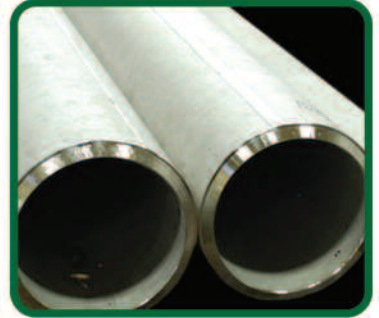
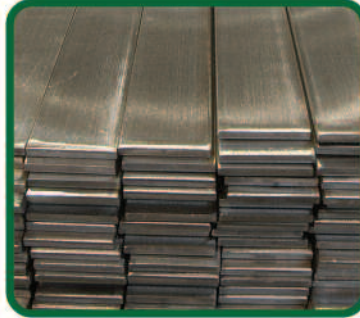
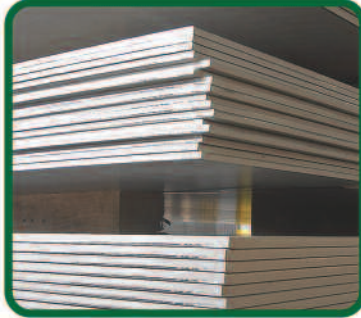
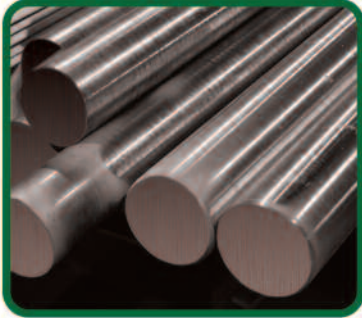




ALLOY 409 SPECIFICATIONS: UNS S40900



ALLOY 409 (UNS S40900)

Penn Stainless inventory now includes Alloy 409 (UNS S40900) in sheet, sheet coil, plate, round bar, processed flat bar and tubular products.

GENERAL PROPERTIES

Alloy 409 is a general purpose, chromium, titanium stabilized, ferritic stainless steel whose primary application is automotive exhaust systems. It contains 11% chromium which is the minimum amount for the formation of the passive surface film which gives stainless steels their corrosion resistance. It combines good elevated temperature corrosion resistance with medium strength, good formability, and overall cost. Alloy 409 resists corrosion strongly compared

to carbon steel and is used as an alternative to carbon steel in mildly challenging environments where its high resistance to corrosion and high temperature oxidation gives an advantage. It is commonly used in applications where appearance is a secondary quality to mechanical properties and corrosion resistance.

APPLICATIONS

Although Alloy 409 is designed principally for the automotive exhaust industry, it has been successfully used in other industrial applications as well. Some examples of applications that call for Alloy 409 include:

- Automotive exhaust systems
- Catalytic converters
- Mufflers
- Tailpipes
- Farm equipment
- Structural support and hangers
- Transformer cases
- Furnace components
- Heat exchanger tubing

STANDARDS ALLOY 409

ASTM/ASMEUNS S40900

EURONORMFeMi35Cr20Cu4Mo2

DIN2.4660

ALLOY 409 (UNS S40900) 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
- S/E PROCESSED BAR

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CORROSION RESISTANCE

- Resists atmospheric and exhaust gas corrosion
- In most atmospheres a light surface rust will form which inhibits further corrosion but makes the surface less appealing

HEAT RESISTANCE

- Generally classified as resistant to scaling in intermittent service up to 1499°F (815°C) and up to 1247°F (675°C) in continuous service

WELDABILITY

- Readily weldable
- Pre-heat of 302 to 500°F (150 to 260°C) is recommended
- Post-weld annealing at 1400 to 1499°F improved weld ductility
- Post-weld annealing is not required when welding thin sections
- Automotive exhaust tubing is typically welded without filler metal

Type	Cr	Ni	C	Mn	Si	S	P	Ti
409	min: 10.50 max: 11.75	0.50 max	0.08 max	1.00 max	1.00 max	0.03 max	0.04 max	min: 6 x C max: 0.75

CHEMICAL 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
409	(380)	(207)	20	207	95

MECHANICAL PROPERTIES

PHYSICAL PROPERTIES

Alloy 409	
Density	7600 kg/m ³
Elastic Modulus	208 GPa
Mean Coefficient of Thermal Expansion	µm/m°C
at 32 to 212°F (0 to 100°C)	11.0
at 32 to 599°F (0 to 315°C)	11.7
at 32 to 1000°F (0 to 538°C)	12.4
Thermal Conductivity	W/m.K
at 212°F (100°C)	25.8