METALS INTERNATIONAL LIMITED

ABOUT US

Metals International Limited offers a wide range of Stainless Steel Pipes & Tubes including welded/ seamless straight, U-tubes and coils, welded & seamless pipes, large dia EFW pipes and rectangular and square sections in various finishes and grades. The company is one of the very few worldwide to offer as wide a product range.

Metals International Limited owns 40 senior engineers, and we have achieved the certificates of ISO9001:2000, PED, TUV, Lloyd's, Moody International, ASME**,** DNV, GOST,API 5LC and the License of Special Equipments Production (Pressure piping). We have 8 lines cold-drawn steel pipe mill, and also 19 advanced lines of type LG120-H/LG60-H/LG30-H/LG30/LD30/LG15 enhanced cold-rolling mill in our factory. As well as a testing centre with advanced equipments, such as mechanical experiments, ultrasonic testing/eddy current testing, hydraulic test, intergranular corrosion, metallurgical microscopy, spectral analysis system. And full sets of analyzing equipments.

Metals International Limited is one of the best entity, who can produce all types of stainless steel products. Owning advanced manufacturing and testing equipments, specializing in producing industrial stainless steel tube and molding materials, our products are strictly implemented to the standard GB, JIS, ASTM/ASME, EN/DIN, GOST, ISO, etc. And we can supply the best products and service to all customers.

All kinds of stainless steel tubes are produced by us with size covering outside diameters φ**6-3600mm**, wall thickness in **1-150mm** and major material are 304/304L(1.4301/1.4307); 316/316L (1.4401/1.4404);316Ti(1.4571); 321(1.4541); 310S(1.4845); 317L(1.1138); 321H(1.4878); 304H(1.4948); 347H(1.4550);S32304;S31803/S32205(1.4462);S32750;904L Standard:API 5LC, EN 10216-5;DIN 17456;DIN17458;DIN17459;ASTM A213/ASTM A312/ASTM A269/ASTM A789/ASTM A790/ASTM A511/ASTM A376;JIS G3459;JIS G3463;GOST 9940 GOST 9941 or standards stipulated in the technical agreement.

The mission of Metals International Limited is to provide an environment that encourages an entrepreneurial spirit among its employees that leads to the best relationships with mills and customers. We strive to be the Company that others want to do business with – on win-win basis transaction. Our extensive knowledge in metal has allowed us to save our customers time and reduce their costs.

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METALS INTERNATIONAL LIMITED

PRODUCT RANGE

WELDED PIPES & TUBES

MIL is a specialist in welded pipes &t ubes. With its enviable manufacturing infrastructure, vast experience and depth in understanding of the subject, its capabilities match with the best in business, globally.

Equipments like fully integrated and automatic tube mills (with online annealing, eddy current testing, marking etc.), semi automatic tube mills, solution annealing furnaces, cold-drawing facilities, multiple support machines like straightening, cutting, ends facing, polishing, high capacity pickling & passivation setup, U-bending facility etc. give MIL a consummate versatility that is unparalleled.

These products can be supplied in the following grades:

Austenitic Grades:	**TP304, 304L,TP310, 316, 316L, 316Ti, 317L, 321, 321H, 347, 347H.**
Ferritic Grades:	**TP409,410, 430Ti, 436, 439M, 441, 444**
Duplex:	**UNS 31803, UNS 32205,UNS 32750, UNS 32304, LDX2101**

Manufacturing of welded pipes & tubes is carried out on sophisticated tube mills, where the raw material, i.e. SS Strips, sourced from only the world-renowned sources is fed. The strips are welded into tubes/ pipes using TIG/ Plasma/ Laser welding. Under this process, the edges of the strip are heated and fused together in a protective atmosphere of Argon gas using a non-consumable electrode without the addition of any filler material.

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After cutting to size, and depending on the customer requirements, the tubes are then solution-annealed, straightened, cut to final size, pickled, passivated and polished before it is subjected to various tests, marked and released for dispatch.

When tubes are made on fully automatic tube mills, the product is bright annealed, subjected to NDT, size checked, polished if required and stencil marked on line itself.

EFW (ELECTRIC FUSION WELDED) PIPES

A combination of specially designed equipments like 1600MT press brake machine, multiple rolls bending machine, welding installations for outside, inside and circumferential welding, size calibrating press, solution annealing furnace and a host of other related machinery, is employed to manufacture pipes used in critical applications like refineries, fertilizers, LNG terminals, cross country pipe lines etc.

These products can be supplied in the following grades:

Austenitic Grades:	**TP304, 304L, 316, 316L, 316Ti, 317L, 321, 321H, 347, 347H.**
Ferritic Grades:	**TP409, 410, 430Ti, 436, 439M, 441, 444**
Duplex:	**UNS 31803, UNS 32205,UNS 32750, UNS 32304, LDX2101**

Edges of the Stainless Steel Plate cut to size are prepared and pre-bent followed by roll forming into pipes. It is prewelded and then the final welding is done using filler material. All welders, welding operators and weld procedures are qualified to the ASME Boiler and Pressure Vessel Code, Section-IX. Heat treatment is done on continuous roller hearth furnace or batch furnace. The pipe is nowsized, pickled&passivated.

Spiral welded tube

This tube is produced by the helical forming and automatic welding of a continuous strip of stainless steel.

Typical applications include water and pulp in paper mills, product and effluent lines in chemical processing, water lines for brewing, dust fume extraction, furnace and boiler flues, stormwater down-pipes in high-rise applications and ventilation ducts and condensation lines for air conditioning.

Manufacturing specification: generally to ASTM A778, except for mechanical properties.

SEAMLESS PIPES & TUBES

Cold drawn seamless (CDS) tube

This tube is produced by drawing from hollow billets. It is usually supplied in the annealed and pickled condition and used where service conditions involve high pressure and corrosive conditions and where good surface finish and close tolerances are required, e.g. heat exchanger and condenser tubing, instrumentation tubing and some refinery applications.

Manufacturing specification: ASTM A269 for general service ASTM A213M for heat exchanger service.

With specialized machinery like cold pilgering machines, draw benches, solution annealing furnace and U-bending facility, we offer the best quality seamless tubes and pipes.

Mother tubes or hollows are procured from reputed manufacturers in India and abroad, and are subjected to a thorough chemical analysis with rigorous physical and mechanical tests.

The best quality mother tubes are then cold-rolled on pilger machines and/ or cold-drawn on draw benches with precise pull forces, achieving the desired dimensions and a smooth finish. Tubes are then solution annealed, straightened, pickled, passivated before they are inspected, tested and released for dispatch. Polishing is also done wherever required by a customer.

