



Materials

- 7. Analysis of the kinetics of precipitation of MX-type interstitial phases in microalloyed steels
M. Opiela (Poland)

- 19. Structural analysis of heat treated automotive cast alloy
E. Tillová, M. Chalupová,
L. Hurtalová (Slovak Republic) M. Bonek,
L.A. Dobrzański (Poland)



Properties

- 26. Effects of deformation rates on mechanical properties of PP/SEBS blends
O. Balkan, H. Demirer, E. Sabri Kayali (Turkey)

- 34. Interaction between hydrogen and a nitrided layer
J. Ćwiek (Poland)

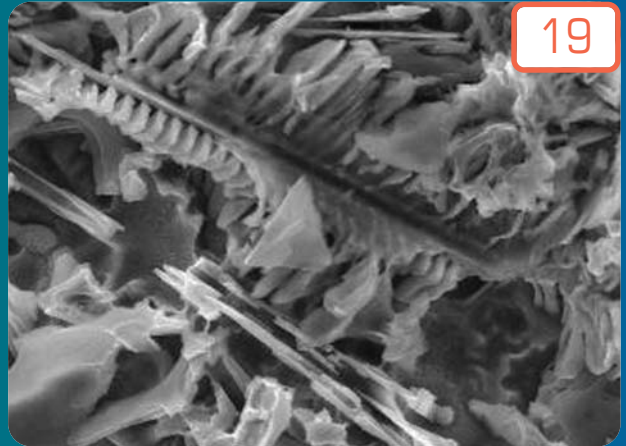


Manufacturing and processing

- 42. Laser surface alloying of sintered stainless steels with SiC powder
Z. Brytan, L.A. Dobrzański, W. Pakieła (Poland)

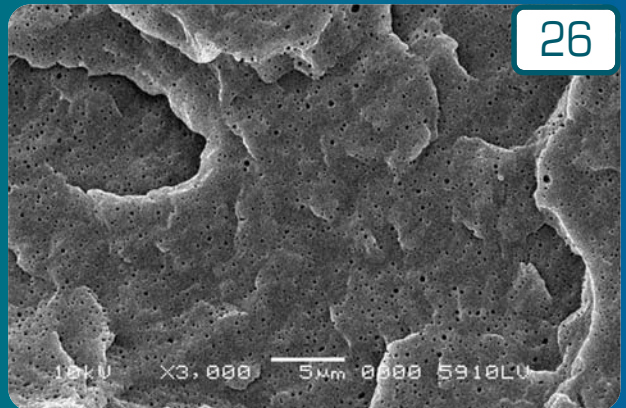
- 57. Automatic programming and generation of collision-free paths for the Mitsubishi Movemaster RV-M1 robot
K. Foit, G.G. Kost, D. Reclik (Poland)

19

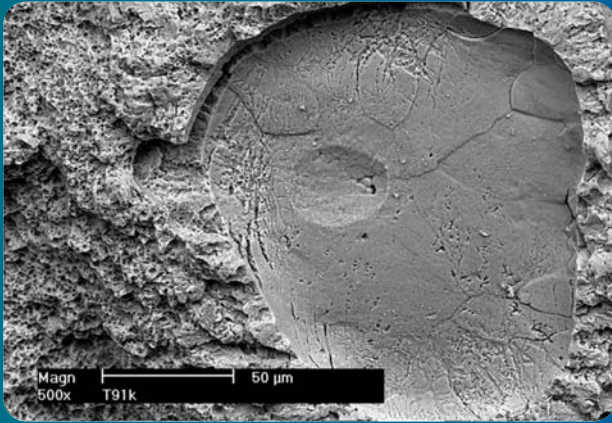


The Materials area section represented by E. Tillová, M. Chalupová, L. Hurtalová, M. Bonek and L.A. Dobrzański on "Structural analysis of heat treated automotive cast alloy" on a **page 19** is focused on study of the effect of solution heat treatment on mechanical properties and on changes in morphology of eutectic Si and Cu- and Fe-rich intermetallic phases. The results indicate that increasing solution treatment temperature results in spheroidization of eutectic Si, gradual disintegration of iron rich intermetallic phases on base $Al_{15}(FeMn)_3Si_2$, dissolution but also melting of intermetallic phases on base Al_2Cu-Si . Optimal solution treatment (515°C/4 hours) improves the most mechanical properties. Further increases of solution time, leads to alloy elongations, while both, the tensile strength continuously drop.

