ALLOY A286

AMS 5525 / AMS 5731 / AMS 5732 / AMS 5737 / AMS 5858 / UNS S66286

Incoloy® Alloy A-286—also known as A286 stainless steel or UNS S66286—is a high-strength, iron-nickel-chromium austenitic superalloy designed for applications requiring excellent mechanical strength and corrosion resistance at elevated temperatures. This alloy performs reliably up to 1300°F (704°C) and can support even higher temperatures in lower-stress conditions. Its mechanical properties are developed through solution annealing and precipitation hardening, which produce a strong combination of tensile strength, creep resistance, and durability. A286 also offers excellent high-temperature oxidation resistance, with stability in continuous service up to 1500°F (816°C) and intermittent service up to 1800°F (982°C).

A286 can achieve very high strength levels when aged after cold work, making it suitable for demanding applications such as high-temperature fasteners, springs, jet engine components, automotive parts, turbine hardware, afterburner components, offshore equipment, and structural parts in elevated-temperature service.

Products & Sizes			
Coil	**Sheet**	**Bar**	**Precision Reroll Strip**
0.0200" - 0.1250"	0.0200" - 0.1250"	0.250" - 6.000"	0.0008" - 0.015"

A286 Chemical Composition

	Element	Min	Max
C	Carbon	-	0.08
Mn	Manganese	-	2.00
P	Phosphorus	-	0.025
S	Sulfur	-	0.025
Si	Silicon	-	1.00
Cr	Chromium	13.50	16.00
Ni	Nickel	24.00	27.00
Mo	Molybdenum	1.00	1.50
Ti	Titanium	1.90	2.35
V	Vanadium	0.10	0.50
Al	Aluminum	-	0.35
B	Boron	0.003	0.010
Fe	Iron	-	Balance

Industry Standards

- EN 1.4980
- DIN EN 10204 3.1
- PWA-LCS
- GE Aircraft Engine (GT193)
- GE Aviation S-SPEC-35 AeDMS S-400
- RR SABRe Edition 2
- DFARS Compliant

Industry Applications

- Jet engine components
- Fasteners
- Springs
- Bolts
- Flanges
- Blades
- Afterburners
- Automotive applications
- Offshore Oil Gas
- Moderate Corrosion Applications in Aqueous Solutions
- Non-magnetic Cryogenic Equipment

Physical Properties

- Specific Heat: 420 Joules kg°K (Btu/lb/°F)

Physical Properties		
	Solution Treated	Solution Treated and Aged
Density	0.286 lb./in3 (7.92 g/cm3)	0.287 lb./in3 (7.94 g/cm3)
Specific Gravity	7.92	7.94
Melting Range	2500 - 2600 °F	1370 - 1430 °C
Magnetic Permeability	1.010	1.007

Thermal Conductivity			
Temperature Range		Linear Coefficients of Thermal Expansion · 10-6	
°C	°F	/°C	/°F
21-93	70-200	16.5	9.17
21-204	70-400	16.8	9.35
21 - 316	70 - 600	17.0	9.47
21 - 427	70 - 800	17.4	9.64
21 - 538	70 - 1000	17.6	9.78
21 - 649	70 - 1200	17.8	9.88
21 - 760	70 - 1400	18.6	10.32

Thermal Conductivity			
Temperature Range		Coefficients	
°C	°F	W/m·K	Btu/(hr/ft²/in/°F)
150	302	15.1	8.7
300	572	17.8	10.3
500	932	21.8	12.6
600	1112	23.9	13.8

Electrical Resistivity		
Temperature		microhm-cm
°C	°F	
25	77	91.0
540	1004	115.6
650	1202	118.8
730	1346	120.1
815	1499	122.4

Mechanical Properties

Type A286 alloy is formed most easily in the solution treated condition. Typical room temperature tensile properties of material solution treated at 1800°F (982°C) are shown below.

Property	Value
Yield Strength	40,000 psi (275 MPa)
Ultimate Tensile Strength	90,000 psi (620 MPa)
Elongation	40%