material, we also provide value added services to our customer such as Water-jet cutting, Casting, machining, drilling, Plasma Cutting, Shearing, Bending, at a very economical cost.

Our customer focused strategy, together with our global network of trading partners, ensures a fully integrated, comprehensive and efficient service from a single contact point.

شركة سبيشل ميتل
Special Metal

Quality Policy

Yet another confirmation of our competence and Quality complaince

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 ensuring 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 continuously improving our quality to serve our clients better.

We provide Relevant Chemical & Physical Analysis Certificate along with the supply of Materials, according with the International standards.

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.

Additional testing & Services provided

Destructive & Non-destructive tests like
Chemical Analysis
Mechanical Testing
Hydro testing
Eddy current
PMI
Spectro Analysis etc.

شركة سبيشل ميتل
Special Metal

Our Marque Clients Say it all

Third Party Inpection

DET NORSKE VERITAS

NPCIL
Nuclear Power Corp. of India Ltd.

TÜV INDIA

PDIL

SGS

Toyo Engineering India Ltd.

HEG Ltd.

UHDE
Uhde India Ltd.

Lloyd's Register

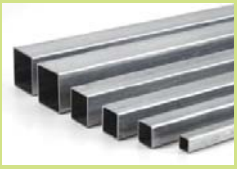
TATA
TATA Project

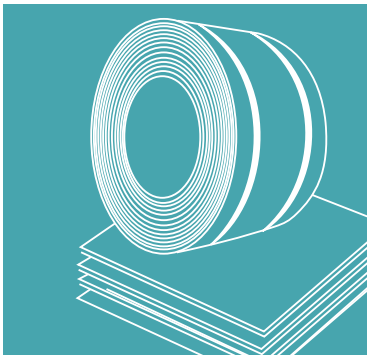
شركة سبيشل ميتل
Special Metal

POLISH TUBE, SHEET & COIL

We are one of the leading stainless steel pipe and sheet suppliers in this field, and we are also the agents of many well-known mills respectively in the world. The products include 304 / 304L / 201 / 202 / 321 / 316 / 316L / 430 / 409 / 409L / 443...etc. with available types of finish as NO.1 / 2B / BA / NO.8 / NO.3 / NO.4 / Hair Line / SB finish. Our stainless steel sheet and pipe products become more sophisticated because of specialized and professional manufacturing technique.

Special Metal is a professional supply welded pipes, round, square, rectangular tubes and the related products which have been applied extensively in fields of petrochemical, ornament, mechanical , structural purpose, food sanitary and so on. Our stainless steel sheet quality implemented with conformity by international standards, such as ASTM, AI JIS, CNS, GB as well as customers ' other requests.






NICKEL 200
NICKEL 201
INCONEL 601
INCONEL 800
INCONEL 718
MONEL alloys K-500
MONEL alloy 400
Hastelloy C276
Hastelloy C22
INCONEL alloy 600
INCONEL alloy 625
CAST MONEL alloys
Titanium
INCONEL 825
904 L
Alloy 20
CuproNickel
شركة سبيشل ميتل
Special Metal

NICKEL 200

Commercially pure (99.6%) wrought nickel with good mechanical properties and resistance to a range of corrosive media. Good thermal, electrical and magnetostrictive properties. Used for variety of processing equipment, particularly to maintain product purity in handling foods, synthetic fibers and alkalies. Standard product forms are round, flats, pipe, tube, plate, forging stock, strip and wire.

Limiting Chemical Composition %

Ni[a].....99.2 min	Mn.....0.35 min	S.....0.01 max
Cu.....0.25 min	C .....0.15 min	
Fe.....0.40 max	Fe.....0.35 max	

UNS N02200 BS 3072-3076 (Na11) ASTM B 160 B 163
B 725 B730 ASME SB. 160-SB. 163,
Boiler Code Sections III, VIII, IX

Specifications and Designations

DIN 17740, 17750-17754
Werkstoff Nr. 2.4060
2.4066

NICKEL 201

Commercially pure (99.6%) wrought nickel essentially the same as Nickel 200 but with a lower carbon content to prevent embrittlement by intergranular carbon temperatures over 600 oF (3015oC). Lower carbon content also reduces hardness Nickel 201 particularly suitable for cold-formed items. Standard product forms are round, flats, pipe, tube, plate, sheet, forging stock, strip and wire.

Limiting Chemical Composition %

Ni[a]..... 99.0 min	Mn..... 0.35 max	S.....0.01 max
Cu.....0.25 max	C .....0.02 max	
Fe..... 0.40 max	Fe.....0.35 max	

UNS N02201 BS 3072-3076 (Na12) ASTM B 160 B 163 B 725,
B730 ASME SB. 160-SB. 163, Boiler Code Sections III, VIII, IX

Specifications and Designations

SAE AMS 5553
DIN 17740, 17750-17754
Werkstoff Nr. 2.4061, 2.4068
VdTüV 345

MONEL 400

A nickel-copper alloy with high strength and excellent corrosion resistance in a range of media including sea water hydrofluoric, chemical and hydrocarbon processing equipment, valves, pumps, shafts, fitting, fasteners and heat exchangers. Standard product forms are round, hexagon, flats, forging stock, pipe, tube, plate, sheet, strip and wire.

Limiting Chemical Composition, %

Ni[a]..... 63.0 min	Mn ..... 2.0 max	Si ..... 0.5 max
Cu 28.0-34.0	C ..... 0.3 max	
Al ..... 2.5 max	S ..... 0.024 max	

UNS NO4400 MIL-T-1368,
BS 3072-3076 (NA 13)
ASTM B Boiler Code Section III, IV, VIII, IX
NACE MR-01-75

Specifications and Designations

MONEL IS REGISTERED TRADEMARK OF SPECIAL METAL LTD.

MIL-T-23520
Werkstoff Nr. 2.4360, 2.4361
QQ-N-281

MONEL K-500

Corrislon-hardenable nickel-copper alloy that combines on resistance of Monel alloy 400 with greater hardness. It also has low permeability and is to under -1 5PF (-101 T).Us ed for pump shah, and value instruments, doctor blades and scrapers, trim, fasteners, and marine propeller shafts. Product forms are round, hexagon, flats, forging tube, plate, sheet, strip and wire.

Limiting Chemical Composition, %

Ni[a]. .....63.0 min	Ti 0.35-0.85	Mn .....1.5 max
Cu 27.0-33.0	Fe ..... 2.0 max	S .....0.01 max
AL..... 2.30-3.15	C .....0.25 max	Si .....0.5 max

MONEL ALLOY K-500
BS 3072-3076 (NA 13)
ASTM B Boiler Code Section VIII
NACE MR-01-75

Specifications and Designations

MIL-N-24549 DIN 17743,
17752, 17752
WERKSTOFF NR. 2.4375
QQ-N-286

Alloy - 904L

904L is a non-stabilised lowcarbon high alloy austenitic stainless steel, The addition of copper to this grade gives greatly improved resistance to strong reducing acids. particularly sulphuric acid. It is also highly resistant to chloride attack-both pitting / crevice corrosion and stress corrosion and stress corrosion cracking.

Limiting Chemical Composition %

Ni.....23.0-28.0
Mo.....4.00-5.00
Cr.....19.0-23.0
P 0.045
C.....0.020 max
Mn.....2.0 max
Cu.....1.0-2.0
S.....0.035 max
Si.....1.00 max
C.....0.020

Alloy - 20

Alloys 20 is one of the so-called "super" stainless steels that was designed for maximum resistance to acid attack, It's nickel, chromium, molybdenum and copper content contribute to its overall resistance to chloride on stress corrosion cracking and general pitting attack. The alloy is stabilized with columbium to minimize carbide precipitation during welding. It has good mechanical properties and can be fabricated with comparative ease. Although the alloy was designed for use in sulfuric acids related industries, it finds wide usage throughout the chemical processing industry. It also is used in sulfuric acid related industries, it finds wide usage throughout the chemical processing industry. It also is used for processing pharmaceuticals, food, gasoline, solvents, plastics, explosives, synthetic fibres and many other products.

Limiting Chemical Composition %

Ni.....32-38.0
Mo.....2.00-3.00
Cr.....19.0-21.0
p.....0.045 max
C.....0.07 max
Mn.....2.0 max
Cu.....3.0 - 4.0
Fe.....Bal
S.....0.035 max
SI.....1.00 max
Cb.....1.00 max

TITANIUM

TITANIUM GRADE 1

Grade 1 has very good weld ability. Being substantially single-phase material, the micro structure of the alpha phase is not affected greatly by thermal treatments or welding temperatures. Therefore, themechanical properties of a correctly welded joint are equal to, or exceed those of the parent metal and show good ductility.

TITANIUM GRADE 2

Grade 2 has very good weld ability. Being substantially single phase material, the micro structure of the alpha phase is not affected greatly by thermal treatments or welding temperatures. Therefore, the mechanical properties of a correctly welded joint are equal to, or exceed those of the parent metal and show good ductility.

Compressor blades, discs and rings for jet engines, aircraft components, pressure vessels, rocket engine cases, offshore pressure vessels.

TITANIUM GRADE 5

Since the two-phase micro ctructure of alpha-beta titanium alloys responds to thermal treatment, the temperatures encountered during the welding cycle can affect the material being welded.

CUPRO - NICKEL (90 /10)

Widely used in condensers, coolers and heat exchangers, where corrosion resistance and erosion is paramount, yet maintaining a high conductivity rate. To be used preferably in marine conditions, forms a protective film which is multi layered in flowing sea water. Resist marine bifouling cooling water speed 2.5m/s working temperature approx. 250 deg.C

Ni.....10
Fe.....1
Mn.....
Cn.....102
Mn.....2.0 max

CUPRO - NICKEL (70 /30)

Improved corrosion resistance and almost insensitive to stress corrosion, this alloy will give superior result in high velocity polluted water including sea water. A reduced thermal conductivity level but will retain at moderately increases temperatures

Ni..... 29 - 32
Fe..... 0.5 - 1.5
Mn..... 0.4 - 1
Cu..... Remaining

We are Specialist Suppliers of HIGH NICKEL ALLOYS

NICKEL 200

NICKEL 201

Hastelloy C276

Inconel 601

Inconel alloy 718

INCONEL 601

INCONEL 800

MONEL alloys K-500

MONEL 400

Hastelloy C22

904 L

INCONEL 600

INCONEL 625

CAST MONEL

INCONEL 825

Alloy 20

Titanium

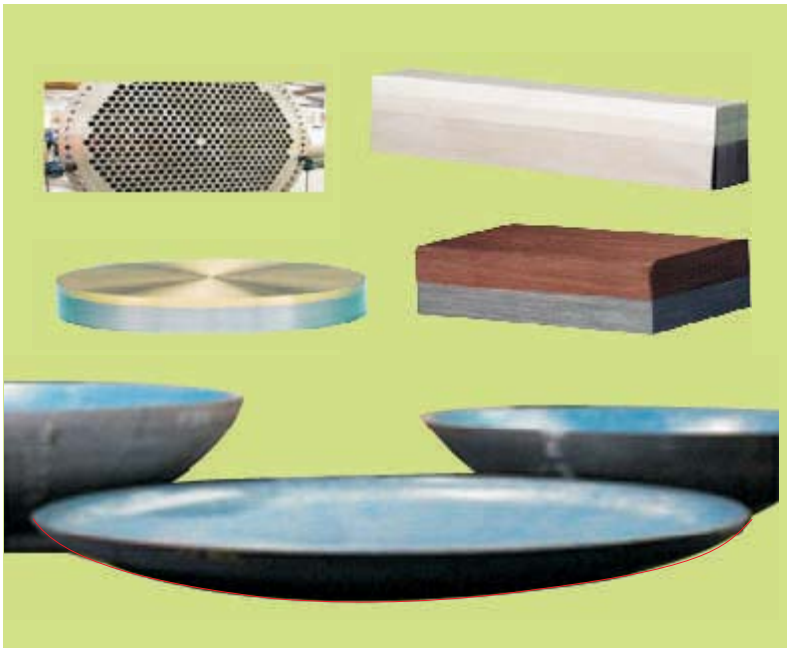
CuproNickel

Cladded Plates

Explosion cladding is a process wherein a cladding plate is positioned over the backer plate with a small gap. Specially made explosives are spread on top of the cladding plate. On detonation the cladding plate is accelerated towards the backer plate and collides with it at a high velocity. This collision takes place progressively from one end of the plate to the other in microseconds.

This acceleration causes a unique phenomenon of progressive turbulence at the interface and removes the contaminating surface films like oxides and gases, creating a strong metallurgical bond at the collision point of the two surfaces.

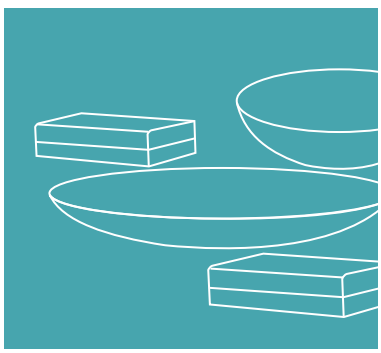
The thickness of explosive layer, its propagation characteristics as well as stand off distance and the collision angles are carefully controlled to produce uniform and strong metallurgical bonding all over the plate. It is basically a solid-state pressure bonding process.



Clad Layer	Stainless Steel, Duplex, Titanium, Zirconium, Tantalum, Al-Bronze, Nickel, Nickel Alloys, Aluminium, Copper, Copper Alloys
Base Material	Carbon Steel, Stainless Steel, Alloy Steel, Copper, Aluminium

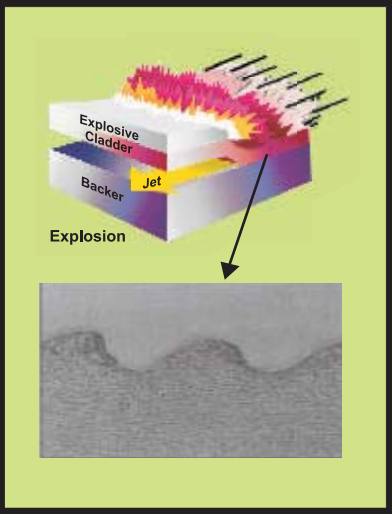
Cladding on both sides of a backer metal with the same/different cladding metal is possible. Even multilayered clad composites are possible.

