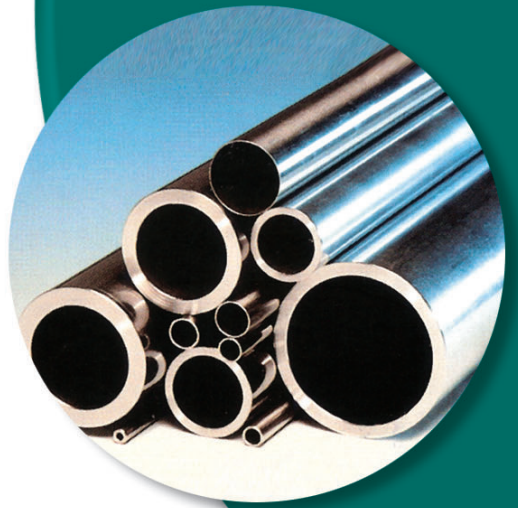


SUPERFIX®



Stainless Steels

Introduction

SUPERFIX®

- A Leader in Customer Service
- Products Of Consistent Quality
- Continuous Research & Development
- Competitive Pricing

Superfix offers a wide range of semi-finished products made from more than 100 different stainless steels. These consist of rods, plates, heavy-walled and thin-walled tubes, and sections in stock.

We distribute our semi-finished stainless steels from Singapore to around the globe for commerce with various industries. We are able to help you get any facts and figures you need on non-standard materials. Our professional sales team places customer satisfaction as a top priority, attending to your various needs.

Key features of the system we implemented are the advisory service provided by our engineers, and a customer oriented logistics concept.

We specialise in the fabrication of Semi-Finished Stainless Steels, and offer a complete range of service to our customers, from basic to complex fabrication. There are no restrictions on the minimum quantity ordered. We have produced quantities from one or two pieces up to one million pieces.

If your product requires a secondary operation such as drilling, tapping or punching, we have the equipment and knowledge to perform the work. For the more demanding machining work requiring close-tolerance, our CNC machines centre provides us with both accuracy and flexibility. Our in-house coordinates measuring machine enables us to inspect the material to our customers' specifications.

The fabrication services listed above are only a brief overview of our capabilities. Send us your blue prints and specifications for a prompt quote without obligation.

For any enquiries, email us or contact us.

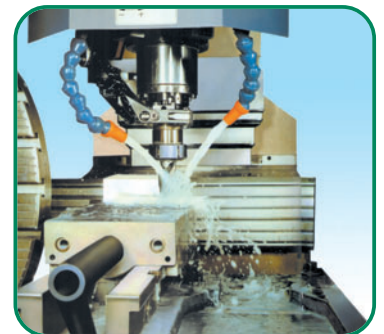


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1. Mission Statement

A leader in customer service, with technical competence to ensure compliance to international standards of safety and quality, continuous research and developments and providing products of consistent quality at competitive prices.

2. Company Profile

Superfix was incorporated in 1987 to provide a wide range of semi-finished products made from more than 100 different stainless steels. These consist of rods, plates sheets, coils, heavy-walled and thin-walled tubes, and sections in stock.

Our focus is on providing a total solution, offering sales and services to a diverse base of customers in the Electronic, Chemical, Marine, Food, Automotive, Interior Decoration, Medical, Automation, Semi-Conductor and Disk Drive Industries. Over the years, with our commitment to total quality excellence, we were able to build up a team of dedicated professionals with a wide spectrum of expertise. It was through their collective efforts, together with the support of valued clients and business partners, that we established our presence in the local industry, as well as the international arena.

Superfix name has become synonymous with engineered Stainless Steels that provide excellent properties for Corrosion Resistance Weldability, Fabricability, Ductility, Good High and Low Temperatures, Cleanability and Hygiene characteristics to a vast array of sectors.

Superfix is keen to establish a worldwide network of distributors and business partners. We look forward to technical discussions, sharing of knowledge and expertise, and building up multi-party, beneficial business relationships in an era where society and the world becomes a global village. We are adaptable to changes and embrace Information Technology as a necessary step towards excellence in customer service.

Share our vision. Join us as a business partner. Together, we can be more competitive and reach out more effectively to our customers to serve them better.

3. Important Note

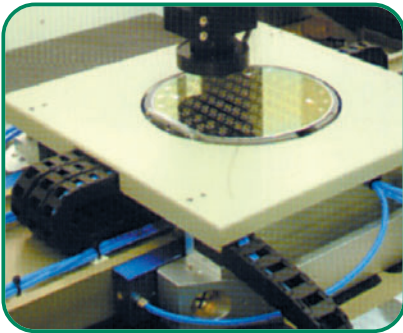
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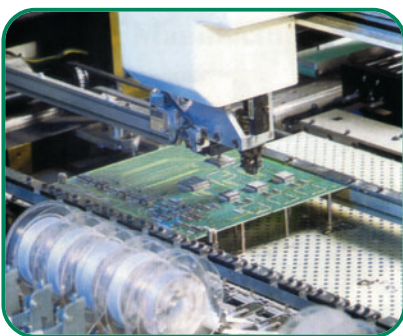
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4. Industry Applications



Semi-Conductor

- E-beam Inspection of Wafers in Vacuum.
- Magnetic Random Access Memory (MRAM) Machine.
- Custom Air Bearing Equipment.
- Structural Plate for Integrated Mechanical Air Bearing Stage Systems.
- Multi Process Cluster Tool.



Electronic

- Audio and Consumer Electronics.
- Semi-Conductor Equipment.
- Computers Peripheral.
- Assembly Base Plate and Values.
- Disc Drive Industrys.



Medical

- Biomedical Equipment.
- Laboratory Equipment.
- Surgical Equipment.
- Sterilisation Equipment.
- Pharmaceutical Equipment.



Chemical

- Chemical Plant Oil Pipe.
- Boiler Chamber.
- Heat Exchanger.
- Petro Chemical Tank.
- Oil Tank.

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4. Industry Applications



Food Processing

- Food Processing Equipment
- Kitchen Sink
- Kitchen Pot
- Household Utensils, Knife, Spoon, Fork
- Cooking Stove and Oven



Automotive

- Exhaust Manifold
- Catalytic Converter
- Main Muffler
- Flexible Pipe
- Centre Pipe



Marine

- Vessel Fuel Tank
- Deck Cleats
- Bow Rails
- Panels for Decks and Side Walls
- Front and Rear Seat Base



Building Interior

- Interior Fittings
- Hand Rails
- Lift Landings
- Pillar Cover
- Decorative Panels

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What is Stainless Steel?

Stainless steel is a generic term for a family of corrosion resistant alloy steels containing 10.5% or more chromium.

All stainless steels have a high resistance to corrosion. This resistance to attack is due to the naturally occurring chromium-rich oxide film formed on the surface of the steel. Although extremely thin, this invisible, inert film is tightly adherent to the metal and extremely protective in a wide range of corrosive media. The film is rapidly self repairing in the presence of oxygen, and damage by abrasion, cutting or machining is quickly repaired.

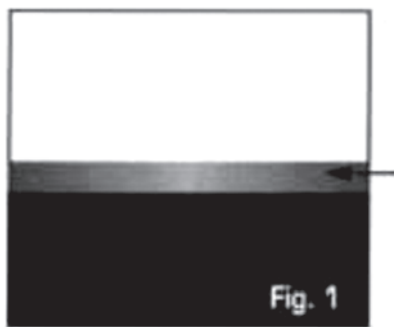


Fig. 1 - In any normal oxidising environment a protective coating of passive chromium rich oxide film is automatically formed on stainless steel.

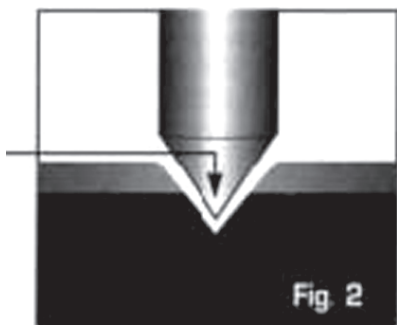


Fig. 2 - When scratched, damaged or machined this protective film is denuded exposing the steel to the atmosphere.

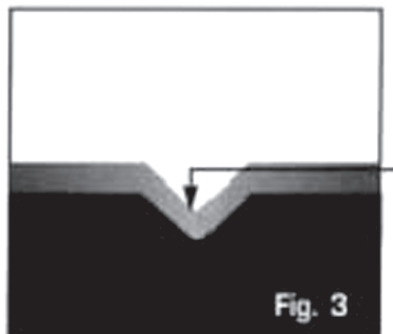


Fig. 3 - The protective coating is quickly restored through the rapid self-repairing quality of the chromium rich film.

Benefits of Stainless Steel

Corrosion resistance

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

High and low temperature resistance

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

Ease of fabrication

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

Strength

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

Aesthetic appeal

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

Hygienic properties

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

Life cycle characteristics

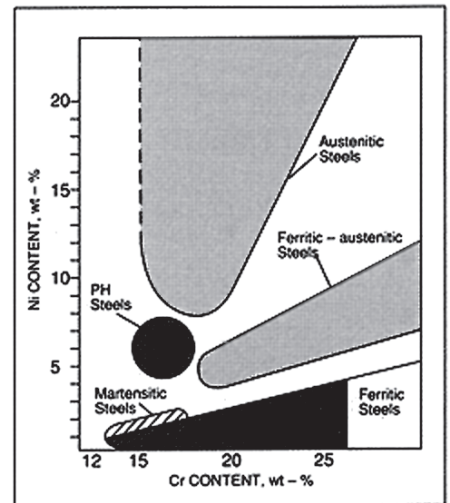
Stainless steel is a durable, low maintenance material and is often the least expensive choice in a life cycle cost comparison.

Types of Stainless Steel

In addition to chromium, nickel, molybdenum, titanium, niobium and other elements may also be added to stainless steels in varying quantities to produce a range of stainless steel grades, each with different properties.

There are a number of grades to choose from, but all stainless steels can be divided into five basic categories:

- austenitic
- ferritic
- duplex
- martensitic
- precipitation hardening



Relation between nickel and chromium contents of stainless steels and type of steel. (PH steels are precipitation – hardening steels.)

These are named according to the microstructure inherent in each steel group (a function of the primary alloying elements). Austenitic and ferritic grades account for approximately 95% of stainless steel applications.

