

Magnesium AZ91D-F, Cast

Categories: [Metal](#); [Nonferrous Metal](#); [Magnesium Alloy](#)

Material Notes: Mg content calculated as balance. Information provided by Starmet and the references. AZ91A, B, C, D, and E have the same nominal composition but differ in ranges and/or specified impurity limits. This high purity alloy has excellent corrosion resistance. It is the most commonly used magnesium die casting alloy.

Key Words: UNS M11916; Mg; European EN 1753 MC 21120; ASTM B 94;SAE J465 (Ingot UNS M11917)

Vendors: [Click here to view all available suppliers for this material.](#)

Please [click here](#) if you are a supplier and would like information on how to add your listing to this material.

Physical Properties	Metric	English	Comments
Density	1.81 g/cc	0.0654 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	63.0	63.0	500 kg load, 10 mm ball
Hardness, Knoop	84.0	84.0	Estimated from Brinell
Hardness, Rockwell E	75.0	75.0	
Hardness, Vickers	71.0	71.0	Estimated from Brinell
Tensile Strength, Ultimate	230 MPa	33400 psi	
Tensile Strength, Yield	150 MPa	21800 psi	at 0.2% Offset
Elongation at Break	3.00 %	3.00 %	in 50 mm
Modulus of Elasticity	44.8 GPa	6500 ksi	In Tension
Compressive Yield Strength	165 MPa	23900 psi	at 0.2% offset
Poissons Ratio	0.350	0.350	
Charpy Impact	2.70 J	1.99 ft-lb	V-notch
Fatigue Strength	97.0 MPa @# of Cycles 5.00e+8	14100 psi @# of Cycles 5.00e+8	R.R. Moore Test
Shear Modulus	17.0 GPa	2470 ksi	
Shear Strength	140 MPa	20300 psi	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000143 ohm-cm	0.0000143 ohm-cm	

Thermal Properties	Metric	English	Comments
Heat of Fusion	373 J/g	160 BTU/lb	
CTE, linear 20°C	26.0 µm/m-°C	14.4 µin/in-°F	at 25°C
CTE, linear 100°C	27.2 µm/m-°C	15.1 µin/in-°F	20-200°C
Specific Heat Capacity	1.047 J/g-°C	0.2502 BTU/lb-°F	
Thermal Conductivity	72.7 W/m-K	505 BTU-in/hr-ft ² -°F	
Melting Point	>= 421 °C	>= 790 °F	Incipient Melting
Solidus	470 °C	878 °F	
Liquidus	595 °C	1100 °F	

Processing Properties	Metric	English	Comments
Casting Temperature	640 - 675 °C	1180 - 1250 °F	Die Casting

Material Components Properties	Metric	English	Comments
Aluminum, Al	8.30 - 9.70 %	8.30 - 9.70 %	
Copper, Cu	<= 0.0300 %	<= 0.0300 %	
Iron, Fe	<= 0.00500 %	<= 0.00500 %	
Magnesium, Mg	90.0 %	90.0 %	
Manganese, Mn	>= 0.130 %	>= 0.130 %	
Nickel, Ni	<= 0.00200 %	<= 0.00200 %	
Silicon, Si	<= 0.100 %	<= 0.100 %	
Zinc, Zn	0.350 - 1.00 %	0.350 - 1.00 %	

[References](#) for this datasheet.

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistent format. Users requiring more precise data for scientific or engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the original value or one of its raw conversions in your calculations to minimize rounding error. We also ask that you refer to MatWeb's disclaimer and terms of use regarding this information. [Click here](#) to view all the property values for this datasheet as they were originally entered into MatWeb.

MMAZ96