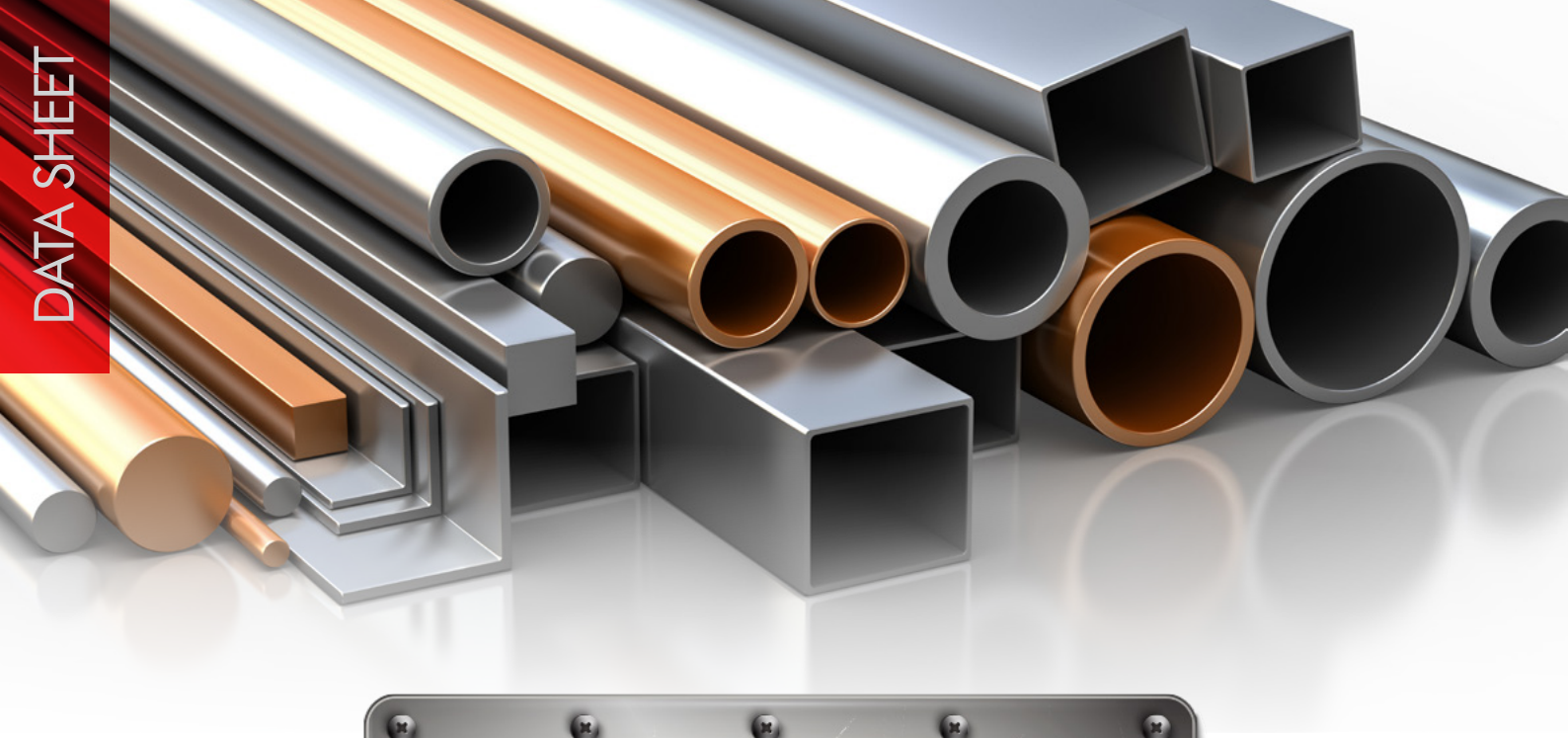
DATA SHEET



S. S. 309 / 309S

UNS No - S30900 / S30908

Stainless Steel Grade 309 and 309S are austenitic chromium-nickel stainless steels that are frequently utilized for higher temperature applications. Because of their high chromium and nickel content, Alloys 309 and 309S are highly corrosion resistant, have greater resistance to oxidation, and magnificent heat resistance while giving good qualities at room and high temperatures. The difference between Stainless Steel 309 and 309S is the carbon content. Alloy 309S has a substantially less carbon composition which reduces carbide precipitation and improves weldability.

Applications

- Heating elements
- Aircraft and jet engine parts
- Heat exchangers
- Carburizing annealing products
- Sulphite liquor handling equipment
- Kiln liners
- Boiler baffles
- Refinery and chemical processing equipment
- Auto exhaust parts

Characteristics

- Maximum temperature of 1000°C in service in the air
- Very good resistance to carburizing
- Good weldability and formability
- Excellent resistance to corrosion and oxidation

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S. S. 309 / 309S

Machining
This alloy machines same as type 304 stainless steel. The chips of this alloy are stringy and it will work harden very quickly. It is compulsory to keep the tool cutting at all times and utilize chip breakers.

Welding
By using fusion or resistance technique most of the austenitic stainless steels can be quickly welded. Oxyacetylene welding is not suggested. Filler metal should be AWS E/ER 309 or 309L.

Hot Working
Working temperatures of this alloy are 2150°F (1177°C), with reheating compulsory at 1800°F (982°C). Fast quenching is suggested. To reattain maximum corrosion resistance full post-work annealing is required.

Cold Working
In spite of the fact that this alloy has a high work hardening rate, this alloy can be drawn, headed, upset and stamped. To remove internal stress full annealing is required after cold work.

Annealing
1900-2050°F (1038-1121°C), water quench.

Hardening
These alloys do not react to heat treatment. Cold work will cause in an increase in both hardness and strength.

Chemical Properties

Grade	C	Si	P	S	Cr	Mn	Ni	Fe
309	0.20 max	1.0 max	0.045 max	0.030 max	22.0-24.0	2.0 max	12.0-15.0	Reminder
309S	0.08 max	1.0 max	0.045 max	0.030 max	22.0-24.0	2.0 max	12.0-15.0	Reminder

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S. S. 309 / 309S

Mechanical Properties

Grade	Tensile Strength (ksi) min.	0.2% Yield Strength (ksi)	Elongation% in 2 inches
309	75	30	40
309S	70	25	40

Physical Properties

Properties	309	309S	Temperature in °C
Density	7.9 g/cm³	8.03 g/cm³	Room
Specific Heat	0.12 Kcal/kg.C		22°
Melting Range	1399-1454 °C		-
Modulus of Elasticity	200 KN/mm²		22°
Electrical Resistivity	78 µΩ.cm		Room
Coefficient of Expansion	14.9 µm/m °C		20-100°
Thermal Conductivity	15.6 W/m-°K		20°

ASTM Specifications

Pipe / Tube (SMLS)	Sheet / Plate	Bar	Forging	Fitting
A 213, A 249	A 167, A 240	A 276	A 473	A 403

Availability

MANUFACTURING
Refractory Anchors
Fasteners
Custom Machining
Custom Fabrication
Piping / Spools
Stamped Parts
B/W Fittings
S/W Fittings
Flanges
Compression Fittings

RAW MATERIALS
Pipes
Tubes
Bars
Sheets
Plates
-
-
-
-