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Austenitic Grades:	**TP304, 304L, 316L, 321, 347, 347H**
Duplex:	**UNS 31803, UNS 32205, UNS 32304, LDX2101**

CONDENSER & HEATER TUBES

We offer specialty welded tubing for heat transfer applications like condenser, feedwater heater, LP heater and HP heater etc. on its state-of-the-art, PLC run tube mills. All operations like forming, seam welding, bead rolling, sizing, OD seam polishing, bright annealing, straightening, NDT checking, dimension control, continuous marking and cut-off are done online and automatically. These fully integrated and perfectly synchronized processes result in a very high and consistently good quality of products. Whether it is the surface finish, dimensional accuracy or the welding integrity, the tubes made on these mills meet the highest quality standards. The customers are able to rely on these products for their critical usages with complete peace of mind.

As-welded (AW) tube

Decorative and Structural tube-ASTM A554

This tubing is produced direct off the continuous tube welding mill, using cold rolled stainless steel strip made to ASTM standards, with tube produced to commercial limits of straightness in standard or specific customer lengths. AW tube has a higher yield point than annealed tube and is generally used for decorative applications or in mildly corrosive conditions. It is not suitable for applications requiring significant flaring, expanding or bending.

Food quality tube- ASTM 1528

This tube at the point of manufacture goes through a process where the internal weld bead is rolled. The result is an improved internal finish along the weld, reducing the chance of a crevice where liquid or food product may be trapped. This assists with 'clean in place' (CIP) environment food and beverage process lines or other applications such as the pharmaceutical industry.

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As-welded annealed (AWA) tube- ASTM A269.

This tube is produced by the same process as AW tube but is annealed to relieve stresses and improve ductility. Bright annealing is carried out in a controlled-atmosphere furnace, so that no oxide or scale is formed on the surface.

Annealing both increases the corrosion resistance and softens the tube which allows severe manipulation such as bending, expanding and forming.

Cold worked annealed (CWA) tube- ASTM A249M

This tube is typically destined for heat exchanger applications and is produced in a similar way to AWA product except that the internal bead is rolled flush with the inside tube surface prior to annealing.

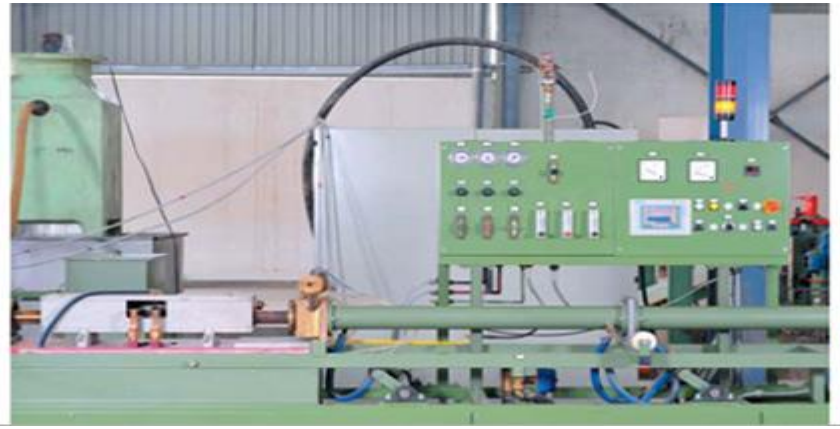
Cold drawn welded (CDW) and cold drawn welded annealed (CDWA) tube- ASTM A249M

The tube is produced by drawing through a hardened steel or tungsten carbide die, at room temperature. The purpose of cold drawing is to reduce the OD or wall or both, to produce a smooth surface finish and to break up the weld structure, which results in recrystallisation when annealed.

Through cold drawing tube in the AW and AWA conditions, fine dimensional tolerances are achieved, with excellent uniformity of wall thickness and concentricity, grain structure and hardness.

METALS INTERNATIONAL LIMITED

MANUFACTURING FACILITIES



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We have a sophisticated 'U bending facility' to cold bend tubes of 15.87mmOD to 25.4mmOD and up to 3.05 mmwall thickness with 25.4mmto 1000mm Center line radius and with leg length up to 14meters.

The modern production facilities of MIL are equipped with state-of-the-art, worldclass machines to manufacture a very wide range of Stainless Steel pipes and tubes as per all international specifications, and suitably accommodating demands of customers in variable quantity and timeframes.

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METALS INTERNATIONAL LIMITED

MACHINERY & EQUIPMENTS:

- 2 Fully Inline Condenser Tube Mills
- 8 Tube Mills
- 4 Pipe Mills
- Coil Slitting Machines
- Overhead Cranes
- Inhouse Argon Gas Mixing Plant

- Pilger Machines
- Draw Benches
- 1600MT Press Brake Machine For Pipe Forming
- Three Rolls Bending Machine For Pipe Forming
- Tri-cathode Imported Tig Welding Sets
- Laser Welding

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- Plasma Welding
- Submerged Arc Welding
- Automatic Circumferential Welding
- Automatic Large Pipe Outside & Inside Welding
- Continuous Roller Hearth Furnace
- Bogie Furnace For Large Pipes

- Inline Bright Annealing
- Straightening Machines
- Pickling Apparatus
- Multiple Head Tube Polishing Machine
- Pipe Beveling Machines
- Plate Beveling Machines

- Tube Bending CNC Machines
- U-bend Annealing Machine
- DM Water Treatment Plant
- Product Marking Machines
- Fully Equipped Tool Room & Mechanical Workshop
- Captive Power Generation

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QUALITY ASSURANCE

MIL carries a Quality Management System certified in accordance with the ISO 9001:2008 standard. The well-deserved certification is the result of high and consistent standards of processes, which is reflected in the high quality of the products.

An independent quality assurance department is responsible for work procedures required to ensure that manufacturing processes are carried out in accordance with international technical delivery conditions given in ASTM, ASME, EN, IS and customer specifications.

To guarantee high quality, MIL procures its raw material from top-notch vendors of international repute. The manufacturing is carried out under strict process control and monitored throughout the production process to ensure total conformity to requisite specifications.

All through the process and finally before dispatch, uncompromising and stringent tests are carried out as per the standards specifications or customer specific requirements.

Every single piece of tube is subjected to a thorough visual inspection by trained staff to detect dimensional inaccuracies, surface imperfections etc.

To ensure complete identification and traceability even after supplies are effected, all the information as required by the standards, i.e. brand name, size, grade, specifications, heat number is marked on all the pipes and tubes.

