

Special Metals UDIMET® alloy R41 Ni-Cr Alloy

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

Material Notes:

UDIMET® alloy R41 (UNS N07041) is a precipitation-hardenable nickel-chromium alloy containing significant amounts of cobalt and molybdenum, along with lesser amounts of aluminum and titanium. Alloy R41 exhibits extremely high room and elevated temperature mechanical properties. Excellent corrosion resistance and fabricability have led to wide usage in critical aircraft engine components such as nozzle partitions, turbine blades and wheels, combustion chamber liners and structural hardware. Information Provided by Special Metals Corporation

Order this product through the following link:

http://www.lookpolymers.com/polymer_Special-Metals-UDIMET-alloy-R41-Ni-Cr-Alloy.php

Physical Properties	Metric	English	Comments
Density	8.25 g/cc	0.298 lb/in ³	

Mechanical Properties	Metric	English	Comments
Rupture Strength	76.0 MPa	11000 psi	
	@Temperature 927 Â°C, Time 3.60e+6 sec	@Temperature 1700 Â°F, Time 1000 hour	
	117 MPa	17000 psi	
	@Temperature 871 Â°C, Time 3.60e+6 sec	@Temperature 1600 Â°F, Time 1000 hour	
	200 MPa	29000 psi	
	@Temperature 816 Â°C, Time 3.60e+6 sec	@Temperature 1500 Â°F, Time 1000 hour	
Rupture Strength	345 MPa	50000 psi	
	@Temperature 760 Â°C, Time 3.60e+6 sec	@Temperature 1400 Â°F, Time 1000 hour	
	550 MPa	79800 psi	
	@Temperature 704 Â°C, Time 3.60e+6 sec	@Temperature 1300 Â°F, Time 1000 hour	
	705 MPa	102000 psi	
	@Temperature 649 Â°C, Time 3.60e+6 sec	@Temperature 1200 Â°F, Time 1000 hour	

Thermal Properties	Metric	English	Comments
CTE, linear	11.9 $\mu\text{m}/\text{m}\cdot\text{Å}^\circ\text{C}$ @Temperature 93.0 $\text{Å}^\circ\text{C}$	6.61 $\mu\text{in}/\text{in}\cdot\text{Å}^\circ\text{F}$ @Temperature 199 $\text{Å}^\circ\text{F}$	
Specific Heat Capacity	0.435 J/g- $\text{Å}^\circ\text{C}$	0.104 BTU/lb- $\text{Å}^\circ\text{F}$	
Thermal Conductivity	9.00 W/m-K	62.5 BTU-in/hr-ft Å^2 - $\text{Å}^\circ\text{F}$	
Melting Point	1232 - 1391 $\text{Å}^\circ\text{C}$	2250 - 2536 $\text{Å}^\circ\text{F}$	
Solidus	1232 $\text{Å}^\circ\text{C}$	2250 $\text{Å}^\circ\text{F}$	
Liquidus	1391 $\text{Å}^\circ\text{C}$	2536 $\text{Å}^\circ\text{F}$	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	1.4 - 1.8 %	1.4 - 1.8 %	
Boron, B	0.0030 - 0.010 %	0.0030 - 0.010 %	
Carbon, C	≤ 0.12 %	≤ 0.12 %	
Chromium, Cr	18 - 20 %	18 - 20 %	
Cobalt, Co	10 - 12 %	10 - 12 %	
Iron, Fe	≤ 5.0 %	≤ 5.0 %	
Molybdenum, Mo	9.0 - 10.5 %	9.0 - 10.5 %	
Nickel, Ni	47.27 - 58.597 %	47.27 - 58.597 %	Balance
Titanium, Ti	3.0 - 3.3 %	3.0 - 3.3 %	

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