Compact hybrid suspension for BOF converters

A NEW solution for the suspension of BOF converters combines the proven, maintenance-free ConLink suspension system of Siemens VAI with lamella-type elements mounted below the trunnion ring. The result is a space-saving converter suspension that enables the converter vessel to expand without obstruction. The compact dimensions of the Simetal Compact Link allow the converter capacity to be maximised for the available space. The suspension system is also suitable to retrofit existing converters, and has already been successfully installed on three converters in the steelworks of voestalpine Stahl in Linz, Austria.

Converter vessels are subject to high thermal stresses during operation that lead to substantial thermal expansion and deformation. The converter is connected to the trunnion ring by a suspension system that has to compensate for these effects.

Increasing productivity demands and the resulting large converter sizes of today place enormous burdens on the suspension system. To date, there have been two main technical approaches for supporting high suspension loads: a static suspension system with link elements, and a radially flexible lamella suspension system of compact size.

The Simetal Compact Link combines the advantages of both of these suspension types by incorporating vertical lamella elements and horizontal links. Depending on requirements, the links can be positioned either above or below the trunnion ring. As the lamella elements also absorb some of the forces acting horizontally, the horizontal links can be dimensioned smaller as they no longer have to bear all of the horizontal forces. Arrangement of the horizontal links and lamella elements below the trunnion ring means that all of the suspension elements are located in a protected area.

Three LD converter plants in the Linz

Steelworks of voestalpine AG have been outfitted with the Simetal Compact Link converter suspension system. As this solution requires less space than the previously installed suspension system, the tapping weights of these converters can be increased to 180t. This has expanded the plant’s steel output from 5.45 to 6Mt/y. The insights gained from this first implementation have already been applied to further improve and optimise the system.

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ThyssenKrupp CSA Brazil
starts BOF shop two

THE BOF converter at the second production line of the ThyssenKrupp CSA Siderúrgica do Atlântico steel mill started up last November.

Supplied by Siemens VAI MT; the contract included a slab caster which made its first cast in September.

Overall for the steelworks, Siemens VAI has supplied two basic oxygen furnaces, secondary metallurgical facilities, primary and secondary dust-cleaning systems, two continuous slab casters, and the associated electrical and automation equipment.

The steelworks is designed to produce 5Mt/y of slab, 60% of which is to go to supply TKS’s new start-up in Alabama, USA and 40% to its plants in Germany.

The steel mill is located in Sepetiba in state of Rio de Janeiro. Steel is produced in two 330t BOF converters equipped with the maintenance-free ConLink vessel-suspension systems, quick-change oxygen lances, pneumatic slag stoppers, subslances and bottom-stirring systems. The secondary metallurgical plant includes two ladle-blowing stands for steel homogenisation, a chemical-heating stand, and an RH vacuum-degassing plant.

The RH tank has a combined oxygen-blowing (COB) lance for decarburisation and precise adjustment of the steel quality. A dry-type primary dust-cleaning system was used here for the first time in South America. It is designed to recover and clean 282600Nm3 of converter offgas per hour. The waste heat from the converter offgas is also used to generate steam in a boiler plant. The secondary dust-cleaning system has a capacity of more than 2.2Mm3/h.

ArcelorMittal doubles capacity at João Monlevade

ArcelorMittal Monlevade, part of the ArcelorMittal Long Carbon Americas Division, is a long product manufacturer with a present production capacity of about 1.2Mt/y of crude steel. The company is currently carrying out a comprehensive expansion programme at its João Monlevade steel mill located in the Brazilian state of Minas Gerais which will double capacities throughout the entire process chain. In the course of this programme both of the existing 130t BOF converters will be equipped for parallel operation.

Siemens VAI will design and supply the hot-metal desulphurisation station, ladles, deslagging stands, the ladle and slag pot transfer cars, and the associated electrical and automation equipment. The material-feeding system will also be expanded, and its alloying capacity doubled. The scope of supply also includes two secondary dust-cleaning systems with cleaning capacities of 800 000 and 1 000 000m3/h respectively. Offgases from hot-metal desulphurisation, the converters, the hot-metal supply and secondary steel refining will all be cleaned.

Capacity will be doubled by 2012.

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Steelmaking

April 2011 – Steel Times International
A NEW Vessel Manager’s software and hardware that monitors temperature changes over the entire surface of metal ladles helps assure plant safety by warning of potential break-outs and provides trend data to establish efficient re-lining schedules.

Designed for steel mills and other molten metal processes, the system provided by Land Instruments International includes multiple Thermal Imaging cameras positioned to view the entire exterior surface of a ladle. Temperature information is collected each time the ladle passes a measuring station, allowing assessment of the extent and distribution of wear to the lining. The system’s software creates actionable records for each ladle.

Vessel Manager data helps prevent two serious problems by:

– Accurate statistical measuring of lining wear to allow managers to set realistic re-lining schedules, reducing both the cost of too-frequent maintenance and the risk of break-outs.
– Constant recording of temperature changes helps identify ladles that are threatening to fail earlier than predicted, sounding an alarm and lessening risk of plant damage and worker injury.

By identifying the exact location of unexpected hot spots in a particular ladle, the system allows some partial re-linings to extend the life of the ladle.

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NEW Zealand based LanzaTech has signed a memorandum of understanding with Posco for the implementation of its gas fermentation technology to convert the steel maker’s CO from its BOS converters to ethanol and other value added products.

LanzaTech uses non food renewable resources to produce ethanol and also 2,3-Butanediol (2,3-BD), a key building block used to make polymers, plastics and hydrocarbon fuels. It has investment from K1W1 (New Zealand), Khosla Ventures (US) and Qiming Ventures (China) as well as funding from the New Zealand and US governments.

LanzaTech chief executive Dr Jennifer Holmgren comments: “Posco’s environmentally conscious policies are consistent with LanzaTech’s technology vision of reducing the carbon footprint while increasing energy efficiencies at industrial facilities. The proposed licensing by Posco of our patented microbe and fermentation process fits with our growth strategy in Asia.”

Noi-Ha Cho, chief technology officer of Posco, says gas fermentation technology creates greater value from by-products of the steel process.

“It provides a new way to produce green energy and it will also contribute to reducing CO2 in steel plants,” he says.

This is the second signing with a major steel company. In June 2010, China’s Baosteel signed an agreement to build a demonstration plant due to be completed later this year.

LanzaTech has run a pilot plant using its technology at NZ Steel at Glenbrook, Auckland since 2008. A demonstration plant is the last stage before commercial operation.

For further information on the technology follow the link:

THE Japan Steel Works (JSW) has received a 150t Electroslag Remelting (ESR) plant which will be the largest single electrode static melting ESR plant in the world when commissioned.

Supplied by Consarc Corporation, USA, the ESR furnace consists of two furnace heads with two melt stations, and is capable of melting a single 150t electrode, or multiple smaller electrodes simultaneously, under complete inert gas cover. It employs proprietary power systems designed and built by Consarc specifically for this large scale ESR. The furnace system was designed, manufactured, preassembled for test, and shipped from Consarc’s world headquarters in Rancocas, NJ USA. JSW plans to put the ESR furnace into production in August 2011.

JSW’s Muroran Plant boasts some of the world’s most modern and technically advanced equipment including a 14kt hydraulic forging press. The plant manufactures a wide range of forged and cast products used to support the global energy sector.

The world’s largest single electrode ESR plant awaiting shipment to Japan