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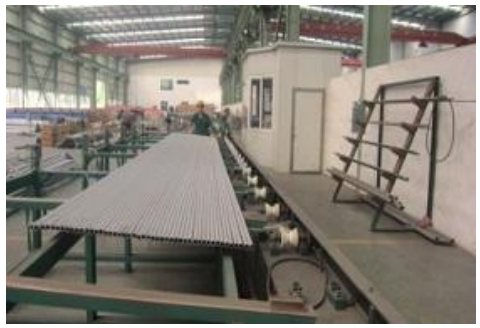
INSPECTION & TESTS

MIL BOASTS OF A COMPREHENSIVE AND FULLY EQUIPPED IN-HOUSE LABORATORY&INSPECTION FACILITIES TO CONDUCTALL NECESSARY TESTS IN-HOUSE. THESE INCLUDE:

NON DESTRUCTIVE TESTS (NDT)

- » Eddy Current Offline & Inline
- » Radiography
- » Ultrasonic
- » Hydrostatic
- » Pneumatic Leak
- » Surface Roughness
- » Positive Material Identification (PMI)
- » Liquid Dye Penetrant
- » Ultrasonic Thickness Testing
- » Laser Dimension Checking
- » Optical Pyrometer

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Mechanical / Physical

» Tensile
» Flattening
» Flaring
» Hardness
» Reverse Bend
» Reverse Flattening
» Impact
» Root Bend
» Face Bend
» Residual Chloride Salt Contamination
» Drift Expansion
» Ferrite content measurement
» Residual stress measurement

Metallurgical

» Corrosion Tests as per IGC pr. A, B, C & E
» Micro Structure and Grain size determination



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Specification

ASTM/ASME Standards

ASTM A 213/A 213M ASME SA213/SA213M Specification for Seamless Ferric and Austenitic Alloy-Steel Boiler, Su[perheater, and Heat-Exchanger Tubes

ASTM A 249/A 249M Specification for Welded Austenitic Steel Boiler, Superheater, Heat-Exchanger, and Condenser tubes

ASTM A268/A268M, ASME SA268/SA268M Specification Seamless and welded ferritic and martensitic stainless steel tubing for general service

ASTM A269/A269M, ASME SA269/SA269M Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service

ASTM A 270 Specification for Seamless and Welded Austenitic and Ferritic/Austenitic Stainless Steel Sanitary Tubing

ASTM A312/A312M, ASME SA312/SA312M Specification for Seamless and Welded Austenitic Stainless Steel Pipes

ASTM A 358/A 358M Specification for Electric-Fusion-Welded Austenitic Chromium-Nickel Alloy Steel Pipe for High-Temperature Service

ASTM A376/A376M, ASME SA376/SA376M Seamless austenitic steel pipes for high-temperature central-station service

ASTM A409/SA409 Welded Large Diameter Austenitic Steel Pipe for Corrosive or High Temperature Service

ASTM A 450/A 450M Specificaion for General Requirements for Carbon, Ferritic Alloy, and Austenitic Alloy Steel Tubes

ASTM A 511 Specification for Seamless Stainless Steel Mechanical Tubing

ASTM A 530/ A 530M Specification for General Requirements for Specialized Carbon and Alloy Steel Pipe

ASTM A 554 Specification for Welded Stainless Steel Mechanical Tubing

ASTM A632 Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing (Small-Diameter) for General Service

ASTM A 688 / SA 688 For Welded feed water heater ‘U’ Tubes

ASTM A731 / A731M Seamless and Welded Ferritic and Martensitic Stainless Steel Pipe

ASTM A 778 Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products

ASTM A789/A789M, ASME SA789/SA789M Seamless and Welded Ferritic/Austenitic Stainless Steel Tubing for General Service

ASTM A790/A790M, ASME SA790/SA790M Seamless and Welded Ferritic/Austenitic Stainless Steel Pipe

ASTM A 999/A 999M Specification for General Requirements for alloy and Stainles Steel Pipe

ASTM A813/A813M Standard Specification for Single- or Double-Welded Austenitic Stainless Steel Pipe
ASTM A814/A814M Standard Specification for Cold-Worked Welded Austenitic Stainless Steel Pipe
ASTM A999/A999M Standard Specification for General Requirements for Alloy and Stainless Steel Pipe
ASTM A1016/A1016M Standard Specification for General Requirements for Ferritic Alloy Steel, Austenitic Alloy Steel, and Stainless Steel Tubes
ASTM A530/A530M Standard Specification for General Requirements for Specialized Carbon and Alloy Steel Pipe
ASTM A450/A450M Standard Specification for General Requirements for Carbon and Low Alloy Steel Tubes

Line Pipe:
API 5LC CRA Line Pipe- LC30-1812/LC52-1200/LC65-2205/LC65-2506/LC30-2242
API 5LD CRA Clad or Lined Steel Pipe-X42, X46, X52, X56, X60, X65, X70,X80 LC1812/LC2205/2506/LC2242/LC2262
DEP 31.40.20.34-Gen Welded and seamless duplex and super duplex stainless steel line pipe (amendments/supplements to API Spec 5LC)
DEP 31.40.20.36-Gen Weldable martensitic stainless steel line pipe for use in oil and gas operations (amendments/supplements to API Spec 5LC)
DEP 31.40.20.32-Gen CRA clad or lined steel pipe (amendments/supplements to API Spec 5LD) 61.40.20.30 1999 Field welding of duplex and super duplex stainless steel pipelines (amendments/ supplements to API 1104)
61.40.20.31 1999 Field welding of duplex stainless steel pipelines (amendments/supplements to API 1104)
NACE MR 0175/ISO 15156-2 Petroleum and Natural Gas Industries – Materials for Use in H2S Containing Environments in Oil and Gas Production. Part 2. Cracking resistant Carbon and Low Alloy Steels, and the Use of Cast Irons.
NACE TM 0177 Laboratory Testing of Metals for Resistance to Sulfide Stress Cracking in Hydrogen Sulfide (H2S) Environments
NACE TM 0284 Standard Test Method - Evaluation of Pipeline and Pressure Vessel Steels for Resistance to Hydrogen-Induced Cracking

BS-Standards
BS 3059 Steel boiler and super heater tubes
BS 3605 Austenitic stainless steel pipes and tubes for pressure purposes
BS 3606 Steel tubes for heat exchangers

NF-Standards

NF A 49-117 Seamless ferritic and austenitic stainless steel tubes for general service

NF A 49-217 Seamless ferritic, austenitic, and ferritic-austenitic stainless steel tubes for heat exchangers

NF A 49-317 Seamless plain-end austenitic stainless steel mechanical tubing

German-Standards

DIN 2463-1Welded austenitic stainless steel tubes: dimensions and masses per unit length

DIN 17455 Welded circular stainless steel tubes with general quality requirements -Technical delivery conditions

