

Incoloy A-286 Alloy

Heanjia Super Metals Co., Ltd

Introduction

The **Incoloy A-286 alloy** is a Ferrous – Nickel – Chromium alloy that also includes molybdenum and titanium. The alloy is easily age hardenable to achieve good mechanical characteristics. It retains its high strength and resistance to oxidation at the elevated temperature ranges up to 1300oF or 700oC. It is an austenitic alloy in the metallurgical conditions.



Chemical constituents of Incoloy A-286

Ni	24.0-27.0 %
Fe	Bal.
Cr	13.5-16.0 %
Ti	1.90-2.35 %
Mo	1.0-1.5 %
V	0.10-0.50 %
C	0.08 %
Mn	2.0 %
Si	1.0 %
Al	0.35 %
S	0.030 %
B	0.001-0.01 %

Physical properties of Incoloy A-286 alloy

Density	7.94 g/cm ³
Melting Range	1370-1430oC or 2500-2600oF
Specific Heat, J/kg•oC	419
Young's Modulus	201 GPa
Permeability at 200 oersted	1.007

Thermal and Electrical properties of Incoloy A-286 alloy

Temp oF	Coefficient of Expansion 10-6in/in•oF	Thermal Conductivity Btu•in/ /ft(2)•h•oF	Electrical Resistivity ohm•circ mil/ft
70	-	88	547
200	9.09	97	-
400	9.16	112	-
600	9.42	126	-
800	9.61	140	-

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Mechanical Properties of Incoloy A-286 alloy

It introduces superior creep rupture strength when set into high temperature environments for long period. The Stress levels to cause creep rates of one percent over hundred hours. The mechanical features of alloy specimen are evaluated for certain heat treatments like solution processing at temperature of 1800oF or 980oC and age hardening at 1325oF or 720oC for 16 hours and air cooling.

Condition	Approx tensile strength		Approx service temperature	
Annealed	600 – 750 N/mm2	87 – 109 ksi	-200 to 400oC	-330 to +750°F
Annealed + Aged	1100-1300 N/mm2	159 – 188 ksi	-200 to 400oC	-330 to +750°F
Spring Temper	1050- 1250 N/mm2	152 – 181 ksi	-200 to 400oC	-330 to +750°F
Spring Temper +Aged	1300- 1500 N/mm2	188 – 218 ksi	-200 to 400oC	-330 to +750°F

Corrosion Resistance Features

The resistance to corrosion offered by Incoloy A-286 alloy is due to the concentration of nickel and chromium. It is a superior resistant to oxidation and corrosion. The alloy offers excellent resistance to oxidation at the operation temperatures of 1300oF or 700oC.

Production of Incoloy A-286

It is easily fabricated by following the regular processes that are used for stainless steel and nickel alloy formation. The cold processing is performed on the specimen in the solution processed condition. The processes, forces and work toughening rates are equivalent to the inconel 600 and incoloy 800.

For hot formation, the **Incoloy A-286 alloy** is heated at 2100oF or 1150oC. The ultimate reductions at temperature of 1800oF or 980oC must be more than 10% to restrict the large grain formation in the solution processing. The formation process is not performed at temperatures lower than 1700oF or 930oC. The heat processing of incoloy A-286 alloy is done at 1800oF or 980oC or 1650oF or 900oC, followed by the frequent cooling by age hardening for continuous 16 hours at temperature of 1325oF or 720oC and then air quenching is performed.

The solution processing at 1800oF offers maximum creeping resistance in the age toughened alloy A-286 although work processing at 1650oF offers enhanced ductility and room temperature tensile properties.

Applications of Incoloy A-286 Alloy

The excellent potential and formation features of incoloy A-286 make it purposeful in the variety of applications of aerospace and gas turbines used on the commercial scale. It is also used in the fastener operations in the automotive engine and diverse components for high levels of heat and pressure and the sea oil and gas applications.

Incoloy A-286 Product Forms Available:

Wire, Wiremesh Screen, Strip, Sheet, Rod, Pipe, Bar, Tubing, Plate, Ribbon, Tape

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