Certain **NEON ALLOYS** clad products can be further rolled/extruded into thinner gauges and can be considered when technically feasible and quantities are adequate.



Cladding Process

Fig : (Copper +Al) clad transition joints in Zinc Smelters :-
EXPLOSION CLAD STRUCTURAL TRANSITION JOINTS



A major area of application of explosion bonded transition joints is in structures consisting of dissimilar metals, Structural transition joints may be either flat or tubular jointsA for effecting permanent, strong, crevice-free and leak proof metallurgical weld between dissimilar metals and alloys.

In case your requirement does not fit into the above range, we can, together, find a solution, Please do not hesitate to contact us.

The different areas of applications and most standard products offered are as below :

Clad plates over the years have become the favoured material of construction for equipment with most designers and fabricators., Clad plates offer a cost effective solution even for the most demanding applications.

ADVANTAGES OF CLAD PRODUCTS : -

1. Guaranteed strong Metallurgical bonds
2. Wide range of metal combinations
3. Economic use of scarce and dearer metals
4. Wide range of sizes and composite thickness
5. Custom made products
6. Adoption of conventional fabrication procedures
7. Extremely low electrical metal properties
8. Retention of individual metal properties
9. Good heat transfer
10. Short processing times

Product and its uses : CLAD PLATES manufactured by Explosion Cladding Process For FABRICATION OF PROCESS EQUIPMENT :

SHIP BUILDING & SHIP REPAIR YARDS

Fig. (Al+Steel) clad structural transition joints used in ship building industry

Fig. (Al+Titanium+Steel) clad transition joints used in Aluminum Smelters

Fig. (CS+SS304L) Clad dish ends

Fig. (CS+Naval Brass) Clad tube sheet

Fig. (CS+HASTELLOYS C-22) Clad tube sheet duly drilled

EXPLOSION CLAD ELECTRICAL TRANSITION JOINTS APPLICATIONS :

electrical transition joints are widely used in the electrochemical industries like chlor-alkali and electrometallurgical industries such as Aluminium Smelters, Zinc electrolysis apart from electrical contacts.

QUALITY ASSURANCE We at NEON ALLOYS are committed to excellent quality and customer service. We have a well established Quality assurance system in place where a documented procedure is adopted. Furthermore our clad plates have met the ASME/ASTM requirements and been certified by all reputed inspection agencies.

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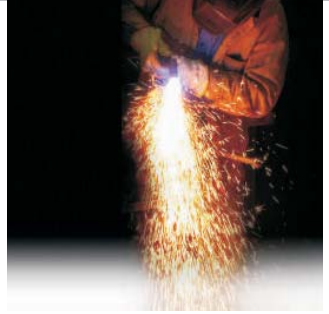
Special Metal



Pipes & Tubes

Pipes/tubes

Nickel Alloy

ASTM / ASME SB 163 UNS 2200 (NICKEL 200)

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)

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 C 276)

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, 316TI, 316H, 321, 321H, 347, 347H.

Duplex Steel

ASTM / ASME SA 790 UNS NO: 31803 / 32760

Carbon Steel

ASTM / ASME A 53 GR. A & B, ASTM A 106 GR. A, B & C. API 5L GR. B, API 5L X 42,

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) IBR & NON-IBR

Nickel & Copper Alloy Pipes

Adopting the highest industry standards, we manufacture finest range of nickel and copper alloy pipes. These pipes are fabricated from qualitative raw material as per global demand and ensures accurate precision. Available in wide range of technical specifications, our comprehensive range is highly acknowledged in Indian as well as overseas market for their attributes of high strength, excellent finish, and complete reliability in services.

Stainless & Duplex Steel Pipes

Leveraging on our finest manufacturing unit and experienced work force, our company offers stainless and duplex steel pipes. High quality pipes are stainless because of a protective layer on their surfaces which reduces the rate of corrosion to almost negligible levels. Available in different grades and dimensions, these stainless steel and duplex steel pipes are widely used in various industries such as construction, cement, petrochemical and more.

Carbon & Alloy Steel Pipes

We are one of the most trusted manufacturers for offering finest range of Carbon and Alloy Steel pipes. Used in different industries for diverse applications, these pipes can be availed in standard as well as customized dimensions as per the requirement of the clients. These pipes are appreciated for their sturdy and precise construction. We are known for offering our product range at reasonable prices and delivering consignment within given time frame.

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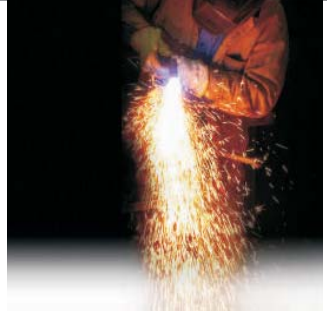
Special Metal



Sheet/Plates/Coils

شركة سبيشل ميتل
Special Metal

Sheet/Plates/Coils

We have been offering to our clients a vast range of Sheets and Coils, that are offered in various specifications to our clients. Catering to the requirements of various industries, our range is known for its corrosion resistance, durability & high tensile strength.

Our clients can avail from us Plates that are manufactured using high grade stainless steel. These cater to the requirements of various industries and are known for their attributes, such as high tensile strength, corrosion resistance & long life usage. Further, we also have the expertise to customize our range as per the requirements of the clients.

- **Carbon Steel / Alloy Steel / Nickel Alloys**
- **Stainless Steel / Sheets / Coil / Plates / Strips**

Nickel Alloy

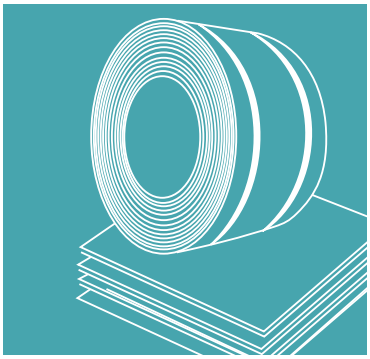
ASTM / ASME SB 163 UNS 2200 (NICKEL 200)
ASTM / ASME SB 163 UNS 2201 (NICKEL 201)
ASTM / ASME SB 163 / 165 UNS 4400 (MONEL 400)
ASTM / ASME SB 464 UNS 8020 (ALLOY 20 / 20 CB 3)
ASTM / ASME SB 704/705 UNS 8825 INCONEL (825)
ASTM / ASME SB 167 / 517 UNS 6600 (INCONEL 600)
ASTM / ASME SB 167 UNS 6601 (INCONEL 601)
ASTM / ASME SB 704 /705 UNS 6625 (INCONEL 625)
ASTM / ASME SB 619/622/626 UNS 10276 (HASTELLOY C 276)

Stainless Steel: Plates as per ASTM A240, Gr. TP 304,304L, 304LN, 309, 309S, 309H, 310H, 316, 316L, 316H, 316LN, 316Ti, 317, 317L, 321, 321H, 347, 347H, 409, 410, 420, 430 etc

.**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

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.

Range: 0.5 mm To 200 mm thick in 1000 mm To 3000 mm width & 2500 mm to 12500 mm length available with NACE MR 01-75



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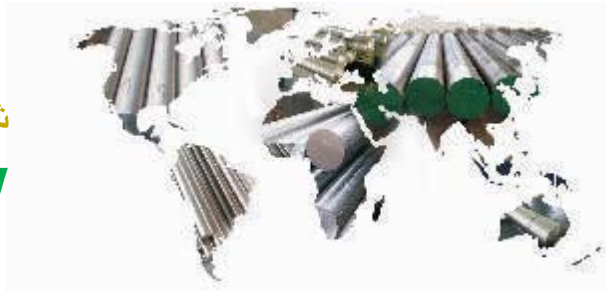
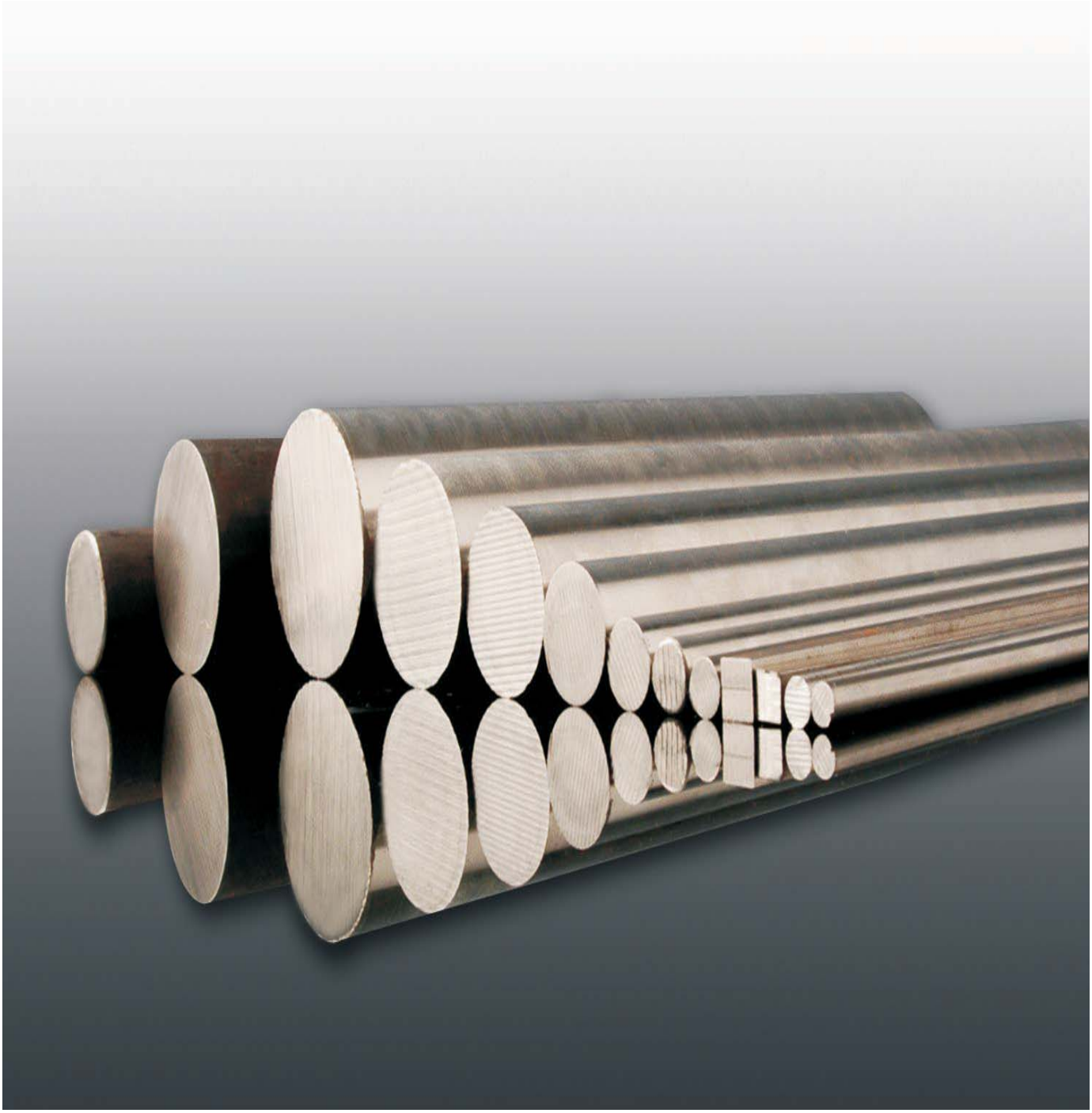


Rods/Bars



Rods/Bars

We are offering to our clients a wide range of Round Bars that are available in varied grades of stainless steel, carbon steel, nickel alloys and alloy steel. Our Round Bars have great utility as machinery equipment in various industries and for diverse architectural purposes. These round bars feature superior polish, excellent finish, sturdy construction and high tolerance level.

- **Nickel & Copper Alloy**
- **Stainless & Duplex Steel**
- **Carbon & Alloy Steel**

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

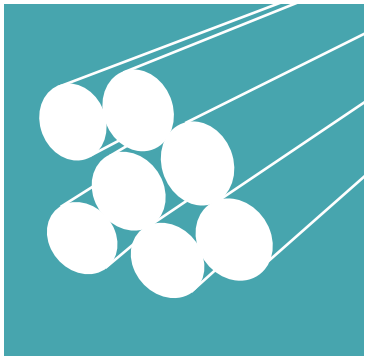
Material Grade : Stainless Steel, Nickel Alloys, Carbon Steel, Alloy Steel.

Stainless Steel: Plates as per ASTM A240, Gr. TP 304,304L, 304LN, 309, 309S, 309H, 310H, 316, 316L, 316H, 316LN, 316Ti, 317, 317L, 321, 321H, 347, 347H, 409, 410, 420, 430 etc

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

Alloy Steel : 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.

Types: Round / Square / Hexagonal / Rectangular



شركة سبيشل ميتل
Special Metal
o.)

Flanges

Flanges

We are engaged in importing and supplying a wide range of Flanges that are available in variables sizes for different applications in waterworks, petrochemicals, refineries, chemical industry and construction works. Owing to its high quality, optimum performance, less maintenance, our range of flanges is appreciated by our clients and is available in various material configurations stainless steel, carbon steel, alloy steel, nickel alloys and copper alloys. Based on the sizes, dimensions, shapes and length of these flanges, we can customize the products for our respected clients and following material of Construction.

- **Nickel & Copper Alloy**
- **Stainless & Duplex Steel**
- **Carbon & Alloy Steel**
- **Carbon Steel / Low Temperature**
- **Alloy Steel**

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

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

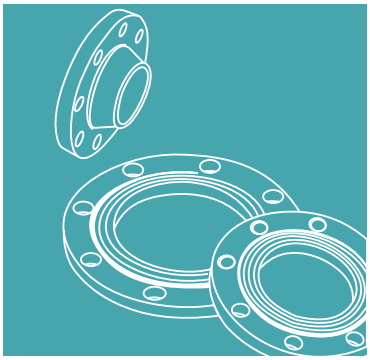
Stainless Steel: ASTM A182 F304/ 304L/ 304H/ 316/ 316L/ 317/ 317L/ 321/ 310/ 347/ 904Letc.

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.

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

Size: 1/2” NB TO 24” NB.
Class: 150#, 300#, 600#, 900#, 1500# & 2500#.



شركة سبيشل ميتل
Special Metal
o.)