DIN 17456 Seamless circular austenitic stainless steel tubes for general service

DIN 17457 Welded circular austenitic stainless steel tubes subject to special requirements

DIN 17458 Seamless circular austenitic stainless steel tubes subject to special requirements

DIN 17459 Seamless circular high-temperature austenitic stainless steel tubes

DIN 11850 Tubes for the food, chemical and pharmaceutical industry - Stainless steel tubes - Dimensions,materials

DIN 28180-85 Seamless steel tubes for tubular heat exchangers

DIN EN ISO 1127 Seamless stainless steel tubes (Dimensions and weights)

EN Standards

EN 10216-5 Welded Stainless Steel Tube

EN 10216-7 Seamless Stainless Steel Tube

EN 10217-7 Welded steel tubes for pressure purposes - Technical delivery conditions - Part 7: Stainless steel tubes

EN 10296-2 Welded circular steel tubes for mechanical and general engineering purposes - Technical delivery conditions - Part 2: Stainless steel

Australian Standards

AS 1528 Tubes (Stainless Steel) and Tube Fittings for the Food Industry.

JIS-Standards

JIS G 3447 Stainless Steel Sanitary Pipes

G 3448 Light Gauge Stainless Steel Tubes for Ordinary Piping

G 3459 Stainless Steel Pipes

G 3468 Large Diameter Welded Stainless Steel Pipes

G 3463 Stainless Steel Boiler and Heat Exchanger Tubes

G 3446 Stainless Steel Pipes for Machine and Structural Purposes

GOST

GOST 9940 Seamless stainless steel tubes, hot finished

GOST 9941 Seamless stainless steel tubes, cold and hot finished

AD-W0 (AD2000-Merkblatt W0) General principles for materials

AD-W2 (AD2000-Merkblatt W2) Materials for pressure vessels-Austenitic and austenitic-ferritic steels

AD-W10 (AD2000-Merkblatt W10) Materials for low temperatures - Ferrous materials

AD-HP100R (AD2000-Merkblatt HP100R) Construction regulations Metal piping

SEW 400 Stainless steels

UNI 6904 Seamless tubes of special alloyed corrosion and heat resisting stainless steel

METALS INTERNATIONAL LIMITED

Material Comparative Table

Sr.	Type	Chinese	Former Soviet Union	Germany	France	Japan	United States of America			Bristish	ISO
		(GB)	(TOCT)	(DIN)	(NF)	(JIS)	AISI/ ASTM	UNS	SAE	(BS)	(ISO)
1	**Austenitic**	**1Cr17Mn6Ni5N**	**12X17T9AH4**	**—**	**—**	**SUS201**	**201**	**S20100**	**30201**	**—**	**A-2**
2		1Cr18Mn8Ni5N	12X17T9AH4	X8CrMnNi189	Z15CNM19.08	SUS202	202	S20200	30202	284S16	A-3
3		1Cr18Mn10Ni5Mo3N	—	—	—	—	—	—	—	—	—
4		2Cr13Mn9Ni4	20X13H4T9	—	—	—	—	—	—	—	—
5		1Cr17Ni7	09X17H7Ю	X12CrNi17.7	Z12CN17.07	SUS301	301	S30100	30301	301S21	14
6		1Cr17Ni8	—	X12CrNi17.7	—	SUS301J1	—	—	—	—	—
7		1Cr18Ni9	12X18H9	X12CrNi18.8	Z10CN18.09	SUS302	302	S30200	30302	302S25	12
8		Y1Cr18Ni9	—	X12CrNiS18.8	Z10CNF18.09	SUS303	303	S30300	30303	303S21	17
9		Y1Cr18Ni9Se	12X18H10E	—	—	SUS303Se	303Se	S30323	30303Se	303S41	17
10		1Cr18Ni9Si3	—	X12CrNiSi18.8	—	SUS302B	302B	S30215	30302B	—	—
11		0Cr18Ni9	08X18H10	X5CrNi18.9	Z6CN18.09	SUS304	304	S30400	30304	304S15	11
12		00Cr18Ni10	03X18H11	X2CrNi18.9	Z2CN18.09	SUS304L	304L	S30403	30304L	304S12	10
13		0Cr19Ni9N	—	—	—	SUS404N1	304N	S30451	—	—	—
14		0Cr19Ni10NbN	—	X5CrNiNb18.9	—	SUS304N2	XM21	S30452	—	—	—
15		00Cr18Ni10N	—	X2CrNiN18.10	Z2CN18.10	SUS304LN	304LN	S30453	—	304S62	—

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				(Az)						
16		1Cr18Ni12	12X18H12T	X5CrNi19.11	Z8CN18.12	SUS305	305	S30500	30305	305S19	13
17		0Cr18Ni12	8X18H12T 、 06X18H11	X5CrNi19.11	Z8CN18.12	—	—	—	—	—	—
18		0Cr23Ni13	—	X7CrNi23.14	—	SUS309S	309S	S30908	30309S	—	—
19		0Cr25Ni20	—	—	—	SUS310S	310S	S31008	30310S	—	—
20		0Cr17Ni12Mo2	08X17H13M2T	X5CrNiMo18.10	Z6CND17.12	SUS316	316	S31600	30316	316S16	20,20a
21		1Cr17Ni12Mo2	10X17H13M2T	—	—	—	—	—	—	—	—
22		0Cr18Ni12Mo2Ti	08X17H13M2T	X10CrNiMoTi18.10	Z6CNDT17.12	—	—	—	—	320S31 320S17	—
23		1Cr18Ni12Mo2Ti	10X17H13M2T	X10CrNiMoTi18.10	Z8CNDT17.12	—	—	—	—	—	—
24		00Cr17Ni14Mo2	03X17H14M2	X2CrNiMo18.10	Z2CND17.12	SUS316L	316L	S31603	30316L	316S12	19,19a
25		0Cr17Ni12Mo2N	—	—	—	SUS316N	316N	S31651	—	—	—
26		00Cr17Ni13Mo2N	—	X2CrNiMoN18.12	Z2CND17.12 (AZ)	SUS316LN	316LN	S31653	—	316S61	—
27		0Cr18Ni12Mo2Cu2	—	—	—	SUS316J1	—	—	—	—	—
28		00Cr18Ni14Mo2Cu2	—	—	—	SUS316J11	—	—	—	—	
29		0Cr18Ni12Mo3Ti	08X17H15M3T	—	Z6CNDT17.13	—	—	—	—	—	—
30		1Cr18Ni12Mo3Ti	10X17H13M3T	X10CrNiMoTi18.12	Z8CNDT17.13B	—	—	—	—	—	—
31		0Cr19Ni13Mo3	08X17H15M3T	X5CrNiMo17.13	—	SUS317	317	S31700	30317	317S16	25

