HAYNES® R-41 alloy

Fabrication

Solution Annealed Room Temperature Hardness

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

HRB = Hardness Rockwell "B"
HRC = Hardness Rockwell "C"

R-41, Solution Annealed, Room Temperature Tensile

Form	Test Temperature		0.2% Yield Strength		Ultimate Tensile Strength		4D Elongation
	°F	°C	ksi	MPa	ksi	MPa	%
Sheet	RT	RT	84.2	581	148.1	1021	44.7
Plate	RT	RT	101.0	696	195.0	1344	38.8

For welding HAYNES® R-41 alloy, please review the General Welding and Joining Guidelines. In addition to those guidelines, there are some additional considerations when welding R-41 alloy.

HAYNES® R-41 alloy is a precipitation-strengthened alloy and requires a postweld heat treatment (PWHT) to develop suitable properties. Postweld heat treatment for R-41 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 R-41 alloy to itself. For filler metal suggestions for welding R-41 alloy to other alloys, please refer to the Haynes Welding SmartGuide,or contact Haynes International for further guidance.