

Really Useful Products makes useful savings

Plastics manufacturer Really Useful Products says it is enjoying a 10% increase in productivity – equating to an extra £3 million of turnover – yet without investment in additional machinery.

The reason: creative ideas from IsoCool that have significantly reduced manufacturing cycle time. In addition, the process cooling specialist's IsoFC energy-saving device, which IsoCool retrofitted onto the plant's existing system, is set to reduce cooling costs by more than £18,500 every year.

A spokesperson for the West Yorkshire-based manufacturer explains that its plant's mould and hydraulic machines are in operation 24/7 – and that, historically, the mould circuit was cooled by a single water chiller, with a 316kW cooling capacity, plus an air blast cooler for the hydraulic oil cooling circuit.

That system was costing around £33,000 a year to run, so when an issue



with flow capacity arose, as well as a suspected fault with the cooling system, Really Useful sought help from IsoCool.

IsoCool managing director Nigel Hallett explains that the chiller had an integrated tank and pump group, which was insufficient to meet the demand.

"It also occasionally caused air ingress problems when tools were

changed," he says. "To solve both of these issues, we installed a weir tank, and separate chiller and process pump sets, with variable speed drives. Due to the weir tank design, air contamination is no longer a problem, as the tank self-vents the return water from the process."

IsoCool also improved the mould cooling system by installing large process pumps, which, in turn, reduced cycle times on the injection moulding process – so saving on machine time.

However, having upgraded the existing system, IsoCool proposed an additional solution to lower energy consumption even further, by retrofitting its IsoFC energy-saving device.

Now, during low ambient conditions, the IsoFC uses surplus capacity from an ambient cooling system – the air blast cooler – to pre-cool water returning from the mould circuit before it reaches the refrigeration plant.

Centrifugal fan solution keeps plant in production

A design fault on a large centrifugal fan that could have caused Hanson Cement's plant in Clitheroe to stop production, due to a failure to comply with emission regulations, has been resolved by maintenance and repair specialist Brammer.

The problem was traced to the bearing assembly of the fan on a wet gas scrubber, the unreliability of which was preventing the plant from burning alternative fuels. Material build-up on the impeller was causing vibration, and damaging the non-drive end bearing and housing.

Wendy Taylor, regional account executive for Brammer UK, explains that the solution involved replacing the non-drive end bearing with an SKF CARB toroidal roller bearing and introducing regular cleaning. Since the change, the bearings have performed well and David Holgate, engineering manager at Hanson Cement, estimates cost savings at £15,000.

Originally, the bearing was allowed to float, he explains, whereas Brammer's solution was to install a fixed housing with a tight fit.

"Previously, we were cleaning the fan impeller on a weekly basis and changing the bearings around every six months" says Holgate. "Since the retrofit, we have not had to replace the bearings."



Welsh Water improves efficiency with gearboxes

Welsh Water is reporting improved efficiency at one of its sewage treatment works since replacing old worm gear drives, on six half-bridge scrapers, with planetary gearboxes that were a direct fit for the boxes.

Welsh Water says it achieved the swap without the cost or downtime of remanufacturing gearboxes or using bridge structures, thanks to Brevini's ability to design drive systems into existing footprints.

"This project was a little trickier than previous ones, as the worm gearboxes were set well back and there was a housing containing the bearing assembly to support the bridge," says Brevini sales manager Dave Brown.

"However, we were able to provide a planetary solution that utilises the taper roller bearings in the output assembly to support the bridge directly by fitting the wheel onto the gearbox shaft," he explains. Brown makes the point that planetary gearboxes can efficiently accommodate high reduction ratios and tough duties.

In total, six planetary gearboxes were delivered, each with smaller diameter shafts than standard to accommodate STW's wheel sizes. Technicians only had to drill holes in the existing structure for each drive's foot bracket to allow the fitting.



