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Siemens Fan Upgrade at Hanson Purfleet

Saves Energy and Reduces Carbon Foot-print

- Hanson Cement projected to save in excess of £175,000 per annum at Purfleet by using Siemens integrated drive systems
- Bonus additional energy savings after follow-up site review
- CO2 emissions reduced by 1,487 tonnes

A fan upgrade by Siemens at Hanson Cement's highly productive Purfleet plant has resulted in energy savings of more than 36 per cent being made, with payback on the investment anticipated to be well under two years.

Hanson Cement's Purfleet Works is situated next to the River Thames in Essex and is capable of producing around one million tonnes a year of Regen – a cement replacement in ready-mixed and pre-cast concrete which is manufactured from ground granulated blast-furnace slag. The works consist of two closed circuit ball mills and a Loesche vertical grinding mill. It was Mill 3 that Hanson required an upgrade to, as the existing mill fan was fixed-speed, using a 1 MW 11kV slip-ring machine running at around 980 kW. The airflow was continuously at full speed and

was controlled by a damper. The fan design airflow was 350,000m³/hr; but the system was damped to the operational requirement of approx 241,000m³/hr.

As Hanson Purfleet's electrical engineer Dave Jackson explained, the mill upgrade was part of a more general review Hanson Cement was making of all of its sites: "We were looking to make energy savings around the plant and a survey had recommended a new drive and motor for this mill. The Siemens solution means we are now running with the damper open 100 per cent of the time, yet actual energy consumption has dropped by around 360-400 kW."

The Siemens total engineered solution centred around the integrated drive systems (IDS) concept, which ensures that all products within the drive system are as integrated as possible, supported by Siemens both in specification and throughout their lifecycle. By optimising the drive system to the highest degree of performance, and by acquiring data through monitoring that system, the best operational performance can be achieved.



For mill 3, this meant replacing the fixed speed fan with a 1000 kW Sinamics Perfect Harmony 11000/4160 V medium voltage (MV) converter, installed and commissioned to link with existing Siemens process control systems at the plant. A new Siemens MV 1000 kW, 4160 V, 6-pole motor was also installed along with new motor cable and a modified motor base (the bed plate was raised by 60mm). Siemens was able to provide the full turn-key solution.



Perfect Harmony

Every element of the Sinamics Perfect Harmony cell-based drive range is engineered to maximise productivity and protect a customer's process in a way that other drives are unable to do. Its modularity allows for a scalable solution achieving near-100 per cent reliability and 99 per cent availability, two key factors for a busy plant like Purfleet.

Benefits of the upgrade included:

- greater productivity through optimised speed and process performance
- improved flexibility, with faster run-up/run-down times
- standardisation, reduced size and line attendance
- increased amount of pre-emptive maintenance information
- a significantly reduced total cost of ownership over the product's lifecycle.

As Dave Jackson continued: "It took about a month before we could clearly identify all the changes in running costs,

but we were very pleased with the whole system, and more savings were made than originally anticipated. A follow-up visit by Siemens led to even further savings being made using the new drive system and the entire project was completed on time and within budget."

The annual savings to Hanson from the upgrade have been estimated at £175,000-£200,000.

Siemens minerals account development manager Gary Chapman said: "This upgrade proves that using the appropriate software and with the Siemens knowledge of integrated processes and applications, significant savings can be made as well as enhancing the overall lifecycle of the plant."

Being able to address a reduction in energy usage and increase plant availability have become key targets for industrial companies. Hanson Cement has been able to reduce its carbon footprint at Purfleet by 1,487 tonnes since the new system was installed eight months ago and is continuing to make further savings.

Hanson's national operations manager for Regen Steve Hall concluded: "The project was a great success, with the new drive and motor enabling us to reduce drive speed and lower power consumption by approximately 37 per cent. We are continuing to save about 4.5 wh/t on our total process with this one fan drive, and these energy savings represent a rapid return on investment for us."

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