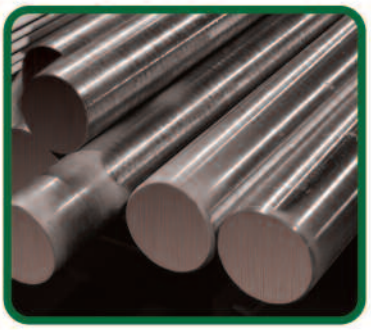
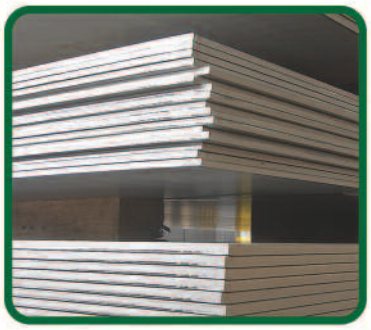
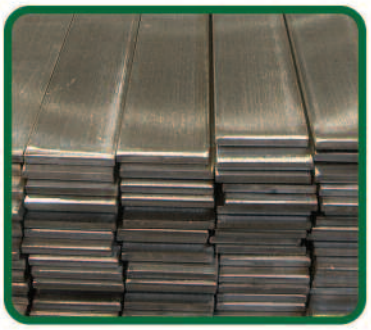
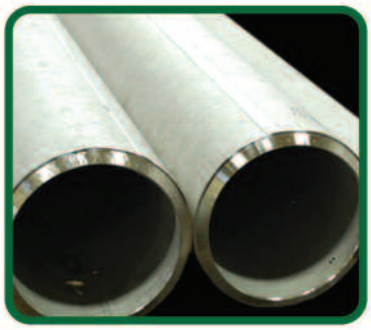
Alloy 304/304L Specifications: UNS S30400 / S30403

ALLOY 304/304L – UNS S30400 / S304033

Penn Stainless inventory now includes Alloy 304/304L (UNS S30400 / S30403), in sheet, sheet coil, plate, plate coil, round bar, processed flat bar and tubular products. Alloy 304/304L is ideally suited for home and commercial applications.

GENERAL PROPERTIES

Alloy 304 / 304L a T-300 series stainless steel austenitic, which has a minimum of 18% chromium and 8% nickel. Type 304 has a maximum carbon of 0.07% while Type 304L carbon maximum is 0.030. It is the standard "18/8 stainless" that is commonly found in pans and cooking tools. Alloys 304 & 304L are the most versatile and widely used alloy in the stainless steel family. Ideal for a wide variety of home and commercial applications, Alloys 304 & 304L exhibits excellent corrosion resistance and has a high ease of fabrication, outstanding formability. The austenitic stainless steels are also considered to be the most weldable of the high-alloy steels and can be welded by all fusion and resistance welding processes.

APPLICATIONS

Alloy 304/304L Stainless Steel is used in a wide variety of home and commercial applications, including:

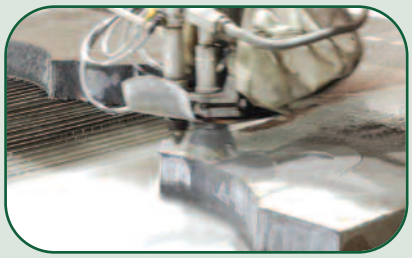
- Food processing equipment, particularly in beer brewing, milk processing, and wine making
- Kitchen benches, sinks, troughs, equipment, and appliances
- Architectural trim and molding
- Automotive and aerospace structural use
- Construction material in large buildings
- Chemical containers, including for transport
- Heat exchangers
- Nuts, bolts, screws, and other fasteners in the marine environment
- Dyeing industry
- Woven or welded screens for mining, quarrying & water filtration

STANDARDS 304 / 304L

ASTM/ASME .....UNS S30400 / S30403
EURONORM .....1.4301 / 1.4303
AFNOR.....Z5 CN 18.09 / Z2 CN 18.10
DIN .....X5 CrNi 18 10 / X2 CrNi 19 11

Penn Stainless can provide you with custom cut, sized and processed stainless product through any of our available processing methods:

- Shear Cutting
- Plasma Cutting
- HQ Plasma Cutting
- Dynamic Water Jet Cutting
- Laser Cutting
- Saw Cutting
- Gauer Processing
- Machine Cutting



