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Cover Photo:

The cover figure demonstrates the simulated distribution of solid alloying inclusions in a turbulent flow of liquid steel (time-averaged velocities are shown in the central vertical plane) within an induction crucible furnace at the moment, when they just have left the free surface of the melt. The simulation is part of the model for optimization of admixture parameters, which is presented in the article by Mihails Ščepanskis and co-workers on page 169.

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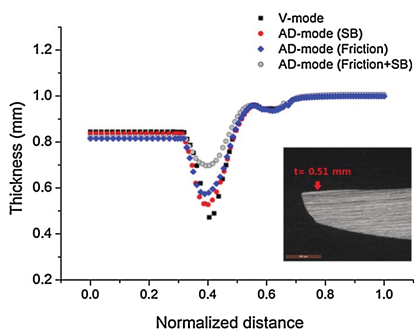
Contents

Full Paper

O. Majidi, F. Barlat,* M.-G. Lee, and D.-J. Kim

Formability of AHSS under an Attach-Detach Forming Mode

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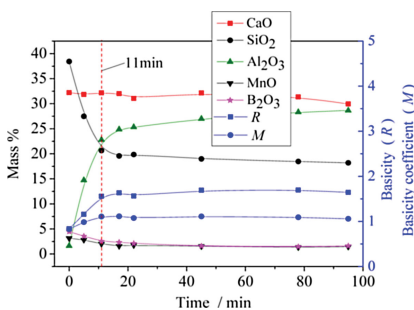


The FE simulation results demonstrate that the thinning tendency is limited by the simultaneous effects of friction coefficient reduction and springback after each detachment. It explains the increased drawability when the non-conventional forming mode is used compared to the conventional V-mode, as shown by the cup-drawing test results.

X. Fu,* G. Wen, Q. Liu, P. Tang, J. Li, and W. Li

Development and Evaluation of CaO-SiO₂ Based Mould Fluxes for Casting High Aluminum TRIP Steel

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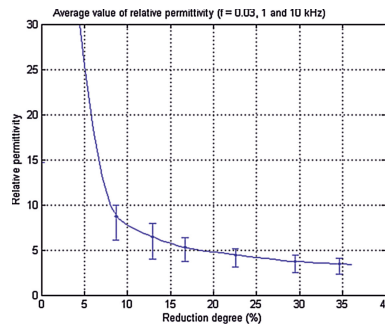


The content of SiO₂, B₂O₃, and MnO decreases while the content of Al₂O₃ increases during the beginning 11 min of the casting. Eleven minutes after the start of casting, the content of each component of the liquid slag remains almost the same, which indicates that the slag-metal reaction reached dynamic equilibrium at that time.

Contents

A. M. Heikkilä,* J. H. Pussinen,
O. J. Mattila, and T. M. J. Fabritius
**About Electrical Properties of
Chromite Pellets – Effect of Reduction
Degree**

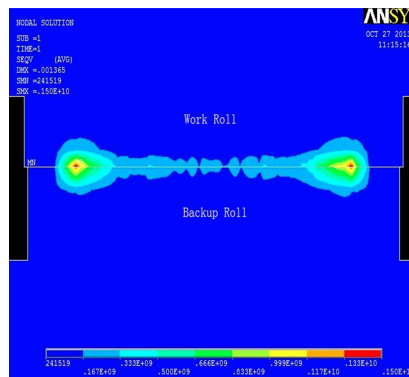
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Chromite pellets, which are used as a part of SAF charge, are considered. The electrical behavior as a function of reduction degree of the chromite pellets is studied. It is found out that increase in reduction degree decreased the electrical conductivity measured in room temperature.

