

ATI Wah Chang Zircadyne® Alloy Zr 705

Category : Metal , Nonferrous Metal , Zirconium Alloy

Material Notes:

Zircadyne 705 is zirconium alloyed with niobium to increase its strength and improve its formability. Alloy exhibits good ductility even at cryogenic temperatures and strength comparable with other common engineering alloys. Information provided by ATI Wah Chang

Order this product through the following link:

http://www.lookpolymers.com/polymer_ATI-Wah-Chang-Zircadyne-Alloy-Zr-705.php

Physical Properties	Metric	English	Comments
Density	6.64 g/cc	0.240 lb/in ³	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	281 MPa	40800 psi	
	@Temperature 371 °C	@Temperature 700 °F	
	300 MPa	43500 psi	
	@Temperature 316 °C	@Temperature 601 °F	
	326 MPa	47300 psi	
	@Temperature 260 °C	@Temperature 500 °F	
	370 MPa	53600 psi	
	@Temperature 204 °C	@Temperature 399 °F	
	389 MPa	56400 psi	
@Temperature 149 °C	@Temperature 300 °F		
495 MPa	71800 psi		
@Temperature 93.0 °C	@Temperature 199 °F		
615 MPa	89200 psi		
@Temperature 23.0 °C	@Temperature 73.4 °F		
Tensile Strength, Yield	173 MPa	25100 psi	
	@Temperature 371 °C	@Temperature 700 °F	
	190 MPa	27600 psi	
	@Temperature 316 °C	@Temperature 601 °F	
	196 MPa	28400 psi	
@Temperature 260 °C	@Temperature 500 °F		
262 MPa	38000 psi		

Mechanical Properties	Metric	English	Comments
	272 MPa	39500 psi	
	@Temperature 149 °C	@Temperature 300 °F	
	391 MPa	56700 psi	
	@Temperature 93.0 °C	@Temperature 199 °F	
	506 MPa	73400 psi	
	@Temperature 23.0 °C	@Temperature 73.4 °F	
Elongation at Break	18.8 %	18.8 %	
	@Temperature 23.0 °C	@Temperature 73.4 °F	
	27.8 %	27.8 %	
	@Temperature 371 °C	@Temperature 700 °F	
	28.9 %	28.9 %	
	@Temperature 260 °C	@Temperature 500 °F	
	29 %	29 %	
	@Temperature 316 °C	@Temperature 601 °F	
	30.5 %	30.5 %	
	@Temperature 93.0 °C	@Temperature 199 °F	
31.7 %	31.7 %		
@Temperature 149 °C	@Temperature 300 °F		
33 %	33 %		
@Temperature 204 °C	@Temperature 399 °F		
Modulus of Elasticity	74.6 GPa	10800 ksi	
	@Temperature 371 °C	@Temperature 700 °F	
	77.8 GPa	11300 ksi	
	@Temperature 316 °C	@Temperature 601 °F	
	81.0 GPa	11700 ksi	
	@Temperature 260 °C	@Temperature 500 °F	
84.2 GPa	12200 ksi		
@Temperature 204 °C	@Temperature 399 °F		
87.3 GPa	12700 ksi		
@Temperature 149 °C	@Temperature 300 °F		

Mechanical Properties	Metric	English	Comments
	93.8 GPa	13600 ksi	
	@Temperature 93.0 °C	@Temperature 199 °F	
	93.8 GPa	13600 ksi	
	@Temperature 38.0 °C	@Temperature 100 °F	
	94.7 GPa	13700 ksi	
	@Temperature 23.0 °C	@Temperature 73.4 °F	
Poissons Ratio	0.33	0.33	
Fatigue Strength	55.2 MPa	8000 psi	notched
	290 MPa	42000 psi	Unnotched
	@# of Cycles 1.00e+7	@# of Cycles 1.00e+7	
Shear Modulus	34.5 GPa	5000 ksi	
	@Temperature 23.0 °C	@Temperature 73.4 °F	

Thermal Properties	Metric	English	Comments
CTE, linear	4.86 $\mu\text{m}/\text{m}\cdot\text{°C}$	2.70 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 149 °C	@Temperature 300 °F	
	5.58 $\mu\text{m}/\text{m}\cdot\text{°C}$	3.10 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 260 °C	@Temperature 500 °F	
	5.94 $\mu\text{m}/\text{m}\cdot\text{°C}$	3.30 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 371 °C	@Temperature 700 °F	
Melting Point	1840 °C	3340 °F	

Component Elements Properties	Metric	English	Comments
Fe + Cr	<= 0.20 %	<= 0.20 %	
Hafnium, Hf	<= 4.5 %	<= 4.5 %	
Niobium, Nb (Columbium, Cb)	2.0 - 3.0 %	2.0 - 3.0 %	
Zirconium, Zr	>= 91 %	>= 91 %	

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