Categories of Stainless Steels

- I. Austenitic - A family of alloys containing chromium and nickel (and manganese and nitrogen when nickel levels are reduced), generally built around the type 302 chemistry of 18% Cr, 8% Ni, and balance mostly Fe. These alloys are not hardenable by heat treatment.
- II. Ferritic - This group of alloys generally containing only chromium, with the balance mostly Fe, are based upon the type 430 composition of 17% Cr. These alloys are somewhat less ductile than the austenitic types and again are not hardenable by heat treatment.
- III. Martensitic - The members of this family of stainless steels may be hardened and tempered just like alloy steels. Their basic building block is type 410 which consists of 12% Cr, 0.12% C, and balance mostly Fe.
- IV. Precipitation-Hardening - These alloys generally contain Cr and less than 8% Ni, with other elements in small amounts. As the name implies, they are hardenable by heat treatment.
- V. Duplex - This is a stainless steel alloy group, or family, with two distinct microstructure phases -- ferrite and austenite. The Duplex alloys have greater resistance to chloride stress corrosion cracking and higher strength than the other austenitic or ferritic grades.
- VI. Cast - The cast stainless steels, in general, are similar to the equivalent wrought alloys. Most of the cast alloys are direct derivatives of one of the wrought grades, as C-8 is the cast equivalent of wrought type 304. The C preceding a designation means that the alloy is primarily used for resistance to liquid corrosion. An H designation indicates high temperature applications.

Austenitic Stainless Steel Grades

When nickel is added to stainless steel in sufficient amounts the crystal structure changes to "austenite". The basic composition of austenitic stainless steels is 18% chromium and 8% nickel. Austenitic grades are the most commonly used stainless steels accounting for more than 70% of production (type 304 is the most commonly specified grade by far).

Basic properties

- excellent corrosion resistance
- excellent weldability (all processes)
- excellent formability, fabricability and ductility
- excellent cleanability, and hygiene characteristics
- good high and excellent low temperature properties
- non magnetic (if annealed)
- hardenable by cold work only

Common uses

- computer floppy disk shutters (304)
- computer keyboard key springs (301)
- kitchen sinks (304D)
- food processing equipment
- architectural applications
- chemical plant and equipment

Common austenitic stainless steel grades and their applications

Common Name	UNS No	Forms Available*	Typical Compositions (%)						Typical Applications
			C	Cr	Ni	Mo	Ti	Other	
301	S30100	Sheet and Coil	0.05	17	7.0	-	-	-	General purpose stainless steel with good corrosion resistance for most applications. Used where the high work-hardening exponent is desirable. Can be supplied cold worked to give high strength. Used for structural applications such as rail carriages and wagons.
302HQ	S30430	Wire	0.02	18.0	9.0	-	-	3.5Cu	Wire for cold heading to produce fasteners etc.
303	S30300	Bars	0.12	18.0	9.0	-	-	0.25S	Free machining steel used where extensive machining is required. Corrosion resistance and weldability inferior to 304
304	S30400	Sheet and Coil, Plate and Bars	0.05	18.5	8.5	-	-	-	General purpose stainless steel with good corrosion resistance for most applications. Used for architecture, food processing, domestic sinks and tubs and deep drawing applications.
304L	S30403	Sheet and Coil, Plate	0.025	18.5	9.0	-	-	-	Chemical plant and food processing equipment, where freedom from sensitisation is required in plate thicknesses

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Common austenitic stainless steel grades and their applications

Common Name	UNS No	Forms Available*	Typical Compositions (%)							Typical Applications
			C	Cr	Ni	Mo	Ti	Other		
304H	S30409	Sheet and Coil, Plate, Pipe and Bar	0.06	18.5	9.0	-	-	-	Higher carbon content than 304L, for increased strength, particularly at elevated temperatures.	
310	S31000	Sheet and Coil, Plate and Bars	0.12	25.0	20.0	-	-	-	Furnace parts and equipment. Resistant to temperature 900°C to 1100°C	
310S	S31008	Sheet, Plate, Bar, Tube and Pipe	0.08	25.0	20.0	-	-	-	A low carbon version of 310 used to resist nitric acid corrosion.	
316	S31600	Sheet and Coil, Plate, Seamless and Welded Tube and Pipe	0.05	17.0	11.0	2.1	-	-	Used where higher corrosion resistance is required, ie marine equipment. Can be welded up to three millimetres without subsequent heat treatment.	
316L	S31603	Sheet and Coil, Plate, Seamless and Welded Tube and Pipe	0.02	17.0	11.0	2.1	-	-	A low carbon modification of 316 where heavy section weldments are required without the risk of intergranular corrosion.	
316Ti	S31635	Plate, Pipe and Tube	0.05	17.0	11.0	2.1	0.5	-	A titanium stabilised version of 316 used where good resistance to intergranular corrosion and high temperature strength is required.	
317L	S31703	Sheet and Coil, Plate	0.02	19.0	13.0	3.25	-	-	For chemical plant - has a greater corrosion resistance than 316 in certain applications, notably in contact with brines and halogen salts. More usually available in the low carbon L grade.	
321	S32100	Sheet and Coil, Plate and Bar	0.06	18.0	10.0	-	0.5	-	Heavy weldments in chemical and other industries. Suitable for heat resisting applications to 800oC. Not suitable for bright polishing.	
904L	N08904	Sheet, Plate, Bar, Pipe and Tube	0.02	20.0	25.0	4.5	-	1.5Cu	High resistance to: general corrosion in eg sulphuric and acetic acids, crevice corrosion, stress corrosion cracking, pitting in chloride bearing solutions. Good weldability.	
+	S31254	Sheet, Plate, Tube, Pipe, Bar	0.02	20.0	18.0	6.0	-	0.2N	Used where high resistance to chloride pitting and crevice corrosion is required, eg seawater heat exchangers, bleach vats and washers in the pulp and paper industry.	
+	S30815	Sheet, Plate, Bar, Tube and Pipe	0.10	21.0	11.0	-	-	0.15N 0.04Ce	Used for furnace parts, radiant shields, fluidised beds. Resistant to temperatures up to 1150oC. Possesses high strength and resistance to sigma phase formation.	

* Compatible or equivalent grades also available in castings.

+ Proprietary alloy names apply.

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Ferritic Stainless Steel Grades

These are plain chromium stainless steels with varying chromium content between 12 and 18%, but with low carbon content.

Basic properties

- moderate to good corrosion resistance increasing with chromium content
- not hardenable by heat treatment and always used in the annealed condition magnetic
- weldability is poor
- formability not as good as the austenitics

Common uses

- computer floppy disk hubs (430)
- automotive trim (430)
- automotive exhausts (409)
- colliery equipment (3CR12)
- hot water tanks (444)

Common ferritic stainless grades and their applications

Common Name	UNS No	Forms Available*	Typical Compositions (%)					Typical Applications
			C	Cr	Mo	Ti	Other	
409	S40900	Sheet and Coil	0.02	11.5	-	0.25	-	Heat resistant steel, easily formed and welded. Mainly used for automotive exhausts or welded applications where superior performance to galvanised steel is required.
446	S44600	Tube and Pipe	0.08	26.0	-	-	-	Used for severe heat resistant applications up to 1200oC. In recuperators, highly resistant to sulphidation and oil ash corrosion.
430	S43000	Sheet and Coil, Plate	0.06	17.0	-	-	-	Interior architectural components, stove and automotive trim, dishwasher and clothes dryer liners. Fusion welds tend to be brittle.
444	S44400	Sheet and Coil	0.02	18.5	2.0	0.4	-	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.
12% Cr Structural Steels	S41003	Sheet and Coil, Welded Tube and Hollow Sections	0.02	11.5	-	-	-	Mildly corrosive environments where better life cycle cost is obtainable than with carbon or galvanised steel. Usually referred to by proprietary designations eg 3CR12 or 5CR12.

* Compatible or equivalent grades also available in castings.

Martensitic Stainless Steel Grades

Martensitic stainless steels were the first stainless steels commercially developed (as cutlery) and have relatively high carbon content (0.1 - 1.2%) compared to other stainless steels. They are plain chromium steels containing between 12 and 18% chromium.

Basic properties

- moderate corrosion resistance
- can be hardened by heat treatment and therefore high strength and hardness levels can be achieved
- poor weldability
- magnetic

Common uses

- knife blades
- surgical instruments
- shafts
- spindles
- pins

Common martensitic stainless steel grades and their applications

Common Name	UNS No	Forms Available*	Typical Compositions (%)					Typical Applications
			C	Cr	Ni	Mo	Other	
410	S41000	Bars	0.10	12.5	-	-	-	General purpose grade for use in mildly corrosive environments.
416	S41600	Bars	0.10	12.5	-	-	0.20S	Free machining variation of 410.
420	S42000	Bars	0.25	12.5	-	-	-	General engineering uses, such as pump and valve shafts.
420C	-	Sheet and Coil, Plate and Bars	0.30	12.5	-	-	-	Developed for high hardness after heat treatment. Used for cutting tools, surgical knives etc.
431	S43100	Bars	0.18	16.0	2.0	-	-	Hardenable steel with corrosion resistance approaching 304. Used for pump shafts etc. Should be double tempered after hardening.
440C	S44004	Bars	1.10	17.0	-	0.40	-	Capable of being hardened to 60HRC. Highest hardness and abrasion resistance of all the stainless steels. Corrosion resistance similar to 410.

* Compatible or equivalent grades also available in castings.

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Duplex Stainless Steel Grades

These are stainless steels containing relatively high chromium (between 18 and 28%) and moderate amounts of nickel (between 4.5 and 8%). The nickel content is insufficient to generate a fully austenitic structure and the resulting combination of ferritic and austenitic structures is called duplex. Most duplex steels contain molybdenum in a range of 2.5 - 4%.

Basic properties

- high resistance to stress corrosion cracking
- increased resistance to chloride ion attack
- higher tensile and yield strength than austenitic or ferritic steels
- good weldability and formability

Common uses

- marine applications, particularly at slightly elevated temperatures
- desalination plant
- heat exchangers
- petrochemical plant

Common duplex grades and their applications

Common Name	UNS No	Forms Available*	Typical Compositions (%)							Typical Applications
			C	Cr	Ni	Mo	N	Cu	W	
+	S32304	Sheet, Plate, Pipe, Fittings	0.03	23.0	4.0	-	0.1	-	-	Similar corrosion resistance to 316L. Higher yield strength and stress-corrosion cracking resistance. Used where high corrosion resistance is required in marine, mining, chemical, food and power industries. Particularly useful in nitric acid.
2205	S31803 S32205	Plate, Pipe, Bar, Fittings	0.03	22.0	5.5	3.0	0.14	-	-	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.
+	S32550	Plate, Sheet, Pipe, Bar, Fittings	0.03	25.0	5.5	3.0	0.15	2.0	-	Excellent resistance to corrosion by seawater, acids and salts combined with high strength, abrasion resistance and weldability.
+	S32750	Plate, Pipe, Bar, Fittings	0.03	25.0	7.0	4.0	0.3	-	-	Extremely high resistance to corrosion in severe marine, chloride and acid environments. Suitable for heat exchangers, reactors, pipework etc.
+	S32760	Plate, Pipe, Bar, Fittings	0.02	25.0	7.0	3.5	0.25	0.7	0.7	
+	S32520	Plate, Pipe, Bar, Fittings	0.02	25.0	6.5	3.5	0.25	1.6	-	

* Compatible or equivalent grades also available in castings.