32		00Cr19Ni13Mo3	03X16H15M3	X2CrNiMo18.16	Z2CND19.15	SUS317L	317L	S31703	—	317S12	24
33		0Cr18Ni16Mo5	—	—	—	SUS317J1	—	—	—	—	—
34		1Cr18Ni9Ti	12X18H9T	X12CrNiTi18.9	Z10CNT18.10	SUS321	321	S32100	30321	321S20	—
35		0Cr18Ni10Ti	08X18H10T	X10CrNiTi18.9	Z6CNT18.11	SUS321	321	S32100	30321	321S12	15
36		1Cr18Ni11Ti	12X18H10T	—	—	—	—	—	—	321S20	—
37		0Cr18Ni11Nb	08X18H12B	X10CrNiNb18.9	Z6CNNb18.10	SUS347	347	S34700	30347	347S17	16
38		1Cr18Ni11Nb	12X18H12B	—	—	—	—	—	—	—	—
39		0Cr18Ni9Cu3	—	—	Z6CNU18.10	SUSXM7	XM7	S30430	—	—	D32
40		0Cr18Ni13Si4	—	—	—	SUSXM15J1	XM15	S38100	—	—	—
41	Austenitic-Ferritic	0Cr26Ni5Mo2	08X21H6M2T	X8CrNiMo275	—	SUS329J1	329	S32900	—	—	—
42		1Cr18Ni11Si4AlTi	15X18H12C4TЮ	—	—	—	—	—	—	—	—
43		1Cr21Ni5Ti	12X21H5T	—	—	—	—	—	—	—	—
44		00Cr18Ni5Mo3Si2	—	—	—	—	—	—	—	—	—
45		00Cr24Ni6Mo3N	—	—	—	—	—	—	—	—	—
46		0Cr13A1	1X12CЮ	X7CrAl13	Z6CA13	SUS405	405	S40500	51405	405S17	2
47	C	00Cr12	—	—	—	SUS410L	—	—	—	—	—
48	—	1Cr15	—	—	—	SUS429	429	S42900	51429	—	—
49	T	00Cr17	—	—	—	SUS430LX	—	—	—	—	—
50	R	1Cr17	12X7	X8Cr17	Z8C17	SUS430	430	S43000	51430	430S15	8

51	FERRITE	Y1Cr17	—	X12CrMoS17	Z10CF17	SUS430F	430F	S43020	51430F	—	8a
52		1Cr17Mo	—	X6CrMo17	Z8CD17.01	SUS434	434	S43400	51434	434S17	9c
53		00Cr17Mo	—	—	—	SUS436L	—	—	—	—	—
54		00Cr18Mo2	—	—	—	SUS444	18Cr2Mo	—	—	—	—
55	MARTENSITE	1Cr25Ti	15X25T	X8Cr28	—	—	446	S44600	51446	—	—
56		00Cr27Mo	—	—	Z01CD26.1	SUSXM27	XM27	S44625	—	—	—
57		00Cr30Mo2	—	—	—	SUS447J1	—	S44700	—	—	—
58		1Cr12	—	—	—	SUS403	403	S40300	51403	403S17	—
59		0Cr13	08X13	X7Cr13、X7Cr14	Z6C13	SUS410S	410S	S4108	—	430S17	1
60		1Cr13	12X13	X10Cr13	Z12C13	SUS410	410	S41000	51410	410S21	3
61		1Cr13Mo	—	X15CrMo13	—	SUS410J1	—	—	—	—	—
62		Y1Cr13	—	X12CrS13	Z12CF13	SUS416	416	S41600	51416	416S21	7
63		2Cr13	20X13	X20Cr13	Z20C13	SUS420J1	420	S42000	51420	420S37	4

Chemical Composition

Alloy No.	WS	Chemical Composition (%)															
		C≤	Mn≤	P≤	S≤	Ni	Cr≤	Al.	Ti	Ca+Ta	Ta≤	N	V.	Cu.	Mo	Ag	Al
TP304	S30400	0.08	2	0.04	0.03	8.00-11.0	18.0-20.0	-	-	-	-	-	-	-	-	-	-
TP304H	S30409	0.04-0.10	2	0.04	0.03	8.00-11.0	18.0-20.0	-	-	-	-	-	-	-	-	-	-
TP304L	S30403	0.35	2	0.04	0.03	8.00-13.0	18.0-20.0	-	-	-	-	-	-	-	-	-	-

TP304N	S30451	0.08	2	0.04	0.03	8.00-11.0	18.0-20.0	-	-	-	-	0.10-0.16	-	-	-	-	-
TP304LN	S30453	0.035	2	0.04	0.03	8.00-11.0	18.0-20.0	-	-	-	-	0.10-0.16	-	-	-	-	-
TP309CB	S30940	0.08	2	0.045	0.03	12.0-16.0	22.0-24.0	0.75max	-	10XCmin	-	-	-	-	-	-	-
										1.10max	-						
TP309H	S30909	0.04-0.10	2	0.04	0.03	12.0-15.0	22.0-24.0	-	-	-	-	-	-	-	-	-	-
TP309CB	S30941	0.04-0.10	2	0.045	0.03	12.0-16.0	22.0-24.0	0.75max	-	10×Cmin	-	-	-	-	-	-	-
										1.10max	-						
TP309S	S30908	0.08	2	0.045	0.03	12.0-15.0	22.0-24.0	0.75max	-	-	-	-	-	-	-	-	-
TP310CB	S31040	0.08	2	0.045	0.03	19.0-22.0	24.0-26.0	0.75max	-	10×Cmin	-	-	-	-	-	-	-
										1.10max	-						
TP310H	S31009	0.04-0.10	2	0.04	0.03	19.0-22.0	24.0-26.0	-	-	-	-	-	-	-	-	-	-
TP310HCB	S31041	0.04-0.10	2	0.045	0.03	19.0-22.0	24.0-26.0	0.75max	-	10×Cmin	-	-	-	-	-	-	-
TP310HCB	S31041	0.04-0.10	2	0.045	0.03	19.0-22.0	24.0-26.0	0.75max	-	10×Cmin	-	-	-	-	-	-	-
										1.10max	-						
TP310S	S31008	0.08	2	0.045	0.03	19.0-22.0	24.0-26.0	0.75max	-	-	-	-	-	-	-	-	-
	S31272	0.08-0.12	1.5-2	0.03	0.015	14.0-16.0	14.0-16.0	1.0-1.4	0.3-0.6	-	-	-	-	-	-	0.004-0.008	-
TP316	S31600	0.08	2	0.04	0.03	11.0-14.0	16.0-18.0	2.00-3.00	-	-	-	-	-	-	-	-	-
TP316H	S31609	0.04-0.10	2	0.04	0.03	11.0-14.0	16.0-18.0	2.00-3.00	-	-	-	-	-	-	-	-	-
TP316L	S31603	0.035	2	0.04	0.03	11.0-14.0	16.0-18.0	2.00-3.00	-	-	-	-	-	-	-	-	-
TP316N	S31651	0.08	2	0.04	0.03	11.0-14.0	16.0-18.0	2.00-3.00	-	-	-	0.10-0.16	-	-	-	-	-
TP316LN	S31653	0.035	2	0.04	0.03	11.0-14.0	16.0-18.0	2.00-3.00	-	-	-	0.10-0.16	-	-	-	-	-
TP317	S31700	0.08	2	0.04	0.03	11.0-15.0	18.0-20.0	3.00-4.00	-	-	-	-	-	-	-	-	-
TP317	S31700	0.08	2	0.04	0.03	11.0-15.0	18.0-20.0	3.00-4.00	-	-	-	-	-	-	-	-	-
TP317L	S31703	0.035	2	0.04	0.03	9.00-13.0	18.0-20.0	3.00-4.00	-	-	-	-	-	-	-	-	-
TP321	S32100	0.08	2	0.04	0.03	9.00-13.0	17.0-20.0	-	-	-	-	-	-	-	-	-	-

