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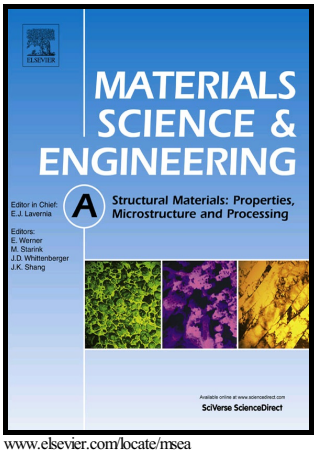

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Superplasticity in a commercially extruded ZK30 magnesium alloy

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Abstract

The high temperature mechanical behavior of a commercial ZK30 Magnesium alloy was studied by means of tensile tests at various temperatures and strain rates. This behavior was related to the complex as-received microstructure that evolves during testing to a microstructure formed by few large grains (≈30 μm) combined with a large amount of small grains (1-5 μm). Large elongations to failure up to 360 % and low apparent stress exponents between 2.6 and 2.9 at low strain rates are a hint of the activation of grain boundary sliding as the controlling deformation mechanism. This is corroborated by the equiaxed microstructure after testing. The stress exponents higher than 2 are attributed to the accelerated grain growth of the dual grain size microstructure.