+ Proprietary alloy names apply.

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Precipitation Hardening Stainless Steel Grades

Precipitation hardening stainless steels have been formulated so that they can be supplied in a solution treated condition, (in which they are machineable) and can be hardened, after fabrication, in a single low temperature "ageing" process.

Basic properties

- moderate to good corrosion resistance
- very high strength
- good weldability
- magnetic

Common uses

- Shafts for pumps and valves

Sheet Finishes

ASTM A 480 "Standard Specification for General Requirements for Flat Rolled Stainless & Heat Resisting Steel Plate, Sheet & Strip" covers finish requirements in detail. Refer to this specification for more complete explanations of finishes for sheet, strip and plate product forms.

FINISH FOR SHEET:

- No. 1 Finish -** Hot-rolled, annealed and descaled.
- No. 2D Finish -** Cold-rolled, dull finish.
- No. 2B Finish -** Cold-rolled, bright finish.
- Bright Annealed Finish -** Cold-rolled bright finish obtained by final anneal in controlled atmosphere furnace.
- No. 3 Finish -** Intermediate polished finish, one or both sides.
- No. 4 Finish -** General purpose polished finish, one or both sides.
- No. 6 Finish -** Dull satin finish, Tampico brushed one or both sides.
- No. 7 Finish -** High luster finish.
- No. 8 Finish -** Mirror finish.
- TR Finish -** Cold-worked to obtain specified properties.

Surface Finishes

Surface finish is an important element in any specification or purchase order for stainless steel regardless of the intended end use. For those applications in which appearance is important, finish is a design element and must be specified. For those applications where finish is not so important, it should still be specified to avoid receiving a finish that is inappropriate for the application.

The purpose of this section is to help designers and specifiers achieve a better understanding of stainless steel finishes. The text describes and illustrates standard industry finishes and how finishes are applied to stainless steel.

Finish - A Design Element

There are several good reasons for paying close attention to the finish designation. In architecture or other highly visible applications, the appearance of stainless steel is a critical design element and a misunderstanding or the wrong finish can alter the desired effect. In consumer products such as appliances, cookware and automobiles, the gleam of well polished stainless steel has strong sales appeal. In commercial equipment, such as used in institutional kitchens, restaurants and hospitals, properly finished stainless steel helps to emphasise the feeling of cleanliness.

In addition to the visual appeal of polished stainless steel, there are a number of functionally important purposes served by properly prepared stainless steel surfaces. In sanitary applications, polished stainless steel not only looks clean, it is easy to clean and keep clean.

In aggressive environments, the smoother the surface, the better the corrosion resistance. A smooth surface is less susceptible to an accumulation of deposits which may become focal points for localised corrosion.

Finish and Fabrication

Some fabrication operations in manufacturing stainless steel products, such as deep drawing, may yield better results if the metal surface has a slightly rough texture to hold lubricants. Proper lubrication minimises tool wear, and it helps to reduce the severity of tool marks. In wire, the finish and coating serve to facilitate further steps in manufacturing such as cold heading of fasteners.

There are also economic considerations in specifying finish. For example, a cold rolled bright annealed finish might be specified instead of a more expensive No. 8 polished finish.

Surface Finishes

Relative comparison of grit size

Particle size inches	Particle size microns	All product other than emery			Emery	
		Grading system		Comparable grit symbol	Polishing paper	Cloth
		CAMI	FEPA			
0.00026	6.5	1200	-	-	4/0	-
0.00035	9.0	-	-	-	-	-
0.00036	9.2	1000	-	-	3/0	-
0.00047	12.0	-	-	-	-	-
0.00048	12.2	800	-	-	-	-
0.00059	15.0	-	-	-	-	-
0.00060	15.3	-	P1200	-	-	-
0.00062	16.0	600	-	-	2/0	-
0.00071	18.3	-	P1000	-	-	-
0.00077	19.7	500	-	-	0	-
0.00079	20.0	-	-	-	-	-
0.00085	21.8	-	P800	-	-	-
0.00092	23.6	400	-	10/0	-	-
0.00098	25.0	-	-	-	-	-
0.00100	25.75	-	P600	-	-	-
0.00112	28.8	360	-	-	-	-
0.00118	30.0	-	P500	-	-	-
0.00137	35.0	-	P400	-	-	-
0.00140	36.0	320	-	9/0	-	-
0.001575	40.0	-	-	-	-	-
0.00158	40.5	-	P360	-	-	-
0.00172	44.0	280	-	8/0	1	-
0.00177	45.0	-	-	-	-	-
0.00180	46.2	-	P320	-	-	-
0.00197	50.0	-	-	-	-	-
0.00204	52.5	-	P280	-	-	-
0.00209	53.5	240	-	7/0	-	-
0.00217	55.0	-	-	-	-	-
0.00228	58.5	-	P240	-	-	-
0.00230	60.0	-	-	-	-	-

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Surface Finishes

Relative comparison of grit size

Particle size inches	Particle size microns	All product other than emery			Emery	
		Grading system		Comparable grit symbol	Polishing paper	Cloth
		CAMI	FEPA			
0.00254	65.0	-	P220	-	-	-
0.00257	66.0	220	-	6/0	2	-
0.00304	78.0	180	P180	5/0	3	-
0.00363	93.0	150	-	4/0	-	Fine
0.00378	97.0	-	P150	-	-	-
0.00452	116.0	120	-	3/0	-	-
0.00495	127.0	-	P120	-	-	-
0.00550	141.0	100	-	2/0	-	Medium
0.00608	156.0	-	P100	-	-	-
0.00749	192.0	80	-	0	-	Coarse
0.00768	197.0	-	P80	-	-	-
0.01014	260.0	-	P60	-	-	-
0.01045	268.0	60	-	1/2	-	-
0.01271	326.0	-	P50	-	-	-
0.01369	351.0	50	-	1	-	Ex. Coarse
0.01601	412.0	-	P40	-	-	-
0.01669	428.0	40	-	1-1/2	-	-
0.02044	524.0	-	P36	-	-	-
0.02087	535.0	36	-	2	-	-
0.02426	622.0	-	P30	-	-	-
0.02488	638.0	30	-	2-1/2	-	-
0.02789	715.0	24	-	3	-	-
0.02886	740.0	-	P24	-	-	-
0.03530	905.0	20	-	3-1/2	-	-
0.03838	984.0	-	P20	-	-	-
0.05148	1320.0	16	-	4	-	-
0.05164	1324.0	-	P16	-	-	-
0.06880	1764.0	-	P12	-	-	-
0.07184	1842.0	12	-	4-1/2	-	-

FEPA - Federation of European Producers of Abrasives

CAMI - Coated Abrasive Manufacturers Institute (USA)

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Chemical Compositions of Stainless Steels

Wrought Stainless Steels									
Alloy	C	Mn	P	S	Si	Cr	Ni	Mo	Others
201	0.15	6.50	0.060	0.030	1.00	17.00	4.50	-	0.25N
202	0.15	9.00	0.060	0.030	1.00	18.00	5.00	-	0.25N
301	0.15	2.00	0.045	0.030	1.00	17.00	7.00	-	-
302	0.15	2.00	0.045	0.030	1.00	18.00	9.00	-	-
303	0.15	2.00	0.20	0.15	1.00	18.00	9.00	0.60	-
303Se	0.15	2.00	0.20	0.06	1.00	18.00	9.00	0.60	0.15Se
304	0.08	2.00	0.045	0.030	1.00	19.00	9.25	-	-
304L	0.03	2.00	0.045	0.030	1.00	19.00	10.0	-	-
309S	0.08	2.00	0.045	0.030	0.75	23.00	13.5	-	-
310S	0.08	2.00	0.045	0.030	1.50	25.00	20.5	-	-
316	0.08	2.00	0.045	0.030	1.00	17.00	12.0	2.5	-
316L	0.03	2.00	0.045	0.030	1.00	17.00	12.0	2.5	-
317	0.08	2.00	0.045	0.030	1.00	19.00	13.0	3.5	-
317L	0.03	2.00	0.045	0.030	1.00	19.00	13.0	3.5	-
321	0.08	2.00	0.045	0.030	1.00	18.00	10.5	-	Ti 5 X C
329	0.10	2.00	0.045	0.030	1.00	27.50	4.5	1.50	-
330	0.08	2.00	0.040	0.030	1.00	18.50	35.5	-	-
347	0.08	2.00	0.045	0.030	1.00	18.00	11.0	-	Cb+Ta 10 X C
409	0.08	1.00	0.045	0.045	1.00	11.50	35.5	-	Ti 6 x C
410	0.15	1.00	0.040	0.030	1.00	12.50	-	-	-
416	0.15	1.25	0.040	-	1.00	13.00	-	0.60	S =0.15 min.
416Se	0.15	1.25	0.060	0.060	1.00	13.00	-	-	0.15 Se
420	0.15 min.	1.00	0.040	0.030	1.00	13.00	-	-	-
430	0.12	1.00	0.040	0.030	1.00	17.00	-	-	-
440C	1.00	1.00	0.040	0.030	1.00	17.00	-	-	-
442	0.20	1.00	0.040	0.030	1.00	20.50	-	-	-
904L	0.02	2.00	0.045	0.035	1.00	21.00	25.5	4.5	Cu 1.5
17-4 PH	0.07	1.00	0.045	0.035	1.00	16.5	5.5	-	Cu 3-5, 0.4 Al
17-7 PH	0.09	1.00	0.045	0.035	1.00	17.0	7.0	-	.75-1.5 Al
2205	0.03	2.00	0.030	0.020	1.00	22.0	5.5	3.0	0.15 N
Cast Stainless Steels									
CA-6NM	0.06	1.00	0.045	0.035	1.00	12.50	4.00	0.70	-
CA-15	0.15	1.00	-	-	1.50	12.50	1.00	-	-
CA-40	0.40	1.00	-	-	1.50	12.50	1.00	-	-
CF-3	0.03	1.50	0.040	0.040	2.00	19.00	10.00	-	-
CF-3M	0.03	1.50	0.040	0.040	1.50	19.00	10.00	2.5	-
CF-8	0.08	1.50	0.040	0.040	2.00	19.00	9.00	-	-
CF-8M	0.08	1.50	0.040	0.040	2.00	19.50	10.00	2.5	-
CH-20	0.20	1.50	0.040	0.040	1.50	20.00	10.00	-	-
CK-20	0.20	2.00	0.040	0.040	2.00	25.00	20.00	-	-
HF	0.30	2.00	0.040	0.040	2.00	19.00	9.00	-	-
HH	0.35	2.00	0.040	0.040	2.00	25.00	12.00	-	0.2 N
HK	0.30	2.00	0.040	0.040	2.00	25.00	20.00	-	-

Properties of Stainless Steel

Mechanical Properties of Wrought Stainless Steel* (All Properties Specified, usually Flat Products)

