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Controlling liquid segregation of semi-solid AZ80 magnesium alloy by back pressure thixoextruding

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Abstract:

A back pressure thixoextruding method was proposed to control the liquid segregation during the thixoforming process. The back pressure was provided by disk springs which can apply an elastic force on the deformed alloy to make it in a three-dimensional compression stress state. Thixoextrusion of AZ80 magnesium alloy was conducted to verify the feasibility of the proposed technology. The results show that the suitable partial remelting regime for AZ80 magnesium alloy is isothermal holding at 560 °C for 15~25min. Although the components with good surface qualities can be successfully fabricated by both back pressure thixoextruding and conventional thixoextruding, the distribution of microstructures and mechanical properties are quite different. Severe liquid segregation occurred during the conventional thixoextruding process, and a great amount of liquid-solidified structures were detected in the

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