Buttweld Fittings

شركة سبيشل ميتل
Special Metal
o.)

Buttweld Fittings

We are engaged in importing and supplying of a wide range of Butt Weld Fitting that is available in varied types & grades sourced from reliable vendors, these fittings are highly acknowledged for their high tensile strength, durability and accurate alloy composition. These find application in several industries such oil & gas, automobile, acid & chemical, pharmaceutical and cement industries. We are known for our butt weld fittings.

Type of Buttweld fittings:

- **Tee**
- **Elbow**
- **Reducing Tee**
- **Coupling**
- **Long & Short Stub Bend**
- **Reducer**
- **Return Bends**
- **Plug & Union**
- **Cap**
- **Collar**
- **Cross, etc.**

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

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

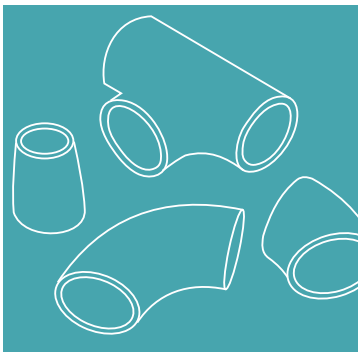
Carbon Steel : ASTM A234 WPB/A420 WPL3/A420 WPL6/ MSS-SP-75 WPHY 42/46/52 /56/60/65/70/A53GR. B/A106 GR.B / ASM 192 / A179 etc.

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

Others : Monel, Nickel, Inconel, Hastelloy, 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.



شركة سبيشل ميتل
Special Metal
o.)

Socketweld

شركة سبيشل ميتل
Special Metal
o.)

Socketweld

We offer to our clients specially designed forged pipe fittings. We also undertake new projects as per the drawings and specifications of the client for forged fittings. The product is delivered in a short time frame. We offer special forged pipes fittings in different metals which find application in various industries. We can offer forged fittings in following materials of construction:-

- **Nickel & Copper Alloy**
- **Stainless Steel**
- **Carbon Steel**
- **Alloy Steel**

High Nickel Alloy : Monel, Nickel, Inconel, Hastelloy, 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

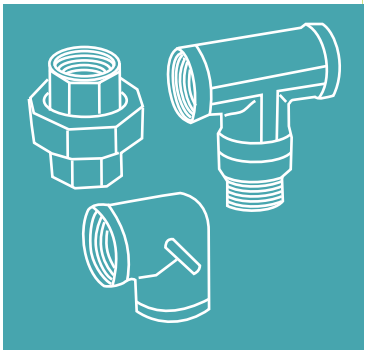
Alloy Steel : ASTM A182 F1/ F5/ F9/ F11/ F22/F91 etc.

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#



شركة سبيشل ميتل
Special Metal
o.)

Fasteners

Fasteners

We hold expertise in offering fasteners, such as nuts, bolts, washers, anchor & fasteners, stud bolts, Threaded Rod to our clients. These are manufactured utilizing high grade, such as Stainless Steel, Carbon Steel, duplex steel, monel, inconel, hastelloy, titanium and nickel alloy, which Alloy Steel assure their high tensile strength and corrosion resistance. Our range finds applications in numerous industries and is offered in sizes ranging from M4 TO M100, length up to 5 meters as per the client's requirements.

Salient features:

- Severe vibration under impulse pressure
- Static pressure
- High tolerance
- Dimensional preciseness
- Corrosion resistance
- Perfect installation & application
- Long service life
- Study construction
- Fast performance

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

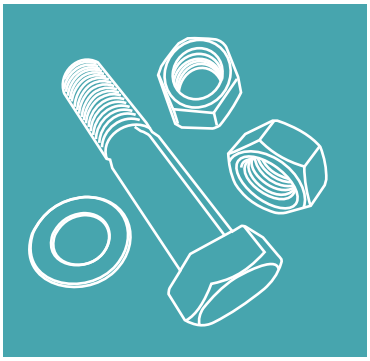
Stainless Steel: AISI 302, 304, 304L, 316, 316L, 310, 317, 317L, 321, 347, 410, 420,904L etc.

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

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

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

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



شركة سبيشل ميتل
Special Metal
o.)

Ferrule/Dairy Fittings

شركة سبيشل ميتل
Special Metal

Ferrule / Dairy Fittings

We are engaged in importing and supplying a wide range of **Ferrule Fittings** that is available in different grades and specifications. These are sourced from authentic vendors, who make use latest technology and quality raw material in the production process of forged pipe fittings to make these in accordance with industry standards. Featuring dimensional accuracy, high tensile strength, and corrosion resistance, these pipe fittings can be easily fitted in the pipe. These fittings are extensively used in diverse industries such as Oil & Gas, Cement, Fertilizers and Petrochemicals. We are known for our Ferrule Fittings etc.

Material Grade : Stainless Steel, Nickel Alloys, Carbon Steel, Alloy Steel, Monel, Nickel, Inconel, Hastelloy, Copper, Brass, Bronze, Titanium, Tantalum, Bimuth, Aluminium, High Speed Steel, Zinc, Lead, Etc.

Types : Nipples, Adaptors, Crosses, Union Ball Joints, Reducing Bushing, Reducers, Pipe Caps, Couplings, Pipe Plug, Hollow Hex Plug, Elbow, Reducing Union, 90 Deg. Union Elbow, Reducing 90 Deg. Union Elbow Etc. Extender Leg 90 Deg. Union Elbow, 45 Deg. Union Elbow, Union Tee, Female Connector, Male Connector, Manifold Tee, Locator Union, Extended Run Leg Union Tee, Reducing Tee, Tribow, ATW Weld Ring, Tube Socket weld To Pipe Butt Weld, Tube Butt Weld To Tube Socket Weld, Port Connector, Etc. Also as per the National & International Standard.

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

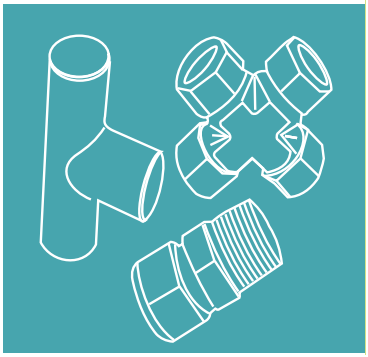
This line consists of Tri-Clover parts with either Tri-Weld ends suitable for use with orbital welding equipment or self-aligning Tri-clamp end connections.

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

Finish : Mechanical Polish as well as Electropolish finishes.

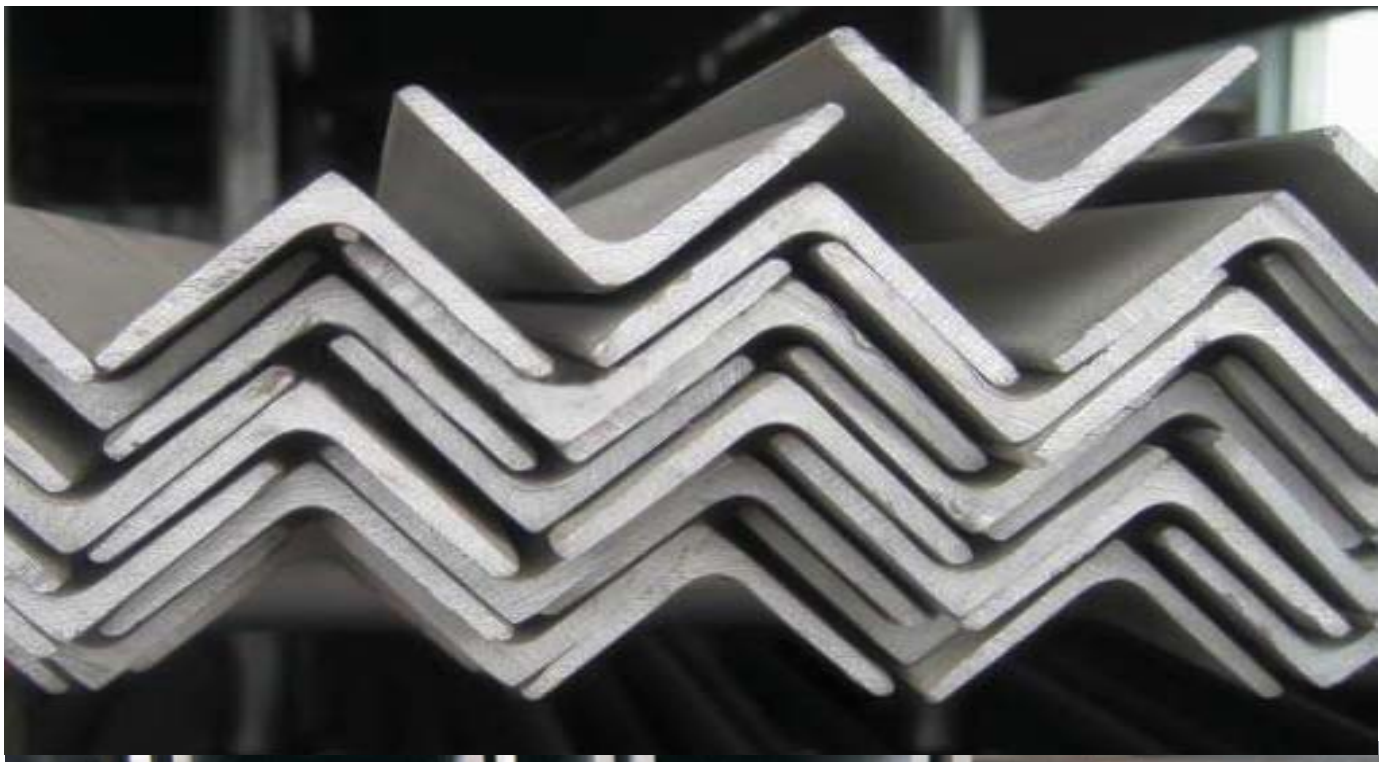
Types: Seamless & Welded

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



شركة سبيشل ميتل
Special Metal

Angle/Channel



شركة سبيشل ميتل
Special Metal

Angle/Channel

● **Mild Steel H Beam** ● **Mild Steel I Beam**

The Mild Steel Beams, which we offer, are extensively used for construction purposes for making steel-frames for buildings and bridges. MS Beams exported by us are highly durable and have high tensile strength. We are one of the most reliable M S Beams Suppliers. Our MS Beams are available in 2 types- Mild Steel H Beam (available from 100mm to 1040mm) and Mild Steel I Beam (available from 100mm to 400mm).

● **U-Channels** ● **C-Channels**

We are engaged in exporting of Mild Steel Channel, which is widely used as structural support in construction works. Available in different sizes and shapes, the MS Channels are procured from reliable sources, which use high grade steel that adds anti-corrosion properties and high tensile strength to the finished range. We are rated among the leading M S Channels Exporters and Mild Steel U Channels Suppliers.

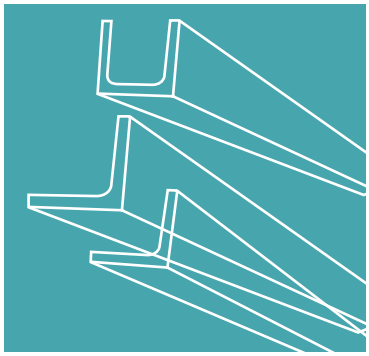
● **Equal Angle** ● **Unequal Angle**

One of the most commonly used Steel Products in construction is M S Angles and we specialize in supplying Wholesale Mild Steel Angles. We Supply Equal Angles, Unequal Angles and T Angles which are available in different thickness and dimensions. Our MS Angles are galvanized to make them corrosion resistant. We are among the topmost Galvanized Mild Steel Angles Suppliers in India.

Technical Specifications :-

Dimension And Properties As Per ISI Specification IS: 2062-1999

Designation	Depth of Section	Width of - Flange	Thickness of - Web	Weight / Mtr	Sectional - Area	Moduli of - Section	
	H	b	t	w	a	Zxx	Zyy
	(mm)	(mm)	(mm)	(Kg)	(cm2)	(cm2)	(cm2)
ISMC 75	75	40	4.8	7.1	9.1	20.3	4.7
ISBC 100	100	50	5.0	9.6	12.2	37.3	7.5
ISMC 125	125	65	5.3	13.1	16.7	68.0	13.5
ISMC 150	150	75	5.7	16.8	21.3	105.0	19.4
ISMC 175	175	75	6.0	19.6	24.4	139.8	22.8
ISMC 200	200	75	6.2	22.3	28.5	181.0	26.4
ISMC 250	250	80	7.2	30.6	39.0	307.0	36.4
ISMC 300	300	90	7.8	36.3	46.3	428.0	47.1
ISMC 400	400	100	8.8	50.1	63.8	760.0	67.0



شركة سبيشل ميتل
Special Metal

Valves

شركة سبيشل ميتل
Special Metal

Valves

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 FLANGED	:	SCREWED /	SIZE	:	40 MM TO 300 MM
SIZE	:	15 MM TO 300 MM	DESIGN BOX)	:	T - TYPE (DIRT
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)
RATING : 150# / 300#
SIZE : 8 MM TO 100 MM

FORGED C. STEEL / S. STEEL
RATING : 150# / 300# / 800# / 1500#
SIZE : 15 MM TO 50 MM

CAST IRON
RATING : 125# / 150#
SIZE : 25 MM TO 600 MM

CAST C. S. / S. S. / A. S.
RATING : 150# / 300# / 600# / 900#
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
Mfg. STD : BS 3155 / AWWA C 504 / API 609 / IS 13095
TEST STD. : BS 5155 / BS 6755

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

CAST IRON
DESIGN : SURESEAL / REPLACEABLE / RUBBER LINING
ENDS : WATER TYPE
SIZE : 40 MM TO 300 MM

STAINLESS STEEL
DESIGN : OFFSET DISC
OPERATION : LEVERMANUAL GEAR / MOTORISED GEAR
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)
RATING : 150# / 300#
SIZE : 8 MM TO 100 MM

FORGED C. STEEL / S. STEEL
RATING : 150# / 300# / 800# / 1500#
SIZE : 15 MM TO 50 MM

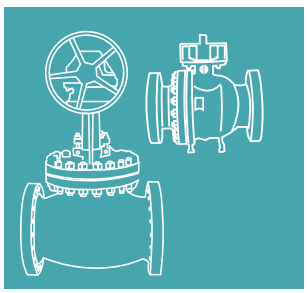
CAST IRON
RATING : 125# / 150#
SIZE : 25 MM TO 400 MM

CAST C.S. / S. S. / A.S.
RATING : 150# / 300# / 600# / 900#
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



شركة سبيشل ميتل
Special Metal

Refractory Fixing, Anchors

شركة سبيشل ميتل
Special Metal

Refractory Fixings, Anchors

Materials

We can supply refractory anchors and fibre fixing systems to exacting tolerances in a wide range of stainless steel and higher alloys. Standard fixings are available in stainless steel grade (304) and grade (310), and Inconel 601. Other grades of stainless steel, mild steels and alloys are available to suit requirements, including Stainless Steel grade (316).