Common Type	UNS No	Condition	0.2% Proof Strength MPa Min	Tensile Strength MPa Min	Tensile Elongation %		Brinell Hardness Max	Rockwell Hardness HB [HRC] Max	Vickers Hardness HRB	ASTM Specification HV Max
					≤1.2mm Min	>1.2mm Min				
201	S20100	Annealed	310	655	40	40	217	100	240	A240
202	S20200	Annealed	260	620	40	40	241	-	-	A240
301	S30100	Annealed	205	515	40	40	217	95	210	A240
301	S30100	1/4 hard	515	860	25	25	-	-	-	A666
301	S30100	1/2 hard	760	1035	15	18	-	-	-	A666
301	S30100	3/4 hard	930	1205	10	12	-	-	-	A666
301	S30100	Full hard	965	1275	8	9	-	-	-	A666
302	S30200	Annealed	205	515	40	40	201	92	210	A240
302HQ	S30430	Annealed	-	605 max	-	-	-	-	-	A493
303	S30300	Annealed	240	585	50	50	-	-	-	A582
304	S30400	Annealed	205	515	40	40	201	92	210	A240
304L	S30403	Annealed	170	485	40	40	201	92	210	A240
305	S30500	Annealed	-	585 max	-	-	-	-	-	A493
+	S30815	Annealed	310	600	40	40	217	95	-	A240
309S	S30908	Annealed	205	515	40	40	217	95	225	A240
310S	S31008	Annealed	205	515	40	40	217	95	225	A240
316	S31600	Annealed	205	515	40	40	217	95	225	A240
316L	S31603	Annealed	170	485	40	40	217	95	225	A240
316Ti	S31635	Annealed	205	515	40	40	217	95	225	A240
317	S31700	Annealed	205	515	35	35	217	95	-	A240

Properties of Stainless Steel

Mechanical Properties of Wrought Stainless Steel*
(All Properties Specified, usually Flat Products)

Common Type	UNS No	Condition	0.2% Proof Strength MPa Min	Tensile Strength MPa Min	Tensile Elongation %		Brinell Hardness Max	Rockwell Hardness HB [HRC] Max	Vickers Hardness HRB	ASTM Specification HV Max
					≤1.2mm Min	>1.2mm Min				
317L	S31703	Annealed	205	515	40	40	217	95	-	A240
321	S32100	Annealed	205	515	40	40	217	95	210	A240
347	S34700	Annealed	205	515	40	40	201	92	-	A240
904L	N08904	Annealed	215	490	35	35	-	90	-	B625
409	S40900	Annealed	205	380	20	22	179	88	-	A240
430	S43000	Annealed	205	450	20	22	183	88	210	A240
444	S44400	Annealed	275	415	20	20	217	96	200	A240
446	S44600	Annealed	280	480	20	-	-	-	-	A580
1.4003	S41003	Annealed	280	460	18	18	220	-	-	-
2205	S31803	Annealed	450	620	25	25	293	[31]	-	A240
+	S32304	Annealed	400	600	25	25	290	[32]	-	A240
+	S32750	Annealed	550	795	15	15	310	[32]	-	A240
+	S32760	Annealed	550	750	25	25	270	[28]	-	A240
+	S32550	Annealed	550	760	15	15	302	[32]	-	A240
410	S41000	Annealed	205	450	20	22	217	96	210	A240
416	S41600	Annealed	276	517	30	30	-	-	-	A582
420	S42000	Cold Finished	-	520	-	42	255	-	-	A276
431	S43100	Cold Finished	-	965 max	-	-	285	-	-	A580
440A	S44002	Cold Finished	-	-	-	-	285	-	-	A580
440C	S44004	Cold Finished	-	-	-	-	285	-	-	A580
17-4PH	S17400	H1025	1000	1070	12	12	401	[42]	-	A564

+ Proprietary alloy names apply.

* Consult the relevant product standard for definitive values.

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Properties of Stainless Steel

Typical Physical Properties - Annealed Condition

Grade or type	UNS No	Density (kg/m ³)	Elastic Modulus (a) GPa	Mean Coefficient of Thermal Expansion (b)			Thermal Conductivity		Specific Heat 0-100°C J/kg.K	Electrical Resistivity nOhms.m
				0-100°C μm/m/ °C	0-315°C μm/m/ °C	0-538°C μm/m/ °C	At 100°C W/m.K	At 500°C W/m.K		
201	S20100	7800	197	15.7	17.5	18.4	16.2	21.5	500	690
202	S20200	7800	-	17.5	18.4	19.2	16.2	21.6	500	690
301	S30100	8000	193	17.0	17.2	18.2	16.2	21.5	500	720
302	S30200	8000	193	17.2	17.8	18.4	16.2	21.5	500	720
302B	S30215	8000	193	16.2	18.0	19.4	15.9	21.6	500	720
303	S30300	8000	193	17.2	17.8	18.4	16.2	21.5	500	720
304	S30400	8000	193	17.2	17.8	18.4	16.2	21.5	500	720
304L	S30403	8000	193	17.2	17.8	18.4	16.3	21.5	500	720
302HQ	S30430	8000	193	17.2	17.8	-	11.2	21.5	500	720
304N	S30451	8000	196	17.2	17.8	18.4	16.3	21.5	500	720
305	S30500	8000	193	17.2	17.8	18.4	16.2	21.5	500	720
308	S30800	8000	193	17.2	17.8	18.4	15.2	21.6	500	720
309	S30900	8000	200	15.0	16.6	17.2	15.6	18.7	500	780
310	S31000	8000	200	15.9	16.2	17.0	14.2	18.7	500	780
314	S31400	7800	200	-	15.1	-	17.5	20.9	500	770
316	S31600	8000	193	15.9	16.2	17.5	16.2	21.5	500	740
316L	S31603	8000	193	15.9	16.2	17.5	16.3	21.5	500	740
316N	S31651	8000	196	15.9	16.2	17.5	14.4	-	500	740
317	S31700	8000	193	15.9	16.2	17.5	16.2	21.5	500	740
317L	S31703	8000	200	16.5	-	18.1	14.4	-	500	790
321	S32100	8000	193	16.6	17.2	18.6	16.1	22.2	500	720
329	S32900	7800	186	10.1	11.5	-	-	-	460	750
330	N08330	8000	196	14.4	16.0	16.7	-	-	460	1020
347	S34700	8000	193	16.6	17.2	18.6	16.1	22.2	500	730

Properties of Stainless Steel

Typical Physical Properties - Annealed Condition

Grade or type	UNS No	Density (kg/m ³)	Elastic Modulus (a) GPa	Mean Coefficient of Thermal Expansion (b)			Thermal Conductivity		Specific Heat 0-100°C J/kg.K	Electrical Resistivity nOhms.m
				0-100°C μm/m/ °C	0-315°C μm/m/ °C	0-538°C μm/m/ °C	At 100°C W/m.K	At 500°C W/m.K		
384	S38400	8000	193	17.2	17.8	18.4	16.2	21.5	500	790
409	S40900	7800	200	11.7	12.0	12.4	24.9	-	460	-
410	S41000	7800	200	9.9	11.4	11.6	24.9	28.7	460	570
416	S41600	7800	200	9.9	11.0	11.6	24.9	28.7	460	570
420	S42000	7800	200	10.3	10.8	11.7	24.9	-	460	550
430	S43000	7800	200	10.4	11.0	11.4	26.1	26.3	460	600
430F	S43020	7800	200	10.4	11.0	11.4	26.1	26.3	460	600
431	S43100	7800	200	10.2	12.1	-	20.2	-	460	720
434	S43400	7800	200	10.4	11.0	11.4	-	26.3	460	600
436	S43600	7800	200	9.3	-	-	23.9	26.0	460	600
440C	S44004	7800	200	10.2	-	-	24.2	-	460	600
444	S44400	7800	200	10.0	10.6	11.4	26.8	-	420	620
446	S44600	7800	200	10.4	10.8	11.2	20.9	24.4	500	670
630	S17400	7500	196	10.8	11.6	-	18.3	23.0	460	800
631	S17700	7800	204	11.0	11.6	-	16.4	21.8	460	830
+	N08904	7900	195	16.0	17.5	-	14.0	-	500	950
+	S30815	7800	200	16.3	17.3	18.0	14.0	18.0	500	-
+	S31803	7800	200	13.7	14.7	-	19.0	-	480	850
+	S32304	7800	200	13.0	-	-	16.0	-	470	850
+	S32750	7800	200	13.0	14.0	-	17.0	-	470	-
3CR12	S41003	7800	205	10.8	11.3	12.0	31.0	32.0	480	570
4565S	S34565	8000	190	14.5	16.3	17.2	14.5	-	510	920
+	S32760	7600	190	12.8	13.8	-	14.4	-	480	850

(a) 1GPa = 1000MPa

(b) μm/m/°C = x 10-6/°C(c) 1% flow in 10,000 hours at 540°C

Magnetic permeability of all 300 series austenitic steels in the annealed condition is approximately 1.02

+ Proprietary alloy names apply

Superfix (Singapore) Pte Ltd

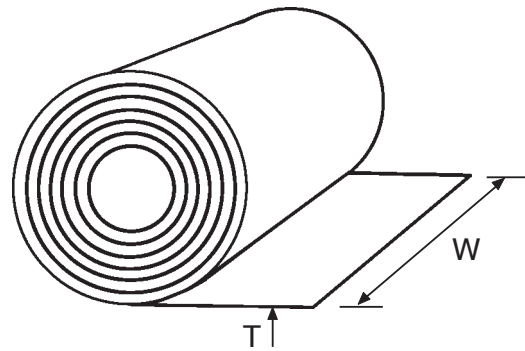
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Specification Cross Reference

U.S. ALLOY	FRENCH AFNOR	GERMAN DIN	UK B.S.	JAPAN JIS	SWEDEN SS
301	Z 12CN18.07	1.4310	301 S 21	SUS 301	2331
303	Z 10CNF18.09	1.4305	303 S 21	SUS 303	2346
304	Z 6CN18.09	1.4301	304 S 15	SUS 304	2333
304L	Z 2CN18.10	1.4306	304 S 11	SUS 304L	2352
309S	Z 15CN24.13	1.4833	309 S 16	SUS 309S	
310S	Z 8CN25.20	1.4845	310 S 16	SUS 310S	2361
316	Z 6CND17.11	1.4401	316 S 31	SUS 316	2343
		1.4436	316 S 33		2347
316L	Z 2CND17.12	1.4435	316 S 11	SUS 316L	2353
			316 S 13		2348
317		1.4436	317 S 16	SUS 317	2366
317L	Z 2CND19.15	1.4435	317 S 12	SUS 317L	2367
321	Z 6CNT18.10	1.4541	321 S 31	SUS 321	2337
329		1.4460	□	SUS 329J1	2324
330	Z 12NCS35.16	1.4864	□	SUH 330	
347	Z 6CNNb18.10	1.4550	347 S 17	SUS 347	2338
403	Z 6C13	1.4000	403 S 17	SUS 403	2301
409	Z 6CT12	1.4512	409 S 19	SUH 409	
410	Z 13C13	1.4024	410 S 21	SUS 410	2302
416	Z 12CF13	1.4005	416 S 21	SUS 416	2380
420	Z 20C13	1.4021	420 S 45	SUS 420J2	2303
430	Z 8C17	1.4016	430 S 17	SUS 430	2320
440C	Z 100CD17			SUS 440C	
904L	Z 2NCDU25.20AZ	1.4539			2562
17-4PH	Z 4CNUNb16.4M	1.4542			
2205	Z 3CND22.05AZ	1.4462	318 S 13		2377

