

# POWER SENSOR IS BLOCKBUSTER

A project that set out to monitor a number of key motors in a building block production plant using a novel power sensor paid unexpected dividends by detecting bearing damage on a waste crushing and recycling unit. Catastrophic failure was prevented and substantial maintenance cost savings were made. The sensor then proved to be ideal for process control and monitoring, resulting in product quality improvement and cycle time reduction.

Marley Building Materials of Birmingham, England manufacture Thermalite aerated concrete building blocks and have a broad range of motor-driven process machines including crushers, mixers, fans and blowers.

A decision was made to fit Hall Effect Power Cells to some of the drives so that real-time recordings of electrical power could be made using the site data acquisition system. The precise electrical power measurements proved to be extremely valuable.

In the main mixer, a number of dry materials are mixed with fly ash and water to produce a slurry which is subsequently cast into a mold. The mixing process had been the subject of problems where batches of material had been mixed for too long and had set in the vessel.

Analysis of the power absorbed by the mixer motor showed that a good relationship existed between this and the mixture viscosity. The controlling PLC software was then modified to incorporate mixing to a viscosity end-point, derived from the stirrer power. Batch mixing is now achieved in a more consistent manner and maintenance and cleaning tasks reduced.

The next part of the process to be monitored was the re-cycling plant where waste block material is crushed, fed to a hopper and then blown to a storage silo under the control of a rotary valve. Various attempts had been made to automatically control the blowing of the powder using in-line flow monitors, but these had proved sensitive to jamming. Analysis of the power traces from the Power Cell on the blower motor showed a relationship between power and flow rate which enabled the controlling loop to blow at constant power.

Constant flow control was thus implemented using a non-invasive sensor which carried no maintenance overhead. Other control tasks for the Power Cells are currently being planned to automate the pumping of slurry in the waste recycling plant and to duplicate the project at the other Thermalite sites.

