

Swedish kraft pulp mill reaps benefits from installed ABB instruments & analyzers and highly values the good service and training



ABB Measurement & Analytics help Ahlstrom-Munksjö Aspa Bruk to produce high-quality fiber-based pulp materials for a sustainable everyday life.

Measurement made easy

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01 Ahlstrom-Munksjö Aspa Bruk, Askersund, Sweden.

02 The kraft pulp making process is divided into six different sections.

Introduction

Ahlstrom-Munksjö develops and produces kraft pulp for customers all over the world. The customers have high demands for brightness, purity and strength. Thanks to the company size and independence Ahlstrom-Munksjö is flexible and offers customers short lead-times from order to dispatch, in addition to customized products.

The cost efficiency has enabled a lot of investment in recent years. These investments have helped them create innovative products, improve the production process/environment, and further develop the products.

In order to run and control the kraft pulp making process, the mill management needs reliable instruments and analyzers plus good service and training.

Over the years ABB has delivered several instruments and analyzers with very good results.

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1. Wood chips



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01 Anders Höggqvist is checking out the data from ABB's analyzer AO2000 CEMS.

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02 TB557 pH-system

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03 FSM4000 EMF signal converter S4

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04 FSM4000 EMF AC-flowmeter

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05 FSM4000 EMF AC-flowmeter and 261 pressure transmitter

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06 261 pressure transmitter

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07 FSM4000 EMF AC-flowmeter

What are the main benefits with ABB and the instruments and analyzers installed at Aspa Bruk pulp mill?

We ask Mr Anders Höggqvist, System engineer/ Process control, Specialty Pulp and Mr Bo Pettersson, Electrical & Instrumentation, Planning Engineer, both Ahlstrom-Munksjö Aspa Bruk AB:

Digester and blow tank section

“In the Digester and blow tank section we have a cumbersome application with blow flow measurement. ABB's AC-flowmeter was installed in 2019 and so far it is working very well with good performance to our satisfaction.”

Screening and washing section

In this section there are several ABB instruments and analyzers installed.

Flowmeters in post-screening section

- AC-flowmeter FSM4000

“We have hardly any problems with the flowmeters in the screening plant. ABB has solved a previous problem that we had with competitor meters, that were unstable with lumps. The ABB solution works very well now with dispense inside the tank.”

Pressure sensor in post-screening section

“The screening removes debris in the pulp. It's like a colander that throws out particles. With ABB pressure sensors it is easy to set the pressure.”

pH sensors

- pH sensor
- ABB pH probe

“The mixing in the tank gives good results on the measurements.”

“Now with ABB's probe installed we have smooth and even measurements without any lumps.”

Rotary coolers

- 11 pcs of flowmeter FSM4000
- 10 pcs of pressure transmitters

Flow and pH measurement training

Mr Lars Broomé from ABB has set up training courses on flow and pH measurement. “Very good and appreciated training for Aspa Bruk's instrumentation technicians.”

Instruments and gas analyzers in the lime kiln area

The reaction that occurs in lime kiln is called calcining, the conversion of calcium carbonate to calcium oxide. Recausticizing is the process of converting the chemicals in spent cooking liquor back to their original form so that they can be re-used in the kraft pulping process.

There are measurement points in the chimney process after the lime kiln – recovery boiler, liquor, lime and white liquor. Then you burn the same thing several times, this called liquor ring – white liquor, digester and black liquor.

Black liquor monitoring by ABB

The kraft pulping process involves the digesting of wood chips at elevated temperature and pressure in ‘white liquor’, which is a water solution of sodium sulfide and sodium hydroxide.

The white liquor chemically dissolves the lignin that binds the cellulose fibers together. Once the cooking is complete, the digester contents are washed in pulp washers and pulp is separated from the spent liquor known as ‘weak black liquor’.

After the water scrubber there is an ABB AO2000 continuous gas analyzer, that measures 4 gases (CO, NO, SO₂, O₂) and TRS. TRS-measurement is obtained by removal of SO₂ and oxidizing reduced sulphur components.

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“In general, we are very satisfied with the installations of ABB’s instruments and analyzers. And our instrumentation team highly values the good service and training initiatives from ABB. Excellent!”

Anders Höggvist and Bo Petterson summarize ABB Measurement & Analytics’ performance at Aspa Bruk AB.

The ABB analyzers have the gas preparation units at the bottom of the cabinet. On a regular basis, ABB checks these units for replacement and control of peristal pump, filters and leakage control of gas line.

“ABB’s AO2000 analyzers with accurate measurements are working very well and the technicians at Aspa Bruk check the analyzer values weekly.”

Pulp bales

“Sales is now about 50-50 between bleached and unbleached pulp. The unbleached pulp (brown bales) sells more and more.”

Aspa Bruk offers bleached and unbleached kraft pulp

- ASPA ECF (Elementary Chlorine Free)
- Very good strength properties
- Brightness minimum 88% ISO

The pulp is available in the following types of products:

Hygiene, print and writing paper, graphic paper, coated paper, cardboard and securities (passport paper, for example).

- ASPA UKP-E (Unbleached kraft pulp – electrical grade)
- Carefully washed pulp to obtain good electrical properties



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01 Lime kiln

The pulp is available in the following types of products:

Electrotechnical paper, transformer boards, filter paper, hygiene paper, cardboard and baking paper (grease resistant paper).

ABB Service

“We always get good service from ABB. Mr Lars Broomé, ABB Measurement & Analytics, sets up, on a regular basis, product training courses at site. A very good and appreciated initiative among Aspa Bruk’s instrumentation technicians.”

“Also, it is very easy to get hold of ABB Measurement & Analytics for service and questions. Even on their vacation!”

During the Annual service for instruments & analyzers, ABB is controlling important parts such as peristal pump, filters, leakage control of gas line, etc.

Facts on the kraft process

The kraft process (also known as kraft pulping or sulfate process) is a process for conversion of wood into wood pulp, which consists of almost pure cellulose fibers, the main component of paper. The kraft process entails treatment of wood chips with a hot mixture of water, sodium hydroxide (NaOH), and sodium sulfide (Na₂S), known as white liquor, that breaks the bonds that link lignin, hemicellulose, and cellulose. The technology entails several steps, both mechanical and chemical. It is the dominant method for producing paper. In some situations, the process has been controversial because kraft plants can release odorous products and, in some situations, produce substantial liquid wastes.

History

The kraft process (so called because of the superior strength of the resulting paper, from the German word Kraft for ‘strength’) was invented by Carl F. Dahl in 1879 in Danzig, Prussia, Germany. U.S. Patent 296,935 was issued in 1884, and a pulp mill using this technology started (in Sweden) in 1890. The invention of the recovery boiler by G. H. Tomlinson in the early 1930s was a milestone in the advancement of the kraft process. It enabled the recovery and reuse of the inorganic pulping chemicals such that a kraft mill is a nearly closed-cycle process with respect to inorganic chemicals, apart from those used in the bleaching process. For this reason, in the 1940s, the kraft process superseded the sulfite process as the dominant method for producing wood pulp.