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Packaging manufacturer cuts annual energy costs on baler machine

A manufacturer of cardboard packing is saving nearly £2,800 a year on electrical energy costs following the installation of an ABB variable speed drive on its baler machine.

Smurfit Kappa's Northampton plant produces packaging such as fruit and vegetable trays, fresh produce boxes and retail-ready packaging. The hydraulic baler is used to compact offcuts from the company's cardboard processing lines into large bales ready for transport to a recycling plant.

The company wanted to improve the energy efficiency of the baler, which uses a motor-driven pump to compress the hydraulic fluid. This motor originally ran at a fixed speed. When hydraulic pressure reached the set point, excess fluid was diverted through a pressure relief valve. This excess fluid represented wasted energy that had not resulted in any useful work.

Another problem was the excess temperatures generated by the constant use - leaving the hydraulic motor on full demand meant that Smurfit Kappa had to install an additional motor-driven fan to keep it cool.

Chris Sims, Energy and Environmental Officer for Smurfit Kappa asked ABB Drives Alliance member Inverter Drive Systems (IDS) to look at the energy saving potential of the application. Says Sims: "We originally selected IDS through a third party who had recommended the company for energy saving projects in different areas. IDS had already installed or modified some motors on other applications, so I invited them to look for more energy saving opportunities."

Smurfit Kappa and IDS monitored the energy use of the baler. Investigations showed that the measured power consumption was 11.1 kW and the baler ran for 6,336 hours. At an energy cost of 8p/kWhr, this gave a total running cost of the baler of £5,626.

IDS installed a 30 kW ABB general purpose drive, ACS550, as well a pressure transducer. Andy Crocker of IDS says: "The pressure transducer gives a 4-20 mA output that is proportional to the pressure. On the drive, we have the set point at just below the valve opening pressure. When the hydraulic ram is moving and fluid is therefore flowing, pressure drops, so the drive speeds up the motor to maintain pressure. When the ram is not moving, pressure rises so the drive slows the motor."

This arrangement means the drive can always give the pressure and flow needed without opening the relief valve and wasting the pressure in the fluid.

Following installation of the variable-speed drive, which took less than a day to complete, the power consumption was measured again and shown to be 5.6 kW. This gave a reduced energy cost of £2,838 a year, a saving of £2,788, with a payback time of just over 17 months.

Adds Sims: "As well as the energy saving aspect, there has also been a reduction in noise from the application and the motor now also operates at a lower temperature. IDS were also very professional in their installation procedures and worked around our production times to minimise disruption."

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Caption: Smurfit Kappa is saving nearly £2,800 a year on electrical energy costs following the installation of an ABB variable speed drive on its baler machine.

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