347

347, also known as Type 347, is a **niobium-stabilized austenitic stainless steel** designed to provide excellent **intergranular corrosion resistance** after exposure to elevated temperatures. By stabilizing the alloy with niobium (columbium), 347 prevents chromium carbide precipitation, making it especially suitable for **welded structures** that operate in the **800–1500°F (427–816°C)** range.

Standards & Designations

- **UNS**: S34700
- **EN / W. Nr.**: 1.4550
- **ASTM/ASME**: A240 (plate), A276 (bars)

Corrosion Resistance: 347 provides corrosion resistance **comparable to Type 304**, with the added benefit of **resistance to sensitization and intergranular attack** after welding or exposure to high temperatures. It performs well in oxidizing environments, though it is less resistant than molybdenum-bearing grades in chloride environments.

Heat Treatment: 347 is **not hardenable by heat treatment**. It is typically supplied in the annealed condition, heated to about **1900–2050°F**, followed by rapid cooling. Stabilization with niobium eliminates the need for post-weld annealing in most applications.

Welding:

- **Machining**: Similar to Type 304 but slightly more difficult due to stabilization elements.
- **Forming**: Good ductility allows standard forming methods.
- **Welding**: Excellent weldability without risk of carbide precipitation; post-weld heat treatment is generally unnecessary.

The list of applications for this general-purpose grade is very extensive and includes:

- aerospace exhaust systems
- chemical processing equipment
- heat exchangers
- boiler components
- refinery piping
- high-temperature welded assemblies

A.I.S.I. Analysis	Grade	C	Mn	Si	P	S	Cr	Ni	Nb + Ta
	347	.08 max	2.00 max	.75 max	.045 max	.030 max	17.0–19.0	9.0–13.0	0.30-1.00

Typical Mechanical Properties - Annealed	Yield Strength .2% Offset psi	Ultimate Strength psi	Elongation % in 2″	Elastic modulus (psi)
	30,000	75,000	40	28×10^6 psi

Other Properties	Density (lb/in^3)	Melting Range	Electrical Resistivity at 68^0F ($\mu\Omega$-cm)	Thermal Expansion 70^0 – 800^0F ($In/In/^0F \times 10^{-6}$)	Thermal Expansion 32^0 – 212^0F ($In/In/^0F \times 10^{-6}$)
	0.290	2550–2650°F	72	9.2	9.6