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## **R-HPDC of Magnesium Alloys**

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### **Abstract**

Flexibility of the Council for Scientific and Industrial Research's Rheocasting System (CSIR-RCS) and its rheo-high pressure die casting (R-HPDC) technology is again demonstrated, as with aluminium alloys, by processing and shape casting of three different magnesium alloys (AM50A, AM60B, AZ91D) in a first attempt. All as-cast microstructures are characterised more by rosette shaped globules of the primary-(Mg) phase together with  $Mg_{17}Al_{12}$  as evidence of nonequilibrium cooling rates. Surface liquid segregation is observed in the as-cast microstructure for all three alloys. Minor alloy additions of Mn, in composition specifications, results in the formation of  $Al_8Mn_5$  intermetallic phase particles dispersed throughout the microstructure. All alloys were homogenised at 415 °C for 16 hours for the T4 condition. The  $Mg_{17}Al_{12}$  phase dissolves with homogenisation while the  $Al_8Mn_5$  intermetallic phase does not dissolve. The resulting tensile properties of all three alloys in the as-cast and T4 conditions are reported.