



310
310S

Description

The grade, combining excellent high temperature properties with good ductility and weld ability 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 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.

Typical Applications

- Furnace parts
- Carburizing boxes
- Heat exchangers
- Oil burner parts
- Heat treatment baskets and jigs
- Welding filler wire and electrodes

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 fusing 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.

Chemical Analysis		C	Mn	P	S	Si	Cr	Ni
	310	.25	2.0	0.045	0.03	1.5	24.0-26.0	19.0-22.0
Max values	310S	.08	2.0	0.045	0.03	1.5	24.0-26.0	19.0-22.0

Typical Mechanical Properties- Annealed	Yield Strength ksi	Tensile Strength ksi	Elongation % in 2"	Hardness		Impact Charpy Ft. - lbs	Modulus of Elasticity in Tension - ksi
				R b	BHN		
	45	95	45	85	170	110	29000

Other Properties	Creep Strength 1% flow 10,000 hours at 1000°F -ksi	Magnetic Permeability at 200H- Annealed	Electrical Resistivity - Microhm -Cm At 68°F	Coefficient of Thermal expansion: (ln/ln°F x 10 ⁻⁶) 32°- 212°F	Thermal Conductivity BTU/ft. ² /Hr./°F/ft.	
					At 212°F	At 932°F
	17.5	1.01	78	8.0	8.0	10.8