Italian mill generates clean micro-power

A former water mill, at Travesio in northern Italy, has been renovated and converted into a micro-hydroelectric scheme and is now saving 500 tonnes of carbon dioxide emissions per year.

The plant, which is based on an Archimedes' screw concept, is controlled by a Unidrive SP ac drive from Control Techniques, which also provides the interface between the generator and the power grid.

The Margarita Water Mill, which dates from 1906, has been sympathetically restored by renewable energy specialist Energy Renewable Source, which says it set out to produce a low environmental impact generating plant in the mill by using the ancient Archimedes' screw design to drive a generator.

Unlike Archimedes' original design, which was used to raise water, in this case the screw is reversed, so that water flowing downhill turns the screw. The proven design has no impact on river life,



even allowing fish to pass through safely.

The hydraulic study and design of the scheme were entrusted to engineer Ottorino Vendramelli of Energy Renewable Source.

Says Vendramelli: "Using this hydroelectric system, we have produced a reliable local source of clean renewable energy, all year round, generating useful

revenue, as well as helping to save a sizeable amount of greenhouse gas."

The micro-hydroelectric plant uses the potential energy of the current of the river to turn the Archimedes' screw set in a race, typically at around 30 rpm. The screw itself can be five to eight metres in length and is totally safe, unlike other systems involving river barrages and high speed turbines.

The generator is a squirrel-cage induction motor, connected to the low speed screw by a high efficiency gearbox. The generator, connected to a Unidrive SP inverter in regenerative mode, produces electrical energy that can be consumed by the user or supplied to the grid, since it complies with the statutory regulations, in terms of quality of waveform.

In this case, the drive is fitted with an SM Application module that runs the special program developed by Energy Renewable Source.

Smart wireless technology helps Swedish paper mill

Swedish paper and board firm Korsnäs Gävle is reporting better environmental compliance verification since installing Emerson's Smart Wireless instrumentation. Its Gävlebukten plant implemented wireless conductivity and temperature transmitters to collect leak-detection data associated with water from heat exchangers, prior to its return to the sea.

Peter Hallenberg, project leader process automation at Korsnäs Gävle, explains that conductivity monitoring had already been in place, but that a renovation project in the utilities section meant that I/O was to be removed.

"Initially, we considered installing new cable runs, but the process would have taken too long and delayed the renovation," states Hallenberg. Wireless equipment installed includes a Rosemount Analytical 6081-C transmitter connected to a conductivity probe, which sends data via a Smart Wireless Gateway to the existing control and data acquisition systems.

Korsnäs Gävle also needed to establish new continuous monitoring of emissions from aerated basins and ponds. So 22 new sensors measuring pH, dissolved oxygen and water temperatures were also installed and connected to the central monitoring system.



Airport saves 4,000 MWh on ABB drives and motors

A project to upgrade the air handling units at Manchester Airport is saving 4,000 MWh, as well as cutting CO₂ emissions by over 2,000 tonnes a year. The project involved replacing supply and extract drives, and motors (from 3 to 90kW) in 95 AHUs throughout terminals 1, 2 and 3, with ABB low voltage drives and high-efficiency motors.

Working with ABB's energy appraisal team, as well as Drives Alliance member Quantum Controls, Andy Sheridan, service facilities manager for Manchester Airport, ran trials on AHUs 48 and 49, which serve the Terminal 1 check-in hall.

"Terminal 1 is 50 years' old," explains Sheridan, "and normal practice at the time was to oversize motors. By installing ABB IE2 high efficiency motors and resizing them, energy savings of 5% can be realised." More than that, the trial also installed ABB standard drives for HVAC on the two AHUs. By reducing the setpoint frequency from 50Hz to 40Hz, savings of 50% were realised, with no noticeable change in airflow.

And it's not just about the drives and motors, according to Sheridan, who points to energy-saving dust filters, which reduce the pressure drop in the AHUs. "We carried out field trials to ensure that the claims of the manufacturer were correct and we did see significant energy savings," he states.

