

EXTRUSION OF CAST MAGNESIUM ALLOYS

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Abstract: In search of improved properties of Mg alloys in a future strongly demanding a recycled metal base this work pushes the defined limitation of the cast alloy AZ91. With proper heat treatment and extrusion as a fabrication technique it is strongly believed that composition far beyond classic standards can be applied with success. This is confirmed in a trial where the cast AZ91 magnesium alloy as well as several experimental alloys based on AZ91 with addition of nickel, zinc and/or copper were extruded into rods followed by precipitation hardening treatment (T6). All experiments were carried out using typical industrial extrusion parameters like extrusion rate (approx. 2 mm/s) and extrusion ratio (4:1 and 6:1).

The dynamic recrystallization phenomenon, partial to full, was observed in the standard AZ91 and the experimental alloys except in the zinc rich alloy. The last one is an alloy of low melting point and it was extruded on the rather lower temperature than the other alloys. Mechanical properties are shown to be on the level of standard AZ91 and with other physical properties of interest.