SUMMARIES

Karbowniczek M., Tuvnes P., Engh T.A.:

Foaming of EAF Stainless Steel Slags with Cr_2O_3 using Steelcal™

Metallurgy and Foundry Engineering – Vol. 34, 2008, No. 2, pp. 93÷104

Foaming of EAF stainless steel slags with Cr_2O_3 using Steelcal has been examined in a 10 kg laboratory furnace at the AGH University of Science & Technology in Krakow, Poland. Steelcal (a modified grade of calcium nitrate) has been injected through a lance into the molten slag in a crucible electric arc furnace with one electrode. 22 tests have been performed changing such parameters as the slag composition, injection gas, pure Steelcal or mixed with C or FeSi. The slag height has been measured. Steel and slag analyses have been carried out. The results of the tests have been evaluated.

Keywords: *slag foaming, arc furnace, stainless steels, slag*

Chyła P., Bednarek S., Łukaszek-Sołek A., Sińczak J., Skubisz P.:

Forging Process in Three Tool Folding Die

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The aim of the paper was presentation control lubrication influence on forging process and apply possibilities. Numerical modeling of the forging process in three tool folding die has been presented. Five different variants of lubrication method have been analysed in order to define lubrication influence on the filling process of the die impression. The results indicate full usefulness of presented lubrication method in planning forging technologies.

Keywords: *lubrication method, closed-die forging, numerical modellin*

Krawczyk J., Pawłowski B.:

The Effect of Non-metallic Inclusions on the Crack Propagation Impact Energy of Toughened 35B2+Cr Steel

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35B2+Cr steel was designed as a material for screws. The investigations were carried out on toughened samples, taken from three ingots of 35B2+Cr steel (delivered from three various steel suppliers), and of different content of non-metallic inclusions. In each case, the fraction of non-metallic inclusions was in agreement with the corresponding standard. This study presents the results of the research focused on the influence of non-metallic inclusions on the impact energy of crack development in 35B2+Cr steel. The role of non-metallic inclusions was considered both in relation to their total fraction and in relation to the fraction of oxides, sulfides, nitrides and exogenous inclusions separately. Assuming linear dependence between notch-root radius and the impact energy of crack nucleation,

basing on the impact toughness tests, the impact energy of the crack development was evaluated. It was proved, that in spite of the level of fraction of non-metallic inclusions compatible with the corresponding standards, they directly or indirectly influence the impact energy of 35B2+Cr steel. This influence depends on the character of the inclusions.

Keywords: *structural steel, impact energy of crack propagation, non-metallic inclusions, toughening*

Krawczyk J., Dziurka R., Rożniata E.:

The High-temperature Tribology of Iron Matrix Hypoeutectic Alloy after Under-annealing Normalizing

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This work includes the results of high-temperature tribology test of cast alloy with iron matrix. The paper presents the discussion on the results of the studies of wear mechanisms and friction factor of G200CrNiMo4-3-3 adamite cast steel after three variants of under – annealing normalization. During the heat treatment of cast steel four annealing temperatures were applied: 850, 900, 950 and 1050°C. Annealing was conducted for 10 h, and then the samples were cooled at a rate of 48°C/h to room temperature.
Four different annealing temperatures resulted in adequate differences in microstructure of test cast steel what determinated tribological properties of the material. Results obtained allow for determination of optimal, from wear resistance point of view, microstructure of test cast steel used for mill rolls.

Keywords: *cast steel, secondary cementite, wear, transformed ledeburite, friction coefficient*

Śleboda T.:

The Influence of Strain Rate on Microstructure and Mechanical Behavior of P/M FeAl

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As part of a broader study of the thermomechanical processing of P/M FeAl alloys, this research is focused on the influence of processing strain rate on the microstructural evolution and mechanical behavior of the processed materials. For the purposes of this study, water atomized FeAl powder was consolidated by hot pressing resulting in fully dense products. The consolidated P/M samples were thermomechanically processed in compression at 800 and 900oC at strain rates of 0.1 s-1 and 10 s-1, to a true strain of 1. The influence of thermomechanical processing parameters on the material flow and microstructural development of investigated alloy was analyzed. Considerable strain rate sensitivity of investigated alloy was observed, specially with reference to microstructural development.

Keywords: *FeAl alloys, microstructural evolution, mechanical behavior, strain rate, powder metallurgy*