

## Stora Enso Paper Mill Improves Product Quality and Process Efficiency with Honeywell



Stora Enso enhanced process operations and product quality through the installation of Honeywell's advanced control solutions at its Varkaus paper mill.

### Benefits

Stora Enso was seeking ways to improve quality and production efficiency, and better utilize resources at its paper mill in Varkaus, Finland. Stora Enso invited Honeywell to recommend suitable solutions from its advanced automation control portfolio. Examples of the benefits provided by these solutions include:

- Improved cross-web direction (CD) profile control for enhanced sheet quality
- Faster dynamic response to reduce recovery time from upsets like paper breaks and grade changes
- Improved process efficiency
- Improved sheet flatness for the end user's printing and conversion processes

### Background

Stora Enso is an integrated paper, packaging and forest products company with an annual production capacity of 13.2 (in 2005) million tonnes of paper and 46,000 employees worldwide. At Stora Enso's paper mill in Varkaus, paper machine 3 produces 60-90 gram fine paper. The production line processes are controlled by Honeywell's Alcont process control system. The system was initially installed on the machine in the mid-1980s but has been upgraded several times during the past two decades. In addition to the actual process control, Alcont also controls the paper quality in the machine direction and the cross-machine direction.

### Challenge

The Varkaus paper mill was looking for a solution to improve fiber orientation for better paper stacking, retention control and better recovery from web breaks. Although paper machine 3 already had a full portfolio of conventional automation applications, the mill recognized that its efficiency and quality could be improved

and began looking for advanced solutions using state-of-the-art technologies.



Use of advanced control methods is increasing in paper industry processes that require control over several mutually conflicting targets at the same time.

### Solution

Together with Honeywell, Stora Enso evaluated various alternatives to enhance process operations and product quality, resulting in the installation of advanced automation solutions from Honeywell.

The mill was able to improve paper stacking capabilities by eliminating side flows from the edge of the headbox during the sheet's forming stages by controlling the basis weight profile set-point value. The profile correction algorithm is based on a wavelet method that is also used for earthquake analysis. Fiber orientation at the edges is controlled by a fuzzy logic strategy that deducts and corrects the headbox side flows. The deductions are based on fiber orientation in the edge areas, as well as the total orientation.

Retention control was enhanced through the use of an advanced wet end controller to help improve the stability of the wet end consistency and retention in the forming section of the paper machine. The wet end controller controls the wet end consistency and retention by optimizing the addition of retention aid chemicals. It incorporates a predictive multivariable controller that maintains the wet end consistency at an optimal value for machine runnability and sheet formation. This optimization controller is designed to function around a number of conflicting process and quality constraints. The wet end controller provides a wide range of benefits from advanced process control methods.

Recovery to full production and quality following a paper break are crucial to overall process efficiency. Retaining the optimum inflow stock values at the headbox, regardless of disturbances, significantly accelerates threading the sheet. Similarly, paper quality can be restored considerably faster following a web break.

At the Varkaus mill, the web break management solution uses statistical process control to monitor the machine functions to identify optimal run situations. During a break the multivariable control analyses the break situation and controls the headbox inflow total consistency and the ash content to an optimal level, based on the previous best-run performance.

### **More Information**

For more information on Honeywell's advanced control solutions, visit [www.honeywell.com/ps](http://www.honeywell.com/ps) or contact your Honeywell account manager.

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