



347
348

Description

These grades are chromium-nickel stainless steel containing columbium and tantalum. The columbium serves to produce a stabilized type of stainless steel which is immune to chromium carbide precipitation. The grades are thus recommended for parts which must operate in service between 800-1600°F. Type 348 has the lower tantalum and cobalt contents of the two steels, making it suitable for use where the steel is subjected to nuclear irradiation.

Typical Applications

- Radioactive Systems
- Jet Engine Parts
- Furnace Parts
- Welding Rods
- Heat Exchangers

Corrosion Resistance

Excellent. Equivalent to Type 304 and superior to Types 302 or 304 where unannealed weldments are involved or service temperatures in the 800 - 1600°F range. Where service is both corrosive and at elevated temperatures, these grades are superior to type 321.

Heat Resistance

Good oxidation resistance in intermittent service to 1600°F and in continuous service to 1600°F. and in continuous service to 1700°F. Best suited to service in the 800 - 1600°F range.

Heat Treatment

Annealing - Heat to 1850-2050 °F and cool rapidly for maximum corrosion resistance.

Stabilizing - Heat to 1500-1650°F for 1 hour per inch of thickness, then air cool.

Stress Relief - After fabrication, hold for 1 to 2 hours at 1300°F and air cool.

Welding

Good characteristics suited to all standard methods. Use Types 347 or 348 filler rod or electrodes. Post-weld annealing is not required.

Chemical Analysis		C	Mn	P	S	Si	Cr	Ni	Ta	Co
	347	0.08	2.0	0.045	0.03	1.0	17.0-19.0	9.0-13.0		
Max values	348	0.03	2.0	0.045	0.03	1.0	17.0-19.0	9.0-13.0	0.10	0.20

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		
	40	95	45	85	160	135	28000

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
	19.3	1.02	73	9.3	9.3	12.8

