

Asymmetric and reverse rolling of AM30 Mg alloy to improve its tensile properties

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Asymmetric rolling (ASR) and reverse rolling (RR) are novel techniques to improve the tensile properties of Mg alloys. An AM30 Mg alloy was cast and homogenized at 400°C for 24 h and rolled at 350°C by symmetric rolling (SR), ASR and ASR+RR processes. The grain size was found to be almost the same after the three rolling processes but the basal texture was weakened after ASR and further weakened after ASR+RR as compared to SR process. The tensile properties of the hot rolled sheets were also observed to be in the same order, i.e., ASR+RR > ASR > SR. Thus, the tensile properties of 0.2% PS = 224 MPa, UTS = 276 MPa and El = 8.2% were obtained for ASR+RR sheet, which are excellent for a hot rolled non-rare earth bearing Mg alloy. The ASR+RR also exhibited the lowest anisotropy as compared to SR and ASR hot rolled sheets.

Keywords: Mg Alloys, Asymmetric Rolling, Reverse Rolling, Texture, Tensile Properties