Stainless Steel At Elevated Temperatures

Standard Stainless Steels provide corrosion resistance in a number of aggressive situations. They also provide very good oxidation and scaling resistance at elevated temperatures. In situations where standard steels reach their temperature limits, higher alloy and specially designed stainless steels provide a combination of increased strength and oxidation resistance, extending the useful working range up to higher temperatures around 1200°C.

Specificat	Type 304	Type 310	Inconel™ Alloy 601
Nearest Werkstoff	1.4301	1.4845	-
Maximum service temp. under certain conditions	800°C	1100°C	115 1230°C
Melting point	1440°C	1490°C	1300-1375°C

Material Specification

Refractory fixings are available in a range of stainless steels and higher alloys:

Grade 1.4301 (304) (18/8)

The most widely used stainless steel grade containing typically 18% Chromium and 8% Nickel as the main alloying elements. This grade has excellent welding properties and is easily formed and fabricated.

Grade 310

A heat resisting steel that combines excellent resistance to both corrosion and oxidation at elevated temperatures. It is resistant to moderate thermal shock and shows high strength at high temperatures.

Inconel Alloy 601

Inconel 601 has an outstanding resistance to corrosion and to high temperature oxidation. The material also has good resistance to aqueous corrosion and high mechanical strength.

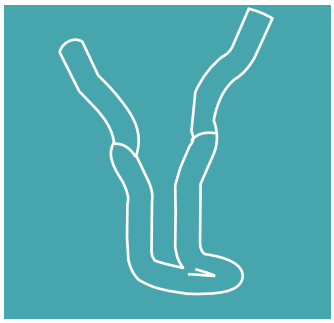
Other Grades

Refractory fixings can be supplied in other grades on request, including Stainless Steel grade 1.4401 (316). Please contact AMI for more details.

Using Stainless Steel At High Temperatures

The resistance to oxidation of stainless steel depends largely on the chromium content. Two other alloying elements, nickel and silicon, can also be instrumental in enhancing the oxidation resistance of the steels. Nickel in the alloy minimises oxide spalling. Silicon increases oxidation resistance by improving the compaction of the scale formed and thereby allows the steel to be used at higher operating temperatures. Corrosion in air or steam occurs relatively slowly due to the formation of a compact adherent chromium oxide based scale.

Specification	Type 304	Type 310	Inconel Alloy 601	Type 309	Type 316	Type 321	330 Alloy	600 Alloy	800H Alloy
	1.4301	1.4845	-	1.4833	1.4401	1.4878	-	-	-
C	0.040	0.050	0.500	0.060	0.040	0.050	0.060	0.050	0.060
S	0.20 - 1.00	0.20 - 1.00	0.500	1.000	1.000	1.000	1.750	0.500.	1000
Mn	0.50 - 2.00	0.50 - 2.00	1.000	2.000	2.000	2.000	2.000	1.000	1.500
P (Max)	0.045	0.045	-	0.450	0.045	0.045	0.400	0.015	-
S (Max)	0.030	0.030	0.015	0.030	0.030	0.030	0.300	0.015	-
Cr	18.30	25.00	21.00 - 24.00	22.50	16.80	17.30	19.000	14.00 - 17.00	19.00 - 23.00
Al	-	-	1.00 -1.70	-	-	-	-	-	0.15 - 0.60
Ni	8.70	20.00	58.00 - 63.00	12.50	10.70	9.20	35.000	72.000	30.00 - 35.00
Others	-	-	Cu 0.5 Bal Fe	-	-	Ti less than /equal to 5 x C	-	Cu 0.5	Cu 0.75 max S=0.015max Al+TI= 0X85-1.20
Mo	-	-	-	-	2.20	-	-	-	-
Ti	-	-	0.500	-	-	-	-	-	0.10 - 0.60



شركة سبيشل ميتل
Special Metal

ANSI B 36 - 10
NOMINAL THICKNESS AND WEIGHTS OF STAINLESS STEEL PIPES

PIPE DIMENSION IN ACCORDANCE TO

Size of Pipe & Tubes		Number of Schedule														
			5S		10		10S		20		30		40		60	
Nominal Bore		Outside Diameter	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m
mm	inch	mm														
3	1/8”	10.29	1.0	0.23	1.28	0.28	-	-	1.60	0.345	-	-	1.73	0.36	-	-
6	1/4”	13.72	1.2	0.37	1.65	0.49	-	-	2.00	0.580	-	-	2.24	0.63	-	-
10	3/8”	17.15	1.2	0.47	1.65	0.63	-	-	2.00	0.750	-	-	2.31	0.85	-	-
15	1/2”	21.34	1.65	0.80	2.11	1.00	-	-	2.5	1.15	-	-	2.77	1.26	-	-
20	3/4”	26.67	1.65	1.03	2.11	1.28	-	-	2.5	1.500	-	-	2.87	1.68	-	-
25	1”	33.40	1.65	1.29	2.77	2.09	-	-	2.9	2.24	-	-	3.38	2.50	-	-
32	1 1/4”	42.16	1.65	1.65	2.77	2.73	-	-	3.0	2.910	-	-	3.56	3.38	-	-
40	1 1/2”	48.28	1.65	1.90	2.77	3.11	-	-	3.0	3.370	-	-	3.68	4.05	-	-
50	2”	60.33	1.65	2.38	2.77	3.99	-	-	3.0	4.9	-	-	3.91	5.43	-	-
65	2 1/2"	73.03	2.11	3.70	3.05	5.26	-	-	4.00	6.80	-	-	5.16	8.62	-	-
80	3”	88.90	2.11	4.50	3.05	6.45	-	-	4.00	8.423	-	-	5.49	11.47	-	-
100	3 1/2”	101.60	2.11	5.20	3.05	7.41	-	-	4.5	10.500	-	-	5.74	13.78	-	-
125	4”	114.30	2.11	5.81	3.05	8.50	-	-	4.5	12.255	-	-	6.02	16.32	-	-
150	5”	141.30	2.77	9.45	3.40	11.74	-	-	5.00	16.900	-	-	6.55	21.80	-	-
200	6”	168.28	2.77	11.31	3.40	14.04	-	-	6.35	25.500	-	-	7.11	28.69	-	-
250	8”	219.08	2.77	14.78	3.76	20.27	-	-	6.35	33.28	7.04	37.38	8.18	42.70	10.31	53.07
300	10”	273.05	3.40	22.62	4.19	27.80	-	-	6.35	42.41	7.80	51.81	9.27	60.30	12.70	82.8
350	12”	323.85	3.96	31.36	4.57	36.17	-	-	6.35	50.48	8.38	66.20	9.52	75.17	14.27	110.62
400	14”	355.60	3.96	34.23	4.78	41.60	6.35	55.53	7.92	68.98	9.52	82.58	11.13	95.00	15.09	128.42
450	16”	406.40	4.19	41.60	4.78	47.60	6.35	63.61	7.92	79.03	9.52	94.20	12.17	125.2	16.66	162.59
500	18”	457.20	4.19	46.83	4.78	54.15	6.35	71.69	7.92	89.10	11.13	124.32	14.27	158.27	19.05	209.00
600	20”	508.00	4.78	59.22	5.54	69.70	6.35	79.76	9.52	118.93	12.70	156.04	15.09	185.89	21.62	251.65
650	22”	558.80	4.78	63.75	5.54	76.76	6.35	87.84	9.52	131.07	12.70	172.04	-	-	22.22	298.55
700	24”	609.60	5.54	82.60	6.35	95.92	6.35	95.92	9.52	143.20	14.27	211.72	17.48	258.74	24.61	360.21
750	26”	660.40	-	-	-	-	7.92	129.40	12.70	205.97	-	-	-	-	-	-
800	28”	711.20	-	-	-	-	7.92	139.47	12.70	222.13	15.88	276.48	-	-	-	-
850	30”	762.00	-	-	-	-	7.92	148.55	12.70	238.28	15.88	296.68	-	-	-	-
900	32”	812.80	-	-	-	-	7.92	158.3	12.70	254.44	15.88	316.88	17.48	342.17	-	-
950	34”	863.60	-	-	-	-	7.92	168.32	12.70	270.50	15.88	336.96	17.48	364.01	-	-
1000	36”	914.40	-	-	-	-	7.92	178.26	12.70	284.75	15.88	357.28	19.05	420.21	-	-

N.B. Thickness and weight “Standard” Extra-Strong and “Double Extra-Strong” within swell elges have a correspondant value in a “Schedule”.
For different thickness that suitable the weights can proceed by the following formular $\frac{24.66 (D-t) t}{1000}$

* In accordance to ANSI B 36.19

شركة سبيشل ميتل
Special Metal

ANSI B 36 - 10
NOMINAL THICKNESS AND WEIGHTS OF STAINLESS STEEL PIPES

PIPE DIMENSION IN ACCORDANCE TO

Number of Schedule															
80		100		120		140		160		Standard		Extra-Strong		Double Extra-Strong	
mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m
2.41	0.46	-	-	-	-	-	-	-	-	1.73	0.36	2.41	0.46	-	-
3.02	0.80	-	-	-	-	-	-	-	-	2.24	0.63	3.02	0.80	-	-
3.20	1.10	-	-	-	-	-	-	-	-	2.31	0.85	3.20	1.10	-	-
3.73	1.62	-	-	-	-	-	-	4.78	1.97	2.77	1.26	3.73	1.62	7.47	2.54
3.91	2.21	-	-	-	-	-	-	5.56	2.93	2.87	1.68	3.91	2.19	7.82	3.63
4.55	3.23	-	-	-	-	-	-	6.35	4.30	3.38	2.50	4.55	3.23	9.09	5.45
4.85	4.50	-	-	-	-	-	-	6.35	5.69	3.56	3.38	4.85	4.46	9.70	7.75
5.08	5.49	-	-	-	-	-	-	7.14	7.35	3.68	4.05	5.08	5.40	10.16	9.54
5.54	7.60	-	-	-	-	-	-	8.74	11.26	3.91	5.43	5.54	7.47	11.07	13.44
7.01	11.59	-	-	-	-	-	-	9.52	15.15	5.16	8.62	7.01	11.40	14.02	20.39
7.62	15.25	-	-	-	-	-	-	11.13	21.67	5.49	11.28	7.62	15.25	15.24	28.11
8.08	18.62	-	-	-	-	-	-	-	-	5.74	13.56	8.08	18.62	-	-
8.56	22.29	-	-	11.13	28.25	-	-	13.49	34.05	6.02	16.06	8.56	22.29	17.12	41.66
9.52	30.92	-	-	12.70	40.24	-	-	15.88	49.87	6.55	21.76	9.52	30.92	19.05	58.31
10.97	43.21	-	-	14.27	54.20	-	-	18.26	68.53	7.11	28.23	10.97	42.52	21.95	79.11
12.70	65.63	15.09	76.93	18.26	90.32	20.62	102.47	23.01	112.97	8.18	42.49	12.70	64.57	22.22	107.78
15.09	97.27	18.26	116.38	21.44	134.90	25.40	157.51	28.58	174.95	9.27	60.24	12.70	81.46	25.40	155.5
17.48	133.88	21.44	162.14	25.40	189.82	28.58	211.31	33.32	242.40	9.52	73.76	12.70	97.36	25.40	189.92
19.05	159.00	23.83	197.74	27.79	227.88	31.75	257.47	35.71	286.04	9.52	81.21	12.70	107.28	-	-
21.44	203.50	26.19	249.34	30.96	290.88	36.53	338.32	40.49	370.74	9.52	93.13	12.70	123.18	-	-
23.83	258.29	29.36	314.54	34.92	369.34	39.67	414.74	45.24	466.67	9.52	105.05	12.70	139.07	-	-
26.19	315.97	32.54	387.41	38.10	448.3	44.45	515.94	50.01	573.31	9.52	116.97	12.70	154.97	-	-
28.58	379.70	34.92	457.83	41.28	535.17	47.62	609.30	53.98	682.57	9.52	128.89	12.70	170.86	-	-
30.96	448.3	38.89	555.76	46.02	649.44	52.37	730.72	59.54	819.70	9.52	140.81	12.70	186.75	-	-
-	-	-	-	-	-	-	-	-	-	9.52	152.73	12.70	202.85	-	-
-	-	-	-	-	-	-	-	-	-	9.52	164.65	12.70	218.75	-	-
-	-	-	-	-	-	-	-	-	-	9.52	176.57	12.70	234.44	-	-
-	-	-	-	-	-	-	-	-	-	9.52	188.50	12.70	250.33	-	-
-	-	-	-	-	-	-	-	-	-	9.52	200.42	12.70	266.22	-	-
-	-	-	-	-	-	-	-	-	-	9.52	212.34	12.70	282.12	-	-

N.B. Thickness and weight “Standard” Extra-Strong and “Double Extra-Strong” within swell elges have a correspondant value in a “Schedule”.
For different thickness that suitable the weights can proceed by the following formular $\frac{24.66 (D-t) t}{1000}$