Stainless Steel Coil



Thickness (T) (mm)	Width (W) (mm)	Weight	304 2B	304 No. 4	304 BA	304 HL	304 MR	316/ 316L 2B	316 No. 4
0.20	1219	1 to 7 tons	●	●	●	●	●	●	●
0.25	1219	1 to 7 tons	●	●	●	●	●	●	●
0.30	1219	1 to 7 tons	●	●	●	●	●	●	●
0.40	1219	1 to 7 tons	●	●	●	●	●	●	●
0.50	1219	1 to 7 tons	●	●	●	●	●	●	●
0.60	1219	1 to 7 tons	●	●	●	●	●	●	●
0.70	1219	1 to 7 tons	●	●	●	●	●	●	●
0.80	1219	1 to 7 tons	●	●	●	●	●	●	●
0.90	1219	1 to 7 tons	●	●	●	●	●	●	●
1.00	1219	1 to 7 tons	●	●	●	●	●	●	●
1.25	1219	1 to 7 tons	●	●	●	●	●	●	●
1.50	1219	1 to 7 tons	●	●	●	●	●	●	●
2.00	1219	1 to 7 tons	●	●	●	●	●	●	●
2.50	1219	1 to 7 tons	●	●	●	●	●	●	●
3.00	1219	1 to 7 tons	●	●	●	●	●	●	●

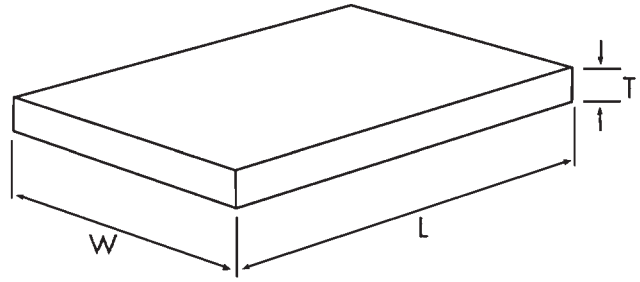
We slit any width from 10mm to 550mm. There are no minimum quantities.

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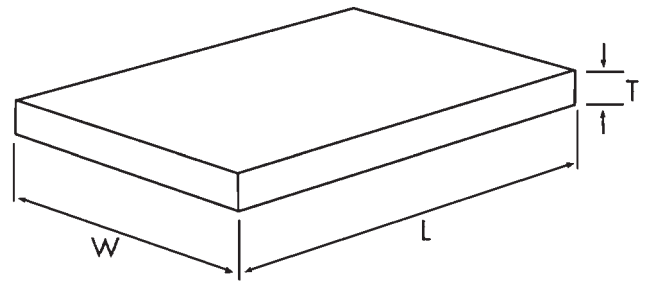
Stainless Steel Sheet



Thickness (mm)	Width (mm)	Length (mm)*	304 2B	304 No 4 PC	304 BA PC	304 HL PC	304 MR PC	316/316L 2B	316 No 4 PC
0.40	1220	2440	●	●				●	
	1500	3000	●	●				●	
0.50	1220	2440	●	●	●	●		●	●
	1500	3000	●	●	●	●		●	●
0.60	1220	2440	●	●	●	●		●	●
	1500	3000	●	●	●	●		●	●
0.70	1220	2440	●	●	●	●		●	●
	1500	3000	●	●	●	●		●	●
0.80	1220	2440	●	●	●	●		●	●
	1500	3000	●	●	●	●		●	●
0.90	1220	2440	●	●	●	●		●	●
	1500	3000	●	●	●	●		●	●
1.00	1220	2440	●	●	●	●	●	●	●
	1500	3000	●	●	●	●	●	●	●
1.20	1220	2440	●	●	●	●	●	●	●
	1500	3000	●	●	●	●	●	●	●

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Stainless Steel Sheet



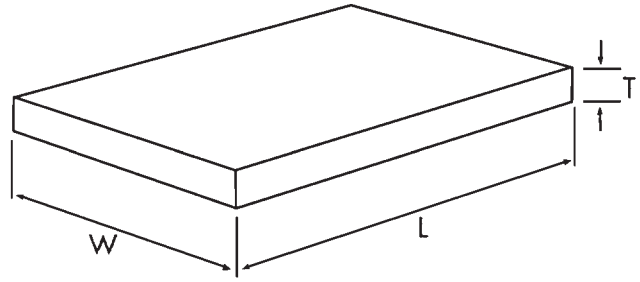
Thickness (mm)	Width (mm)	Length (mm)*	304 2B	304 No 4 PC	304 BA PC	304 HL PC	304 MR PC	316/316L 2B	316 No 4 PC
1.50/1.60	1220	2440	●	●	●	●	●	●	●
	1500	3000	●	●	●	●	●	●	●
2.00	1220	2440	●	●	●	●	●	●	●
	1500	3000	●	●	●	●	●	●	●
2.50	1220	2440	●	●		●	●	●	●
	1500	3000	●	●		●	●	●	●
3.00	1220	2440	●	●		●	●	●	●
	1500	3000	●	●		●	●	●	●
4.00	1220	2440	●	●				●	
	1500	3000	●	●				●	
5.00	1220	2440	●	●				●	
	1500	3000	●	●				●	
6.00	1220	2440	●	●				●	
	1500	3000	●	●				●	
8.00	1220	2440	●					●	
	1500	3000	●					●	

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Stainless Steel Plate (No.1)



Thickness (mm)	Width (mm)	Length (mm)	304/304L HRAP	316/316L HRAP
3.00	1220	2440	●	
	1500	3000	●	
4.00	1220	2440	●	●
	1500	3000	●	●
5.00	1220	2440	●	●
	1500	3000	●	●
6.00	1220	2440	●	●
	1500	3000	●	●
8.00	1220	2440	●	●
	1500	3000	●	●
10.00	1220	2440	●	●
	1500	3000	●	●
12.00	1220	2440	●	●
	1500	3000	●	●
13.00	1220	2440	●	●
	1500	3000	●	●
15.00	1220	2440	●	●
	1500	3000	●	●
16.00	1220	2440	●	●
	1500	3000	●	●
19.00	1220	2440	●	●
	1500	3000	●	●
20.00	1220	2440	●	●
	1500	3000	●	●
22.00	1220	2440	●	●
	1500	3000	●	●

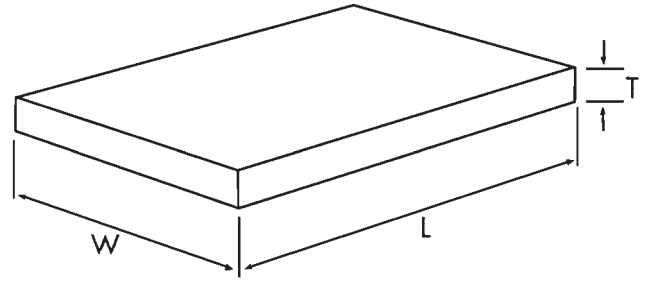
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Stainless Steel Plate (No.1)



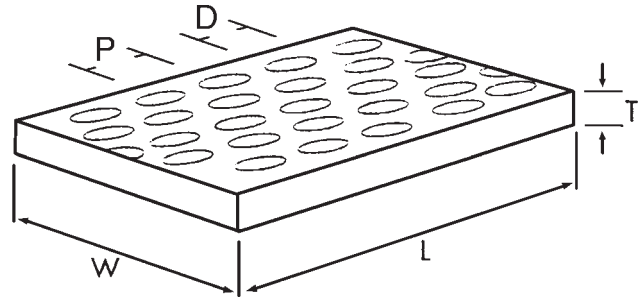
Thickness (mm)	Width (mm)	Length (mm)	304/304L HRAP	316/316L HRAP
25.00	1220	2440	●	●
	1500	3000	●	●
28.00	1220	2440	●	●
	1500	3000	●	●
30.00	1220	2440	●	●
	1500	3000	●	●
32.00	1220	2440	●	●
	1500	3000	●	●
35.00	1220	2440	●	●
	1500	3000	●	●
38.00	1220	2440	●	●
	1500	3000	●	●
40.00	1220	2440	●	●
	1500	3000	●	●
45.00	1220	2440	●	●
	1500	3000	●	●
50.00	1220	2440	●	●
	1500	3000	●	●
55.00	1220	2440	●	●
	1500	3000	●	●
65.00	3000	4000	●	●
80.00	3000	3000	●	●
100.00	2000	3000	●	●

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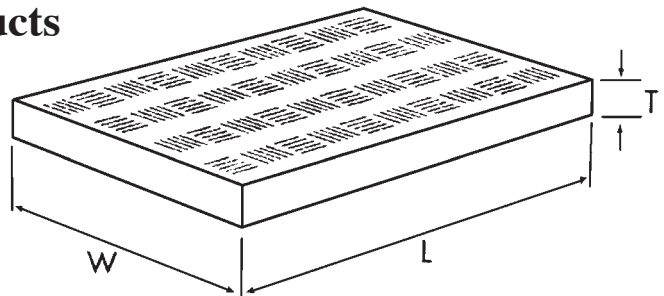
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Stainless Steel Perforated Sheet - Grade 304



Hole dia (mm)	Centres (mm)	Thickness (mm)	Width (mm)	Length (mm)
1.60	2.54	0.7	1220	2440
2.01	3.00	0.9	1220	2440
3.25	4.52	0.9	1220	2440
3.25	5.59	1.5	1220	2440
4.80	8.00	0.9	1220	2440
4.80	10.00	1.2	1220	2440
6.35	9.55	1.5	1220	2440
9.53	14.30	1.5	1220	2440
12.70	17.30	1.5	1220	2440

Stainless Steel Safety Flooring Products



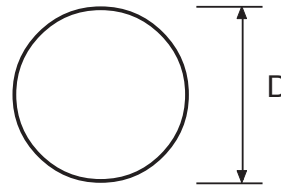
Product	Thickness (mm)	Width (mm)	Length (mm)	304 HR	304 Pressed
Floor (Checkered) Plate	1.00	1220	2440		●
	2.00	1220	2440		●
	3.00	1220	2440	●	●
	3.50	1220	2440	●	
	4.50	1220	2440	●	
		1500	3000	●	
	6.00	1220	2440	●	
		1500	3000	●	

