

Industry: **Plant and Machinery**
Products: **Control systems, e-F@ctory solution**

Fit for the future with intelligent condition monitoring

In coating machine 3 (SM 3) at the Bielefeld site of Mitsubishi HiTec Paper Europe GmbH (MPEB), thermal paper is given its special coating. With a maximum operating speed of 1730 metres per minute, it currently holds the world record for curtain coating technology. The four-storey machine has 26 fan units, each consisting of a supply and exhaust air fan. These ensure the contactless drying of the coated paper.

The challenge: Early detection of imbalance and bearing damage

With a fan weighing up to 100 kilograms and rotating at a speed of 1500 rpm, this results in an imbalance over time. When an imbalance was not detected in time, it resulted in the failure of a fan on the coating machine SM 3. Besides the bearing, attachment parts were also heavily damaged. This resulted in a short system shutdown which led to a production shortfall. In order to detect potential damage early and avoid costly unplanned shutdowns, the MPEB Technical Team decided to look for a way to switch from time-based to condition-oriented maintenance.

The solution: Comprehensive monitoring

26 FAG SmartCheck systems from Schaeffler now monitor the vibration characteristics of the fans continuously. An FAG SmartController based on a Mitsubishi Electric PLC from the MELSEC L-series operates as a bidirectional gateway between the customer controller and sensors.

The solution requires minimal cabling thanks to Power-over-Ethernet technology (PoE). A single cable is all that is required in order to power the whole system, provide a Power-over-Ethernet network connection and enable the bidirectional exchange of data.

The FAG SmartController distributes variable speeds to the sensors automatically and transmits vibration data and status information from those sensors to the customer controller where the data are then displayed in a SCADA system.



“Condition monitoring with the FAG SmartCheck has enabled us to take a decisive step towards Industry 4.0. The FAG SmartController is the key part of the whole system as it enables us to transmit information from the sensor at field level via the control system level and the MES for use in the ERP system as well as to implement higher-level data directly at field level!”

Jürgen Heitland, Head of Electronics and Measurement and Control Technology (EMSR),
Mitsubishi HiTec Paper Europe GmbH

The result: Condition-oriented maintenance

The early warning system predicts the actual failure of a component up to several months in advance, thus enabling a system shutdown for maintenance and repairs to be accurately scheduled. Based on a meaningful data history, MPEB is able to track the long-term behaviour of the units and carry out targeted structural improvements. The result: increased machine availability and process reliability together with reduced total operating costs. The plan is that in the future, the freely expandable solution will monitor the whole of SM 3, enabling the behaviour of all the rotating parts if the speed is increased to be precisely recorded.