Inventory:

- Sheet
- Plate
- Perforated
- Flat & expanded
- Round bar
- Square bar
- Hex bar
- Rolled flat bar
- S/E processed bar
- Threaded rod
- Half round
- Tubular products (welded & seamless)
- Structurals

CORROSION RESISTANCE

- Resistance to corrosion in oxidizing environments is a result of the 18 to 19% chromium that the 304 alloys contain.
- Resistance to moderately aggressive organic acids is a result of the 9 to 11% nickel that the 304 alloys contain.
- At times, alloy 304L may show a lower corrosion rate than the higher carbon Alloy 304; otherwise, the 304, 304L, and 304H may be considered to perform uniformly in most corrosive environments.
- Alloy 304L is preferred for use in environments sufficiently corrosive to cause intergranular corrosion of welds and heat-affected zones on susceptible alloys.

HEAT RESISTANCE

- Good oxidation resistance in intermittent service to 1600°F and in continuous service to 1690°F.
- Continuous use of 304 in the 800-1580°F range is not recommended if subsequent aqueous corrosion resistance is important.
- Grade 304L is more resistant to carbide precipitation and can be heated into the above temperature range.
- Grade 304H has higher strength at elevated temperatures, so it is often used for structural and pressure-containing applications at temperatures above about 930°F and up to about 1470°F.

WELDING CHARACTERISTICS

- Excellent welding properties; post-weld annealing is not required when welding thin sections. Two important considerations in producing weld joints in the austenitic stainless steels are:
  1) preservation of corrosion resistance
  2) avoidance of cracking

PROCESSING / HOT FORMING

- To forge, heat uniformity to 2100 / 2300 ºF.
- Do not forge below 1700 ºF.
- Forging can be air cooled without danger of cracking

PROCESSING / COLD FORMING

- Its austenitic structure allows it to be deep-drawn without intermediate annealing, Making this the stainless steel grade of choice in the manufacturing of sinks, hollow-ware and saucepans.
- These grades work harden rapidly. To relieve stresses produced in severe forming or spinning, parts should be full annealed or stress relief annealed as soon as possible after forming.

MACHINABILITY

- The use of chip breakers is advised since the chips can be stringy. Stainless steel work harden rapidly, heavy positive feeds, sharp tooling, and a rigid set-up should be used.of cut below the work-hardened layer resulting from the previous passes.

CHEMICAL PROPERTIES

	C	Mn	Si	P	S	Cr	Ni	N
304	0.07 max	2.0 max	0.75 max	0.45 max	0.03 max	min: 18.0 max: 20.0	min: 8.0 max: 10.5	–
304L	0.030 max	2.0 max	0.75 max	0.45 max	0.03 max	min: 18.0 max: 20.0	min: 8.0 max: 12.0	0.10 max

MECHANICAL PROPERTIES

Grade	Tensile Strength ksi (min)	Yield Strength 0.2% ksi (min)	Elongation %	Hardness Brinell (max)	Hardness Rockwell B (max)
304	75	30	40	201	92
304L	70	25	40	201	92

PHYSICAL PROPERTIES

Density (lb/in^3)	Thermal Conductivity (BTU/hr•ft•°F)	Electrical Resistivity (in x 10^{-6})	Modulus of Elasticity (psi x 10^6)	Coefficient of Thermal Expansion (in/in)/°F x 10^{-6}	Specific Heat (BTU/lb/°F)	Melting Range (°F)
at 68°F: 0.285	9.4at 212 ºF	28.3 at 68 ºF	28	9.4 at 32 - 212°F	0.1200 at 68°F to 212ºF	2,550 to 2,590
	12.4 at 932 ºF	39.4 at 752 ºF		10.2 at 32 - 1000°F		
		49.6 at 1652 ºF		10.4 at 32 - 1200°F		

Penn Stainless Products, Inc • 190 Kelly Road • Quakertown, Pennsylvania 18951 USA
Toll Free: 1-800-222-6144 • Phone: 215-536-3053 • Fax: 215-536-3255 • E-mail: sales@pennstainless.com
WWW.PENNSTAINLESS.COM • WWW.PIPEANDTUBES.COM

Printed in U.S.A. PSP-055a AP-1000-6-11