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## Packaging plant saves £70,000 on replacement drive project with ABB

A manufacturer of corrugated cardboard packaging has saved nearly £70,000 by using ABB motion control products in a refurbishment project on a cardboard sheet stacking machine.

Smurfit Kappa is one of the UK's leading producers of cardboard packaging material. One of its major facilities is in Mold, North Wales. The plant has a stacker designed to allow the continuous stacking and discharging of cardboard sheets. It consists of two hydraulic lift tables, each fed via five conveyor sections. The speed of each conveyor section was controlled by its own 7.5 kW servo drive to match the loading cycle of the lift tables but when this failed the company turned to ABB for support.

Phil Davies, Senior Electrical Engineer for the plant: "We approached the stacker OEM for a replacement servo drive but were informed that these were now obsolete and no longer stocked. Fortunately we could loan a spare drive from our sister plant in Dublin while we looked for a permanent solution."

The OEM was able to offer Davies a newer servo drive, but at a cost of £7,600 per drive. "The company also recommended that we had a service engineer on site to oversee the installation and carry out the subsequent commissioning. This would have meant an investment of approximately £82,000 and require a week's shutdown to install, had we decided to replace all of the drives in one go."

To find an alternative solution, Smurfit Kappa approached ABB, which was already a preferred supplier of variable-speed drives at the plant. ABB offered two options. The first involved supplying an ABB industrial drive and a new motor gearbox. The second option involved an ABB motion control drive, ACSM1, and reusing the existing servo motor gearboxes.

Says Davies: "At first sight, the first option looked like the simpler solution, given the reasonably straight forward application of controlling the conveyor's speed. However, the additional work involved with changing all the existing servo motors for standard AC Motors, made it physically a much bigger project than the second option."

Yet, the second option presented its own challenges, as the company had limited experience with installing and commissioning servo drives. Davies was reassured that ABB could provide all the technical support needed with option two. The option was less expensive than the one proposed by the stacker OEM, with the cost for one servo drive, complete with a filter, choke and resolver interface card representing a 70 percent saving on the alternative solution.

The first stage of the project involved installing an ACSM1 to prove the equipment, which was completed over a weekend. Says Davies: "We were able to install the new drive alongside an existing drive and do most of the cabling in advance. This allowed us time to commission the drive and ensures the speed of the conveyor is correct."

The ACSM1 worked with the original permanent magnet motor and set up and commissioning went ahead with no major problems.

The next step was to decide whether to change all of the remaining drives or just enough to release some spares. Says Davies: "As the stacker is in two levels, each with its own control cabinet, a sensible

solution was to replace all of the drives in one level. This would help keep investment to a minimum whilst freeing up spares for the other level and also for other plants within the group.”

As the replacement drive was on the lower stacker, it was decided to replace all the servo drives in this unit, including an obsolete AC drive controlling a vacuum fan.

All of the old equipment was removed and one ABB general purpose drive and five ABB motion control drives were installed along with associated control gear. “As the new drives came with easy to use key-pads, that can display multiple lines of useful information, we decided to mount these on the panel door to make programming, fault diagnosis and monitoring easier in the future,” says Davies.

“As modern drives are more energy efficient than 20 year old drives we carry out an energy consumption comparison between the modified lower stacker and the original upper stacker. The eight hour monitoring, with an energy profile logger, showed that over a year the modified lower stacker would save over £1,000 in energy costs which equates to 7.9 metric tons of CO<sub>2</sub> saved per year. This is in addition to the savings the project has already made.”

“Overall, this was a very good solution in lots of ways,” concludes Davies. “We increased the serviceable life of the stacker for many years to come and saved in the region of £70,000 by not using the OEM’s solution. As well as this, we gained a better understanding of how our machines work through a process of in house development, as well as built a good relationship, support network and trust in our supplier, ABB. In addition, by removing the existing drives on the stacker, we gained a stock of spares to support several plants within the SK Group with the added bonus of saving over £1,000 per year in energy costs.”

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**Caption:** ABB motion control products have saved Smurfit Kappa nearly £70,000 in a refurbishment project on a cardboard sheet stacking machine.

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