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Stainless Steel Round Bar



Diameter (mm)	Diameter (inches)	303	304/304L	316/316L
3.18	0.125	●	●	●
3.97	0.156	●	●	●
4.76	0.187	●	●	●
5.00	0.197	●	●	●
6.00	0.236	●	●	●
6.35	0.250	●	●	●
7.95	0.313	●	●	●
8.00	0.315	●	●	●
9.52	0.375	●	●	●
10.00	0.394	●	●	●
11.11	0.437	●	●	●
12.00	0.472	●	●	●
12.70	0.500	●	●	●
14.00	0.551	●	●	●
14.29	0.563	●	●	●
15.88	0.625	●	●	●
16.00	0.630	●	●	●
18.00	0.709	●	●	●
19.05	0.750	●	●	●
20.00	0.787	●	●	●
22.00	0.866	●	●	●
24.00	0.945	●	●	●
25.00	0.984	●	●	●
25.40	1.000	●	●	●
28.58	1.125	●	●	●
30.00	1.181	●	●	●
31.75	1.250	●	●	●
34.93	1.375	●	●	●
35.00	1.378	●	●	●

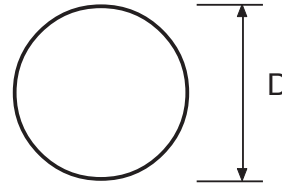
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Stainless Steel Round Bar



Diameter (mm)	Diameter (inches)	303	304/304L	316/316L
36.00	1.417	●	●	●
38.10	1.500	●	●	●
40.00	1.575	●	●	●
41.27	1.625	●	●	●
44.45	1.750	●	●	●
47.63	1.875	●	●	●
50.00	1.969	●	●	●
50.80	2.000	●	●	●
53.97	2.125	●	●	●
55.00	2.165	●	●	●
57.15	2.250	●	●	●
60.00	2.362	●	●	●
62.00	2.440	●	●	●
63.50	2.500	●	●	●
65.00	2.559	●	●	●
67.00	2.637	●	●	●
69.85	2.750	●	●	●
70.00	2.756	●	●	●
75.00	2.952	●	●	●
76.20	3.000	●	●	●
80.00	3.150	●	●	●
82.55	3.250	●	●	●
85.00	3.346	●	●	●
88.90	3.500	●	●	●
90.00	3.543	●	●	●
93.00	3.661	●	●	●
95.25	3.750	●	●	●
101.60	4.000	●	●	●
110.00	4.330	●	●	●

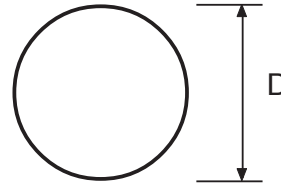
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Stainless Steel Round Bar



Diameter (mm)	Diameter (inches)	303	304/304L	316/316L
114.30	4.500	●	●	●
120.00	4.724	●	●	●
127.00	5.000	●	●	●
130.00	5.118	●	●	●
140.00	5.512	●	●	●
152.40	6.000	●	●	●
165.00	6.496		●	●
170.00	6.693		●	●
180.00	7.087		●	●
203.20	8.000			●
205.00	8.071			●
228.60	9.000			●
254.00	10.000			●
280.00	11.020			●
304.80	12.000			●
310.00	12.204			●
330.00	12.992			●
355.60	14.000			●
375.00	14.764			●
400.00	15.748			●

Stainless Steel Flat Bar



Thickness (mm/inches)	Width (mm/inches)	304	316
3	12	●	●
	14	●	●
	15	●	●
	16	●	●
	20	●	●
	25	●	●
	30	●	●
	35	●	●
	40	●	●
	45	●	●
	50	●	●
	60	●	●
	65	●	●
1/8"	0.5"	●	●
	5/8"	●	●
	0.75"	●	●
	1"	●	●
	1.25"	●	●
	1.5"	●	●
	1.75"	●	●
	2"	●	●
	2.5"	●	●
	3"	●	●
3/16"	0.5"	●	●
	5/8"	●	●
	0.75"	●	●
	1"	●	●
	1.25"	●	●
	1.5"	●	●
	1.75"	●	●
	2"	●	●
	2.5"	●	●
	3"	●	●
3.5"	●	●	
5	10	●	●
	12	●	●
	14	●	●
	15	●	●
	16	●	●
	20	●	●

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Stainless Steel Flat Bar



Thickness (mm/inches)	Width (mm/inches)	304	316
5	25	●	●
	30	●	●
	32	●	●
	35	●	●
	40	●	●
	45	●	●
	50	●	●
	60	●	●
	65	●	●
	70	●	●
	75	●	●
	80	●	●
	90	●	●
100	●	●	
1/4"	0.5"	●	●
	5/8"	●	●
	0.75"	●	●
	1"	●	●
	1.25"	●	●
	1.5"	●	●
	1.75"	●	●
	2"	●	●
	2.5"	●	●
	3"	●	●
	3.5"	●	●
	4"	●	●
6	10	●	●
	12	●	●
	14	●	●
	15	●	●
	16	●	●
	20	●	●
	25	●	●
	30	●	●
	32	●	●
	35	●	●
	40	●	●
	45	●	●
	50	●	●
60	●	●	
65	●	●	

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Stainless Steel Flat Bar



Thickness (mm/inches)	Width (mm/inches)	304	316
6	70	●	●
	75	●	●
	80	●	●
	90	●	●
	100	●	●
5/16"	0.75"	●	●
	1"	●	●
	1.25"	●	●
	1.5"	●	●
	1.75"	●	●
	2"	●	●
	2.5"	●	●
	3"	●	●
	3.5"	●	●
	4"	●	●
8	12	●	●
	15	●	●
	16	●	●
	20	●	●
	25	●	●
	30	●	●
	32	●	●
	35	●	●
	40	●	●
	45	●	●
	50	●	●
	60	●	●
	65	●	●
	70	●	●
	75	●	●
80	●	●	
90	●	●	
100	●	●	
3/8"	0.75"	●	●
	1"	●	●
	1.25"	●	●
	1.5"	●	●
	1.75"	●	●

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Stainless Steel Flat Bar



Thickness (mm/inches)	Width (mm/inches)	304	316
3/8"	2"	●	●
	2.5"	●	●
	3"	●	●
	3.5"	●	●
	4"	●	●
	5"	●	●
	6"	●	●
10	15	●	●
	20	●	●
	25	●	●
	30	●	●
	32	●	●
	35	●	●
	40	●	●
	45	●	●
	50	●	●
	60	●	●
	65	●	●
	70	●	●
	75	●	●
	80	●	●
	90	●	●
100	●	●	
110	●	●	
120	●	●	
125	●	●	
150	●	●	
12	20	●	●
	25	●	●
	30	●	●
	32	●	●
	35	●	●
	40	●	●
	45	●	●
	50	●	●
	60	●	●
	65	●	●
70	●	●	
75	●	●	

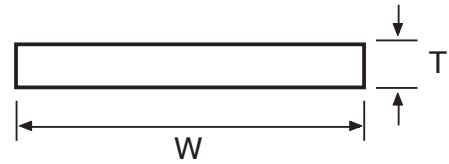
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Stainless Steel Flat Bar



Thickness (mm/inches)	Width (mm/inches)	304	316
12	80	●	●
	90	●	●
	100	●	●
	110	●	●
	120	●	●
	125	●	●
	150	●	●
1/2"	0.75"	●	●
	1"	●	●
	1.25"	●	●
	1.5"	●	●
	1.75"	●	●
	2"	●	●
	2.5"	●	●
	3"	●	●
	3.5"	●	●
	4"	●	●
	5"	●	●
6"	●	●	
5/8"	1"	●	●
	1.25"	●	●
	1.5"	●	●
	1.75"	●	●
	2"	●	●
	2.5"	●	●
	3"	●	●
	3.5"	●	●
	4"	●	●
5"	●	●	
6"	●	●	
16	25	●	●
	30	●	●
	32	●	●
	35	●	●
	40	●	●
	45	●	●
	50	●	●
	60	●	●

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Stainless Steel Flat Bar



Thickness (mm/inches)	Width (mm/inches)	304	316
16	65	●	●
	70	●	●
	75	●	●
	80	●	●
	90	●	●
	100	●	●
	110	●	●
	120	●	●
	125	●	●
	150	●	●
	175	●	●
	200	●	●
3/4"	1"	●	●
	1.25"	●	●
	1.5"	●	●
	1.75"	●	●
	2"	●	●
	2.5"	●	●
	3"	●	●
	3.5"	●	●
	4"	●	●
	5"	●	●
6"	●	●	
20	25	●	●
	30	●	●
	32	●	●
	35	●	●
	40	●	●
	45	●	●
	50	●	●
	60	●	●
	65	●	●
	70	●	●
	75	●	●
	80	●	●
	90	●	●
	100	●	●
110	●	●	
120	●	●	

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Stainless Steel Flat Bar



Thickness (mm/inches)	Width (mm/inches)	304	316
20	125	●	●
	150	●	●
	175	●	●
	200	●	●
25	30	●	●
	32	●	●
	35	●	●
	40	●	●
	45	●	●
	50	●	●
	60	●	●
	65	●	●
	70	●	●
	75	●	●
	80	●	●
	90	●	●
	100	●	●
	110	●	●
	120	●	●
	125	●	●
150	●	●	
175	●	●	
200	●	●	
1"	1.25"	●	●
	1.5"	●	●
	1.75"	●	●
	2"	●	●
	2.5"	●	●
	3"	●	●
	3.5"	●	●
	4"	●	●
5"	●	●	
6"	●	●	
30	50	●	●
	60	●	●
	65	●	●
	70	●	●
	75	●	●
	80	●	●

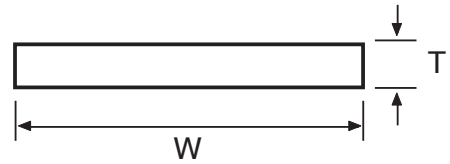
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Stainless Steel Flat Bar



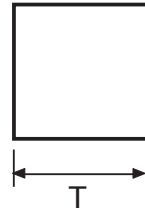
Thickness (mm/inches)	Width (mm/inches)	304	316
30	90	●	●
	100	●	●
	110	●	●
	120	●	●
	125	●	●
	150	●	●
	175	●	●
	200	●	●
1.25"	2"	●	●
	2.5"	●	●
	3"	●	●
	3.5"	●	●
	4"	●	●
	5"	●	●
	6"	●	●
35	50	●	●
	60	●	●
	65	●	●
	70	●	●
	75	●	●
	80	●	●
	90	●	●
	100	●	●
	110	●	●
	120	●	●
	125	●	●
	150	●	●
	175	●	●
200	●	●	
40	125	●	●
	150	●	●
	175	●	●
	200	●	●