* In accordance to ANSI B 36.19

CHEMICAL COMPOSITION OF STAINLESS STEEL

Grade AISI	Chemical Composition - Per cent										Nearest Equivalent Specification	
	C Max	Mn Max	P Max	S Max	Si Max	Cr	Ni	Mo	N	Other Element	I.S	En
301	0.15	2.0 max	0.045	0.040	1.0	16.0/18.0	6.0/8.0	-	-	-	10Cr17Ni7	-
302	0.15	2.0	0.045	0.030	1.0	17.0/19.0	8.0/10.0	-	-	-	07Cr18Ni9	En-58A
303	0.15	2.0	0.045	-	1.0	17.0/19.0	8.0/10.0	-	-	-	15Cr18Ni9	En-58M
304	0.08	2.0	0.045	0.030	1.0	18.0/20.0	8.0/10.0	-	-	-	04Cr18Ni10	En-58E
304L	0.030	2.0	0.045	0.030	1.0	18.0/20.0	8.0/10.0	-		-	02Cr18Ni11	-
304H	0.04-0.10	2.0	0.045	0.030	1.00	18.0/20.0	8.0/10.0	-	-	-	-	-
310	0.25	2.0	0.045	0.030	1.50	24.0/26.0	19.0/22.0	-	-	-	10Cr25Ni12	-
310H	0.04-0.10	2.0	0.045	0.030	1.00	18.0/20.0	8.0/10.0	-	-	-	-	-
310S	0.08	2.0	0.045	0.030	1.50	24.0/26.0	19.0/22.0	-	-	-	-	-
316	0.08	2.0	0.045	0.030	1.0	16.0/18.0	10.0/14.0	2.0/3.0	-	-	04Cr17Ni12Mo2	En58H
316L	0.030	2.0	0.045	0.030	1.0	16.0/18.0	10.0/14.0	2.0/3.0	-	-	03Cr17Ni12Mo2	-
316Ti	0.080	2.0	0.045	0.030	1.0	16./18.0	10.0/14.0	2.0/3.0		Ti5xCmin	-	-
317	0.08	2.0	0.045	0.030	1.0	18.0/20.0	11.0/15.0	3.0/4.0	-	-	-	-
317L	0.030	2.0	0.045	0.030	1.0	18.0/20.0	11.0/15.0	3.0/4.0	-	-	Ti5xCmin	-
321	0.08	2.0	0.045	0.030	1.0	17.0/19.0	9.0/12.0	-	0.10	Ti5xCmin	04Cr18Ni10Nb20	En-58C
347	0.08	2.0	0.040	0.030	1.0	17.0/19.0	9.0/12.0	-	-	Nb/Ta10xCmin	04Cr18Ni10Nb40	En-58G
321H	0.04-0.10	2.0	0.045	0.030	1.0	17.0/19.0	93.0/12.0	-	-	-	-	-
347H	0.04-0.10	2.0	0.045	0.030	1.0	17.0/19.0	93.0/12.0	-	-	-	-	-
430	0.12	1.0	0.040	0.030	0.75	14.0/18.0	0.60	-	-	-	07Cr17	En-60
446	0.20	1.50max	0.040	0.030	1.0	23.0/27.0	0.60max	-		N-25max	-	-
410	0.15	1.0	0.040	0.030	1.0	11.5/13.5	0.60	-	-	-	12Cr13	En-58A
410S	0.08	1.0	0.040	0.030	1.0	11.5/13.5	0.60max	-	-	-	-	-
420	over.15	1.0	0.040	0.030	1.0	12.0/14.0	0.60	-	-	-	22Cr13	En56C&D
431	0.20	1.0max	0.040	0.030	1.0	15.0/17.0	1.25/2.50	0.75max	-	-	15Cr16Ni2	En-57
S31803	0.030	2.0	0.030	0.020	1.0	21.0/23.0	4.5/6.5	2.5-3.5	0.08-0.20	-	-	-
S32205	0.030	2.0	0.030	0.020	1.0	22.0/23.0	4.5/6.5	2.5-3.5	0.14-0.20	-	-	-
S32750	0.030	1.0	0.030	0.030	1.0	24.0/26.0	4.5/6.5	3.0-4.0	0.24-0.32	-	-	-
S32760	0.030	1.0	0.030	0.030	0.80	24.0/26.0	6.0/8.0	3.0-4.0	0.20-0.30	-	-	-

MECHANICAL PROPERTIES OF STAINLESS STEEL

Tensile Strength min. Ksi (Mpa)	Yield Point min. Ksi (Mpa)	Elongation % (G.L : 2 in or 50mm)				Hardness Test	
		Full Selection specimen	Strip Specimen		Round Specimen	Brinell max	Rockwell max
			t ≤ 6/16in	t ≤ 5/16in			
75(515)	30(205)	35	35	56t + 17.50	28	192	B 90
75(515)	30(205)	35	35	56t + 17.50	28	192	B 90
75(485)	25(170)	35	35	56t + 17.50	28	192	B 90.
80(515)	35(240)	35	35	56t + 17.50	28	192	B 90
75(515)	30(205)	35	35	56t + 17.50	28	192	B 90
-	-	-	-	-	-	-	-
75(515)	30(205)	35	35	56t + 17.50	28	192	B 90
-	-	-	-	-	-	-	-
80(485)	35(240)	35	35	56t + 17.50	28	192	B 90
75(515)	30(205)	35	35	56t + 17.50	28	192	B 90
75(515)	30(205)	35	35	56t + 17.50	28	192	B 90
70(485)	25(170)	35	35	56t + 17.50	28	192	B 90
70(485)	35(240)	35	35	56t + 17.50	28	192	B 90
75(515)	30(205)	35	35	56t + 17.50	28	192	B 90
70(485)	35(240)	35	35	56t + 17.50	28	192	B 90
70(485)	35(240)	35	35	56t + 17.50	28	192	B 90
-	-	-	-	-	-	-	--
-	-	-	-	-	-	-	--
70(485)	25(170)	35	35	56t + 17.50	28	192	B 90
70(485)	35(240)	35	35	56t + 17.50	28	192	B 90
75(515)	30(205)	35	35	56t + 17.50	28	192	B 90
75(515)	30(205)	35	35	56t + 17.50	28	192	B 90
75(515)	30(205)	35	35	56t + 17.50	28	192	B 90
75(515)	30(205)	35	35	56t + 17.50	28	192	B 90
	-	-	-	-	-	-	--
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

MATERIAL SPECIFICATION FOR PIPE & TUBES OF ALLOY STEEL, CARBON STEEL & MILD STEEL.

PIPE SPECIFICATION	CHEMICAL PROPERTIES								MECHANICAL PROPERTIES				OTHERS
	C%	Mn%	P% (Max)	S% (Max)	Si%	Cr%	Ni%	Mo%	U.T.S. (Min) Mpa	Y.S. (Min) Mpa	ELONG. (Min) L	ELONG. (Min) T	
ASTM A 106 Gr. A	0.25 Max	0.27-0.93	0.035	0.035	0.10 Min	0.40 Max	0.40 Max	0.15 Max	330	205	35	25	Cu%:0.40 Max, Va%: 0.08
ASTM A 106 Gr. B	0.30 Max	0.29-1.06	0.035	0.035	0.10 Min	0.40 Max	0.40 Max	0.15 Max	415	240	30	16.5	Cu%:0.40 Max, Va%: 0.08
ASTM A 106 Gr. C	0.35 Max	0.29-1.06	0.035	0.035	0.10 Min	0.40 Max	0.40 Max	0.15 Max	485	275	30	16.5	Cu%:0.40 Max, Va%: 0.08
ASTM A 53 Gr. A	0.25 Max	0.95 Max	0.050	0.045	-	0.40 Max	0.40 Max	0.15 Max	330	205	30	16.5	Cu%:0.40 Max, Va%: 0.08
ASTM A 53 Gr. B	0.30 Max	1.20 Max	0.050	0.045	-	0.40 Max	0.40 Max	0.15 Max	415	240	30	16.5	Cu%:0.40 Max, Va%: 0.08
ASTM A 333 Gr. 1	0.30 Max	0.40-1.06	0.025	0.025	-	-	-	-	380	205	35	25	Impact Test= -45 °C, J=18 Min, HRB=85 Max
ASTM A 333 Gr. 6	0.30 Max	0.29-1.06	0.025	0.025	0.10 Min	-	-	-	415	240	30	16.5	Impact Test=-45 °C, J=18 Min, HRB=85 Max
ASTM A 335 Gr. P1	0.10-0.20	0.30-0.80	0.025	0.025	0.10-0.50	-	-	0.44-0.65	380	205	30	20	
ASTM A 335 Gr. P2	0.10-0.20	0.30-0.61	0.025	0.025	0.10-0.30	0.50-0.81	-	0.44-0.65	380	205	30	20	
ASTM A 335 Gr. P5	0.15 Max	0.30-0.60	0.025	0.025	0.50 Max	4.00-6.00	-	0.45-0.65	415	205	30	20	
ASTM A 335 Gr. P9	0.15 Max	0.30-0.60	0.025	0.025	0.25-1.00	8.00-10.00	-	0.90-1.10	415	205	30	20	
ASTM A 335 Gr. P11	0.05-0.15	0.30-0.60	0.025	0.025	0.50-1.00	1.00-1.50	-	0.44-0.65	415	205	30	20	
ASTM A 335 Gr. P12	0.05-0.15	0.30-0.61	0.025	0.025	0.50 Max	0.80-1.25	-	0.44-0.65	415	220	30	20	
ASTM A 335 Gr. P22	0.05-0.15	0.30-0.60	0.025	0.025	0.50 Max	1.90-2.60	-	0.87-1.13	415	205	30	20	
ASTM A 335 Gr. P91	0.08-0.12	0.30-0.60	0.020	0.010	0.20-0.50	8.00-9.50	0.40 Max	0.85-1.05	620	440	20	-	V%=0.18-0.25, N%=0.030-0.070, Al%=0.02 Max, Cb%=0.06-0.10
ASTM A 213 Gr. T2	0.10-0.20	0.30-0.61	0.025	0.025	0.10-0.30	0.50-0.81	-	0.44-0.65	415	205	30		HRB=85 Max
ASTM A 213 Gr. T5	0.15 Max	0.30-0.60	0.025	0.025	0.50 Max	4.00-6.00	-	0.45-0.65	415	205	30		HRB=85 Max
ASTM A 213 Gr. T11	0.05-0.15	0.30-0.60	0.025	0.025	0.50-1.00	1.00-1.50	-	0.44-0.65	415	205	30		HRB=85 Max
ASTM A 213 Gr. T12	0.05-0.15	0.30-0.61	0.025	0.025	0.50 Max	0.80-1.25	-	0.44-0.65	415	220	30		HRB=85 Max
ASTM A 213 Gr. T22	0.05-0.15	0.30-0.60	0.025	0.025	0.50 Max	1.90-2.60	-	0.87-1.13	415	205	30		HRB=85 Max
ASTM A 179	0.06-0.18	0.27-0.63	0.035	0.035	-	-	-	-	325	180	35		HRB=72 Max
ASTM A 210 Gr. A1	0.27 Max	0.93 Max	0.035	0.035	0.10 Min	-	-	-	415	255	30		HRB=79 Max

PIPE SPECIFICATION	CHEMICAL PROPERTIES								MECHANICAL PROPERTIES			OTHERS
	C%	Mn%	P% (Max)	S% (Max)	Si%	Cr%	Ni%	Mo%	U.T.S. (Min) Mpa	Y.S. (Min) Mpa	ELONG. (Min) L T	
API 5L Gr. A	0.22 Max	0.90 Max	0.030	0.030	-	-	-	-	331	207	e=625 000 $A^{0.2}$ / $U^{0.9}$	For Seamless : C% Will be 0.028 for Gr. B to x 70 Mn% will be 1.40 for Gr. X65 to X 70
API 5L Gr. B	0.26 Max	1.20 Max	0.030	0.030	-	-	-	-	414	241		
API 5L Gr. X 42	0.26 Max	1.30 Max	0.030	0.030	-	-	-	-	414	290		
API 5L Gr. X 46	0.26 Max	1.40 Max	0.030	0.030	-	-	-	-	434	317		
API 5L Gr. X 52	0.26 Max	1.40 Max	0.030	0.030	-	-	-	-	455	359		
API 5L Gr. X 56	0.26 Max	1.40 Max	0.030	0.030	-	-	-	-	490	386		
API 5L Gr. X 60	0.26 Max	1.45 Max	0.030	0.030	-	-	-	-	517	414		
API 5L Gr. X 65	0.26 Max	1.65 Max	0.030	0.030	-	-	-	-	531	448		
API 5L Gr. X 70	0.26 Max	1.65 Max	0.030	0.030	-	-	-	-	565	483		
BS 3059 PT-I Gr. 320	0.16 Max	0.30-0.70	0.040	0.040	0.35 Max	-	-	-	320-480	195	25	
BS 3059 PT-II Gr. 360	0.17 Max	0.40-0.80	0.035	0.035	0.10-0.35	-	-	-	360-500	235	24	
BS 3059 PT-II Gr. 440	0.12-0.18	0.90-1.20	0.035	0.035	0.10-0.35	-	-	-	440-580	245	21	
BS 3059 PT-I Gr. 620	0.10-0.15	0.40-0.70	0.030	0.030	0.10-0.35	0.70-0.10	-	0.45-0.65	460-610	180	22	
BS 6323 Gr. 1	0.13 Max	0.60 Max	0.050	0.050	-	-	-	-	300	200	20	
BS 6323 Gr. 2	0.16 Max	0.70 Max	0.050	0.050	-	-	-	-	340	250	15	
BS 6323 Gr. 3	0.20 Max	0.90 Max	0.050	0.050	0.35 Max	-	-	-	400	300	12	
BS 1387	0.20 Max	1.20 Max	0.045	0.045	-	-		-	320-460	195	20	
DIN 17175 Gr. St 35.8	0.17 Max	0.40-0.80	0.040	0.040	0.10-0.35	-		-	225	360-480	25	
DIN 17175 Gr. St 45.8	0.21 Max	0.40-1.20	0.040	0.040	0.10-0.35	-		-	245	410-530	21	
DIN 17175 Gr. 17Mn4	0.14-0.20	0.90-1.20	0.040	0.040	0.20-0.40	0.30 Max		-	275	460-580	23	
DIN 17175 Gr. 19Mn5	0.17-0.22	1.00-1.30	0.040	0.040	0.30-0.36	0.30 Max		-	315	510-610	19	
DIN 17175 Gr. 15Mo3	0.12-0.20	0.40-0.80	0.035	0.035	0.10-0.35	-		0.25-0.35	275	550-600	22	
DIN 17175 Gr. 13CrMo44	0.10-0.18	0.40-0.80	0.035	0.035	0.10-0.35	0.70-1.10		0.45-0.65	295	440-590	22	
DIN 17175 Gr. 10CrMo910	0.08-0.15	0.40-0.70	0.035	0.035	0.50 Max	2.00-2.50		0.90-1.20	385	550-600	20	
DIN 17175 Gr. 13CrMo910	0.10-0.18	0.40-0.70	0.035	0.035	0.10-0.35	0.70-1.10		0.45-0.65	295	440-590	22	
DIN 17175 Gr. 14MoV63	0.10-0.18	0.40-0.70	0.035	0.035	0.10-0.35	0.50-0.70		0.50-0.70	325	460-610	20	V: 0.22-0.32
DIN 17175 Gr. X20CrMoV121	0.17-0.23	1.00 Max	0.030	0.030	0.50 Max	0.80-1.20	0.30-0.80	0.80-1.20	490	690-850	17	V: 0.25-0.35
IS 1239 Part I	-	-	0.050	0.050	-	-	-	-	320	-	20	
IS 3589 Gr. Fe 380	0.16 Max	1.20 Max	0.040	0.040	-	-	-	-	330	195	20	
IS 3589 Gr. Fe 410	0.20 Max	1.30 Max	0.040	0.040	-	-	-	-	410	235	18	
IS 1979 Gr. YST 290	0.28 Max	1.25 Max	0.040	0.050	-	-	-	-	410	290	e=1942 57 $A^{0.2}$ / $U^{0.9}$	
IS 1979 Gr. YST 320	0.30 Max	1.35 Max	0.040	0.050	-	-	-	-	430	320		
IS 1979 Gr. YST 360	0.30 Max	1.35 Max	0.040	0.050	-	-	-	-	450	360		
IS 1979 Gr. YST 390	0.26 Max	1.35 Max	0.040	0.050	-	-	-	-	490	390		
IS 1979 Gr. YST 410	0.26 Max	1.35 Max	0.040	0.050	-	-	-	-	520	410		
IS 1979 Gr. YST 450	0.26 Max	1.40 Max	0.040	0.050	-	-	-	-	530	450		
IS 1979 Gr. YST 480	0.26 Max	1.60 Max	0.040	0.040	-	-	-	-	565	480		
IS 1978 Gr. YST 210	0.22 Max	0.90 Max	0.040	0.050	-	-	-	-	330	210		
IS 1978 Gr. YST 240	0.27 Max	1.15 Max	0.040	0.050	-	-	-	-	410	240		

