

# Typical Magnesium Forging Alloys



Provided Courtesy of Materials Technology@TMS

The following is a summary of typical magnesium forging alloys, including links to supplier property data and links to articles and handbook information.

For additional resources, visit <http://www.materialstechnology.org>

*Designations in parentheses are British designations for the ASTM designations which precede them.*

ALLOY	TEMPER	DESCRIPTION	SUPPLIER INFORMATION	REFERENCE	READ MORE
AZ31B	F	Mg-Al-Zn alloy with moderate mechanical properties and high elongation.		<p>Handbook of Materials Selection, ed. Kutz, Myer, 2002 John Wiley &amp; Sons</p> <p>Metallic Materials Properties Development and Standardization, U. S. Department of Transportation, 2003</p> <p>M. Barnett, "A Taylor Model Based Description of the Proof Stress of Magnesium AZ31 during Hot Working", Met. Trans. A, September 2003, pp. 1799-1806.</p> <p>A. Ben-Artzy, A. Shtechman, N. Ben-Ari and D. Dayan, "Defromation Characteristics of Wrought Magnesium Alloys AZ31, Zk60", Magnesium Technology 2000, TMS, pp. 363-374.</p> <p>G. Tausig, N. J. Ricketts and S. R. Peck, "Forging of Magnesium Using Squeeze Cast Pre-Form", Magnesium Technology 2001, TMS, pp. 235-242.</p> <p>ASM Specialty Handbook: Magnesium and Magnesium Alloys, eds. M. M. Avedesian and H. Baker, ASM International, 1999.</p> <p>For more articles, search <a href="#">Magnesium Article and Presentation Database</a>, Eric Nyberg of Pacific Northwest National Laboratory, 2007.</p>	<p><a href="#">Read the Full Article</a></p> <p><a href="#">Read the Full Article</a></p> <p><a href="#">Acquire the Article</a></p> <p><a href="#">Read the Full Article</a></p> <p><a href="#">Read the Full Article</a></p> <p><a href="#">Acquire the Book</a></p> <p><a href="#">Search Database</a></p>
ZM21	F	Medium strength. Easily formed. Fully weldable by argon arc process.	<a href="#">Magnesium-Elektron</a>		
AZ61A (AZM)	F	General purpose Mg-Al-Zan alloy with good mechanical properties and moderate cost. Gas and arc weldable.	<a href="#">Magnesium-Elektron</a>	<p>Handbook of Materials Selection, ed. Kutz, Myer, 2002 John Wiley &amp; Sons</p> <p>Metallic Materials Properties Development and Standardization, U. S. Department of Transportation, 2003</p> <p>ASM Specialty Handbook: Magnesium and Magnesium Alloys, eds. M. M. Avedesian and H. Baker, ASM International, 1999.</p> <p>For more articles, search <a href="#">Magnesium Article and Presentation Database</a>, Eric Nyberg of Pacific Northwest National Laboratory, 2007.</p>	<p><a href="#">Read the Full Article</a></p> <p><a href="#">Read the Full Article</a></p> <p><a href="#">Acquire the Book</a></p> <p><a href="#">Search Database</a></p>

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M1A	F	Mg-Mn alloy with moderate mechanical properties. Has excellent weldability, corrosion resistance and hot formability.		ASM Specialty Handbook: Magnesium and Magnesium Alloys, eds. M. M. Avedesian and H. Baker, ASM International, 1999.	<a href="#">Acquire the Book</a>
ZK31(ZW3)	T5	High strength alloy. Weldable under good conditions.	<a href="#">Magnesium-Elektron</a>		
AZ80A	F, T5	High strength Mg-Al-Zn alloy.	<a href="#">Magnesium-Elektron</a>	Handbook of Materials Selection, ed. Kutz, Myer, 2002 John Wiley & Sons  ASM Specialty Handbook: Magnesium and Magnesium Alloys, eds. M. M. Avedesian and H. Baker, ASM International, 1999.  For more articles, search Magnesium Article and Presentation Database, Eric Nyberg of Pacific Northwest National Laboratory, 2007.	<a href="#">Read the Full Article</a>  <a href="#">Acquire the Book</a>  <a href="#">Search Database</a>
ZK60A	F, T5	High strength alloy. Has best combination of strength and ductility at room temperature of the wrought Mg alloys.	<a href="#">Magnesium-Elektron</a>	Handbook of Materials Selection, ed. Kutz, Myer, 2002 John Wiley & Sons  Metallic Materials Properties Development and Standardization, U. S. Department of Transportation, 2003  A. Ben-Artzy, A. Shtechman, N. Ben-Ari and D. Dayan, "Deformation Characteristics of Wrought Magnesium Alloys AZ31, ZK60", Magnesium Technology 2000, TMS, pp. 363-374.  A. M. Galiyev, R. O. Kaibyshev and G. Gottstein, "Grain Refinement of ZK60 Magnesium Alloy During Low Temperature Deformation", Magnesium Technology 2002, TMS, pp. 181-185.  ASM Specialty Handbook: Magnesium and Magnesium Alloys, eds. M. M. Avedesian and H. Baker, ASM International, 1999.  For more articles, search Magnesium Article and Presentation Database, Eric Nyberg of Pacific Northwest National Laboratory, 2007.	<a href="#">Read the Full Article</a>  <a href="#">Read the Full Article</a>  <a href="#">Read the Full Article</a>  <a href="#">Acquire the Book</a>  <a href="#">Search Database</a>

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ALLOY	TEMPER	DESCRIPTION	SUPPLIER INFORMATION	REFERENCE	READ MORE
WE54A	T6, T5 (for 200°C use)	Elevated temperature Mg-Y-RE alloy for use at temperatures up to 300°C. Properties are more isotropic than those in most wrought alloys.	<a href="#">Magnesium-Elektron</a>	For articles, search Magnesium Article and Presentation Database, Eric Nyberg of Pacific Northwest National Laboratory, 2007.	<a href="#">Search Database</a>
WE43A	T6, T5 (for 200°C use)	Elevated temperature Mg-Y-RE alloy for use at temperatures up to 300°C. Stable for long times at 250°C. Properties are more isotropic than those in most wrought alloys.	<a href="#">Magnesium-Elektron</a>	For articles, search Magnesium Article and Presentation Database, Eric Nyberg of Pacific Northwest National Laboratory, 2007.	<a href="#">Search Database</a>