

310 / 310S (1.4845)

This grade, combining excellent high temperature properties with good ductility and weldability is designed for cyclic elevated temperature service. It resists oxidation in continuous service at temperatures up to 2100°F provided reducing sulphur gasses are not present. It is also used for intermittent service at temperatures up to 1900°F because it resists rescaling and has a low co-efficient of expansion. This factor reduces the tendency of the steel to warp in heat service.

Type **310S** is used when the application environment involves moist corrodents in a temperature range lower than that which is normally considered "high temperature" service.

Corrosion Resistance: Excellent resistance at normal temperatures and when in high temperature service exhibits good resistance to oxidation and carburizing atmospheres. Resists fuming nitric acid at room temperature and fused nitrates up to 800°F.

Heat Resistance: Good resistance to oxidation in intermittent service in air at temperatures up to 1900°F and 2100°F in continuous service. Good resistance to thermal fatigue and cyclic heating. Widely used where sulphur dioxide gas is encountered at elevated temperatures. Continuous use in 800 - 1575°F range not recommended but often performs well in temperatures fluctuating above and below this range.

Heat Treatment: Annealing – heat to 1900 - 2100°F and cool rapidly for maximum corrosion resistance. This treatment is also recommended to restore ductility after each 1000 hours of service at 1200 - 1900°F.

Welding: Good characteristics suited to all standard methods. Type **310S** electrodes generally recommended for fusion welding.

Typical Applications:

- furnace parts
- carburizing boxes
- heat exchangers
- oil burner parts
- heat treatment baskets and jigs
- welding filler wire and electrodes

A.I.S.I. Analysis		C	Mn	P	S	Si	Cr	Ni
	310	.25 max	2.0 max	.045 max	.030 max	1.5 max	24.0 to 26.0	19.0 to 22.0
	310S	.08 max	2.0 max	.045 max	.030 max	1.5 max	24.0 to 26.0	19.0 to 22.0

Typical Mechanical Properties - Annealed	Yield Strength .2% Offset psi	Ultimate Strength psi	Elongation % in 2"	Hardness		Impact Charpy ft. – lbs.	Modules of Elasticity in Tension - psi
				Rb	BHN		
		45,000	95,000	45	85	170	110

Other Properties	Creep Strength 1% Flow in 10,000 hrs at 1,000°F psi	Magnetic Permeability at 200 H-Annealed	Electrical Resistivity Microhm – Cm at 68°F	Coefficient of Thermal Expansion (In/In/°F x 10 ⁻⁶) 32° - 212°F	Thermal Conductivity BTU/Ft.2/Hr./°F/Ft.	
					at 212°F	at 932°F
		17,500	1.01	78	8.0	8.0