Q. Dong, J.-G. Cao,* H.-B. Li,
Y.-S. Zhou, T.-L. Yan, and W.-Z. Wang
**Analysis of Spalling in Roughing Mill
Backup Rolls of Wide and Thin Strip
Hot Rolling Process**

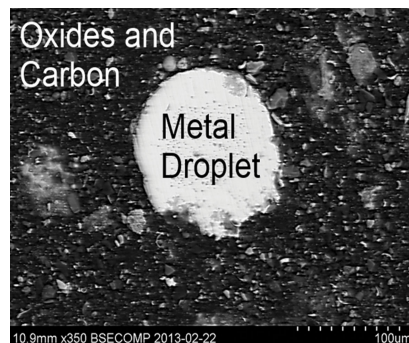
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Spalling causes of backup rolls in a roughing mill of a hot strip mill are investigated in this paper. The dominant cyclic stress applied on backup rolls is contact stress and its distributions in whole service periods of work and backup roll indicate that roll wear has significant impact on backup roll spalling.

A. Davydenko,* S. Mostafae,* A. Karasev,
and P. Jönsson
**Characterization of Briquettes Used
for Slag Foaming in the EAF during
Stainless Steel Production**

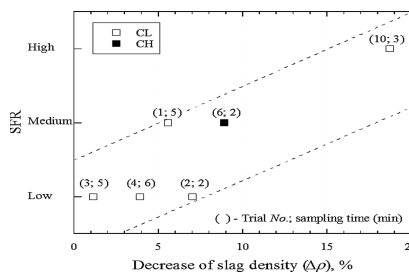
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This study is focused on a characterization of briquettes, which are used for slag foaming and waste product reduction in the Electric Arc Furnace (EAF) during the stainless steel production. The experimental data is compared with calculations according to the obtained results.

A. Davydenko,* A. Karasev, G. Lindstrand,
and P. Jönsson
**Investigation of Slag Foaming by
Additions of Briquettes in the EAF
during Stainless Steel Production**

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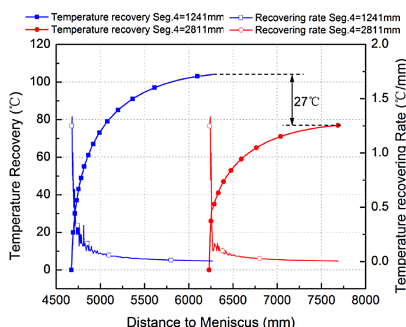
This study is focused on an investigation of slag foaming by briquettes additions in the EAF during the stainless steel production. The briquettes produced for industrial trials are characterized and used for slag foaming on an industrial scale. The obtained results are compared with calculations.

Contents

M. Long,* Z. Dong, J. Sheng, D. Chen, and C. Chen

Universal Secondary Cooling Structure for Round Blooms Continuous Casting of Steels in Various Diameters

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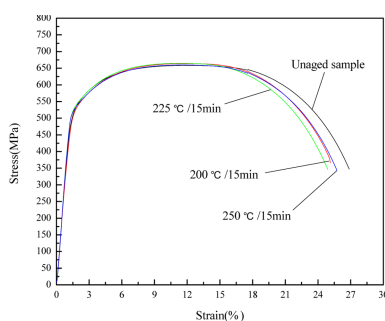


Based on the thermodynamic calculations, the optimal universal secondary cooling structure, and cooling system for continuous casting of round blooms in various diameters are studied by discussing the temperature recovery, temperature fluctuation, and solidified shell growth with a 2D heat transfer model. The results contribute to the efficiency and flexibility of round blooms continuous casting process.

X. Zuo* and R. Li

Research of Strain Aging in Pipeline Steel with a Ferrite/Martensite Dual-Phase Microstructure

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The high-deformability pipeline steel with a ferrite/martensite dual-phase microstructure exhibits a superior strain aging resistance aging at 200–250°C for 5–15 min. The yield ratios are below 0.77 and the pipe still exhibits continuous yielding behavior, meanwhile tensile strength, uniform elongation and impact toughness do not experience significant change.

M. Ščepanskis*, A. Jakovičs, E. Baake, and B. Nacke

A Model for Homogenization of Solid Alloying Admixtures in an Induction Crucible Furnace

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The paper presents a methodology for identification of homogenization time of alloying inclusions in an induction crucible furnace where particles are admixed from a free surface of a melt. The methodology is based on the Large Eddy Simulation (LES) Euler-Lagrange calculation of inclusions and a regression model for size of the inclusions and their density. The regression model avoids the repeated LES calculations and, therefore, is suitable for an optimization task.