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TP321H	S32109	0.04-0.10	2	0.04	0.03	9.00-13.0	17.0-20.0	-	-	-	-	-	-	-	-	-	-
TP347	S34700	0.08	2	0.04	0.03	9.00-13.0	17.0-20.0	-	-	-	-	-	-	-	-	-	-
TP347H	S34709	0.04-0.10	2	0.04	0.03	9.00-13.0	17.0-20.0	-	-	-	-	-	-	-	-	-	-
TP348	S34800	0.08	2	0.04	0.03	9.00-13.0	17.0-20.0	-	-	-	0.1	-	-	-	-	-	-
TP348H	S34809	0.04-0.10	2	0.04	0.03	9.00-13.0	17.0-20.0	-	-	-	0.1	-	-	-	-	-	-
TPXM-10	S21900	0.08	8.0-10.0	0.04	0.03	5.50-7.50	19.0-21.5	-	-	-	-	0.15-0.40	-	-	-	-	-
TPXM-11	S21904	0.04	8.00-10.00	0.04	0.03	5.50-7.50	19.0-21.5	-	-	-	-	0.15-0.40	-	-	-	-	-
TPXM-15	S38100	0.08	2	0.03	0.03	17.5-18.5	17.0-19.0	-	-	-	-	-	-	-	-	-	-
TPXM-19	S20910	0.06	4.00-6.00	0.04	0.03	11.5-13.5	20.5-23.5	1.50-3.00	-	0.10-0.30	-	0.20-0.40	0.10-0.30	-	-	-	-
TPXM-29	S24000	0.08	11.5-14.5	0.06	0.03	2.25-3.75	17.0-19.0	-	-	-	-	0.20-0.40	-	-	-	-	-
	S31254	0.02	1	0.03	0.01	17.5-18.5	19.5-20.5	6.00-6.50	-	-	-	0.18-0.22	-	0.50-1.00	-	-	-
	S30615	0.16-0.24	2	0.03	0.03	13.5-16.0	17.0-19.5	-	-	-	-	-	-	-	-	-	0.8-1.5
	S30815	0.05-0.10	0.8	0.04	0.03	10.0-12.0	20.0-22.0	-	-	-	-	0.14-0.20	-	-	0.03-0.08	-	-
	S31050	0.25	2	0.02	0.015	20.2-23.5	24.0-26.0	1.6-2.5	-	-	-	0.09-0.15	-	-	-	-	-
	S30600	0.018	2	0.02	0.02	14.0-15.5	17.0-18.5	0.20max	-	-	-	-	-	0.50max	-	-	-
	S30600	0.018	2	0.02	0.02	14.0-15.5	17.0-18.5	0.20max	-	-	-	-	-	0.50max	-	-	-
	S31725	0.03	2	0.04	0.03	13.5-17.5	18.0-22.0	4.0-5.0	-	-	-	0.1	-	0.75max	-	-	-
	S31726	0.03	2	0.04	0.03	13.5-17.5	17.0-20.0	4.0-5.0	-	-	-	0.10-0.20	-	0.75max	-	-	-
	S32615	0.07	2	0.045	0.03	19.0-22.0	16.5-19.5	0.3-1.5	-	-	-	-	-	1.5-2.5	-	-	-
	S33228	0.04-0.08	1	0.02	0.015	31.0-33.0	26.0-28.0	-	-	0.6-1.0	-	-	-	-	0.05-0.10	-	0.25max
	S24565	0.03	5.0-7.0	0.03	0.01	16.0-18.0	23.0-25.0	4.0-5.0	-	0.1max	-	0.4-0.6	-	-	-	-	-
	S30415	0.04-0.06	0.8	0.045	0.03	9.00-10.0	18.0-19.0	-	-	-	-	0.12-0.18	-	-	0.03-0.08	-	-
	S32654	0.02	2.00-4.00	0.03	0.005	21.0-23.0	24.0-25.0	7.0-8.0	-	-	-	0.45-0.55	-	0.30-0.50	-	-	-

DSS		C≤	Mn≤	P≤	S≤	Ni≤	Cr≤		Si≤			N		Cu≤	Mo		
S32750	(SAF2507) 00Cr25Ni7Mo4N	0.03	1.2	0.035	0.02	6.0/8.0	24.0/26.0		0.8			0.24/0.32		0.5	3.0/5.0		

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S31803/S32205	(SAF2205) 00Cr22Ni5Mo3N	0.03	2	0.03	0.02	4.50/6.50	21.0/23.0		1			0.08/0.20			2.50/3.50		
S31500	(3RE60) 00Cr18Ni5Mo3Si2	0.03	1.2/2.00	0.03	0.03	4.25/5.25	18.0/19.0		1.4/2.00			0.05/0.10			2.50/3.00		

