



Photo essay

- 7.** Memories of the 16th International Scientific Conference on Achievements in Mechanical and Materials Engineering AMME'2008, 22nd – 25th June 2008 in Gliwice – Ryn, Poland
The Organising Committee of the AMME'2008 Conference



Research paper

- 11.** Prediction of cannon barrel life
R.A. Mahdaveinejad (Iran)



Properties

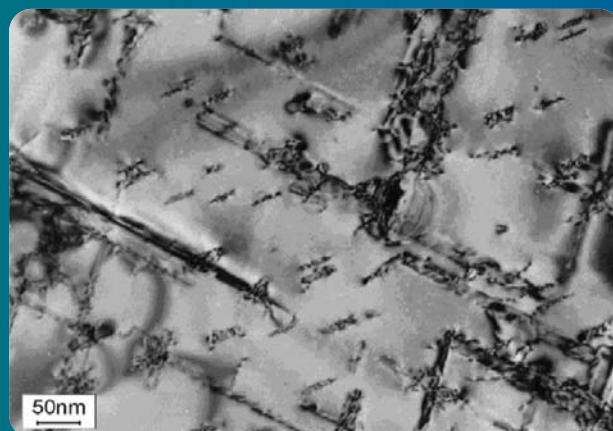
- 19.** Effect of heat treatment on the structure and fatigue behaviour of austenitic Fe-Ni alloy
K.J. Ducki, M. Cieśła (Poland)
- 27.** Structural and mechanical behaviour of TRIP-type microalloyed steel in hot-working conditions
A. Grajcar (Poland)
- 35.** The effect of intermetallics on the fracture mechanism in AlSi1MgMn alloy
G. Mrówka-Nowotnik (Poland)



Analysis and modelling

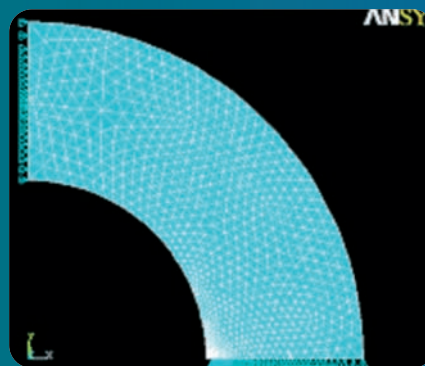
- 43.** Polar graphs and structural numbers in synthesis of active and passive mechanical systems
K. Białas (Poland)
- 51.** State of the art of the passive pedestrian safety simulation
A. Naddeo, M. Annarumma, M. Pappalardo, N. Cappetti (Italy)
- 59.** Analysis and modelling of rotational systems with the Modyfit application
S. Żółkiewski (Poland)

Selected materialographical photo



The paper entitled "The effect of intermetallics on the fracture mechanism in AlSi1MgMn alloy" by G. Mrówka-Nowotnik on a **page 35** demonstrates the fracture nucleation and propagation of 6082 aluminium alloy. Fracture toughness in aluminium alloys is one of the main obstacles to use these materials in widespread ways and, therefore, various aspects of fracture mode would be closely examined, pointing out the microstructure influence. Nucleation of voids is heterogeneous and most likely occurs by the debonding of the particle matrix interfaces. Other damage modes such as fracture of the intermetallic particles has been observed. These damage modes can significantly affect a macroscopic behaviour (tensile strength, fatigue strength, fracture toughness, and so on) of the investigated aluminium alloy under carried out tests. The damage of the 6082 aluminium alloy tested at room temperature can be clearly attributed to the following mechanisms: propagation of cracks by fracturing the intermetallic particles, crack preceded by the nucleation of voids results from debonding along β particle/matrix interfaces and α particle/matrix due to stress concentration in this region.

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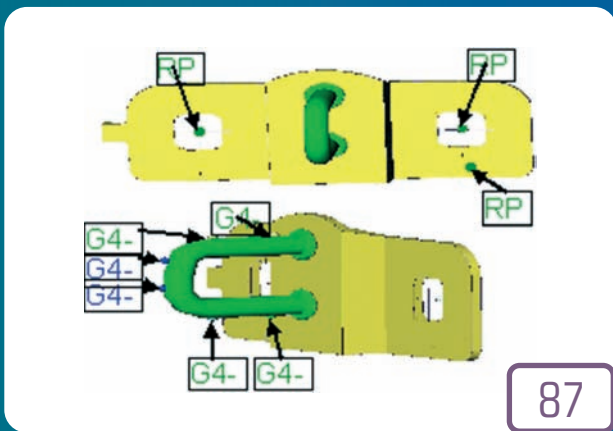
The research paper section represented by R.A. Mahdaveinejad on "Prediction of Cannon Barrel Life" on a **page 11** informs that calculation of the fatigue life based on attaining a critical defect size for fast fracture is very important. Cannon is one of the most used parts in military industries and analysis of this component is under consideration. Therefore, the prediction of its longevity to say, the number of cannon ball that can be fired till it is broken down should be under consideration. The methods of testing and analysis are believed to be generally applicable to problems in fatigue life evaluation. This analysis shows that the stress intensity on the tip of the crack is a function of its length and increases with the number of these cracks. Since the cannon barrel life is a convert function of the stress intensity of the cracks, multi-cracks condition passes the most fatigue cycling. The shape function of the cracks is also decreased with the number of the cracks. Characterisation of the cracking at a cannon bore is a difficult problem. This analysis shows that the critical cycle life of the cannon barrel occurs at two numbers of the cracks.

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In the paper entitled "State of the art of the passive Pedestrian Safety Simulation" by A. Naddeo, M. Annarumma, M. Pappalardo, N. Cappetti on a **page 51** the work of Design Methods' research group of the Department of Mechanical Engineering of Salerno University, in the research sector concerning passive pedestrian safety for vehicles is presented. The reaching of the elevated pedestrian safety performance, compatibly with the others, sometimes conflicting, performances, is one of the main targets to reach for the automotive industry by now and, above all, for the future. In such a context, this paper is intended to study the pedestrian injury at the impact with vehicles and methods of designing and constructing vehicles in order to reduce the damage itself. The carried out models show a very good degree of Numeric/Experimental correlation, and also virtual impactors, designed following EEVC-WG17 requirements were numerically certified. These impactors have been tested at higher speed and the authors have had a good correlation, even if some difficulties there was, regarding the critical behaviour of the foam that covers some impactors, solved following different model-design optimisation methods.



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Authors: D. Szewieczek, M.T. Roszak, D. Helizanowicz in the paper entitled "Methodology of the quality management in the productive process" on a **page 87** presents characteristics of the management methods and application of the processing point analysis in the chosen productive process. The quality management in the productive processes is essential in formation of the quality of the final product. It is particularly important in the motor industry. To solve the problem presented in the paper the authors used the method of the processing point analysis applied in the enterprises adapting the quality management model of the World Class Production. Methodology presented in the paper and the way of running the processing point analysis being an example of the quality management in the process may serve as the guide for realisation of similar tasks. Original application in the example of the methodology of the processing points analysis.



Manufacturing and processing

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M. Kisin, M. Noc Razinger, F. Pusavec, J. Kopac (Slovenia)



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79. The modern quality control of pre-production sphere in a company
M. Dudek-Burlikowska, D. Szewieczek (Poland)
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