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Stainless Steel Square Bar



Across Flats (mm)	Across Flats (mm)	304	316
5.00	0.20	●	●
6.00	0.24	●	●
6.35	0.25	●	●
8.00	0.32	●	●
9.52	0.38	●	●
10.00	0.39	●	●
12.00	0.47	●	●
12.70	0.50	●	●
16.00	0.63	●	●
19.05	0.75	●	●
20.00	0.78	●	●
22.22	0.87	●	●
25.00	0.98	●	●
25.40	1.00	●	●
30.00	1.18	●	●
31.75	1.25	●	●
32.00	1.26	●	●
35.00	1.38	●	●
38.00	1.50	●	●
40.00	1.60	●	●
44.45	1.75	●	●
50.00	2.00	●	●
57.15	2.25	●	●
60.00	2.36	●	●
63.50	2.75	●	●
65.00	2.59	●	●
69.85	2.75	●	●
76.20	3.00	●	●
80.00	3.14	●	●
82.55	3.25	●	●
88.90	3.50	●	●
90.00	3.54	●	●
95.25	3.75	●	●
100.00	3.94	●	●
101.60	4.00	●	●

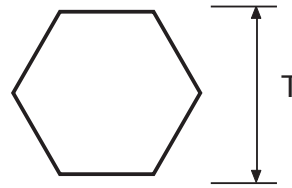
* Available in cold drawn finish

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Stainless Steel Hexagonal Bar



Across Flats (mm)	Across Flats (mm)	304	316
9.53	0.375	●	●
13.34	0.525	●	●
15.27	0.601	●	●
18.03	0.710	●	●
19.05	0.750	●	●
20.83	0.820	●	●
22.23	0.875	●	●
23.37	0.920	●	●
24.00	0.945	●	●
25.65	1.010	●	●
28.58	1.125	●	●
30.48	1.200	●	●
31.75	1.250	●	●
33.05	1.300	●	●
34.92	1.374	●	●
37.59	1.479	●	●
38.10	1.500	●	●
40.00	1.600	●	●
42.42	1.670	●	●
44.45	1.750	●	●
47.63	1.875	●	●
50.80	2.000	●	●
57.15	2.250	●	●
63.50	2.500	●	●
69.85	2.750	●	●
76.20	3.000	●	●

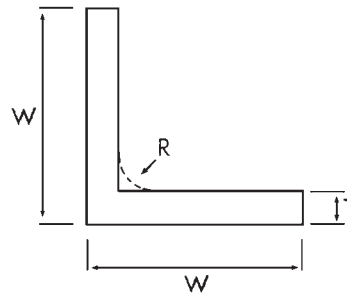
* Available in cold drawn finish

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Stainless Steel Equal Angle Bar



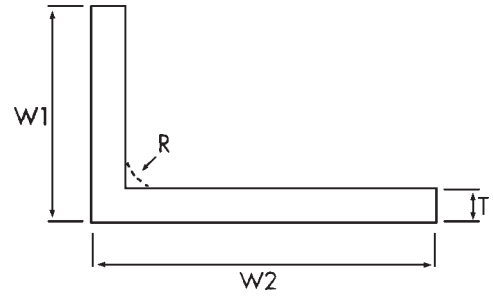
Across Flats (mm)	304	316
20 x 20 x 3	●	●
25 x 25 x 3	●	●
25 x 25 x 5	●	●
25 x 25 x 6	●	●
30 x 30 x 3	●	●
30 x 30 x 4	●	●
30 x 30 x 5	●	●
30 x 30 x 6	●	●
40 x 40 x 3	●	●
40 x 40 x 4	●	●
40 x 40 x 5	●	●
40 x 40 x 6	●	●
50 x 50 x 3	●	●
50 x 50 x 4	●	●
50 x 50 x 5	●	●
50 x 50 x 6	●	●
60 x 60 x 6	●	●
65 x 65 x 6	●	●
65 x 65 x 8	●	●
65 x 65 x 10	●	●
75 x 75 x 6	●	●
75 x 75 x 8	●	●
75 x 75 x 10	●	●
75 x 75 x 12	●	●
100 x 100 x 6	●	●
100 x 100 x 8	●	●
100 x 100 x 10	●	●
100 x 100 x 12	●	●

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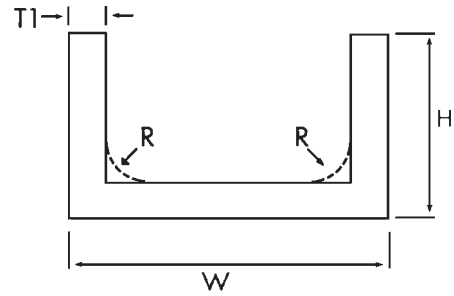
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Stainless Steel Unequal Angle Bar



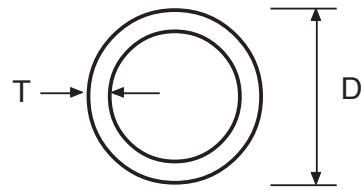
Size (mm)	304	316
50 x 30 x 5	●	●
60 x 30 x 5	●	●
60 x 40 x 5	●	●
60 x 40 x 6	●	●
75 x 50 x 6	●	●
80 x 40 x 6	●	●
80 x 65 x 6	●	●
90 x 60 x 6	●	●
100 x 50 x 6	●	●
100 x 75 x 6	●	●
80 x 40 x 8	●	●
90 x 60 x 8	●	●
100 x 50 x 8	●	●
100 x 65 x 8	●	●
100 x 75 x 8	●	●
75 x 50 x 10	●	●
100 x 75 x 10	●	●
125 x 75 x 10	●	●
150 x 75 x 10	●	●
150 x 100 x 10	●	●

Stainless Steel U Channels



Dimensions (mm) Thickness x Flange x Web [(B) x (H) x (t)]	304	316
40 x 20 x 3	●	●
50 x 25 x 3	●	●
80 x 40 x 5	●	●
100 x 50 x 6	●	●
130 x 65 x 6	●	●
150 x 75 x 6	●	●
200 x 100 x 10	●	●

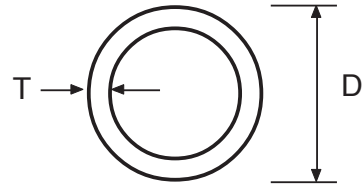
Stainless Steel Round Tube



Wall Thickness (mm)	Outside Diameter (mm)	304	316
0.6	12.70	●	●
	19.10	●	●
	22.20	●	●
	25.40	●	●
0.8	12.70	●	●
	19.10	●	●
	22.20	●	●
	25.40	●	●
	31.80	●	●
	38.10	●	●
	50.80	●	●
1.0	12.70	●	●
	19.10	●	●
	22.20	●	●
	25.40	●	●
	31.80	●	●
	38.10	●	●
	50.80	●	●
1.2	12.70	●	●
	19.10	●	●
	22.20	●	●
	25.40	●	●
	31.80	●	●
	38.10	●	●
	50.80	●	●
	63.50	●	●
	76.20	●	●

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Stainless Steel Round Tube



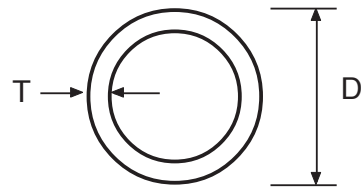
Wall Thickness (mm)	Outside Diameter (mm)	304	316
1.5	12.70	●	●
	19.10	●	●
	22.20	●	●
	25.40	●	●
	31.80	●	●
	38.10	●	●
	50.80	●	●
	76.20	●	●
2.0	25.40	●	●
	31.80	●	●
	38.10	●	●
	50.80	●	●
	63.50	●	●
	76.20	●	●
2.5	25.40	●	●
	31.80	●	●
	38.10	●	●
	50.80	●	●
	63.50	●	●
	76.20	●	●
3.0	25.40	●	●
	31.80	●	●
	38.10	●	●
	50.80	●	●
	63.50	●	●
	76.20	●	●
3.5	25.40	●	●
	31.80	●	●
	38.10	●	●
	50.80	●	●
	63.50	●	●
	76.20	●	●

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Stainless Steel Pipe



Schedule	Diameter Nominal	304/304L SMLS	304L WLD	316/316L SMLS	316L WLD
5S	8	●		●	●
	10	●		●	●
	15	●	●	●	●
	20	●	●	●	●
	25	●	●	●	●
	32	●	●	●	●
	40	●	●	●	●
	50	●	●	●	●
	65	●	●	●	●
	80	●	●	●	●
	90	●	●	●	●
	100	●	●	●	●
	125	●	●	●	●
	150	●	●	●	●
	200	●	●	●	●
	250	●	●	●	●
300	●	●	●	●	
10S	8	●		●	
	10	●		●	
	15	●	●	●	●
	20	●	●	●	●
	25	●	●	●	●
	32	●	●	●	●
	40	●	●	●	●
	50	●	●	●	●
	65	●	●	●	●
	80	●	●	●	●
	90	●	●	●	●
	100	●	●	●	●
	125	●	●	●	●
	150	●	●	●	●
	200	●	●	●	●
	250	●	●	●	●
300	●	●	●	●	

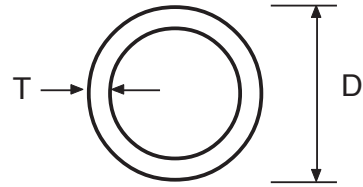
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Stainless Steel Pipe



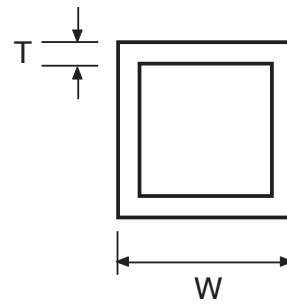
Schedule	Diameter Nominal	304/304L SMLS	304L WLD	316/316L SMLS	316L WLD
20S	8	●		●	●
	10	●		●	●
	15	●	●	●	●
	20	●	●	●	●
	25	●	●	●	●
	32	●	●	●	●
	40	●	●	●	●
	50	●	●	●	●
	65	●	●	●	●
	80	●	●	●	●
	90	●	●	●	●
	100	●	●	●	●
	125	●	●	●	●
	150	●	●	●	●
	200	●	●	●	●
	250	●	●		●
300	●	●	●	●	
40S	8	●		●	●
	10	●		●	
	15	●	●	●	●
	20	●	●	●	●
	25	●	●	●	●
	32	●	●	●	●
	40	●	●	●	●
	50	●	●	●	●
	65	●	●	●	●
	80	●	●	●	●
	90	●	●	●	●
	100	●	●	●	●
	125	●	●	●	●
	150	●	●	●	●
	200	●	●		●
	250	●	●	●	●
300	●	●	●	●	

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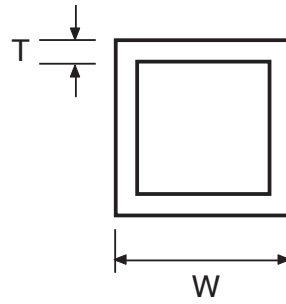
Stainless Steel Square Tube