Trade Desig.	UNS No.	Typical Composition (%)						Form	Treatment	T.S .(MPa)	Y.S. (0.2% offset) MPa	Elongation %	Hardness	Description and Applications
		C	Mn	Cr	Mo	Ni	Others			Min.	Min.	Min.	Max.	
Super Austenitic Stainless Steels														
904L	N08904	0.02	1	20	4.5	24	Cu 1.5	Plate	Annealed	550	250	40	84 HRB	Super austenitic grade with very high corrosion resistance, particularly to sulphuric acid and warm chlorides.
2111HTR	S30815	0.08	0.6	21		11	N 0.16 Ce 0.06	Plate	Annealed	600	310	40	95 HRB	Excellent scaling and creep resistance at temperatures up to 1150 ℃.
4565S	S34565	0.02	6	24	5	17	N 0.45	Plate	Annealed	900	450	40		Super austenitic grade with extremely high corrosion resistance, particularly to strong acids and hot chlorides.
Ferritic Stainless Steels														
3CR12	S41003	0.03	1	11.5				Plate	Annealed	460	300	20	160 HRB	"Utility" stainless steel with useful resistance to wet abrasion, and good formability and weldability.
409	S40900	0.06	1	11			Ti 0.4	Plate	Annealed	380	205	20	80 HRB	Resists atmospheric and automotive exhaust gas corrosion. Used extensively in auto exhaust systems.
430	S43000	0.03	0.4	16.5				Plate	Annealed	450	205	22	88 HRB	Good combination of corrosion resistance and formability. Used for interior panelling and cold headed fasteners.
430F	S43020	0.07	1	16.5			S 0.25	Bar	Annealed	590-860	-	-	-	Free machining version of 430
444	S44400	0.02	0.8	18	2		Ti 0.4							Weldable chromium-molybdenum ferritic grade has excellent corrosion resitance to hot water containing minor amounts of

														chlorides.
Martensitic Stainless Steels														
410	S41000	0.1	0.5	12				Plate	Annealed	450	205	20	95 HRB	Resists dry atmospheres, fresh water and other mild environments. Hardened and tempered to achieve best strength and corrosion resistance.
416	S41600	0.12	1.0	12										Free machining hardenable grade. Corrosion resistance not as good as for 410.
420	S42000	0.3	0.5	13				Bar	Annealed	-	-	-	-	Higher carbon content than 410 gives higher hardness for cutlery, knife blades, dies and surgical instruments.
431	S43100	0.2	0.6	15		2		Bar	Annealed	-	-	-	285 HRB	High strength, excellent toughness and corrosion resistance similar to that of 304. Used for pump shafts, bolts and value components.
Precipitation Hardening Stainless Steels														
630	S17400	0.05	0.6	16		4	Cu 4 Nb 0.25	Bar	Solution Treated	1150	1050	15	38 HRC	Precipitation hardening ("aging") treatment after machining gives high strength without distortion. Corrosion resistance similar to 304.

Grade	Typical Yield Strength	Mechanical UTS	Properties Hardness		% Min Tensile Elongation		Condition
	MPa(Min)	MPa (Min)	BHN (Max)	Rb (Max)	<1.2mm	>1.2mm	
303	240	585	160	84	50	50	Annealed
304	205	520	202	92	40	40	Annealed
304L	170	485	183	88	40	40	Annealed

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316	205	520	219	95	40	40	Annealed
316L	170	485	217	95	40	40	Annealed
316Ti	205	520	217	95	40	40	Annealed
317L	205	515	217	95	40	40	Annealed
310	205	520	170	85	40	40	Annealed
321	205	520	217	95	40	40	Annealed
253MA	310	600	-	-	40	40	Annealed
904L	-	-	-	-	40	40	Annealed
420C	-	S20	192	92		12	Hardenable
431		965 Max	262	10	-	-	Hardenable
17-4 PH	1000	1070	331	-	12	12	Solution Hardened
-630							
440C	-	-	223	97	-	-	Hardenable
444	310	415	200	95	20	20	Annealed
3CR12	340	460	-	160	40	40	Annealed
2205	450	620	290	32RC	25	25	Annealed
2304	400	600	290	31RB	25	25	Annealed

Grade	Common Applications
303	Free machining steel used where extensive machining is required. Corrosion resistance and weldability inferior to 302.
304	General purpose steel with good corrosion resistance for most applications. Used for architecture, food processing, domestic sinks and tubs and deep drawing applications.
304L	Chemical plant and food processing equipment, where freedom from senitisation is required in plate.

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316	Most commonly used s/s main applications ie. marine, chemical, food, mining.
316L	A low carbon modification of 316 where heavy section weldments are required without the risk of intergranular corrosion.
316Ti	A titanium stabilised version of 316. Excellent high temperature strength.
317L	For chemical plant. Has greater corrosion resistance than 316L notably with brines and halogen salts.
310	Furnace parts and equipment. Resistant to temperatures 900ºC to 1100ºC.
321	Heavy weldments in chemical and other industries. Suitable for heat resisting applications to 800ºC. Not suitable for bright polishing.
253MA	Furnace parts and equipment. Resistant to temperatures up to 1150ºC.
904L	High resistance to: general corrosion in e.g. sulphuric and actic acids; crevice corrosion; stress corrosion cracking; pitting in chloride bearing solutions. Good weldabilty.
420C	Developed for high hardness after heat treatment. Used for cutting tools, surgical knives, etc.
431	Used for pump shafts etc. Similar corrosion resistance to T302.
17-4 PH-630	Main applications: pump shafts, marine boat shafts, valve stems. Similar corrosion resistance to type 304.
440C	Capable of being hardened to 60 Rc. Highest hardness and abrasion resistance of all the stainless steels. Corrosion resistance similar to 410.
444	Heat exchanger and hot water tanks, and in chloride containing waters. Not prone to chloride stress corrosion - superior resistance to pitting, crevice and intergranular corrosion. Possesses excellent deep drawing properties.
3CR12	Excellent wet abrasion resistance. Used in hoppers, bins, tanks etc.
2205	Superior corrosion resistance to 316L and 317L, combined with high strength. Excellent stress corrosion and abrasion resistance. Typically used in heat exchangers, gas scrubbers, fans, chemical tanks, flowlines, marine and refinery applications.
2304	Similar corrosion resistance to 316L. Higher yield strength, corrosion and stress-corrosion crackling resistance is required in marine, mining, chemical, food and power industries. Particularly useful in nitric acid.

