

Korsnäs Improves Pulp Digester Process Efficiency and Reduces Maintenance Cost with Vortex Technology

RESULTS

- Operating cost savings through process efficiency improvement
- Reduced maintenance cost
- Mitigated workers health and safety risk



APPLICATION

White liquor flow measurement in a Kraft (Sulfate) pulp digester

CUSTOMER

Paper mill in Sweden

CHALLENGE

Korsnäs is one of the world's leading producers of virgin fiber-based packaging materials. They use the Sulfate or Kraft pulp-making process in their mills, which uses white liquor (sodium hydroxide and sodium sulfide dissolved in water) as primary cooking chemicals in the digester. The white liquor is added to the pulp in the impregnation zone of the digester where it is heated and circulated, cooking the pulp. The alkali to wood ratio is carefully controlled to deliver a target Kappa number, which indicates the residual lignin content or "bleachability" of the wood stock. Reliable flow measurement is critical in accurately controlling the alkali to wood ratio which directly affects digester performance.

They previously used a differential pressure flowmeter to measure the white liquor flow. The solids and fibers in the liquor flow would frequently plug the ports of the differential pressure flowmeter which resulted in unpredictable flow reading errors and eventual complete loss of the measurement until the meter could be removed and cleaned. They also tried a magnetic flowmeter, normally effective in this type of application, but in this case the flow meter was occasionally subjected to significant vacuum, which would partially collapse the liner. This caused the meter to read a higher flow rate resulting in too little alkali input, reducing digester performance.

When the flow measurement was inaccurate, unreliable, or completely failed the mill could not accurately control the alkali to

"The Rosemount 8800 Vortex has been working reliably for over a year with no downtime for cleaning or repair."

Peter Hallenberg

Project Leader Process Automation

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wood ratio. Charging with too much alkali resulted in over-pulping, reducing the amount of usable fiber or yield. Too little alkali results in under-pulping, forcing the mill to use more unrecoverable chemicals in bleaching to hit the desired Kappa target. This process inefficiency resulted in higher cost per ton of the final product since shutting down the process means delay in production and higher cost of start-up.

SOLUTION

The mill solved this flow measurement challenge by choosing a different metering technology to measure white liquor flow in this application. The Rosemount 8800 Vortex flow meter was selected as it is not affected by the high liquor temperature, vacuum, coating, or suspended solids in the flow. Typically, vortex flow meters are not considered for this application as the fluid contains solids and fibers that would clog the crevices and ports common to traditional vortex flowmeters. The Rosemount 8800 Vortex unique design eliminates crevices and ports which can be clog with solids and fibers, impacting performance, and is balanced so it is not affected by vibrations in the pipes that are typical in the mill. The resulting flow measurement is accurate, stable, and reliable.

Reliability of the flow measurement enabled the Kappa number control to be restored allowing optimum control of the process. The result is more consistent pulp quality at lower cost per ton of pulp. Further, the mill is able to save on maintenance cost for cleaning the failed flowmeter and reduce the personnel's exposure related to maintenance and manual operation.



Rosemount 8800 Vortex Flowmeter.

RESOURCES

Emerson Process Management Pulp and Paper Industry

<http://www2.emersonprocess.com/en-US/plantweb/customerproven/Pages/PulpPaper.aspx>

Rosemount 8800 Series Vortex Flowmeter

<http://www2.emersonprocess.com/en-US/brands/rosemount/Flow/Vortex-Flowmeters/Pages/index.aspx>

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