Case note
Synchronized drive control prevents damage in aluminium lifting

Synchronized control provided by ABB drives, ensures that the crane hooks operate together, giving a smooth, balanced lift and descent.

Aleris Aluminium Duffel BVBA located in Belgium, is part of Aleris International, Inc., a global leader in aluminium rolled products and extrusions, aluminium recycling and specification alloy production.

Expansion in 2007 saw the company invest in five new cranes. Four of the electric overhead travelling (EOT) cranes are identical and operate in two directions - cross travel and long travel - having a 15 metres span and a lifting capacity of 2 x 12.5 tonnes.

The fifth crane has the same lifting capacity but with a span of 28.6 metres, it is used in the warehouse for stacking and storing the aluminium plates. As such it has the ability to rotate through 270 degrees in order to cover all the floor area.

Belgium's leading crane and steelworks manufacturer, Timmers Cranes and Steelworks (TCS) was selected as the Aleris partner.

The cranes are fitted with Demag hoists along with a second brake; a platform spanning the entire length; and radio control. An ABB industrial drive with crane control program is being put to use on all five cranes to assist in lifting the aluminium plates.

ABB industrial drives bring accurate control when lifting aluminium plates.

Symmetrical lifting

During lifting, the aluminium plates must be held perfectly horizontal to avoid any slipping of the load. The two hooks, therefore, pick up a vacuum lifting device at its extremities.

Hook 1 and hook 2 need to be perfectly synchronized when lifting the aluminium plates. Each hook is driven by a 40 kW geared motor, with a 40 kW ABB industrial drive being used to vary the speed of each hook as it approaches the plate. The drives work in a master-follower arrangement and synchro control.

To ensure accuracy, an encoder device, located on the motor shaft, is used to feedback the position of each hook to the respective low voltage AC drive. This function of the encoder is essential in synchronizing the drive, based on the position of the master as measured by the encoder.

“A crane operator expects his crane to react immediately. Any delay leads to frustration and possible accidents,” says Leo Cazaerck, project manager for the Aleris expansion including the crane installation. “But using fiber optics to communicate directly between the two drives gives a faster response without the need for any external hardware. The crane operator gets instant results without any frustrating delays in positioning or lifting. And there will be fewer maintenance problems making the solution more cost efficient.”

The accurate, synchronized control is achieved by ABB’s crane control program. This features synchro control, which uses fiber optics to communicate directly between the two drives, giving a faster response without the need for any external hardware.

The crane control program works together with the direct torque control (DTC) motor control platform to provide accurate, slow speed control with high torque levels.

Among the benefits of the solution are less risk of damaging the material through the smooth operation, which ensures that loads are put down gently. This is important in ensuring that end-users of the material receive scratch-free finished products.

Challenge

– Accurate control of cranes lifting aluminium sheets

Solution

– Synchronized control of the ABB industrial drives with crane control program ensures that the crane hooks at each end of the aluminium sheet operate together, giving a smooth, balanced lift and descent

Benefits

– Smooth control ensures that aluminium sheets can be moved without damage, ensuring that end-users receive sheets that are scratch free

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