



Materials

- 115. Pitting corrosion in the wet section of the automotive exhaust systems
C. Hoffmann, P. Gümpel (Germany)
- 122. The influence of long-lasting annealing on microstructure of AlCu4Ni2Mg2 Alloy
M. Wierzbńska, J. Sieniawski (Poland)



Properties

- 130. Effects of sintering on Y_2O_3 -doped CeO_2
M.Tavafoghi Jahromi, M.J. Tan (Singapore)
- 137. Estimation of the residual life of L17HMF cast steel elements after long-term service
A. Zieliński, J. Dobrzański, G. Golański (Poland)



Analysis and modelling

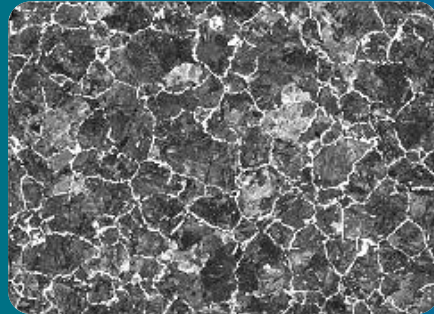
- 145. Design of automatic vision-based inspection system for solder joint segmentation
N.S.S. Mar, C. Fookes, P.K.D.V. Yarlagadda (Australia)
- 152. Computer simulation of working stress of heat treated steel specimen
B. Smoljan, D. Iljkić, S. Smokvina Hanza (Croatia)



Manufacturing and processing

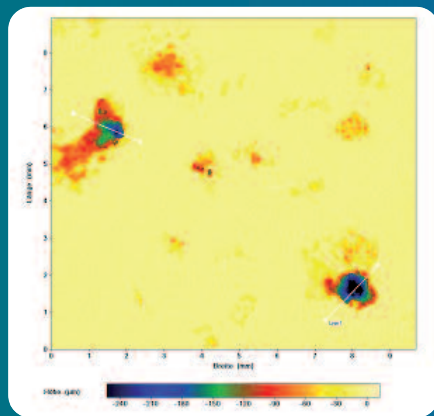
- 157. GMAW process stability evaluation through acoustic emission by time and frequency domain analysis
E. Huanca Cayo, S.C. Absi Alfaro (Brazil)

Selected materialographical photo



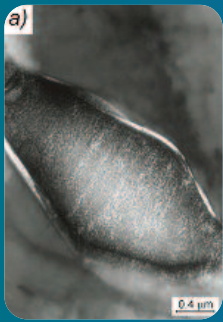
188

The paper written by M.H. Robert and A.G.S. Galdino on "Investigations on the suitability of some ferrous alloys for semi-solid processing" on a **page 188** informs about analyses of the thixoability of SAE 1070, SAE 1548 and SAE 4340 steels; the possibility of producing thixotropic semi-solid by partial melting of these alloys and the phase transformations taking place during the process. Thixoability was characterised by differential scanning calorimetry (DSC) to determine transformation temperatures involving liquid formation and df/dT within the solidification range. Thixotropic slurries were produced by heat treatments at different temperatures above T_0 , and distinct holding times. Microstructures were analysed by RX diffractometry, optical and electronic microscopy and EDS microanalysis. The prediction of the thixoability of a certain alloy can make it more effective its thixoprocessing, allows better control of processing parameters and of the quality of final product. The viability of producing thixotropic semi-solid of ferrous alloys by simple partial melting can definitively insert these families of metallic alloys in the semi-solid processing field.



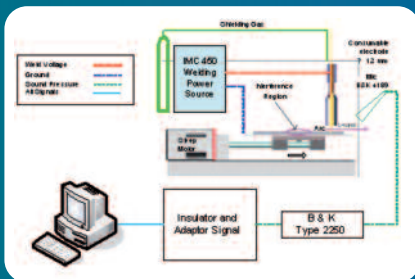
115

The Materials section represented by C. Hoffmann and P. Gümpel on "Pitting corrosion in the wet section of the automotive exhaust systems" on a **page 115** informs that the evaluation of the pitting corrosion by means of the new measurement methods with the optical 3D-Measuring System MikroCAD is more accurate, work fast and is an obligatory complement of the previous methods of evaluation of the pitting corrosion: mass loss and the depth of the deepest pit. The different types of occurring corrosion, both general attack and pitting corrosion demands a combination of evaluation methods of the corrosion attack: mass loss measurements and the measure of the average depth of a certain number of pits with an optical 3D-Measuring System MikroCAD were used. A higher quantification of the pitting corrosion leads to a better rating of the different stainless steel grades for using them in the wet section of the automotive exhaust systems.



122

In the research paper entitled "The Influence of long-lasting annealing on microstructure of AlCu4Ni2Mg2 Alloy" by M. Wierzbńska and J. Sieniawski on a **page 122** the influence of long-term annealing at elevated temperature on the microstructure and mechanical properties of AlCu4Ni2Mg2 alloy is presented. In order to complete obtained results it is recommended to perform further investigations of behaviour of AlCu4Ni2Mg2 alloy in 573 K and 623 K corresponding to the maximum values of temperature at which structural elements of piston engines made of aluminium alloys operate. It was found that after long time hold at elevated temperature (523 K) the degradation of microstructure of alloy was observed. The microstructural changes consist in increase of size of hardening phases precipitates (θ' -Al₂Cu) and changing its shape. These phenomena cause decrease in the mechanical properties of the alloy. This work has provided essential data about microstructural changes of aluminium alloy proceeding during elements of piston engines operation.



157

Authors: E. Huanca Cayo and S.C. Absi Alfaro in the paper entitled "GMAW process stability evaluation through acoustic emission by time and

frequency domain analysis" on a **page 157** presents a comparative analysis in time domain and frequency domain to the acoustical pressure generate by the electric arc to determinate which of the two analysis methods is better to evaluate the stability in GMAW process. Welds had been made with the parameters adjusted to get the highest stability. In these conditions, instabilities that had been generated by the grease presence in the weld trajectory were simulated. In both experimental groups the acoustical pressure signal produced by electric arc to made analysis based in time domain and frequency domain was acquired. In the gotten results, the time domain analysis method could represent adequately the stability and the instability of the process. The stability characterises for the continuity and minim variation of the statistical parameters, but in the presence of instabilities, these parameters present chaotic changes. In the frequency domain method the variations are imperceptible for steady and unstable regions, but it presents little definite variations in the amplitude of determined bands of frequencies. The stability evaluation in welding is crucial because it is responsible in the weld quality. The non contact methods as the acoustical method have a potentiality extraordinary to monitor and detect instabilities in welding. The acoustical sensing has the capacity to make an on-line monitoring of the weld process.

165. Main assumptions of the foresight of surface properties formation leading technologies of engineering materials and biomaterials
A. Dobrzańska-Danikiewicz (Poland)
172. Roll casting of 5182 aluminium alloy
T. Haga, M. Mtsuo, D. Kunigo, Y. Hatanaka, R. Nakamuta, H. Watari, S. Kumai (Japan)
180. Achievements of sustainable manufacturing by machining
J. Kopac (Slovenia)
188. Investigations on the suitability of some ferrous alloys for semi-solid processing
M.H. Robert, A.G.S. Galdino (Brazil)
196. The visualisation of discrete sequential systems
J. Świder, M. Hetmańczyk (Poland)



Industrial management and organisation

204. Integrated product and process system with continuous improvement in the auto parts industry
I.B. Silva, G.F. Batalha, M. Stipkovik Filho (Brazil), F.Z. Ceccarelli, J.B. Anjos, M. Fesz (Poland)



Indexes

211. Author index
212. Keywords index