Aluminum 713.0-F, Sand Cast

Categories: Metal; Nonferrous Metal; Aluminum Alloy; Aluminum Casting Alloy

Material Notes: Data points with the AA note have been provided by the Aluminum Association, Inc. and are NOT FOR DESIGN.

Composition Notes:
Composition information provided by the Aluminum Association and is not for design.

Key Words: Aluminium 713.0-F; UNS A07130; AA713.0-F

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Physical Properties	Metric	English	Comments
Density	2.81 g/cc	0.102 lb/in³	AA; Typical

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	60 - 90	60 - 90	AA; Typical; 500 g load; 10 mm ball
Hardness, Knoop	98	98	Estimated from Brinell Hardness.
Hardness, Vickers	85	85	Estimated from Brinell Hardness.
Tensile Strength, Ultimate	>= 221 MPa	>= 32000 psi	AA
Tensile Strength, Yield	>= 152 MPa @Strain 0.200 %	>= 22000 psi @Strain 0.200 %	AA
Elongation at Break	>= 3.0 %	>= 3.0 %	AA; in 2 in. (50 mm) or 4D
Modulus of Elasticity	71.0 GPa	10300 ksi	In tension for aluminum 770.0
Poissons Ratio	0.33	0.33	Estimated from aluminum 770.0
Fatigue Strength	60.0 MPa @# of Cycles 5.00e+8	8700 psi @# of Cycles 5.00e+8	Notch Status unknown, R.R. Moore Test
Machinability	90 %	90 %	0-100 Scale (100=best)
Shear Modulus	26.5 GPa	3840 ksi	Estimated from aluminum 770.0
Shear Strength	180 MPa	26100 psi	
Charpy Impact	3.40 J	2.51 ft-lb	V-notch
Charpy Impact, Unnotched	16.3 J	12.0 ft-lb	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.00000570 ohm-cm	0.00000570 ohm-cm	AA; Typical 30% IACS Conductivity

Thermal Properties	Metric	English	Comments
Heat of Fusion	389 J/g	167 BTU/lb	Typical for cast aluminum
CTE, linear	24.1 µm/m-°C @Temperature 20.0 - 100 °C	13.4 µin/in-°F @Temperature 68.0 - 212 °F	AA; Typical
	26.3 µm/m-°C @Temperature 20.0 - 300 °C	14.6 µin/in-°F @Temperature 68.0 - 572 °F	AA; Typical; average over range
Specific Heat Capacity	0.963 J/g-°C	0.230 BTU/lb-°F	Typical for cast aluminum
Thermal Conductivity	121 W/m-K	841 BTU-in/hr-ft²-°F	AA; Typical at 25°C
Melting Point	593 - 638 °C	1100 - 1180 °F	AA; Typical
Solidus	593 °C	1100 °F	AA; Typical
Liquidus	638 °C	1180 °F	AA; Typical

Processing Properties	Metric	English	Comments
Melt Temperature	593 - 640.6 °C	1100 - 1185 °F	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	87.5 - 92.4 %	87.5 - 92.4 %	As remainder
Chromium, Cr	<= 0.35 %	<= 0.35 %	
Copper, Cu	0.40 - 1.0 %	0.40 - 1.0 %	
Iron, Fe	<= 1.1 %	<= 1.1 %	
Magnesium, Mg	0.20 - 0.50 %	0.20 - 0.50 %	
Manganese, Mn	<= 0.60 %	<= 0.60 %	
Nickel, Ni	<= 0.15 %	<= 0.15 %	
Other, each	<= 0.10 %	<= 0.10 %	
Other, total	<= 0.25 %	<= 0.25 %	
Silicon, Si	<= 0.25 %	<= 0.25 %	
Titanium, Ti	<= 0.25 %	<= 0.25 %	
Zinc, Zn	7.0 - 8.0 %	7.0 - 8.0 %	