Metals Forming

New compact tandem cold mill – all-in-one solution for efficient cold rolling
(The article appears in English language)

Thorsten Bode, Rüdiger Holz and Christoph Schwarz
(SMS group, Düsseldorf, Germany)

SMS group has developed a bunch of new technological solutions, ensuring an even more flexible, economically and ecological efficient plant. By using the newly developed features, it is possible to design new plants in a much more high performance way. An example is the high performance tandem cold mill equipped with smaller work rolls, resulting in lower investment and operating costs. Further innovative mill features like the newly designed exit side Twin Reel and redesigned mill auxiliaries, help cutting investment and operation costs.

Determining the mechanical stress distributions in the adjusting unit of a roll stand

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(Universität Siegen, Siegen; Willy Zahn Maschinenbau GmbH, Olpe – both Germany)

In roll stands the requested thickness of the rolling stock is realized by modification of the distance between the work rolls. During the adjustment the force transmission is realized by means of a circular pressure plate that is pressed against a supporting bar. Due to the geometries of both components the applied load led to formation of cracks at the top of the pressure plate. In the following article the stress-distribution in the force-transmitting components is evaluated by numerical simulations. A comparison between the occurring mechanical stresses and the strength of the material is performed for different component geometries in order to figure out why and under which preconditions the pressure plate is damaged.

Plant Engineering

RFID technology avoids work roll mix-up in a hot rolling mill

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In order to ensure the correct assignment of the approx. 180 work rolls of the finishing line of the hot strip mill Bochum works of thyssenkrupp Steel Europe AG a new system based on RFID technology has been implemented. The correct selection and positioning of work rolls is imperative to achieve an optimum production. Characteristics as material, diameter, shape, surface and grinding type are key attributes which differentiate work rolls for a customized application. A work roll set configuration not matching a rolling schedule or the incorrect positioning in the mill stand can lead to severe disruptions or quality losses.

Smart production and process innovation for SBQ production

Stefan Schwarz and Jörg von der Heiden
(Friedrich Kocks GmbH & Co KG, Hilden, Germany)

Since its market introduction the three-roll Reducing and Sizing Block RSB is known as the reliable tool for the economical production of SBQ bar and wire rod. The latest generation of this established and well-proven three-roll block from Kocks is the RSB SCS. The new offers improved productivity, mill availability and economy as well as a simplified, safe and environmentally friendly operation. A new modular drive concept grants a smaller footprint in the layout, a reduced oil-lubrication volume and a simplified maintenance schedule. Both a new dynamic stand changing and a new roll gap adjustment concept
allow the automatic stand change in less than three minutes and the immediate stand adjustment in the mill line (under load) in milliseconds.

**Coating decreases material losses caused by scale formation during reheating**

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(VDEh-Betriebsforschungsinstitut GmbH, Düsseldorf; Dörken MKS-Systeme, Herdecke; Walzwerke Einsal GmbH, Nachrodt, all Germany)

A coating layer serving as oxygen barrier to reduce scale formation during re-heating of steel was developed. By a chemical bottom-up synthesis defined properties of the coating layer like e.g. thin layers and appropriate adhesion and application properties were adjusted in a very exact way. The scale formation could be reduced by up to 80 % leading to a significant higher material efficiency. The formed scale is very uniform and easy to remove leading to less surface defects caused by scale residues and less wear at the tools.

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**Innovation**

Rule-based process automation implemented at thyssenkrupp Steel Europe proves highly successful: Clear view of all coil transfer activities in a hot strip mill

Sebastian Weber and Thomas Niepmann

(thyssenkrupp Steel Europe AG, Duisburg; 3tn Industriesoftware GmbH, Holzwickede – both Germany)

thyssenkrupp Steel Europe has renewed its coil transfer system as part of the modernization of its No. 2 hot strip mill in Duisburg-Beeckerwerth, Germany. For the system upgrade, 3tn replaced the existing material tracking and warehouse management system by its standard rule-based warehouse management system TWMSmetals, however, in an enhanced version featuring additional functionalities tailored to the specifics of coil transfer operations.

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