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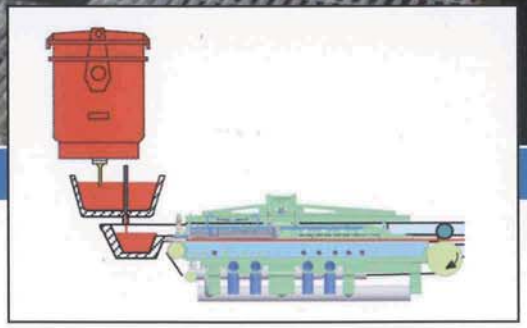
Regenerative flameless burners for reheating furnaces



Implementation of belt casting technology

Contents Volume 33 No. 5 – October 2010

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Cover photo:
Tenova FlexyTech® TRGX burners at a reheating furnace

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New mill stand type for long products rolling

During the last few years the most frequently used type of rolling stands for long products have been housingless and cantilever stands. The Italian engineering company Pert has now developed a new mill stand type to achieve higher yields in new and in revamped rolling mills with low investment costs. This development is a valid alternative to conventional stands as it provides for a dramatic increase in rolling load and for quick production programme changes.

During the last few years the most frequently used type of rolling stands for long products have been housingless and cantilever stands. Frequent requests from steel works aiming at lowering capital investments for complete rolling mills or for revamps of existing plants refer to the following aspects:

- reducing investments in civil works, buildings and cranes,
- reducing equipment delivery times,
- reducing investment cost for the mill train,
- reducing spare parts,
- hydraulics integrated in the machine,
- easy maintenance,
- high-performance equipment.

In other words, the rolling mill operator is primarily interested in lowering costs and increasing yields. In order to cater to these requests and suggestions by production and maintenance managers, Pert has developed the new generation of Bi Support stands (BS type stands). A vertical stand configuration of a roughing stand dia. 550 is shown in figure 1 in comparison with a traditional stand.

Being a further development of the traditional housingless and cantilever stands, the new BS type stand is a valid alternative to conventional equipment as it provides for a dramatic increase in rolling load and quick production programme changes. The advantages of this new type of stands can be summarized as follows:

The stand features a compact and rigid construction of the body, which is made of fabricated and not of cast components. Due to the new design, the rolling stands are extremely stiff (figure 2). Very close tolerances can be achieved during rolling even with a varying rolling process.

For the new stand rings are used instead of traditional cast iron rolls. Ring shafts of alloy steel are mounted in multi-roll bearings (in the intermediate and finishing area). The radius of the neck is dimensioned to minimize strain concentrations. Adjustment of the ring center distance is by means of simultaneous opening/closing of both shafts by screwing down gears which directly act on eccentric sleeves. The ring center distance will be encoder controlled and displayed at the main control pulpit. Regulation of the ring center distances is by hydraulic motor with double worm screw reduction gear in order to ensure absolute precision. Easy access to the stands facilitates ring change, removal of cobbles, maintenance, regulation of guides. High axial and radial rigidity are among the benefits of the stand design.

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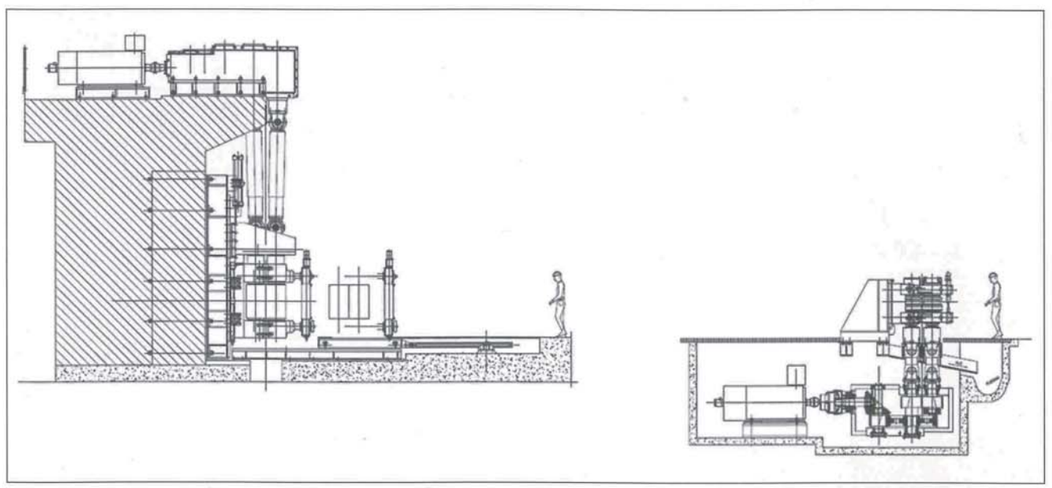

Figure 1. **Vertical roughing stand, traditional design (left) and the Bi Support stand (right)**

The new rolling stand design provides for an operator-friendly arrangement of the rolling line and flexible production of high quality products. In terms of economy and operation, the stands feature various benefits in comparison with today's conventional stands, for example: change-over times are short, downtimes for programme changes are minimized and stand replacement is easily performed. The changing time for a single stand is less than 2.5 minutes.

Due to the fact that horizontal and vertical stands are of the same design, the number of operational spare parts is minimized. Bearings and even the spindles are protected against water and scale. Exchangeable rings fastened on roll shafts result in low operation costs. The use of rolling rings requires smaller tools for machining the grooves and reduced storage space for the rings. The installed rings made of high-strength tool steel make for a longer groove life, resulting in an improved plant utilization factor.

Smaller overall stand dimensions reduce the effort involved in building foundations and require less space in the mill building. Due to the lower weight of the stands, less overhead crane capacity is needed. Erection times are reduced. The new stand developed by Pert can be used in different areas of the mill train. Their reduced dimensions make the stands suitable for installations with limited space or for revamping existing mills.

The newly developed Bi Support stand (BS type) was launched in spring 2010, meeting with great interest in the industry and being confirmed by an immediate contract for the revamping of a bar rolling mill in Ethiopia. Thanks to the installation of the new stand type and a new double strand finishing block, production of the plant will be increased and the quality of the final products improved. After the revamp, the facility will be one of the most modern rolling mills in Africa. ■

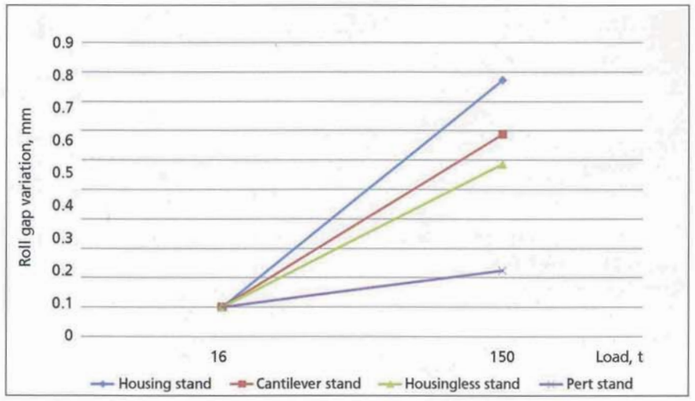

Figure 2. **Stiffness of different stand types**