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ABB drives cut £25,000 off energy costs for asphalt plant

Over £25,000 of energy costs per year are being saved by an asphalt production plant following the fitting of ABB variable speed drives.

Express Asphalt, a subsidiary of Aggregate Industries, produces 40,000 tonnes of asphalt a year at its depot in Darwen, near Blackburn, Lancashire, mainly for local authorities and utility contractors.

The asphalt production process involves a burner supplying heat to an aggregate dryer in the form of a rotating drum. The dryer dries the aggregate at a temperature of 150 degrees centigrade, a process that creates steam and dust. These are extracted by an exhaust fan, with the dust captured in filter bags for reuse.

Because the 90 kW fan was run at full speed with its output damped, it was wasting a lot of energy. Rick Harbour, works manager with Express Asphalt says: "The dryer exhaust fan effectively creates a pressure to draw the steam and dust out, but because the motor was running at 50 Hz constantly, it was doing too much work. This was the largest energy user in the process and we wanted to find a way of making it work as efficiently as possible."

The company asked Rick Hinde of Invertech Solutions to look at ways of controlling the exhaust fan with a variable speed drive. Steve Smith of Beta Power supplied a 110 kW ABB standard drive for the fan. "The fan had its damper placed in the fully open position and the dryer pressure was then controlled via a pressure transmitter feeding a signal back to the ABB drive", Hinde explained.

Invertech Solutions went on to install a 30 KW ABB drive to the dryer. "We experimented with adjusting the speed of the drive to obtain the optimum drying. The burner uses kerosene and we found that running the drive at 55 Hz gives the optimum drum rotation speed for drying. This meant we used half a litre per tonne less of kerosene than before, saving Express Asphalt £8,000 per annum in burner fuel costs. When they are not drying aggregate, the drive ramps right down to a low speed. "

This led to savings of £500 a month in the cost of electricity to run the exhaust fan, cutting energy use from 20 kW per tonne of asphalt produced to between 4 and 5 kW. Payback time was less than 12 months.

Together with other ABB variable speed drives on the bitumen pump, the rotating dryer, the hot stone elevator, the mixer and the batch elevator, as well as other energy saving components such as timers, the plant is saving a total of £1,500 a month on its electrical energy costs. Together with the reduction in burner costs of over £600 a month, this is a total energy cost reduction of around £2,100 a month, or £25,200 a year.

Other benefits include a 5 dB reduction in noise in the asphalt drying area, as well as reduced wear and tear. "We found that previously we were getting a lot of breakdowns because the dryer fan was working so hard all the time. This was losing us up to 20 production days a year, but since the installation of the ABB drive, we have had no more than six lost days," says Harbour.

He adds: "We have been very pleased with the way the project has gone and it has led to us being shortlisted for the Carbon Management section of the Lancashire Business Environment Awards. The

project is also being replicated at other sites throughout the group, so we should see further savings company wide.”

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Caption: Over £25,000 of energy costs per year are being saved by Express Asphalt following the fitting of ABB variable speed drives.

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