Outside Dimension (mm)	Wall Thickness (mm)	304	316
19.05	1.0	●	●
	1.2	●	●
	1.5	●	●
	1.6	●	●
25.40	1.0	●	●
	1.2	●	●
	1.5	●	●
	1.6	●	●
	2.0	●	●
	3.0	●	●
31.75	1.0	●	●
	1.2	●	●
	1.5	●	●
	1.6	●	●
	2.0	●	●
	3.0	●	●
38.10	1.0	●	●
	1.2	●	●
	1.5	●	●
	1.6	●	●
	2.0	●	●
	3.0	●	●

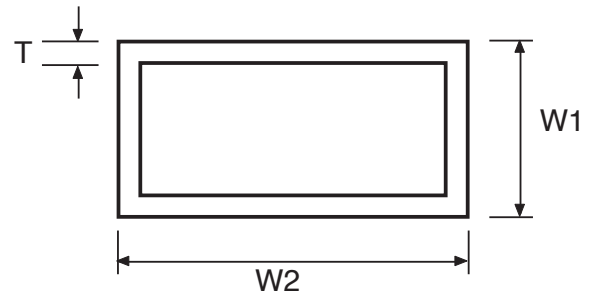
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Stainless Steel Square Tube



Outside Dimension (mm)	Wall Thickness (mm)	304	316
40.00	1.0	●	●
	1.2	●	●
	1.5	●	●
	1.6	●	●
	2.0	●	●
	3.0	●	●
50.80	1.2	●	●
	1.5	●	●
	1.6	●	●
	2.0	●	●
	3.0	●	●
	3.5	●	●
60.00	1.2	●	●
	1.5	●	●
	1.6	●	●
	2.0	●	●
	3.0	●	●
76.20	2.0	●	●
	3.0	●	●
	3.5	●	●
101.60	2.0	●	●
	3.0	●	●
	3.5	●	●

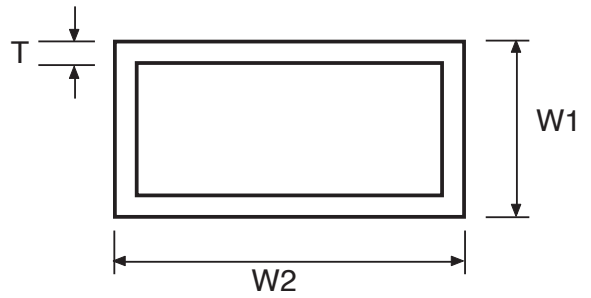
Stainless Steel Rectangular Tube



Outside Dimension (mm)	Wall Thickness (mm)	304	316
24.0 X 14.0	1.0	●	●
	1.2	●	●
	1.5	●	●
	1.6	●	●
	2.0	●	●
	3.0	●	●
40.0 X 18.0	1.0	●	●
	1.2	●	●
	1.5	●	●
	1.6	●	●
	2.0	●	●
	3.0	●	●
40.0 X 25.0	1.0	●	●
	1.2	●	●
	1.5	●	●
	1.6	●	●
	2.0	●	●
	3.0	●	●
50.8 X 25.4	1.0	●	●
	1.2	●	●
	1.5	●	●
	1.6	●	●
	2.0	●	●
	3.0	●	●

.../ con't on page 54

Stainless Steel Rectangular Tube



Outside Dimension (mm)	Wall Thickness (mm)	304	316
50.8 X 25.4	1.0	●	●
	1.2	●	●
	1.5	●	●
	1.6	●	●
	2.0	●	●
	3.0	●	●
60 X 40.0	1.0	●	●
	1.2	●	●
	1.5	●	●
	1.6	●	●
	2.0	●	●
	3.0	●	●
80.0 X 40.0	1.2	●	●
	1.5	●	●
	1.6	●	●
	2.0	●	●
	3.0	●	●
100.0 X 50.8	1.5	●	●
	1.6	●	●
	2.0	●	●
	3.0	●	●
	5.0	●	●

Sales Agreement

1. Agreement for sale

The Seller agrees to sell and the Buyer agrees to buy the Goods at the total purchase price stated in the Purchase Order accepted by the Seller and on the terms and conditions set out in the Purchase Order, and the terms and conditions herein which form part of this agreement. Property in, and risk of loss or damage to, the Goods shall pass to the Buyer as soon as the Seller accepts the Buyer's Purchase Order.

2. Payment

The Buyer will pay the Initial Payment (if any) to the Seller on or before the signing of this agreement, and will pay the balance of the total purchase price to the Seller at the address stated (or at such other address as the Seller may specify in writing to the Buyer at the expiry of 30 days from the date of delivery of the goods / acceptance of the Purchase Order by the Seller. Payments by post shall be at the risk of the Buyer.

3. Seller's remedies

The Buyer acknowledges that punctual payment of the balance of the total purchase price is of the essence of this agreement, and that, if the Credit Limit is exceeded and / or if, the Initial Payment or the balance of the total purchase price or any part thereof remains unpaid for more than 7 days after becoming due, the Buyer will be deemed to have repudiated this agreement and:

- 3.1 the full remaining balance of the total purchase price shall immediately become due and payable with interest rate which is 2% above the average prime rate of The Development Bank of Singapore Limited from time to time in force, such interest to accrue from day to day and to run after as well as before any judgement; and
- 3.2 the Seller shall have the option to resell the Goods and on such resale:
 - 3.2.1 this agreement shall be withdrawn, clause 3.1 shall cease to have effect and the Buyer will cease to have any property or interest in the Goods, but notwithstanding such withdrawal, the Seller will be entitled to retain all payments made by the Buyer under this agreement and to recover from the Buyer the amount of any deficiency in the total purchase price shown after resale together with interest and costs as provided below;
 - 3.2.2 the Buyer will at the Buyer's own expense deliver up possession of the Goods to the purchaser at such address within Singapore as the purchaser may require, and on default the Buyer will indemnify the Seller against all loss and expense sustained by the Seller as a result of such default including, but not limited to the amount of any liability the Seller may insure to the purchaser by reason of the Buyer's default; and
 - 3.2.3 except for the payment of any surplus payable to the Buyer pursuant to clause 4 below, all liabilities of the Seller to the Buyer shall be extinguished and the Buyer will have no rights or claims against the Seller of any kind whatsoever under or arising out of this agreement.

4. Proceeds of resale

The proceeds of any resale under clause 3.2 above shall, after deducting the costs and expenses of insurance (if any), storage, transport and resale, be applied in paying to the Seller the unpaid balance of the total purchase price and interest payable under this agreement with all costs incurred by the Seller (including legal costs on a full indemnity basis) in taking steps to enforce payment by the Buyer or to locate and resell the Goods. If such proceeds of sale are insufficient for that purpose, the Buyer will pay to the Seller on demand the amount of the deficiency. If such proceeds of sale exceed the amount to be paid to or retained by the Seller under this clause, the excess shall be paid to the Buyer, but the Seller will be entitled to retain and set off against what would otherwise be due to the Buyer under this clause such sum as in the sole opinion of the Seller necessary to provide the Seller with the Indemnities due to the Seller from the Buyer under this agreement.

5. Insurance

The Buyer will keep the Goods insured in their full replacement value and with Insurers to be approved by the Seller against loss or damage by fire and such other risks (including third party risks) as are usually covered by insurance in the type of business for which the Goods are for the time being used and such further risks as the Seller reasonably requires in making good the damage; or if the Goods are damaged beyond repair in replacing the Goods by other similar Goods to which the terms of this agreement shall apply.

Sales Agreement (con't)

6. Indemnity against third party claims

As an obligation surviving termination of this agreement, the Buyer will indemnify the Seller in respect of any claims made against the Seller and all damages, costs and expenses suffered or incurred by the Seller as a result of a claim made by a third party arising out of the state, condition or use of the Goods, or in any way arising out of the Goods being sold under this agreement.

7. Condition of Goods

It is now mutually agreed that:

- 7.1 The Buyer declares that he has examined the Goods and that they are in every respect satisfactory;
- 7.2 The Seller does not sell the Goods subject to any condition or warranty, express or implied, save those implied by the provisions of the Sale of Goods Act (Cap 393) Section 12 (relating to the title of the Seller to the Goods), so that (without prejudice to the generality of the foregoing) there is excluded:
 - 7.2.1 any condition of fitness of the Goods for any particular purpose;
 - 7.2.2 in cases where the Goods are sold by reference to a description, any condition that the Goods will correspond with the description; or
 - 7.2.3 where the Goods are sold by reference to a sample, any condition that the bulk will correspond with the sample in quality, that the Buyer will have a reasonable opportunity of comparing the bulk with the sample, and that the Goods will be free from any defect rendering them unmerchantable which would not be apparent on reasonable examination of the sample; and
 - 7.2.4 any condition of merchantable quality in respect of the Goods.

8. Notices

Any notice or demand served under this agreement shall be sufficiently served if sent by prepaid letter post or telex to the usual or last known place of business of the addressee, and proof of dispatch shall be conclusive evidence of receipt by the addressee in due course of transmission.

9. Disclosure

The Seller may disclose details of and relating to the transaction evidenced by this agreement to any credit reference agency or any other party at the Seller's discretion, and the Seller may refuse to enter into this agreement without stating a reason.

10. Interpretation and miscellaneous

- 10.1 The clause headings do not form part of this agreement and shall not be taken into account in its construction or interpretation.
- 10.2 Words importing one gender include all other genders and words importing the singular include the plural and vice versa.
- 10.3 References to the Seller shall where the context so admits include the Seller's successors in the tile and references to the Goods include all replacements and renewals of the Goods and all accessories and additions to the Goods.
- 10.4 The rights conferred on the Seller under this agreement shall be in addition to, and not in substitution for, any rights conferred on the Seller by the Sale of Goods Act (Cap 393) or at common law.
- 10.5 This agreement contains all the terms agreed between the Seller and the Buyer. The Buyer has not relied upon any representation or warranty by the Seller except as expressly stated or referred to in this agreement. No variation of this agreement shall be effective unless it be in writing and signed by or on behalf of the Seller and the Buyer. The rights of the Seller under this agreement shall not in any way be affected by any time or other indulgence granted by the Seller.
- 10.6 Any reference in this agreement to a statutory provision shall be construed as a reference to that provision as from time to time amended or reenacted.

Notes

SUPERFIX®

Superfix is keen to establish a worldwide network of distributors and business partners. We look forward to technical discussions on Stainless Steels, sharing of knowledge and expertise, and building up multi-party, beneficial business relationships in an era where society and the world becomes a global village. We are adaptable to changes and embrace Information Technology as a necessary step towards excellence in customer service.

Share our vision. Join us as a business partner. Together, we can be more competitive and reach out more effectively to our customers to serve them better.



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