Alcoa 2090-T83 Aluminum

Category : Metal , Nonferrous Metal , Aluminum Alloy , 2000 Series Aluminum Alloy

Material Notes:

Aluminum-lithium alloy developed for high strength aerospace applications. The Al-Cu-Li alloy offers an 8 per cent density savings when compared with other aerospace alloys. Alloy 2090-T83 also has a 10 per cent higher elastic modulus. When coupled with the low density feature, this provides for unique weight saving benefits. Alloy 2090-T83 has strengths comparable with other high strength aluminum alloys and superior corrosion resistance. The alloy is also one of the most weldable aluminum products available.Information provided by Alcoa.

Order this product through the following link:
http://www.lookpolymers.com/polymer_Alcoa-2090-T83-Aluminum.php

Physical Properties	Metric	English	Comments
Density	2.59 g/cc	0.0936 lb/in³	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	>= 441 MPa @Thickness 3.17 mm	>= 64000 psi @Thickness 0.125 in	45° Direction
	>= 503 MPa @Thickness 3.17 mm	>= 73000 psi @Thickness 0.125 in	LT Direction
	>= 531 MPa @Thickness 3.17 mm	>= 77000 psi @Thickness 0.125 in	Longitudinal Direction
Tensile Strength, Yield	>= 386 MPa @Thickness 3.17 mm	>= 56000 psi @Thickness 0.125 in	45° Direction
	>= 455 MPa @Thickness 3.17 mm	>= 66000 psi @Thickness 0.125 in	LT Direction
	>= 483 MPa @Thickness 3.17 mm	>= 70000 psi @Thickness 0.125 in	Longitudinal Direction
Elongation at Break	>= 3.0 % @Thickness 3.17 mm	>= 3.0 % @Thickness 0.125 in	Longitudinal Direction
	>= 5.0 % @Thickness 3.17 mm	>= 5.0 % @Thickness 0.125 in	LT Direction
Modulus of Elasticity	79.3 GPa	11500 ksi	
Fatigue Strength	103 MPa	15000 psi	Notched (K_T = 3)

Mechanical Properties	Metric	English	Comments
	@# of Cycles 1.00e+7	@# of Cycles 1.00e+7	
	110 MPa @# of Cycles 1.00e+6	16000 psi @# of Cycles 1.00e+6	Notched (K_T = 3)
	145 MPa @# of Cycles 100000	21000 psi @# of Cycles 100000	Notched (K_T = 3)
	207 MPa @# of Cycles 1.00e+7	30000 psi @# of Cycles 1.00e+7	Smooth
	228 MPa @# of Cycles 10000	33000 psi @# of Cycles 10000	Notched (K_T = 3)
	241 MPa @# of Cycles 1.00e+6	35000 psi @# of Cycles 1.00e+6	Smooth
	303 MPa @# of Cycles 100000	44000 psi @# of Cycles 100000	Smooth
	469 MPa @# of Cycles 10000	68000 psi @# of Cycles 10000	Smooth
Fracture Toughness	44.0 MPa-m½ @Thickness 3.17 mm	40.0 ksi-in½ @Thickness 0.125 in	K_C, L-T

Thermal Properties	Metric	English	Comments
CTE, linear	23.6 µm/m-°C @Temperature 20.0 - 100 °C	13.1 µin/in-°F @Temperature 68.0 - 212 °F	per Aluminum Association
Specific Heat Capacity	1.203 J/g-°C @Temperature 100 °C	0.2875 BTU/lb-°F @Temperature 212 °F	per Aluminum Association
Thermal Conductivity	88.0 W/m-K	611 BTU-in/hr-ft²-°F	per Aluminum Association
Melting Point	560 - 650 °C	1040 - 1200 °F	per Aluminum Association
Solidus	560 °C	1040 °F	per Aluminum Association
Liquidus	650 °C	1200 °F	per Aluminum Association

Component Elements Properties	Metric	English	Comments
Aluminum, Al	93.2 - 95.6 %	93.2 - 95.6 %	As remainder
Chromium, Cr	<= 0.05 %	<= 0.05 %	

Component Elements Properties	Metric	English	Comments
Iron, Fe	<= 0.12 %	<= 0.12 %	
Lithium, Li	1.9 - 2.6 %	1.9 - 2.6 %	
Magnesium, Mg	<= 0.25 %	<= 0.25 %	
Manganese, Mn	<= 0.05 %	<= 0.05 %	
Other, each	<= 0.05 %	<= 0.05 %	
Other, total	<= 0.15 %	<= 0.15 %	
Silicon, Si	<= 0.10 %	<= 0.10 %	
Titanium, Ti	<= 0.15 %	<= 0.15 %	
Zinc, Zn	<= 0.10 %	<= 0.10 %	
Zirconium, Zr	0.08 - 0.15 %	0.08 - 0.15 %	

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