

## H.C. Starck NRC<sup>®</sup> 4N (UNS R05200) Electron Beam Melted Tantalum

Category : Metal , Nonferrous Metal , Refractory Metal , Pure Element

### Material Notes:

**Applications:** NRC<sup>®</sup> ETA Tantalum metal products are used where purity and or ductility of the tantalum metal is more important than strength or grain size. Consequently, their primary applications are in sputtering, nickel based superalloys, explosion bonding of liners for corrosion resistance, medical, and ordnance applications All grades meet ASTM requirements. Forms Available: Sheet, Plate, Tube, Rod, Wire and Bar. Typical Purity: Purity refers to 100% minus total metallic content only, gases are omitted from the calculation. Metallic impurities are measured by GDMS, gases by Leco. Metallurgical Characteristics: Material is single-phase tantalum. Stress relieve at 1500<sup>°</sup>F, re-crystallize at 1900<sup>°</sup>F - 2100<sup>°</sup>F. Information provided by H.C. Starck.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_HC-Starck-NRC-4N-UNS-R05200-Electron-Beam-Melted-Tantalum.php](http://www.lookpolymers.com/polymer_HC-Starck-NRC-4N-UNS-R05200-Electron-Beam-Melted-Tantalum.php)

Physical Properties	Metric	English	Comments
Specific Gravity	16.6 g/cc	16.6 g/cc	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell B	25 - 65	25 - 65	hardness as annealed, typical
Hardness, Vickers	80 - 120	80 - 120	hardness as annealed, typical
Tensile Strength, Ultimate	241 - 310 MPa	35000 - 45000 psi	typical
Tensile Strength, Yield	138 - 207 MPa	20000 - 30000 psi	typical
Modulus of Elasticity	186 GPa	27000 ksi	

Thermal Properties	Metric	English	Comments
CTE, linear	6.48 $\mu\text{m/m}\cdot\text{Å}^\circ\text{C}$	3.60 $\mu\text{in/in}\cdot\text{Å}^\circ\text{F}$	
	@Temperature 20.0 - 500 $\text{Å}^\circ\text{C}$	@Temperature 68.0 - 932 $\text{Å}^\circ\text{F}$	
Specific Heat Capacity	0.141 J/g $\cdot\text{Å}^\circ\text{C}$	0.0336 BTU/lb $\cdot\text{Å}^\circ\text{F}$	
	@Temperature 100 $\text{Å}^\circ\text{C}$	@Temperature 212 $\text{Å}^\circ\text{F}$	
Thermal Conductivity	55.3 W/m-K	384 BTU-in/hr $\cdot\text{ft}\text{Å}^2\cdot\text{Å}^\circ\text{F}$	
	@Temperature 20.0 - 100 $\text{Å}^\circ\text{C}$	@Temperature 68.0 - 212 $\text{Å}^\circ\text{F}$	
Melting Point	2996 $\text{Å}^\circ\text{C}$	5425 $\text{Å}^\circ\text{F}$	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	$\leq 0.00010\%$	$\leq 0.00010\%$	

Component Elements Properties	Metric 010 %	English 010 %	Comments
Calcium, Ca	<= 0.00010 %	<= 0.00010 %	
Carbon, C	<= 0.0040 %	<= 0.0040 %	
Chlorine, Cl	<= 0.00010 %	<= 0.00010 %	
Chromium, Cr	<= 0.00010 %	<= 0.00010 %	
Cobalt, Co	<= 0.00010 %	<= 0.00010 %	
Copper, Cu	<= 0.00010 %	<= 0.00010 %	
Hafnium, Hf	<= 0.00010 %	<= 0.00010 %	
Hydrogen, H	<= 0.0010 %	<= 0.0010 %	
Iron, Fe	<= 0.00010 %	<= 0.00010 %	
Lead, Pb	<= 0.00010 %	<= 0.00010 %	
Lithium, Li	<= 0.00010 %	<= 0.00010 %	
Magnesium, Mg	<= 0.00010 %	<= 0.00010 %	
Manganese, Mn	<= 0.00010 %	<= 0.00010 %	
Molybdenum, Mo	<= 0.0030 %	<= 0.0030 %	
Nickel, Ni	<= 0.00010 %	<= 0.00010 %	
Niobium, Nb (Columbium, Cb)	<= 0.0080 %	<= 0.0080 %	
Nitrogen, N	<= 0.0040 %	<= 0.0040 %	
Other, each	<= 0.00010 %	<= 0.00010 %	
Oxygen, O	<= 0.010 %	<= 0.010 %	
Potassium, K	<= 0.00010 %	<= 0.00010 %	
Silicon, Si	<= 0.00010 %	<= 0.00010 %	
Sodium, Na	<= 0.00010 %	<= 0.00010 %	
Sulfur, S	<= 0.00010 %	<= 0.00010 %	
Tantalum, Ta	>= 99.99 %	>= 99.99 %	Balance
Thorium, Th	<= 5.0e-7 %	<= 5.0e-7 %	
Tin, Sn	<= 0.00010 %	<= 0.00010 %	
Titanium, Ti			

Component Elements Properties	$\leq 0.00010\%$ Metric	$\leq 0.00010\%$ English	Comments
Tungsten, W	$\leq 0.0080\%$	$\leq 0.0080\%$	
Uranium, U	$\leq 5.0e-7\%$	$\leq 5.0e-7\%$	
Vanadium, V	$\leq 0.00010\%$	$\leq 0.00010\%$	
Yttrium, Y	$\leq 0.00010\%$	$\leq 0.00010\%$	
Zinc, Zn	$\leq 0.00010\%$	$\leq 0.00010\%$	
Zirconium, Zr	$\leq 0.00010\%$	$\leq 0.00010\%$	

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

Chemical Properties	Metric	English	Comments
Atomic Mass	180.95	180.95	
Atomic Number	73	73	
Thermal Neutron Cross Section	21.3 barns/atom	21.3 barns/atom	

Descriptive Properties	Value	Comments
Total Metallic Content	<0.01%	

## Contact Songhan Plastic Technology Co.,Ltd.

Website : [www.lookpolymers.com](http://www.lookpolymers.com)

Email : [sales@lookpolymers.com](mailto:sales@lookpolymers.com)

Tel : +86 021-51131842

Mobile : +86 13061808058

Skype : lookpolymers

Address : United North Road 215,Fengxian District, Shanghai City,China