

Evaluation of Formability of AZ61 Magnesium Alloy at Elevated Temperatures

Authors : Ramezani M., Neitzert T.

Abstract : This paper investigates mechanical properties and formability of the AZ61 magnesium alloy at high temperatures. Tensile tests were performed at elevated temperatures of up to 400°C. The results showed that as temperature increases, yield strength and ultimate tensile strength decrease significantly, while the material experiences an increase in ductility (maximum elongation before break). A finite element model has been developed to further investigate the formability of the AZ61 alloy by deep drawing a square cup. Effects of different process parameters such as punch and die geometry, forming speed and temperature as well as blank-holder force on deep drawability of the AZ61 alloy were studied and optimum values for these parameters are achieved which can be used as a design guide for deep drawing of this alloy.

Keywords : AZ61, formability, magnesium, mechanical properties

Conference Title : ICMAE 2015 : International Conference on Manufacturing and Automotive Engineering

Conference Location : London, United Kingdom

Conference Dates : January 19-20, 2015