New measuring technique can save pulp mills millions

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New research at Karlstad University shows that pulp mills can save millions by using a new measuring technique. This new technique enables control of the pulping process, thus reducing the demand of chemicals, water and energy. This may yield positive environmental effects as well as improved pulp quality and increased production.

"My research shows that there is an important parameter that is currently not being measured at pulp mills, namely dissolved lignin," says Caroline Wilke, doctor in chemical engineering.

Better control of the process

Pulp is manufactured by cooking wood chips in water and chemicals to liberate cellulose fibres. The lignin that binds the fibres together must therefore be removed. The dissolved lignin ends up in the liquid surrounding the fibres, and it is already known that dissolved lignin consumes bleaching chemicals. The dissolved lignin content varies substantially, not only during the course of the process, but also in each stage. This makes it difficult to know the exact amount of additional chemicals that must be added to compensate for the dissolved lignin and retain the quality of the pulp.

"This sensor is unique because it can be placed directly in the pulp processes to measure the dissolved lignin content continuously," says Caroline Wilke. "Previously, liquid samples had to be taken and analysed in the laboratory, resulting in a time lag. The analysed liquid had then already passed the processing stage and it was therefore too late to change the load of chemicals applied."

Savings and environmental benefits

This doctoral project investigated the effect of dissolved lignin in different bleaching stages. It was shown that the additional chemicals needed in a chlorine dioxide stage were proportional to the dissolved lignin content measured by the sensor. Measuring the lignin both in the fibres and in the liquid gives pulp mills the opportunity to control the chlorine dioxide stage based on the total chemical demand, which may lead to both economicl and environmental optimisation. The sensor can

also be used to control the washing stages to reduce water and energy demand.

More information: The Impact of Dissolved Matter on Fiberline Processes.
www.diva-portal.org/smash/record.jsf?aq2=%5B%5B%5D%5D&c=1&af=%5B%5D&searchType=RESEARCH&sortOrder2=title_sort_asc&query=&language=sv&pid=diva2%3A1229678&aq=%5B%5B%7B%22freeText%22%3A%22the+impact+of+dissolved+matter+on+fiberline+processes%22%7D%5D%5D&sf=all&aqe=%5B%5D&sortOrder=author_sort_asc&onlyFullText=false&noOfRows=50&dswid=-9346

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