



Grow your pulp mill profits  
with more efficient separation





# Money grows on trees

The global decline in paper production is forcing chemical pulp mills to look for new sources of income and ways to cut operating costs.

Recovery of chemicals plays a key part in both these efforts. Separating out valuable substances from the processes and either selling or reusing them is a good way to boost profitability.

## **New incomes from by-products**

Modern separation technologies let you profit from extracting and selling high-purity chemicals. Examples include tall oil, lignin and turpentine.

## **Cutting operating costs**

You can increase the efficiency of several processes in the chemical recovery loop by exchanging existing settling tanks and filter presses for more efficient solutions.

## **Tools of the trade**

Alfa Laval offers equipment for all types of separation duties in chemical pulp mills. Our products are based on four different separation technologies, allowing us to tailor solutions to your specific conditions – and maximize your profitability.



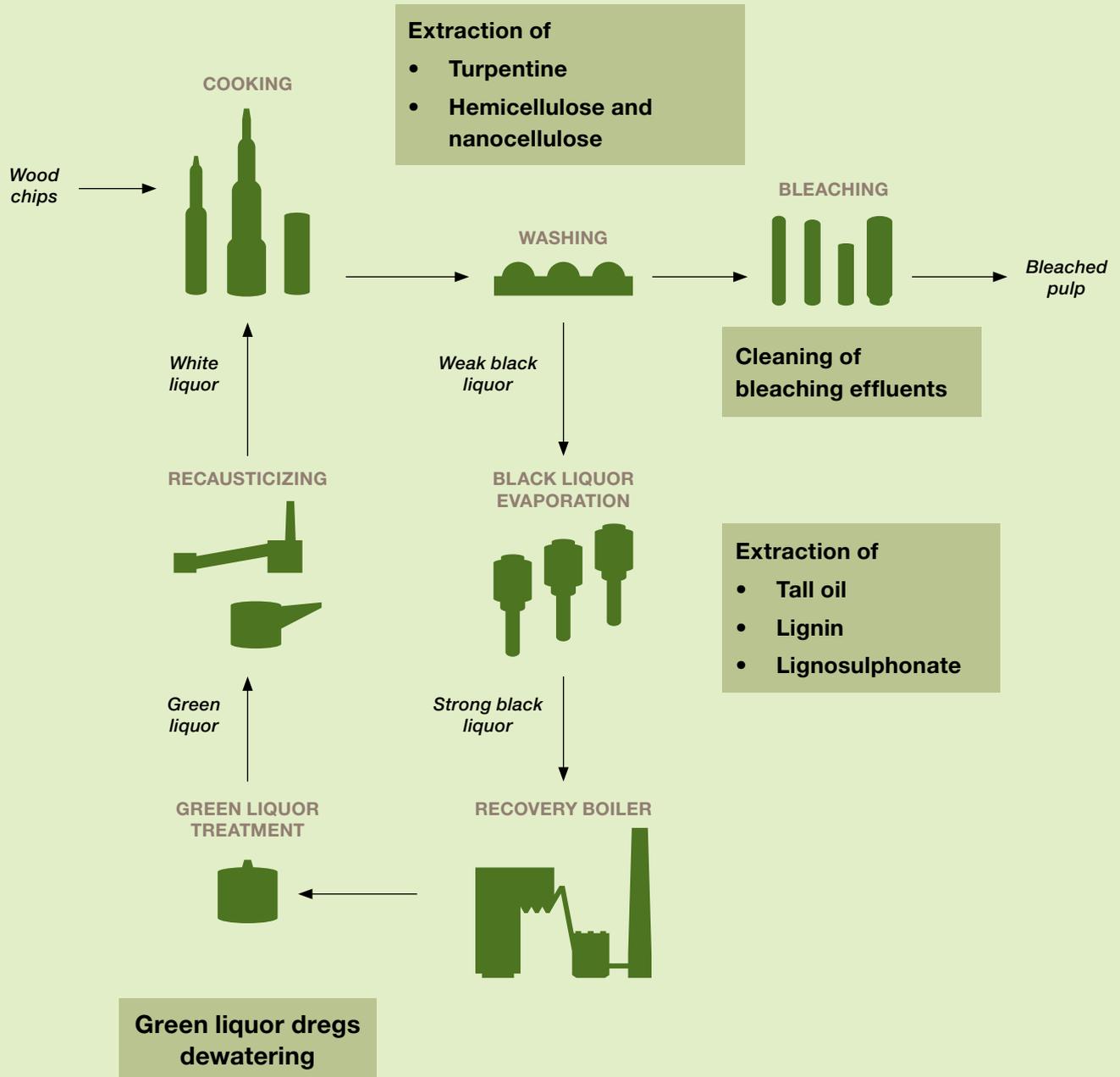
### **Forest biorefineries**

Alfa Laval has long experience from all applications found in a modern forest biorefinery:

- Power generation
- Production of chemicals
- Production of biofuels
- District heating
- Pulp and cellulose production

See our web site at [www.alfalaval.com](http://www.alfalaval.com) for more information or contact your local Alfa Laval representative.

# Chemical recovery



# Selling by-products

There are many opportunities for chemical pulp mills to extract and sell by-products from their processes. With Alfa Laval's solutions you can separate out a range of chemical compounds:

**Tall oil** – In partnership with HEAD Engineering, Alfa Laval supplies plants that automatically remove Kraft soap from black liquor and produce 98% pure tall oil.

**Turpentine** – Alfa Laval's highly efficient condensers let you extract turpentine from digester fumes with minimum cooling water consumption.

**Lignin** – Our membrane filters and decanter centrifuges enable you to extract lignin from black liquor with minimum operating cost.