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Stainless Steel Seamless Tube






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Small Diameter Stainless Steel Seamless Tube

Weight & Thickness of Stainless Steel Schedule Pipes						
Nominal	**Bore**	**Sch 5**	**Sch 10**	**Sch 80**	**Sch 80**	**Sch 160**
Inch	M/M	WT	WT	WT	WT	WT
1/8”	10.3	1.24	1.24	1.73	2.41	-
1/4”	13.7	1.24	1.65	2.24	3.02	-
3/8”	17.2	1.24	1.65	2.31	3.2	-
1/2”	21.3	1.65	2.11	2.77	3.75	4.78
3/4”	26.7	1.65	2.11	2.87	3.91	5.56
1”	33.4	1.65	2.77	3.38	4.55	6.35
1.1/4”	42.2	1.65	2.77	3.56	4.85	6.35
1.1/2”	48.3	1.65	2.77	3.68	5.08	7.14
2”	60.3	1.65	2.77	3.91	5.54	8.74
2.1/2”	73	2.11	3.05	5.16	7.01	9.53
3”	88.9	2.11	3.05	5.49	7.62	11.13
3.1/2”	101.6	2.11	3.05	5.74	8.08	-
4”	114.3	2.11	3.05	6.02	8.56	13.49
5”	141.3	2.77	3.4	6.55	9.53	15.88
6”	168.3	2.77	3.4	7.11	10.97	18.26
8”	219.1	2.77	3.76	8.18	12.7	23.01

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Large Diameter Stainless Steel Seamless Pipe

NPS	O.D. W/T	4	6	8	10	12	20	30	40	50	60	70	80	90	100	110
8"	219.08															
10"	273.05															
12"	323.85															
14"	355.6															
16"	406.4															
18"	457.42															
20"	508															
22"	558.8															
24"	609.6															
26"	660.4															
28"	711.6															
30"	762															
32"	812.8															
34"	863.6															
36"	914.4															
38"	965.2															
40"	1016															
42"	1066.8															
44"	1117.6															
46"	1168.4															
48"	1219.2															

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Pipes/Tubes

Dimensions for Welded

OD				WT inch	0.020	0.031	0.039	0.047	0.055	0.059	0.063	0.070	0.079	0.087	0.098	0.110	0.118	0.138	0.157	0.177	0.197	0.217	0.236	0.256	0.276	0.295	0.315	0.335	0.354	0.374	0.394	0.472	0.551	0.630	0.709	0.787	0.984
				WT mm	0.5	0.8	1.0	1.2	1.4	1.5	1.6	1.8	2.0	2.2	2.5	2.8	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	12.0	14.0	16.0	18.0	20.0	25.0
NPS	DN	inch	mm																																	
1/8	6		10.3																																	
		1/2	12.7																																	
1/4	8		13.7																																	
			15.88																																	
3/8	10		17.1																																	
		3/4	19.05																																	
1/2	15		21.3																																	
			22																																	
		1	25.4																																	
3/4	20		26.7																																	
		1 1/4	31.75																																	
1	25		33.4																																	
		1 1/2	38.1																																	
1 1/4	32		42.2																																	
		1 3/4	44.45																																	
1 1/2	40		48.3																																	
		2	50.8																																	
			57																																	
2	50		60.3																																	
		2 1/2	63.5																																	
2 1/2	65		73																																	
		3	76.2																																	
3	80		88.9																																	
3 1/2	90	4	101.6																																	
			108																																	
4	100		114.3																																	
			139																																	
5	125		141.3																																	
			159																																	
6	150		168.3																																	
8	200		219.1																																	
10	250		273.0																																	
12	300		323.8																																	
14	350		355.6																																	
16	400		406.4																																	
18	450		457																																	
20	500		508																																	
22	550		558.8																																	
24	600		609.6																																	
28	700		711																																	
32	800		813																																	
36	900		914																																	
40	1000		1016																																	
48	1200		1219																																	
52	1300		1321																																	
56	1400		1422																																	
60	1500		1524																																	
64	1600		1626																																	
68	1700		1727																																	
72	1800		1820																																	
76	1900		1930																																	
80	2000		2032																																	
100	2500		2540																																	

- Maximum wall thickness 40mm is available on request
- Other dimensions are available on request

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METALS INTERNATIONAL LIMITED

Range of Applications

Our stainless steel and nickel alloy tubes and pipes are mainly used in the following industries:

Stainless steel tubes and pipes are the preferred choice for processes under the following conditions:
- high temperatures
- aggressive media (e.g. acid and lye)
- and/or high pressure

which call for the use of high-quality materials.

- » Thermal & Nuclear Power
- » Petrochemicals & Refineries
- » Oil & Gas
- » Automobiles
- » Chemical & Pharma
- » Sugar
- » Edibile Oil & Food Processing
- » Dairy & Beverages
- » Fertilizer
- » Paper & Pulp
- » Water & Sewerage Treatment
- » Heat Exchanger & Condensers
- » Refrigeration
- » Architecture, Building & Construction
- »Structural Applications
- » Seawater Desalination

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Stainless steel tube for Heat exchanger

In the **Stainless steel tube for Heat exchanger** the areas of application cover mainly the following:
piping systems apparatus and heat exchangers

Fertilizer industry

In the **Fertilizer industry** the areas of application cover mainly the following:
urea synthesis ethylene plants melamine plants high-pressure tubes and piping systems apparatus and heat exchangers

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Chemical and petrochemical industry

In the chemical and petrochemical industry the areas of application cover mainly the following:
urea synthesis ethylene plantsmelamine plantshigh-pressure tubes and piping systemsapparatus and heat exchangers

Power generation and Environmental technologies

In power plants and the energy sector our tubes and pipes are primarily used for heat exchangers.
The same application area also applies to environmental technologies and waste incineration plants:
reheaterssuperheaters

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METALS INTERNATIONAL LIMITED

Ship Making

SMST-Tubes manufactures tubing and piping for **ship making** in the domains of Exploration, Production and Processing

Oil and gas applications

SMST-Tubes manufactures tubing and piping for **onshore and offshore Oil & Gas applications** in the domains of Exploration, Production and Processing

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Mechanical and plant engineering and construction

In **mechanical and plant engineering and construction** our tubes and pipes are mainly used in the following areas:
food processing
automotive technology
measurement and control technology
pumps
hydraulic cylinders
tubes and pipes as half finished product for fittings and flange productiontubes and pipes as half finished product for radially machined components
(standard and VALIMA grades)

Automotive industry
In the **automotive industry** DMV products are mainly used in the following areas:
hydraulic braking systems
other critical application areas

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Service

Before Service

Supply technical consulting service to the user for selecting material,

Give client's the best suggestion

Save client's time and money.

Service during producing

Choose the best material,

Produce the product strictly according the client's requirement,

Strictly according to the QC system, ensure the quality

Have a fully inspection to ensure the tubes quality,

Inform the produce schedule to the client in time.

Service during delivering

Ensure the tubes with good and proper packaging,

Ensure the deliver time according the client's requirement

Ensure the shipment information be aware by client in time

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After-sale service

Frequently have a good communicate with end user.

Regularly pay a visit to clients

Have a consultation with end user for feedback advice.

Improve the tubes' quality constantly so as to meet the client's requirement.

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