26

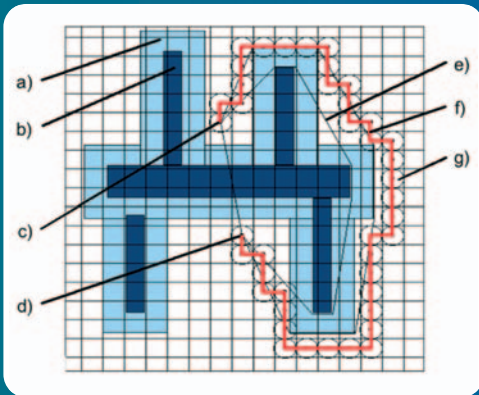


In the paper written by O. Balkan, H. Demirer, E. Sabri Kayali on "Effects of deformation rates on mechanical properties of PP/SEBS blends" on a **page 26** the study to examine effects of tensile deformation rates ($\dot{\epsilon}$) on tensile properties of polypropylene/poly(styrene-*b*-ethylene-*co*-butylene-*b*-styrene) copolymer (PP/SEBS) blends and to determine suitable $\dot{\epsilon}$ for accurate and reliable evaluation of mechanical properties of the blends in accordance with the results of Izod impact tests was made. PP/SEBS blends containing $\psi_s = 0, 2.5, 5$ and 10 volume % of SEBS thermoplastic elastomer were compounded using a twin-screw extruder, and then moulded with an injection moulding machine. Morphological analyses revealed that SEBS elastomer particles were well-dispersed throughout PP matrix in irregular forms with a narrow size distribution and evidenced a two-phase system formation. At a low deformation rate ($\dot{\epsilon}_1$), PP and PP/SEBS blends did not fail during tensile tests despite maximum tensile deformation, $\dot{\epsilon}_{max} = 600\%$; therefore, tensile toughness (U_T), stress and strain values at break point (σ_b and ϵ_b) of the blends were not determined. However, at high deformation rate ($\dot{\epsilon}_2$), all specimens tested in this study failed; a slight decrease in σ_b of the blends with SEBS elastomer was associated with a significant increase in ϵ_b and U_T . Strain-rate-sensitivity of PP/SEBS blends was promoted with SEBS elastomer.



34

The Materials section represented by J. Ćwiek on "Interaction between hydrogen and a nitrided layer" on a page 34 describes the influence of nitrided layer on 34CrAlNi7-10 steel to its susceptibility to hydrogen degradation. Investigation was carried out with the use of slow strain tensile rate test (SSRT). Plasma nitrided layers are effective barriers to hydrogen entry into structural steel which decreases susceptibility of steel to hydrogen degradation. Hydrogen is mainly accumulated in a compact nitrides zone. Evidences of no increase in brittleness of nitrided layers with absorbed hydrogen were observed. Plasma nitrided layers are effective barriers to hydrogen entry into structural steel utilized in aggressive environments, which could be potential sources of hydrogen charging of exploited steels. Plasma assisted nitriding provides the formation of thin compact nitride zone which protects high-strength steels against corrosion and hydrogen degradation. Evidences of no increase in brittleness of nitrided layers with absorbed hydrogen were observed.



57

In the paper entitled "Automatic programming and generation of collision-free paths for the Mitsubishi Movemaster R V - M 1 robot" by K.

Foit, G.G. Kost and D. Reclik on a page 57 the possibility to develop and implement the computer system, which can generate a collision-free path and prepare the data for direct implementing in the robot's programme is presented. The developed *PLANER* application has been adapted for cooperation with the Mitsubishi Movemaster RV-M1 robot. The current tests, together with the previous one carried out on the Fancu RJ3IB robot, have shown the versatility of the method and the possibility to adapt it for cooperation with any robotic system. This approach clearly simplifies the stage of defining the relevant points of the trajectory in order to avoid collisions with the technological objects located in the robot's manipulator environment. Thereby it significantly reduces the time needed for implementation of the programme to the production cycle. The method of generating the collision-free trajectories, which is described in the paper, combines some of the existing tools with the new approach to achieve the optimal performance of the algorithm.

66. Technology of laser repair welding of nickel superalloy inner flaps of jet engine

A. Klimpel, A. Rzeźnikiewicz (Poland)

75. Microstructure evaluation of the Al-Ti alloy with magnesium addition

K. Labisz, L.A. Dobrzański, R. Maniara (Poland),
A. Olsen (Norway)



Industrial management
and organisation

83. Application of estimation method of customer's satisfaction in enterprise focused on quality

M. Dudek-Burlikowska (Poland)



Technical paper

97. A mathematical model to choose effective cutting parameters in electroerosion, EDM

A. Medfai (Tunisia), M. Boujelbene,
E. Bayraktar (France)

103. Author index

104. Keywords index

105. Publisher's notice

106. Editor's notice