SWG DIMENSIONS AND WEIGHTS (SWG WALL THICKNESS)

Outside diameter		22 SWG 0.711mm	20 SWG 0.914mm	18 SWG 1.218mm	16 SWG 1.625mm	14 SWG 2.032mm	12 SWG 2.641mm	11 SWG 2.946mm	10 SWG 3.257mm
Inches	mm	Kg/m	Kg/m	Kg/m	Kg/m	Kg/m	Kg/m	Kg/m	Kg/m
1/4"	6.350	--	0.124	0.157	0.192	--	--	--	--
5/16"	7.950	--	0.161	0.205	0.257	--	--	--	--
3/8"	9.525	--	0197	0.253	0.321	0.381	--	--	--
1/2"	12.700	0.213	0.270	0.350	0.451	0.543	0.665	0.720	--
5/8"	15.875	0.270	0.342	0.447	0.580	0.704	0.875	0.954	--
3/4"	19.050	--	0.415	0.544	0.709	0.866	1.090	1.190	1.290
7/8"	22.225	0.383	0.488	0.641	0.838	1.030	1.300	1.420	1.550
1"	25.400	0.440	0.560	0.738	0.967	1.190	1.510	1.660	1.800
1 1/4"	31.750	0.553	0.706	0.931	1.230	1.510	1.930	2.130	2.320
1 1/2"	38.100	0.666	0.851	1.130	1.480	1.840	2.350	2.590	2.840
1 3/4"	44.450	0.779	0.996	1.320	1.740	2.160	2.770	3.060	3.350
2"	50.800	0.892	1.140	1.510	2.000	2.480	3.190	3.530	3.870
2 1/2"	63.500	--	--	1.900	2.520	3.130	4.030	4.470	4.910
3"	76.200	--	--	2.290	3.030	3.770	4.870	5.400	5.640
3 1/2"	88.900	--	--	2.670	3.550	4.420	5.700	6.340	6.970
4"	101.600	--	--	3.060	4.070	5.070	6.540	7.280	8.010
5"	127.000	--	--	3.628	4.970	6.010	7.926	--	9.673
5 1/2"	139.700	--	--	4.000	5.481	6.624	8.736	--	10.675
6"	152.400	--	--	4.360	6.000	7.330	9.545	--	11.699
6 1/2"	161.100	--	--	4.720	6.480	7.840	10.419	--	12.720

DIMENSIONAL TOLERANCE ANSI B 36.10 / B 36.19

Tubes Specification ASTM	Nominal Pipe Size (mm)	Permissible variations in Outside Diameter (mm)		Permissible variations in THK	Permissible variations in Length (mm)		Straight tolerance
		Over	Under		Over	Under	Max. curvature in any metere Length
A 106 CS Seamless Pipe for High Temp. A 312 Seamless & Welded Austinitic SS Pipes A333 Seamless & Welded pipe for LT Service A 335 Seamless Ferritic Alloy Steel Pipe for High Temp. Service	3 to 40 Incl	0.4	0.8	-12.5% Except for Welded pipe will filler Metal Added	6	0	Up to 125 mm O/D and 12 mm THK Pipe -0.76 mm Over125 mm O/D to 200 mm O/D Inclusive -1.15 mm Over 200 mm O/D to 324 mm O/D Inclusive -1.52 mm
	Over 40 to 100 Incl.	0.8	0.8				
	Over 100 to 200 Incl.	1.6	0.8				
	Over 200 to 450 Incl.	2.4	0.8				
	Over 450 to 650 Incl.	3.2	0.8				
	Over 650 to 850 Incl.	4.0	0.8				
	Over 850 to 1200 Incl.	4.8	0.8				
A 358 ERW Austinitic Cr-NiAs pipe for High Temp.serv.	All Sizes (upto 200 NB)	+0.5% (Based on Circum-ferencial Measurement)	-0.5%	-0.3 mm			3 mm 3/metres
A409 ERW Large Dia Austinitic Steel Pipes	450 to 750 (SCH 5 S & 10 S)	+0.2% +0.4% Based on Circumferential Measurement	+0.2% (For T<4.8mm) -0.4% (For T 4.8 mm)	-0.46 mm			4.8mm/3 metres

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	Yeild Strength mini-MPa	Elong mini %	Hardness	
															Brinell	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 >5xC< 0.70	515	205	40	217	95
	347	0.08	2.00	0.045	0.030	0.75	9.00-13.0	17.0-19.0			Cb + Ta > 10xC < 1.10	515	205	40	201	92
A 387 Class1 Class2	2	005-0.21	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	205 / 310	18	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			415 / 515	240 / 310	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			380 / 450	230 / 275	22	max217HB	max95HRB
	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
												415 / 515	205 / 310	18	max201HB	max92HRB
A 515	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		
	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		
A 516	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		
	70	0.28	0.85-1.20	0.035	0.04	0.15-0.40						485-620	260	21		
A 537	Class 1	0.24	0.70-1.35	0.035	0.040	0.15-0.40	0.25 max	0.80 max	0.35 max			485-620	345	22		
	Class 2	0.24	0.70-1.35	0.035	0.040	0.15-0.40	0.25 max	0.80 max	0.35 max			550-690	415	22		

IS-2062-92 STEEL FOR GENERAL STRUCTURAL PURPOSES

Grade	Designation	% Chemical Composition						Tensile strength (Min) Kg/mm2	Yield Strength (Min) Mpa			%El.in gauge length $5.56\sqrt{Sc}$	Bend Test	Std.test Piece charpy V Notch Impact Energy Joule min
		C max	MN max	S max	P max	Si max	C. E. max		<20 min	<20-40 min	>40min			
A	FE410 WA	0.23	1.5	0.050	0.050	-	0.42	41.8	250	240	230	23	3t	-
B	FE410 WB	0.22	1.5	0.045	0.045	0.40	0.41	41.8	250	250	230	23	t<25mm	2t for 27 3t for t>25mm
C	FE410 WC	0.20	1.5	0.040	0.040	0.40	0.36	41.8	250	250	230	23	2t	27

IS-2002-62 STEEL PLATES FOR BOILERS

Designation	Chemical Composition				Tensile Test		Elongation	
	c max	Si max	P max	S max	Tensile strength Mpa	Yield Strength Mpa	Test Piece	%min
IS 2002-1	0.18	0.10-0.35	0.040	0.040	362-442	540	$5.65\sqrt{Sc}$ $4\sqrt{Sc}$	26 30
IS 2002-2A	0.20	0.10-0.35	0.050	00.50	412-491	491	$5.60\sqrt{Sc}$ $4\sqrt{Sc}$	25 29
IS 2002-2B	0.22	0.10-0.35	0.050	0.050	510-608	491	$5.65\sqrt{Sc}$ $4\sqrt{Sc}$	20 24

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

شركة سبيشل ميتل
Special Metal

STAINLESS STEEL BRIGHT BARS (PEELED/TURNED)

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

Product Range

Condition	Peeled, Centreless & Polished	Peeled & Polished	Peeled (Rough Turned)	Forged, Rough Turned
Grades	201, 202, 301,303, 304, 304L, 310, 316, 316L, 321, 410, 416, 420,430, 431, 430F & others		304, 304L, 316L, 410, 416 420, 430	303, 304, 304L, 316, 316L, 410, 416, 420, 431
Diameter (Size)	20mm to 85mm (3/4" to 3-1/4")	85mm to 140mm (3-1/4" to 5 - ½")	25mm to 140mm (1" to 5-1/2")	150mm to 400mm (6" to 16")
Diameter Tolerance	h9 (Din 671) (ASTM A484)	h 11	K 12/K 13 (Din 1013)	-0mm to /+3mm (-0"/+0.12")
Length	3/4/5, 6/6 meter (12/14ft/20 feet)	3/4/5, 6/6 meter (12/14ft/20 feet)	3/4/5,6/6 meter 10 feet, 16 feet	3 meter - 5 meter
Length Tolerance	-0/+200mm of + 100mm to + 50mm (-0"/1 feet or +4" or 2")	-0/+ 200mm or +100mm or +50mm (-0"/+1 feet or +4" or 2")	-0/+ 100mm or 500mm (-0"/+3 feet or+2 feet)	-0/+2 meter - (-0/+6 feet)

Stainless Steel Wires

Diameter (Size)	Thick/Medium Wire - 1mm to 8mm (0.039" to 0.314")	
Grade	201, 202, 204Cu, 302, 302HQ, 303, 304, 304L, 304HC, 310, 316, 316L, 321, 304LER, 308LER, 316LER, 420, 430L	
Surface Finish	Matt, Bright Drawn, Bright Shiny, EPQ, Coated, De-coated	
Diameter Tolerence	Diameter	Tolerance
	0.80 mm (0.0314") to < 1.50 mm (0.0590") 1.50 mm (0.0590") to < 2.00 mm (0.0787") 2.00 mm (0.0787") to < 4.00 mm (0.1574") 4.00 mm (0.1574") to < 6.00 mm (0.236")	+/-0.013 mm (0.0005") +/-0.013 mm (0.0006") +/-0.025 mm (0.0009") +/-0.030 mm (0.0011")
Tensile Strength	Type	Tensile In Kg/mm^2
	Soft 1/4 Hard 1/2 Hard Full Hard	60-75 75-90 90-140 140-200 or ASTM A313 / DIN 17224
Packing	- HDPE wrapped coils of 20 kg. to 250 kg. - Pattern laid coils on MS Carriers / spiders (200 Kg. to 1000 kg.) - Coils on wooden pallets (100 kg to 800 kg) - Cheese coils (500 kg -1000 kg) - Drum Packing - Fine wire in Spools from Din 80 to Din 250	

Stainless Steel Bright Bars (Cold Drawn)

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

Stainless Steel Hexagon & Square Bars

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

Stainless Steel Cold Heading Wires

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

شركة سبيشل ميتل

Special Metal

شركة سبيشل ميتل
Special Metal

BRONZE, COPPER & BRASS ALLOY

BRONZE ALLOY

Bronze is a metal alloy consisting primarily of copper, usually with tin as the main additive. There are many different bronze alloys but today's bronze is typically 88% copper and 12% tin. Copper and Bronze Alloys have a huge variety of uses that reflect their versatile physical, mechanical, and chemical properties. Some common examples are the high electrical conductivity of pure copper, the excellent deep drawing qualities of cartridge case brass, the low-friction properties of bearing bronze, the resonant qualities of bell bronze, and the resistance to corrosion by sea water of several bronze alloys.

C51000 Wrought Phosphor Bronze
C54400 Wrought Phosphor Bronze
C61400 Wrought Aluminum Bronze

Nickel Aluminum Bronzes

C63000 Wrought Nickel Aluminum Bronze 10%
C63020 Nickel Aluminum Bronze
C63200 Nickel Aluminum Bronze

Silicon Aluminum Bronzes

C64200 Wrought Silicon Aluminum Bronze

Silicon Bronzes

C65100 Wrought Low Silicon Bronze B
C65500 Wrought High Silicon Bronze A
C67300 Wrought Leaded Silicon Manganese Bronze
C674100 Wrought Manganese Aluminum Brass
C67500 Wrought Manganese Bronze
C67600 Wrought Manganese Bronze
C72900 Wrought Copper Nickel Tin Spinodal

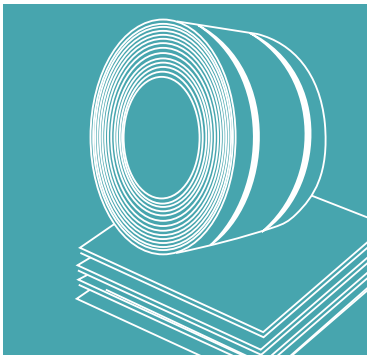
COPPER ALLOY

The major applications of copper are in electrical wires (60%), roofing and plumbing (20%) and industrial machinery (15%). Copper is mostly used as a metal, but when a higher hardness is required it is combined with other elements to make an alloy (5% of total use) such as brass and bronze.

