

## Aluminum 713.0-T5, 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-T5; UNS A07130; AA713.0-T5

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Physical Properties	Metric	English	Comments
Density	2.81 g/cc	0.102 lb/in <sup>3</sup>	
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	

<b>Thermal Properties</b>	<b>Metric</b>	<b>English</b>	<b>Comments</b>
Heat of Fusion	389 J/g	167 BTU/lb	Typical for cast aluminum
CTE, linear 	24.1 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$ @Temperature 20.0 - 100 $^{\circ}\text{C}$	13.4 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$ @Temperature 68.0 - 212 $^{\circ}\text{F}$	
	26.3 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$ @Temperature 20.0 - 300 $^{\circ}\text{C}$	14.6 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$ @Temperature 68.0 - 572 $^{\circ}\text{F}$	
Specific Heat Capacity	0.963 J/g- $^{\circ}\text{C}$	0.230 BTU/lb- $^{\circ}\text{F}$	Typical for cast aluminum
Thermal Conductivity	121 W/m-K	840 BTU-in/hr-ft <sup>2</sup> - $^{\circ}\text{F}$	
Melting Point	593 - 638 $^{\circ}\text{C}$	1100 - 1180 $^{\circ}\text{F}$	
Solidus	593 $^{\circ}\text{C}$	1100 $^{\circ}\text{F}$	
Liquidus	638 $^{\circ}\text{C}$	1180 $^{\circ}\text{F}$	
<b>Processing Properties</b>	<b>Metric</b>	<b>English</b>	<b>Comments</b>
Melt Temperature	593 - 640.6 $^{\circ}\text{C}$	1100 - 1185 $^{\circ}\text{F}$	
<b>Component Elements Properties</b>	<b>Metric</b>	<b>English</b>	<b>Comments</b>
Aluminum, Al	87.5 - 92.4 %	87.5 - 92.4 %	As remainder
Chromium, Cr	$\leq 0.35$ %	$\leq 0.35$ %	
Copper, Cu	0.40 - 1.0 %	0.40 - 1.0 %	
Iron, Fe	$\leq 1.1$ %	$\leq 1.1$ %	
Magnesium, Mg	0.20 - 0.50 %	0.20 - 0.50 %	
Manganese, Mn	$\leq 0.60$ %	$\leq 0.60$ %	
Nickel, Ni	$\leq 0.15$ %	$\leq 0.15$ %	
Other, each	$\leq 0.10$ %	$\leq 0.10$ %	
Other, total	$\leq 0.25$ %	$\leq 0.25$ %	
Silicon, Si	$\leq 0.25$ %	$\leq 0.25$ %	
Titanium, Ti	$\leq 0.25$ %	$\leq 0.25$ %	
Zinc, Zn	7.0 - 8.0 %	7.0 - 8.0 %	