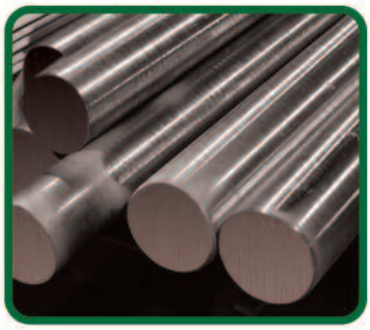
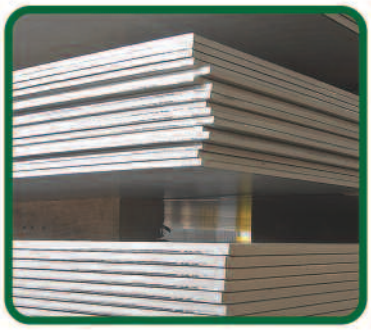
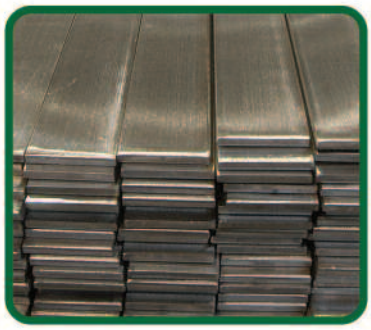
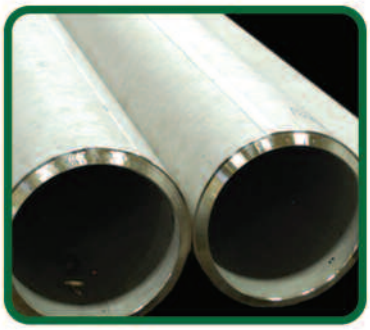
Alloy 304H Specifications: UNS S30409

ALLOY 304 (UNS S30409)

Penn Stainless inventory now includes Alloy 304H (UNS S30409) in sheet, sheet coil, plate, round bar, processed flat bar and tubular products.

GENERAL PROPERTIES

Alloy 304 is a T-300 series stainless steel austenitic, which has a minimum of 18% chromium and 8% nickel with a maximum of 0.08% carbon. It is the standard “18/8 stainless” that is commonly found in pans and cooking tools. Alloy 304 is the most versatile and widely used alloy in the stainless steel family. It may be used for a wide variety of home and commercial applications and exhibits excellent corrosion resistance, has a high ease of fabrication, outstanding formability, and tremendous strength. 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. Due to its controlled carbon content of 0.04 to 0.10, Alloy 304H provides improved high temperature strength when exposed to temperatures above 800ºF. Alloy 304H also has greater short term and long term creep strength than Alloy 304L at temperatures above 500ºC and is more resistant to sensitization than Alloy 304L.

APPLICATIONS

Alloy 304H is often used as a material of construction up to about 1500ºF.

Some examples of applications that Alloy 304H is commonly used for includes:

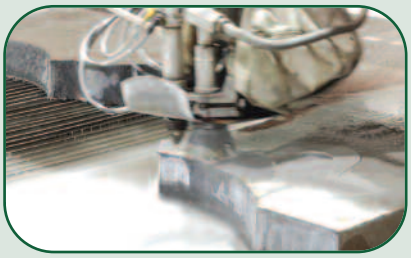
- Boilers
- Condensers
- Cooling towers
- Electric generation plants
- Most commonly used in petroleum refineries
- On occasion will be found in fertilizer and chemical plants
- Heat exchangers
- Pipelines
- Steam exhausts

STANDARDS ALLOY 304H

ASTM/ASME .....UNS S30409
EURONORM FeMi35Cr20Cu4Mo2
DIN 2.4660

Alloy 304H (UNS S30409) can be processed by Penn Stainless utilizing the following methods:

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



Product Offering:

- Sheet
- Plate
- Perforated
- Flate & expanded
- Round bar
- Rolled flat bar
- S/E processed bar
- Tubular products
- Structurals

HEAT RESISTANCE

- Good oxidation resistance in intermittent service to 870°C and in continuous service to 920°C
- Continuous use of Alloy 304 in the 425-860°C range is not recommended if subsequent aqueous corrosion resistance is important
- Alloy 304H has higher strength at elevated temperatures so is often used for structural and pressure-containing applications at temperatures above about 500°C and up to about 800°C
- Alloy 304H will become sensitized in the temperature range of 425-860°C; this is not a problem for high temperature applications, but will result in reduced aqueous corrosion resistance.

CORROSION RESISTANCE

- Resistance to corrosion in oxidizing environments is a result from the 18 to 19% chromium that the 304 alloys contain
- Resistance to moderately aggressive organic acids is a result from 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 alloys may be considered to perform uniformly in most corrosive environments.

CHEMICAL PROPERTIES

Type	C	Mn	Si	P	S	Cr	Ni	N
304	0.08 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	0.03 max	2.0 max	0.75 max	0.45 max	0.03 min	min: 18.0 max: 20.0	min: 8.0 max: 12.0	0.10 max
304H	min: 0.04 max: 0.10	2.0 max	0.75 max	0.45 max	0.03 min	min: 18.0 max: 20.0	min: 8.0 max: 10.5	0.10 max

MECHANICAL PROPERTIES

Grade	Tensile Strength ksi (MPa) min	Yield Strength 0.2% offset ksi (MPa) min	Elongation (% in 50mm) min	Hardness (Brinell) MAX	Hardness (Rockwell B) MAX
304	75 (515)	30 (205)	40	201	92
304L	70 (485)	25 (170)	40	201	92
304H	75 (515)	30 (205)	40	201	92

PHYSICAL PROPERTIES

	Alloy 304H	
Density	lb_m/in^3	g/cm^3
at 68°F (20°C)	0.285	7.91
Coefficient of Thermal Expansion	**(in/in)·°F**	**(cm/cm)·°C**
at 68 - 212°F (20 - 100°C)	9.2×10^{-6}	16.6×10^{-6}
at 18 - 1600°F (20 - 870°C)	11.0×10^{-6}	19.8×10^{-6}
Thermal Conductivity	**Btu/hr/ft/°F**	**W/m/K**
212°F (100°C)	9.4	16.3
932°F (500°C)	12.4	21.4
Specific Heat	**Btu/lbm/°F**	**J/kg/K**
at 32 - 212°F (0 - 100°C)	0.12	500
Modulus of Elasticity (annealed)2	**psi**	**GPa**
in tension (E)	29×10^6	200

Printed in U.S.A. PSP-108 7-13