BRASS ALLOY

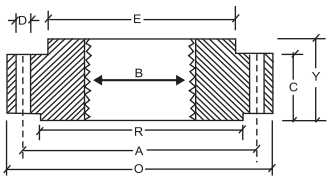
Brass is an alloy of copper and zinc; the proportions of zinc and copper can be varied to create a range of brasses with varying properties. In comparison, bronze is principally an alloy of copper and tin.

Typically used in decorative applications for its bright gold-like appearance. Applications where low friction is required such as locks, gears, bearings, doorknobs, ammunition, and valves; for plumbing and electrical applications; and extensively in musical instruments such as horns and bells for its acoustic properties. Because it is softer than most other metals in general use, brass is often used in situations where it is important that sparks not be struck, as in fittings and tools around explosive gases.

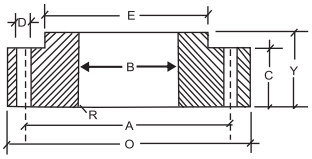


شركة سبيشل ميتل
Special Metal

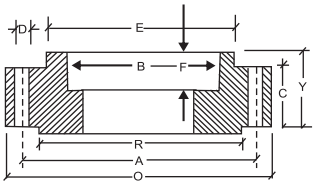
DIMENSION OF FORGED ANSI B 16.5



THREADED FLANGES



LAP JOINT FLANGES



SOCKET WELD FLANGES

DIMENSION OF CLASS 600 FLANGES AS PER ANSI B 16.5

600

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).

DIMENSION OF CLASS 900 FLANGES AS PER ANSI B 16.5

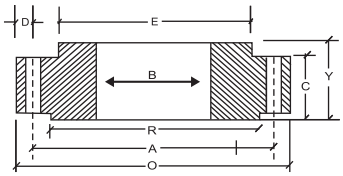
900

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

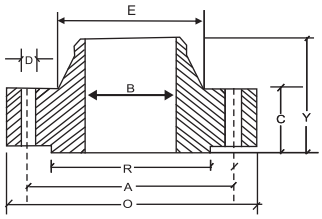
All Dimensions are in Millimeters, Flanges except Lap Joint will be furnished with (6.35mm) Raised Face, which is not included in Thickness (C) and Length Hub (Y).Class 1500 & 2500 also available as per customers requirement.

شركة سبيشل ميتل
Special Metal

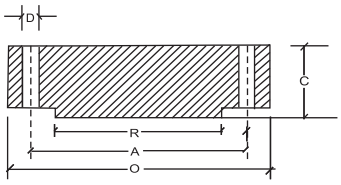
DIMENSION OF FORGED FLANGES AS PER ANSI B 16.5



SLIP-ON FLANGE



WELDING NECK FLANGE



BLIND FLANGE

DIMENSION OF CLASS 1500 FLANGES AS PER ANSI B 16.5

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	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	3/4	130.2	88.9	22.2	4	25.4	44.4	34.9	69.8	34.9	27.7	28.1	42.9	11.1	26.67
25	1	149.2	101.6	25.4	4	28.6	52.4	41.3	73.0	41.3	34.5	35.0	50.8	12.7	33.40
32	1 1/4	158.7	111.1	25.4	4	28.6	63.5	41.3	73.0	41.3	43.2	43.6	63.5	14.2	42.16
40	1 1/2	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	2	215.9	165.1	25.4	8	38.1	104.8	57.1	101.6	57.1	62.0	62.0	92.1	17.4	60.31
65	2 1/2	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	3	266.7	203.2	31.7	8	47.6	133.3	73.0	117.5	73.0	90.7	91.4	127.0	-	88.90
100	4	311.1	241.3	34.9	8	54.0	161.9	90.5	123.0	90.4	116.1	116.8	157.2	-	114.30
125	5	374.6	292.1	41.3	8	73.0	196.8	104.8	155.6	104.8	143.8	144.5	185.7	-	141.30
150	6	393.7	317.5	38.1	12	82.6	228.6	119.1	171.4	119.1	170.7	171.4	215.9	-	168.27
200	8	482.6	393.7	44.4	12	92.1	292.1	142.9	212.7	142.8	221.5	222.2	269.9	-	219.07
250	10	584.2	482.6	50.8	12	107.9	368.3	158.7	254.0	177.8	276.3	277.3	323.8	-	273.05
300	12	673.1	571.5	54.0	16	123.8	450.8	181.0	282.5	218.9	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).

DIMENSION OF CLASS 2500 FLANGES AS PER ANSI B 16.5

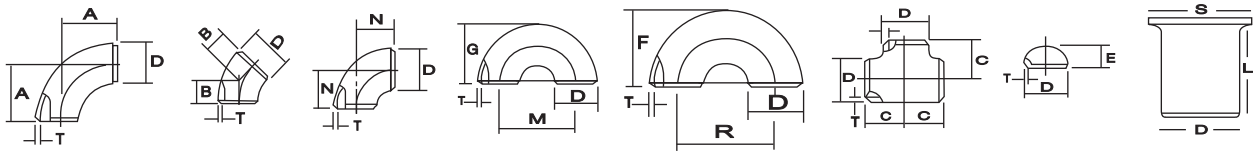
Nominal Pipe Size		Flange Dia	Dia of Bolt Circle	Dia of Bolt Holes	No. of Holes	Thk of Flange	Dia of Hub	Lenght through Hub			Dia of Bore		Dia of R/F	Depth of Socket	Pipe Dia
								S/O & S/W	W/N	L/J	S/O & S/W	L/J			
(MM)	(INCH.)	O	A	D		C	E	Y	Y	Y	B	B	R	F	X
15	1/2	133.3	88.9	22.2	4	30.2	42.9	39.7	73.0	39.7	22.3	22.3	34.9	-	21.33
20	3/4	139.7	95.3	22.2	4	31.7	50.8	42.9	79.4	42.9	27.7	27.7	42.9	-	26.67
25	1	158.7	107.9	25.4	4	34.9	57.1	47.7	88.9	47.7	34.5	34.5	50.8	-	33.40
32	1 1/4	184.1	130.2	28.6	4	38.1	73.0	52.4	95.2	52.4	43.2	43.2	63.5	-	42.16
40	1 1/2	203.2	146.0	31.7	4	44.4	79.4	60.3	111.1	60.3	49.5	49.5	73.0	-	48.26
50	2	234.9	171.4	28.6	8	50.8	95.2	69.8	127.0	69.8	62.4	62.0	92.1	-	60.31
65	2 1/2	266.7	196.8	31.7	8	57.1	114.3	79.4	142.9	79.4	74.7	74.7	104.8	-	73.02
80	3	304.8	228.6	34.9	8	66.7	133.3	92.1	168.3	92.1	90.7	90.7	127.0	-	88.90
100	4	355.6	273.0	41.2	8	76.2	165.1	107.9	190.5	107.9	116.1	116.1	157.2	-	114.30
125	5	419.1	323.8	47.6	8	92.1	203.2	130.0	228.6	130.0	143.8	143.8	185.7	-	141.30
150	6	482.6	368.3	54.0	8	107.9	234.9	152.4	273.0	152.4	170.7	170.7	215.9	-	168.27
200	8	552.4	438.1	54.0	12	127.0	304.8	177.8	317.5	177.8	221.5	221.5	269.9	-	129.07
250	10	673.1	539.7	66.7	12	165.1	374.6	228.6	419.1	228.6	276.3	276.3	323.8	-	273.05
300	12	762.0	619.1	73.0	12	184.1	441.3	254.0	463.5	254.0	327.1	327.1	381.0	-	323.85

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

MATERIAL SPECIFICATION FOR SEAMLESS/WELDED BUTT-WELDING PIPE-FITTINGS.

SPECIFICATION (ASTM-2002)	CHEMICAL PROPERTIES								MECHANICAL PROPERTIES					OTHERS
	C%	Mn%	P% (Max)	S% (Max)	Si%	Cr%	Mo%	Ni%	U.T.S. (Min) Mpa	Y.S. (Min) Mpa	ELONG. (Min) L	ELONG. (Min) T	Hardness (Max) BHN	
STAINLESS STEEL														
A 403 Gr. WP 304	0.080 Max	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	-	8.0-11.0	515	205	28	20	-	
A 403 Gr. WP 304L	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	-	8.0-12.0	485	170	28	20	-	
A 403 Gr. WP 304H	0.04-0.10	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	-	8.0-11.0	515	205	28	20	-	
A 403 Gr. WP 304LN	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	-	8.0-11.0	515	205	28	20	-	N%=0.10-0.16
A 403 Gr. WP 309	0.20 Max	2.00 Max	0.045	0.030	1.00 Max	22.0-24.0	-	12.0-15.0	515	205	28	20	-	
A 403 Gr. WP 310S	0.080 Max	2.00 Max	0.045	0.030	1.00 Max	24.0-26.0	-	19.0-22.0	515	205	28	20	-	
A 403 Gr. WP 316	0.080 Max	2.00 Max	0.045	0.030	1.00 Max	16.0-18.0	2.0-3.0	10.0-14.0	515	205	28	20	-	
A 403 Gr. WP 316L	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	16.0-18.0	2.0-3.0	10.0-14.0	485	170	28	20	-	
A 403 Gr. WP 316H	0.04-0.10	2.00 Max	0.045	0.030	1.00 Max	16.0-18.0	2.0-3.0	10.0-14.0	515	205	28	20	-	
A 403 Gr. WP 316LN	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	16.0-18.0	2.0-3.0	10.0-13.0	515	205	28	20	-	N%=0.10-0.16
A 403 Gr. WP 317	0.080 Max	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	3.0-4.0	11.0-15.0	515	205	28	20	-	
A 403 Gr. WP 317L	0.030 Max	2.00 Max	0.045	0.030	1.00 Max	18.0-20.0	3.0-4.0	11.0-15.0	515	205	28	20	-	
A 403 Gr. WP 321	0.080 Max	2.00 Max	0.045	0.030	1.00 Max	17.0-19.0	-	9.0-12.0	515	205	28	20	-	Ti%=(5XC)-0.70
A 403 Gr. WP 321H	0.04-0.10	2.00 Max	0.045	0.030	1.00 Max	17.0-19.0	-	9.0-12.0	515	205	28	20	-	Ti%=(4XC)-0.70
A 403 Gr. WP 347	0.080 Max	2.00 Max	0.045	0.030	1.00 Max	17.0-19.0	-	9.0-12.0	515	205	28	20	-	Cb%=(10XC)-1.10
A 403 Gr. WP 347H	0.04-0.10	2.00 Max	0.045	0.030	1.00 Max	17.0-19.0	-	9.0-12.0	515	205	28	20	-	Cb%=(8XC)-1.10
CARBON STEEL														
A 234 Gr. WPB	0.30 Max	0.29-1.06	0.050	0.058	0.10 Min	0.40 Max	0.15 Max	0.40 Max	415-655	240	30	20	197	Cu%=0.40 Max, Va%=0.08 Max, Cb%=0.02 Max
A 234 Gr. WPC	0.35 Max	0.29-1.06	0.050	0.058	0.10 Min	0.40 Max	0.15 Max	0.40 Max	485-655	275	30	20	197	Cu%=0.40 Max, Va%=0.08 Max, Cb%=0.02 Max
LOW TEMPERATURE CARBON STEEL														
A 420 Gr. WPL6	0.30 Max	0.50-1.35	0.035	0.040	0.15-0.40	0.30 Max	0.12 Max	0.40 Max	415-655	240	30	16.5	197	Cu%=0.40 Max, Va%=0.08 Max, Cb%=0.02 Max **Impact Test**=-45°C, J=17.3-13-6
A 420 Gr. WPL 3	0.20 Max	0.31-0.64	0.050	0.050	0.13-0.37	-	-	3.20-3.80	450-620	240	30	20	197	**Impact Test**=-45°C, J=17.3-13-6
ALLOY STEEL														
A 234 Gr. WP 1	0.28 Max	0.30-0.90	0.045	0.045	0.10-0.50	-	0.44-0.65	-	380-550	205	30	20	197	
A 234 Gr. WP 5	0.15 Max	0.30-0.60	0.040	0.030	0.50 Max	4.0-6.0	0.44-0.65	-	415-585	205	30	20	217	
A 234 Gr. WP 9	0.15 Max	0.30-0.60	0.030	0.030	1.00 Max	8.0-10.0	0.90-1.10	-	415-585	205	30	20	217	
A 234 Gr. WP 11 CL1	0.05-0.15	0.30-0.60	0.030	0.030	0.50-1.0	1.0-1.5	0.44-0.65	-	415-585	205	30	20	197	
A 234 Gr. WP 11 CL2	0.05-0.20	0.30-0.80	0.040	0.040	0.50-1.0	1.0-1.5	0.44-0.65	-	485-655	275	30	20	197	
A 234 Gr. WP 11 CL3	0.05-0.20	0.30-0.80	0.040	0.040	0.50-1.0	1.0-1.5	0.44-0.65	-	520-690	310	30	20	197	
A 234 Gr. WP 12 CL1	0.05-0.20	0.30-0.80	0.045	0.045	0.60 Max	0.80-1.25	0.44-0.65	-	415-585	220	30	20	197	
A 234 Gr. WP 12 CL2	0.05-0.20	0.30-0.80	0.045	0.045	0.60 Max	0.80-1.25	0.44-0.65	-	485-655	275	30	20	197	
A 234 Gr. WP 22 CL1	0.05-0.15	0.30-0.60	0.040	0.040	0.50 Max	1.90-2.60	0.87-1.13	-	415-585	205	30	20	197	
A 234 Gr. WP 22 CL3	0.05-0.15	0.30-0.60	0.040	0.040	0.50 Max	1.90-2.60	0.87-1.13	-	520-690	310	30	20	197	
A 234 Gr. WP 91	0.08-0.12	0.30-0.60	0.020	0.010	0.20-0.50	8.0-9.5	0.85-1.05	0.40 Max	585-760	415	20	-	248	Va%=0.18-0.25, Cb%=0.06-0.10, N%=0.03-0.07, Al%=0.04 Max

DIMENSIONS OF BUTT-WELDING FITTING ANSI B-16.9 / B-16.28 / MSS SP-43

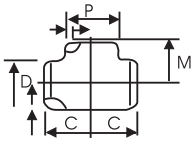


90° Elbow Long Radius | 45° Elbow | 90° Elbow Short Radius | 180° Return Short Radius | 180° Return Long Radius | Tee Equal Tee | Caps | Stub-End

