Editorial programme: Issue 2/2013

Topical Theme:
Plant Engineering / Metal Forming

Ad closing date: 30 January 2013
Publishing date: 15 February 2013

Plant Engineering

Modernization of technology and automation of ThyssenKrupp Steel Europe’s CSP plant
Wolfgang Gruber, Reinhold Leitner and Walter Pitzer
(Siemens VAI Metals Technologies, Linz, Austria)
Since 1999 ThyssenKrupp Steel Europe AG operates a two-strand CSP-plant in its Bruckhausen, Germany works. In 2011, the company decided to thoroughly modernize the automation system of the thin slab caster, an integral part of the CSP plant. After this modernization project has been implemented, the CSP plant will be equipped with an integrated automation solution Siemens VAI.

New secondary cooling concepts to increase the efficiency and flexibility of continuous slab casters
Axel Weyer and Jürgen Frick
(SMS Siemag AG, Düsseldorf; Lechler GmbH, Metzingen – both Germany)
To ensure the flexible production of different steel grades at variable casting speeds and with a wide range of adjustable sizes (product dimensions), novel cooling concepts are needed. For secondary cooling this means that for all cooling strategies an as large as possible control range covering the whole product mix must be attained. Lechler and SMS Siemag have made joint developments and worked out effective overall concepts.

Metal Forming

Quality prediction of cast ingots by simulation
Ingo Hahn and Marc Schneider
(Magma Gießereitechnologie GmbH, Aachen, Germany)
Important effects in the manufacture of high quality cast products which take place during casting processes have been modelled and simulated numerically for more than 25 years. The state-of-art in simulation today makes it possible to carry out 3-D simulations of the teeming and solidification of ingots, where practically all relevant process parameters are considered. This makes it possible to perform quick and reliable virtual casting trials on the computer. In the present article, the significance and value of these kinds of virtual casting trials is illustrated – in particular with regard to shrinkage, centerline porosity, segregation, inclusions, residual stresses and cracks in the cast ingot. Furthermore, the value of the results from subsequent deformation simulations are increased through the consideration of the simulated cast ingot properties.

Innovation

Slab management in real time
Andreas Russow
(Hewlett-Packard GmbH, Bad Homburg, Germany)
Just because of their sheer nature and the rough conditions in the steel plant the efficient warehousing of slabs is extremely difficult. With the help of Hewlett-Packard, ThyssenKrupp has set up a new warehouse management system that was specifically developed for the needs in a slab adjustment department and that is able to define the location of the slabs precisely and in real time. The result: optimized workflow and capacities used to the full.

Energy efficient solutions in hot rolling mills – High pressure descaling with water buffer station
Peter Pawlitzki and Ralf Rehbein
(Schäfer & Urbach GmbH, Ratingen, Germany)
During slab or billet reheating in the reheating furnace of a hot rolling mill and the adjacent rolling process scale formation due to oxidation with the ambient oxygen occurs. This formation of primary and secondary scale has a negative impact on surface quality of the rolled material. The scale has to be removed by hydro mechanically operating descaling systems using high pressure water jets. A new descaling concept, designed and built by Schäfer & Urbach, brings the efficiency of high pressure descaling to a new level by introducing a water buffer station. This allows the descaler not only to work continuously but also to be active in a missed or failed heating pass.
pressure pumps in the furnace area and in the rolling mill. This report gives the concept of high pressure descaling systems with and without a water buffer station. The potentials for energy efficient and resource saving process techniques are shown. The energy use for descaling in hot rolling mills can be reduced drastically by using descaling systems with a water buffer station.