

Aleris AA5024-H116 Aluminum Magnesium Scandium Alloy

Category : Metal , Nonferrous Metal , Aluminum Alloy , 5000 Series Aluminum Alloy

Material Notes:

Features good weldability, excellent damage tolerance, good corrosion resistance, creep-formability. Aleris AlMgSc alloy AA5024 H116 allows simplification of the manufacturing process of aircraft fuselage components. With AA5024 H116 AlMgSc, stringer reinforced aircraft fuselage components can be either Laser Beam Welded (LBW) or Friction Stir Welded (FSW) when the individual parts are still flat, without any prior treatment. The single or double curvature of the fuselage part required for the aircraft body is achieved by creep forming at elevated temperature. Recommended for use as fuselage skin sheet with medium strength but excellent damage tolerance and corrosion properties and can potentially replace traditionally used 2xxx alloys even as drop-in solution. Temper, AMS and MMPDS registration pending. AA5024 H116 is covered by the Airbus specification AIMS 03-04-055 Information and property data for creep formed and welded (if applicable) sheet provided by Aleris.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Aleris-AA5024-H116-Aluminum-Magnesium-Scandium-Alloy.php

Physical Properties	Metric	English	Comments
Density	2.65 g/cc	0.0957 lb/in ³	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	315 MPa	45700 psi	LT Direction
	@Thickness 1.60 mm	@Thickness 0.0630 in	
	375 MPa	54400 psi	LT Direction
	@Thickness 3.00 mm	@Thickness 0.118 in	
	375 MPa	54400 psi	LT Direction
	@Thickness 7.00 mm	@Thickness 0.276 in	
	380 MPa	55100 psi	L Direction
	@Thickness 3.00 mm	@Thickness 0.118 in	
	380 MPa	55100 psi	L Direction
	@Thickness 7.00 mm	@Thickness 0.276 in	
	395 MPa	57300 psi	L Direction
	@Thickness 1.60 mm	@Thickness 0.0630 in	
Tensile Strength, Yield	305 MPa	44200 psi	L Direction
	@Thickness 3.00 mm	@Thickness 0.118 in	
	305 MPa	44200 psi	L Direction
	@Thickness 7.00 mm	@Thickness 0.276 in	

Mechanical Properties	Metric	English	Comments
	@Thickness 3.00 mm	@Thickness 0.118 in	LT Direction
	305 MPa	44200 psi	LT Direction
	@Thickness 7.00 mm	@Thickness 0.276 in	
	310 MPa	45000 psi	LT Direction
	@Thickness 1.60 mm	@Thickness 0.0630 in	
	315 MPa	45700 psi	L Direction
	@Thickness 1.60 mm	@Thickness 0.0630 in	
Elongation at Break	15 %	15 %	L Direction
	@Thickness 1.60 mm	@Thickness 0.0630 in	
	15 %	15 %	L Direction
	@Thickness 3.00 mm	@Thickness 0.118 in	
	15 %	15 %	L Direction
	@Thickness 7.00 mm	@Thickness 0.276 in	
	17 %	17 %	LT Direction
	@Thickness 7.00 mm	@Thickness 0.276 in	
	18 %	18 %	LT Direction
	@Thickness 3.00 mm	@Thickness 0.118 in	
	19 %	19 %	LT Direction
	@Thickness 1.60 mm	@Thickness 0.0630 in	
Tensile Modulus	72.0 GPa	10400 ksi	
Compressive Strength	295 MPa	42800 psi	L Direction
	@Thickness 7.00 mm	@Thickness 0.276 in	
	300 MPa	43500 psi	LT Direction
	@Thickness 7.00 mm	@Thickness 0.276 in	
	305 MPa	44200 psi	LT Direction
	@Thickness 3.00 mm	@Thickness 0.118 in	
	305 MPa	44200 psi	L Direction
	@Thickness 3.00 mm	@Thickness 0.118 in	
	315 MPa	45700 psi	LT Direction
	@Thickness 1.60 mm	@Thickness 0.0630 in	

Mechanical Properties	Metric _{Pa}	English _{psi}	Comments
	@Thickness 1.60 mm	@Thickness 0.0630 in	L Direction
Compressive Modulus	74.0 GPa	10700 ksi	
Fatigue Strength	145 MPa	21000 psi	T-L
	@# of Cycles 1.00e+6	@# of Cycles 1.00e+6	
	145 MPa	21000 psi	T-L
	@# of Cycles 300000	@# of Cycles 300000	
	175 MPa	25400 psi	T-L
	@# of Cycles 100000	@# of Cycles 100000	
	180 MPa	26100 psi	T-L
	@# of Cycles 80000	@# of Cycles 80000	
	190 MPa	27600 psi	T-L
	@# of Cycles 50000	@# of Cycles 50000	
	290 MPa	42100 psi	T-L
	@# of Cycles 10000	@# of Cycles 10000	
	365 MPa	52900 psi	T-L
	@# of Cycles 1000	@# of Cycles 1000	
Fracture Toughness	35.0 MPa-m ^{1/2}	31.9 ksi-in ^{1/2}	K _e ; T-L; Δa _e = 0 mm
	40.0 MPa-m ^{1/2}	36.4 ksi-in ^{1/2}	K _e ; L-T; Δa _e = 0 mm
	90.0 MPa-m ^{1/2}	81.9 ksi-in ^{1/2}	K _e ; T-L; Δa _e = 10 mm
	120 MPa-m ^{1/2}	109 ksi-in ^{1/2}	K _e ; T-L; Δa _e = 20 mm
	120 MPa-m ^{1/2}	109 ksi-in ^{1/2}	K _e ; L-T; Δa _e = 20 mm
	150 MPa-m ^{1/2}	137 ksi-in ^{1/2}	K _e ; L-T; Δa _e = 40 mm
	155 MPa-m ^{1/2}	141 ksi-in ^{1/2}	K _e ; T-L; Δa _e = 40 mm
	170 MPa-m ^{1/2}	155 ksi-in ^{1/2}	K _e ; L-T; Δa _e = 60 mm
	175 MPa-m ^{1/2}	159 ksi-in ^{1/2}	K _e ; T-L; Δa _e = 60 mm
			K _e ; L-T;

Mechanical Properties	185 MPa-m% Metric	168 ksi-in% English	1/8" x 1/2" x 1/8" = 80 mm Comments
Component Elements Properties	Metric	English	Comments
Aluminum, Al	92.95 - 95.95 %	92.95 - 95.95 %	As Balance
Chromium, Cr	<= 0.10 %	<= 0.10 %	
Copper, Cu	<= 0.20 %	<= 0.20 %	
Iron, Fe	<= 0.40 %	<= 0.40 %	
Magnesium, Mg	3.9 - 5.1 %	3.9 - 5.1 %	
Manganese, Mn	<= 0.20 %	<= 0.20 %	
Other, each	<= 0.05 %	<= 0.05 %	
Other, total	<= 0.15 %	<= 0.15 %	
Scandium, Sc	0.10 - 0.40 %	0.10 - 0.40 %	
Silicon, Si	<= 0.25 %	<= 0.25 %	
Titanium, Ti	<= 0.20 %	<= 0.20 %	
Zinc, Zn	<= 0.25 %	<= 0.25 %	
Zirconium, Zr	0.05 - 0.20 %	0.05 - 0.20 %	

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