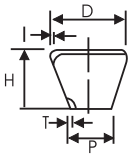
Nominal Pipe Size		Outside Diameter	Center to Face				Back to Face			Center to Center			Length 'L' MSS SP 43 B16.9	
INCH	MM	D	A R=1.5D	B	C	N R=1D	E	F	G	R	M	S	Short L	Long L
1/2	15	21.3	38.00	16.0	25.0	-	25.0	48.0	-	76.0		35.0	50.8	76.2
3/4	20	26.7	29.00	11.0	29.0	-	25.0	43.0	-	57.0		43.0	50.8	76.2
1	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	102.0	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	89.0	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	102.0	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	127.0	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	152.0	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	165.0	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	178.0	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	203.0	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	229.0	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	254.0	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

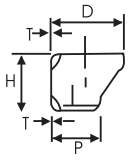
DIMENSIONS OF BUTT-WELDING FITTING ANSI B-16.9 / B-16.28



REDUCING TEES



CONCENTRIC REDUCERS



ECCENTRIC REDUCERS

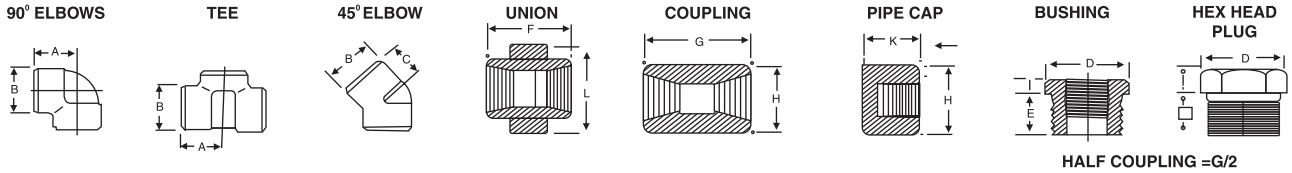
Nominal Pipe Size		Outside Diameter		Center to End		Length
INCH	MM	D	P	C	M	H
1/2 x 3/8	15 x 10	21.3	17.1	25	25	-
1/2 x 1/4	15 x 8	21.3	13.7	25	25	-
3/4 x 1/2	20 x 15	26.7	21.3	29	29	38
3/4 x 3/8	20 x 10	26.7	17.1	29	29	38
1 x 3/4	25 x 20	33.4	26.7	38	38	51
1 x 1/2	25 x 15	33.4	21.3	38	38	51
11/4 x 1	32 x 25	42.2	33.4	48	48	51
11/4 x 3/4	32 x 20	42.2	26.7	48	48	51
11/4 x 1/2	32 x 15	42.2	21.3	48	48	51
11/2 x 11/4	40 x 32	48.3	42.2	57	57	64
11/2 x 1	40 x 25	48.3	33.4	57	57	64
11/2 x 3/4	40 x 20	48.3	26.7	57	57	64
11/2 x 1/2	40 x 15	48.3	21.3	57	57	64
2 x 11/2	50 x 40	60.3	48.3	64	60	76
2 x 11/4	50 x 32	60.3	42.2	64	57	76
2 x 1	50 x 25	60.3	33.4	64	51	76
2 x 3/4	50 x 20	60.3	26.7	64	44	76
21/2 x 2	65 x 50	73.0	60.3	76	70	89
21/2 x 11/2	65 x 40	73.0	48.3	76	67	89
21/2 x 11/4	65 x 32	73.0	42.2	76	64	89
21/2 x 1	65 x 25	73.0	33.4	76	57	89
3 x 21/2	80 x 65	88.9	73.0	86	83	89
3 x 2	80 x 50	88.9	60.3	86	76	89
3 x 11/2	80 x 40	88.9	48.3	86	73	89
3 x 11/4	80 x 32	88.9	42.2	86	70	89
4 x 31/2	100 x 90	114.3	101.6	105	102	102
4 x 3	100 x 80	114.3	88.9	105	98	102
4 x 21/2	100 x 65	114.3	73.0	105	95	102
4 x 2	100 x 50	114.3	60.3	105	89	102
4 x 11/2	100 x 40	114.3	48.3	105	86	102
5 x 4	125 x 100	141.3	114.3	124	117	127
5 x 31/2	125 x 90	141.3	101.6	124	114	127
5 x 3	125 x 80	141.3	88.9	124	111	127
5 x 21/2	125 x 65	141.3	73.0	124	108	127
5 x 2	125 x 50	141.3	60.3	124	105	127
6 x 5	150 x 125	168.3	141.3	143	137	140
6 x 4	150 x 100	168.3	114.3	143	130	140
6 x 31/2	150 x 90	168.3	101.6	143	127	140
6 x 3	150 x 80	168.3	88.9	143	124	140
6 x 21/2	150 x 65	168.3	73.0	143	121	140

Nominal Pipe Size		Outside Diameter		Center to End		Length
INCH	MM	D	P	C	M	H
8 x 6	200x150	219.1	168.3	178	168	152
8 x 5	200 x 125	219.1	141.3	178	162	152
8 x 4	200 x 100	219.1	114.3	178	156	152
8 x 31/2	200 x 90	219.1	101.6	178	152	152
10 x 8	250 x 200	273.1	219.1	216	203	178
10 x 6	250 x 150	273.1	168.1	216	194	178
10 x 5	250 x 125	273.1	141.3	216	191	178
10 x 4	250 x 100	273.1	114.3	216	184	178
12 x 10	300 x 250	323.9	273.1	254	241	203
12 x 8	300 x 200	323.9	219.1	254	229	203
12 x 6	300 x 150	323.9	168.3	254	219	203
12 x 5	300 x 125	323.9	141.3	254	216	203
14 x 12	350 x 300	355.6	323.9	279	270	330
14 x 10	350 x 250	355.6	273.1	279	257	330
14 x 8	350 x 200	355.6	219.1	279	248	330
14 x 6	350 x 150	355.6	168.3	279	238	330
16 x 14	400 x 350	406.4	355.6	305	305	356
16 x 12	400 x 300	406.4	323.9	305	295	356
16 x 10	400 x 250	406.4	273.1	305	283	356
16 x 8	400 x 200	406.4	219.1	305	273	356
16 x 6	400 x 150	406.4	168.3	305	264	356
18 x 16	450 x 400	457.0	406.4	343	330	381
18 x 14	450 x 350	457.0	355.6	343	330	381
18 x 12	450 x 300	457.0	323.9	343	321	381
18 x 10	450 x 250	457.0	273.1	343	308	381
18 x 8	450 x 200	457.0	219.1	343	298	381
20 x 18	500 x 450	508.0	457.0	381	368	508
20 x 16	500 x 400	508.0	406.4	381	356	508
20 x 14	500 x 350	508.0	355.6	381	356	508
20 x 12	500 x 300	508.0	323.9	381	346	508
20 x 10	500 x 250	508.0	273.1	381	333	508
20 x 8	500 x 200	508.0	219.1	381	324	508
24 x 22	600 x 550	610.0	559.0	432	432	508
24 x 20	600 x 500	610.0	508.0	432	432	508
24 x 18	600 x 450	610.0	457.0	432	419	508
24 x 16	600 x 400	610.0	406.4	432	406	508
24 x 14	600 x 350	610.0	355.6	432	406	508
24 x 12	600 x 300	610.0	323.9	432	397	508
24 x 10	600 x 250	610.0	273.1	432	384	508

All Dimensions in Millimeters

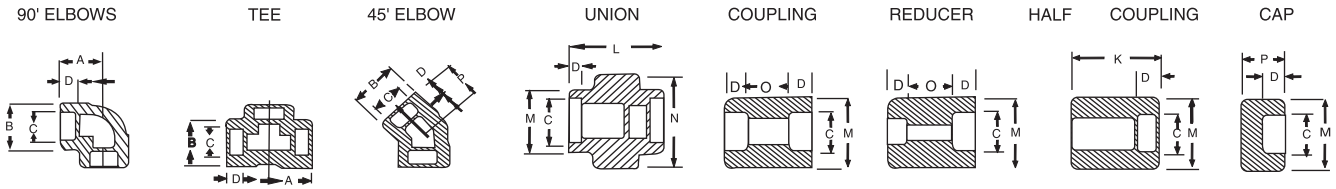
شركة سبيشل ميتل
Special Metal

DIMENSION OF FORGED SCREWED & SOCKET WELD



Dimension in MM of Forged Screwed Fittings to ANSI B-16.11 Threaded to ASA B 2.1

NOM	PIPE	3000 L.B.S.						COMMON FACTORS						6000 L.B.S					
BORE	O.D.	A	B	C	G	H	K	D	E	F	I	J	L	A	B	C	G	H	K
1/8"	10.3	21	22	17	32	16	19	11	10	40	-	6	-	25	25	19	32	22	-
1/4"	13.7	25	25	19	35	19	25	16	11	43	3	6	32	29	33	22	35	25	27
3/8"	17.2	29	33	22	38	22	25	17.5	13	48	4	8	38	33	38	25	38	32	27
1/2"	21.3	33	38	25	48	29	32	22	15	51	5	8	46	38	46	29	48	38	33
3/4"	26.7	38	46	29	51	35	37	27	16	57	6	10	51	44	56	33	51	44	38
1"	33.4	44	56	33	60	44	41	35	19	64	6	10	60	51	62	35	60	57	43
1 1/4"	42.2	51	62	35	67	57	44	44.5	21	70	7	14	72	60	75	43	67	64	46
1 1/2"	48.3	60	75	43	79	64	44	51	21	79	8	16	80	64	84	44	79	76	48
2"	60.3	64	84	45	86	76	48	63.5	22	88	9	17	94	83	102	52	86	92	51
2 1/2"	73.02	83	102	52	92	92	60	76	27	118	10	21	122	95	121	64	92	108	64
3"	89.0	95	121	64	108	108	65	89	29	121	10	25	140	106	146	79	108	127	68
4"	114.5	114	152	79	121	140	68	117.5	32	150	13	25	180	114	152	79	121	159	75



Socket Weld Fitting to ANSI B-16.11

NOM	PIPE	3000 L.B.S.						COMMON FACTORS						6000 L.B.S					
BORE	O.D.	A	B	K	J	L	M	N	P	Q	C	D	O	O	A	B	M	K	N
1/8"	10.3	22	18.5	26	16	40	17.3	32	17.5	10	10.7	10	5	8	22	22	20	25	46
1/4"	13.7	22	22	26	18	43	21.2	32	17.5	10	14.1	10	5	8	27	25	24	25	51
3/8"	17.2	25	25	26	19	48	25.4	36	19	10	17.6	10	3	9	27	28	28	26	60
1/2"	21.3	27	32	30	21	51	31	43	22	10	21.7	10	6	13	31	34	34	31	72
3/4"	26.7	34	38	36	24	57	37	50	25	13	27	13	6	13	37	42	41	35	80
1"	33.4	37	46	40	25	64	45.2	60	27	13	33.8	13	9	17	42	50	50	40	94
1 1/4"	42.2	42	56	40	29	70	55	70	30	13	42.6	13	9	17	47	59	58	41	100
1 1/2"	48.3	47	62	40	30	79	61.4	78	32	13	48.7	13	9	17	53	67	66	43	122
2"	60.3	56	75	52	37	89	75	95	38	13	61.2	16	15	23	59	84	83	55	
2 1/2"	73.02	60	92	52	48	114	91.3	125	38	16	73.8	16	14	24		102		56	
3"	89.00	76	110	52	51	127	108.8	140	44	16	89.8	16	14	24		121		58	
4"	114.50	88	137	58		150	136.9		48	19	115.5	19	14	24		152		64	

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

FORMULAE OF CALCULATING WEIGHT

1) Weight of Stainless Steel Pipe
O.D. (mm) - W. Thick (mm) X W. Thick (mm) X 0.0248= Wt. Per Mtr
O.D. (mm) - W. Thick (mm) X W. Thick (mm) X 0.00756= Wt. Per Feet

2) Weight of Stainless Steel Round Bar
Dia (mm) X Dia (mm) X 0.00623 = Wt. per Mtr.
Dia (mm) X Dia (mm) X 0.0019 = Wt. per Feet

3) Weight of Stainless Steel Square Bar
Dia (mm) X Dia (mm) X 0.00788 = Wt. per Mtr.
Dia (mm) X Dia (mm) X 0.0024 = Wt. per Feet

4) Weight of Stainless Steel Hexagonal Bar
Dia (mm) X Dia (mm) X 0.00680 = Wt. per Mtr.
Dia (mm) X Dia (mm) X 0.002072 = Wt. per Feet

5) Weight of Stainless Steel Flat Bar
Width (mm) X Thickness (mm) X 0.00798 = Weight per Mtr.
Width (mm) X Thickness (mm) X 0.00243 = Weight per Feet

6) Weight of Stainless Steel Sheets & Plates
Length (Mtrs) X Width (Mtrs) X Thick (mm) X 8 = Weight per PC
Length (Feet) X Width (Feet) X Thick (mm) X 3/4 = Weight per PC

7) Weight of Stainless Steel Circle
Dia (mm) X Dia (mm) X Thck (mm) / 160 = Gms. per PC
Dia (mm) X Dia (mm) X Thck (mm) X 0.0000063 = Kg. per PC

8) Weight of Brass Pipes / Copper Pipes
O.D. (mm) - W. Thick (mm) X W. Thick (mm) X 0.0260 = Wt. Per Mtr.

9) Weight Lead Pipe
O.D (mm) - W. Thick (mm) X W. Thick (mm) X 0.0345 = Wt. Per Mtr

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

11) Weight of Aluminium Sheet
Length (Mtrs) X Width(Mtrs) X Thick (mm) X 2.69 = Weight per PC

12) Weight Conversion of Mtr. to Ft.
Length (Mtrs) X Width (Mtrs) X Thick (mm) X 2.69 = Weight per PC

13) Wt. of 1 Mtr / 3.2808 = Wt per Ft.
Barlow's Formula for calculating bursting pressure
P = 2ST/D or t-DP/2S or S-DP/2T or D=2ST/P
P = Bursting Pe\ressure P Si.,
S= Tensile Strength of tubes, T = Wall Thickness (in inches)
D = Outside Diameter (in inches)

14) Formula for Healthy Business
Honesty + Quality of Goods + Quick Service = Good Healthy Business

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