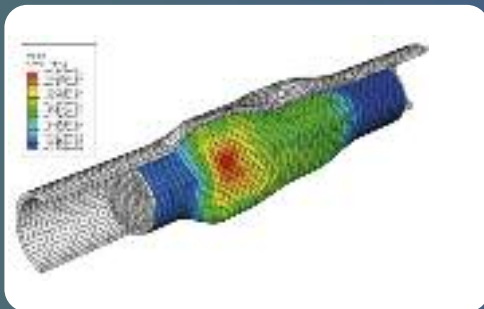


162

Authors: G. Mrówka-Nowotnik, J. Sieniawski and A. Nowotnik in the paper entitled "Effect of heat treatment on tensile and fracture toughness properties of 6082 alloy" on a **page 162** presents study investigations of the effect of heat treatment parameters (temperature and time) on the tensile properties and fracture toughness of 6082 aluminum alloy. This paper is the part of previous authors' investigations which results in modification of the heat treatment parameters that may lead to the most favorable mechanical properties and fracture toughness of 6082 alloy. The paper contains a broad spectrum of experimental data including uniaxial tensile test and fracture toughness investigation based on two various technique and as well as new ideas concerning aging parameters and their effect on the mechanical properties and ductility of the 6082 alloy. The results show that the microstructure, mechanical properties and fracture toughness changes during artificial aging due to the precipitation strengthening process.



188

The Properties area is shown in the paper on "Determination of the optimum forming conditions for warm tube hydroforming of ZM21 magnesium alloy" by J.A. Esnaola, I. Torca, L. Galdos and C. Garcia on **pages 188**. Magnesium tubular parts are very appropriate for automotive and aerospace industry due to their high strength to weight ratio. Thus, WTHF processes allow obtaining excellent quality parts with complex shapes, difficult or even impossible to obtain by other forming techniques. Furthermore, the determined optimum forming conditions can be useful for other warm forming processes such as warm deep drawing. Deformation mechanisms and optimum forming conditions for ZM21 alloy, which presents advantages for warm forming processes, were determined. Furthermore, these forming conditions were tested in an emerging innovative forming process, WTHF. Magnesium alloys are especially appropriate to decrease vehicle weight and consequently reduce fuel consumption. However, forming limitations regarded to their low formability at room temperature are found when being manufactured by conventional forming processes. Consequently, development of new forming techniques, such as warm tube hydroforming (WTHF), is needed to overcome such a limitation. This way, WTHF allows combining the benefit of increasing forming temperature to raise the formability of these alloys with the widely known advantages of conventional Tube Hydroforming processes. In the current work, deformation mechanisms in ZM21 alloy were studied in order to determine the optimum forming conditions for warm forming processes. These working conditions were tested to form a ZM21 prototype by WTHF.



## Research Monograph

115. Ferritic-austenitic steel and its weldability in large size constructions  
J. Nowacki (Poland)



## Materials

142. Microstructure, properties investigations and methodology of the state evaluation of T23 (2,25Cr-O,3Mo-1,6W-V-Nb) steel in boiler application  
J. Dobrzański, A. Zieliński, M. Sroka (Poland)

154. Technological plasticity and structure in stainless steels during hot-working  
D. Kuc, G. Niewielski (Poland)

162. Effect of heat treatment on tensile and fracture toughness properties of 6082 alloy  
G. Mrówka-Nowotnik, J. Sieniawski, A. Nowotnik (Poland)

171. Characterisation of nanostructured copper - WC materials  
J.P. Stobrawa, Z.M. Rdzawski (Poland)



## Properties

179. Structure and properties of alloys of the Mg-Al-Zn system  
L. Čížek, M. Greger, I. Juříčka, R. Kocich, L. Pawlica (Czech Republic), L.A. Dobrzański, T. Tański (Poland)

188. Determination of the optimum forming conditions for warm tube hydroforming of ZM21 magnesium alloy  
J.A. Esnaola, I. Torca, L. Galdos, C. Garcia (Spain)



## Methodology of research

196. Arc voltage behavior in GMAW-P under different drop transfer modes  
P. Praveen (Australia), M.J. Kang (South Korea), P.K.D.V. Yarlagadda (Australia)



## Manufacturing and processing

203. Selection of heat treatment condition of the Mg-Al-Zn alloys  
L.A. Dobrzański, T. Tański (Poland), L. Čížek (Czech Republic), J. Madejski (Poland)



## Indexes

211. Author index  
212. Keywords index