

H.C. Starck Ultra 76 Alloy (Ta 2.5%W)

Category : Metal , Nonferrous Metal , Refractory Metal

Material Notes:

Benefits: Significantly improved corrosion resistance in HCl and H2SO4 acids. Minimized hydrogen embrittlement rates compared to standard NRC[®]76. Up to 100 times lower in HCl acid. Up to 10 times lower in H2SO4 acid. Eliminates the need for a separate Pt application step to protect against H embrittlement. Maintains all the excellent mechanical properties of NRC[®]76. Potential for increased operating temperatures in both HCl and H2SO4. Applications: High strength alloy for corrosion applications in heat transfer equipment, vessels, piping, etc., and all applications where tantalum's physical properties are desired at a higher strength level than pure tantalum, and better corrosion resistance in HCl and H2SO4 acids. Forms Available: Foil, Sheet, Welded Tubing, Rod, Plate, Wire and Bar. Metallurgical Characteristics: Material is single-phase tantalum with tungsten and platinum group metals in solid solution, stress relieved material at 2000[°]F, re-crystallized material at 2400[°]F. Information provided by H.C. Starck.

Order this product through the following link:

http://www.lookpolymers.com/polymer_HC-Starck-Ultra-76-Alloy-Ta-25W.php

Physical Properties	Metric	English	Comments
Density	16.7 g/cc	0.602 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell B	50 - 80	50 - 80	hardness as annealed, typical
Hardness, Vickers	115 - 160	115 - 160	hardness as annealed, typical
Tensile Strength	>= 276 MPa	>= 40000 psi	
	@Temperature 249 [°] C	@Temperature 480 [°] F	
	>= 290 MPa	>= 42000 psi	
	@Temperature 199 [°] C	@Temperature 390 [°] F	
Tensile Strength	>= 331 MPa	>= 48000 psi	
	@Temperature 98.9 [°] C	@Temperature 210 [°] F	
Tensile Strength	>= 345 MPa	>= 50000 psi	
	@Temperature 21.1 [°] C	@Temperature 70.0 [°] F	
Tensile Strength, Ultimate	310 - 379 MPa	45000 - 55000 psi	
	@Temperature 20.0 [°] C	@Temperature 68.0 [°] F	
Tensile Strength, Yield	241 - 310 MPa	35000 - 45000 psi	typical
	@Temperature 20.0 [°] C	@Temperature 68.0 [°] F	

Mechanical Properties	Metric	English	Comments
	@Strain 0.200 %, Temperature 249 Â°C	@Strain 0.200 %, Temperature 480 Â°F	
	>= 189 MPa	>= 27400 psi	
	@Strain 0.200 %, Temperature 199 Â°C	@Strain 0.200 %, Temperature 390 Â°F	
	>= 210 MPa	>= 30500 psi	
	@Strain 0.200 %, Temperature 98.9 Â°C	@Strain 0.200 %, Temperature 210 Â°F	
	>= 245 MPa	>= 35500 psi	
	@Strain 0.200 %, Temperature 21.1 Â°C	@Strain 0.200 %, Temperature 70.0 Â°F	
Elongation at Break	>= 10 %	>= 10 %	
	@Temperature 199 Â°C	@Temperature 390 Â°F	
	>= 10 %	>= 10 %	
	@Temperature 249 Â°C	@Temperature 480 Â°F	
	>= 15 %	>= 15 %	
	@Temperature 98.9 Â°C	@Temperature 210 Â°F	
	>= 20 %	>= 20 %	
	@Temperature 21.1 Â°C	@Temperature 70.0 Â°F	
Modulus of Elasticity	186 GPa	27000 ksi	

Thermal Properties	Metric	English	Comments
CTE, linear	6.48 Âµm/m-Â°C	3.60 Âµin/in-Â°F	
	@Temperature 20.0 - 500 Â°C	@Temperature 68.0 - 932 Â°F	
Specific Heat Capacity	0.141 J/g-Â°C	0.0336 BTU/lb-Â°F	
	@Temperature 100 Â°C	@Temperature 212 Â°F	
Thermal Conductivity	55.3 W/m-K	384 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 20.0 - 100 Â°C	@Temperature 68.0 - 212 Â°F	
Melting Point	2996 Â°C	5425 Â°F	

Component Elements Properties	Metric	English	Comments
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Carbon C Component Elements Properties	$\leq 0.0050\%$ Metric	$\leq 0.0050\%$ English	Comments
Hydrogen, H	$\leq 0.0010\%$	$\leq 0.0010\%$	
Iron, Fe	$\leq 0.0050\%$	$\leq 0.0050\%$	
Molybdenum, Mo	$\leq 0.020\%$	$\leq 0.020\%$	
Nickel, Ni	$\leq 0.0050\%$	$\leq 0.0050\%$	
Niobium, Nb (Columbium, Cb)	$\geq 0.10\%$	$\geq 0.10\%$	
Nitrogen, N	$\leq 0.0050\%$	$\leq 0.0050\%$	
Oxygen, O	$\leq 0.010\%$	$\leq 0.010\%$	
Platinum, Pt	0.10 - 0.20 %	0.10 - 0.20 %	Platinum Group Metals
Silicon, Si	$\leq 0.0025\%$	$\leq 0.0025\%$	
Tantalum, Ta	$\geq 96.14\%$	$\geq 96.14\%$	Balance
Titanium, Ti	$\leq 0.0040\%$	$\leq 0.0040\%$	
Tungsten, W	2.0 - 3.5 %	2.0 - 3.5 %	% wt

Electrical Properties	Metric	English	Comments
Volume Resistivity	0.0000147 ohm-cm @Temperature 0.000 - 100 Å°C	0.0000147 ohm-cm @Temperature 32.0 - 212 Å°F	

Chemical Properties	Metric	English	Comments
Thermal Neutron Cross Section	21.3 barns/atom	21.3 barns/atom	

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