HAYNES® 263 alloy

Fabrication and Welding

Fabrication

HAYNES® 263 alloy has excellent forming and welding characteristics. The hot working temperature range for the alloy is approximately 1750 to 2150°F (954- 1177°C). The alloy has excellent ductility in the annealed condition, and thus may also be formed by cold working. Intermediate annealing in the temperature range from 1900 to 2000°F (1038 to 1093°C) may be needed for complex component forming operations. All hot- or cold-worked parts should be annealed and rapidly cooled in order to restore the best balance of properties.

Welding

For welding HAYNES® 263 alloy, please review the General Welding and Joining Guidelines. In addition to those guidelines, there are some additional considerations when welding 263 alloy.

HAYNES® 263 alloy is a precipitation-strengthened alloy and requires a postweld heat treatment (PWHT) to develop suitable properties. Postweld heat treatment for 263 alloy consists of two parts: a solution anneal, which is followed by a suitable aging treatment. Details can be found here. During PWHT, the gamma-prime phase (Ni_3Al,Ti) precipitates and the alloy undergoes a slight volumetric contraction. This makes it susceptible to strain-age cracking, which typically occurs upon heating to the solution annealing temperature. To inhibit strain-age cracking, the heating rate to the solution annealing temperature should be as fast as possible, within the capability of the furnace being used.

Filler metal of matching composition is suggested for welding 263 alloy to itself. For filler metal suggestions for welding 263 alloy to other alloys, please refer to the Haynes Welding SmartGuide, or contact Haynes International for further guidance.

Tensile Properties of Solution Annealed 263 at Room Temperature

	Ultimate Tensile Strength		Yield Strength		Elongation
	ksi	MPa	ksi	MPa	%
Sheet	116.9	806	49.1	339	57.5
Plate	115.6	797	47.7	329	59.3

Solution Annealed Room Temperature Hardness

Form	Hardness	Typical ASTM Grain Size
Sheet	98 HRB	5 - 7.5
Plate	31 HRC	4 - 6

All samples tested in solution-annealed condition