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## TMP optimization by using an upper level control system

J. Rössle · UPM GmbH · Schongau / Germany

M. Foigtmannsberger · Valmet Automation GmbH · Oberhaching / Germany

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**Targets:** Saving of energy and stabilization of pulp quality

**Implementation:** Installation of an online fiber analyser and an upper level control system incl. soft-sensors.

The basis for the quality optimization of thermomechanically produced pulp (TMP) is the measurement of the pulp properties by using an online fiber analyser. This analyser is measuring the drainage resistance (Canadian Standard Freeness, CSF), but also fiber morphology. Two different cameras are used to measure the fiber morphology. One camera is used to detect the single ingredients of the pulp mixture. The second camera has an extra high resolution to detect fiber surface, especially the bonding active parts.

Measurement results detected with these cameras are evaluated in combination with historical lab measurements of the TMP pulp properties and the actual process parameters. In an upper level control system with this information, the strength properties of the pulp are predicted for the TMP-to-be produced with current process conditions.

Furthermore, this solution includes the modelling of soft sensors which enable the prediction and control of critical process parameters affecting quality, like e.g. CSF and porosity.

This upper level control system uses the information of the soft-sensors to control the process of the TMP plant in a quality and energy optimized way, without the need of permanently updated real online and lab measurements.

This leads to a reduction of process fluctuations of approx. 34%, combined with the upper level control system it achieves a total energy saving of 12 % without quality problems.

Results:

- SEC reduction of 12,0 %
  - CSF variation (COV) reduction of 34%
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