**Hemicellulose and nanocellulose** – With our membrane filters you recover hemicellulose and nanocellulose of the highest quality.

**Lignosulphonate** – Membrane filtration offers a fully automated, low-cost method to recover lignosulphonate from spent sulphite liquor.

For more information see [www.alfalaval.com/chemicalrecovery](http://www.alfalaval.com/chemicalrecovery)



A Chinese pulp mill looking for new revenue streams installed an ultrafiltration system based on 12 Alfa Laval membrane modules to extract lignin from black liquor.

Instead of burning the lignin in the recovery boiler, the mill now sells it to cement and vanillin producers.

The revamp has also increased capacity in the recovery boiler since the lignin is no longer burnt there.

# Tall oil production at Södra Cell's Värö mill

## Turning Kraft soap into crude tall oil

HEAD Engineering offers complete systems for black liquor treatment and production of crude tall oil. The Pinola platform consists of two technologies: Pinola BLiSS which removes Kraft soap from black liquor, and Pinola TOPP which processes the soap to high-purity crude tall oil.

Both Pinola BLiSS and TOPP are based on Alfa Laval technology, and separation takes place in disc stack centrifuges and an optional decanter centrifuge.

There are several benefits of using Pinola BLiSS and TOPP:

- Continuous, fully automatic operation
- Compact installation and high throughput
- Automatic cleaning
- Significantly cleaner black liquor
- High yield of clean, fresh soap
- Less fouling in the evaporation stage and higher capacity in the recovery boiler
- High yield of high-purity crude tall oil



## Improvement for Södra Cell

Södra Cell is one of the largest pulp producers in the world. The company installed a Pinola TOPP tall oil production system in its Värö plant in 2012.

The production rate is 5 tons of tall oil per hour and the recovery yield is >97%.





# Cutting operating costs

Investing in efficient separation equipment helps reduce operating costs in the following ways:

## **Green liquor dregs dewatering**

Decanter centrifuges are perfect for dewatering all types of sludges, such as green liquor dregs. They produce highly dry cake, resulting in low disposal costs and high chemical recovery. Decanter centrifuges are much smaller than equivalent vacuum filters, use less energy and operate continuously.

## **Cleaning of bleaching effluents**

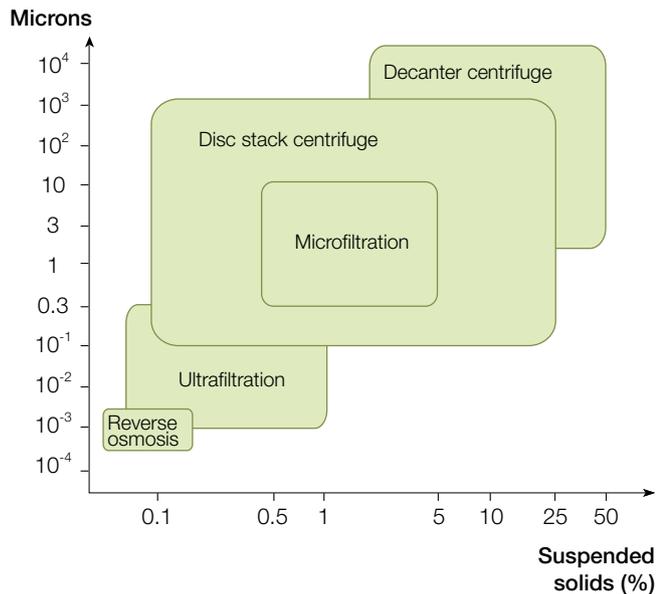
Membrane ultrafiltration is a well-proven method for removing colour from bleaching effluents. It reduces the load on the wastewater plant and the filtered water can be reused in the process.



**Pulp mills across the world**, for example in Turkey, Russia and Chile, have installed decanter centrifuges for green liquor dregs dewatering. The new equipment brings many benefits:

- High chemical recovery
- Low disposal costs for sludge
- Low operating costs
- Low installation cost
- Minimum maintenance
- Continuous operation

# Separation technologies



Alfa Laval offers separation equipment based on four complementing technologies:

- **Decanter centrifuges** are the preferred choice for situations with high solids concentrations and medium to large particle sizes.
- **Disc stack centrifuges** are used for duties where solids concentrations are lower and particle sizes are relatively small.
- **Membranes** filter out the smallest particles and require low concentrations.
- **Evaporators and condensers** separate fluids with different boiling temperatures.

By combining these different technologies we create systems that perfectly match your specific requirements and offer maximum return on investment over time.



### **Decanter and disc stack centrifuges**

Decanter centrifuges and high-speed separators are capable of separating one or two liquids from the solids. They offer several benefits compared to filters and settling tanks:

- Higher separation efficiency
- Lower operating cost (power, water, chemicals, labour)
- Continuous, fully automatic operation – including cleaning
- Much smaller installation
- Contained process without odours or dust



### **Membranes**

Alfa Laval's range of membranes covers all kinds of filtration and can be used for separating out everything from suspended solids to single atoms. The membranes operate according to the cross-flow principle and have many advantages over competing technologies:

- Higher yield and product quality
- No filter cake – consistent flow and product quality
- Easy to expand thanks to modular design
- High reliability and fully automated operation
- Low operating and installation costs



### **Condensers and evaporators**

All our heat exchangers used for condensation and evaporation are compact heat exchangers. Compared to shell-and-tubes they have much higher thermal efficiency, are less prone to fouling, have lower pressure drops and are easier to clean.



# Alfa Laval Service

We offer a wide range of services that maximize uptime, yield and return on investment throughout the entire lifecycle of your Alfa Laval equipment. Our global network of service centres and field service engineers covers most markets of the world, so we can work in close cooperation with our customers.

## 360° Service Portfolio

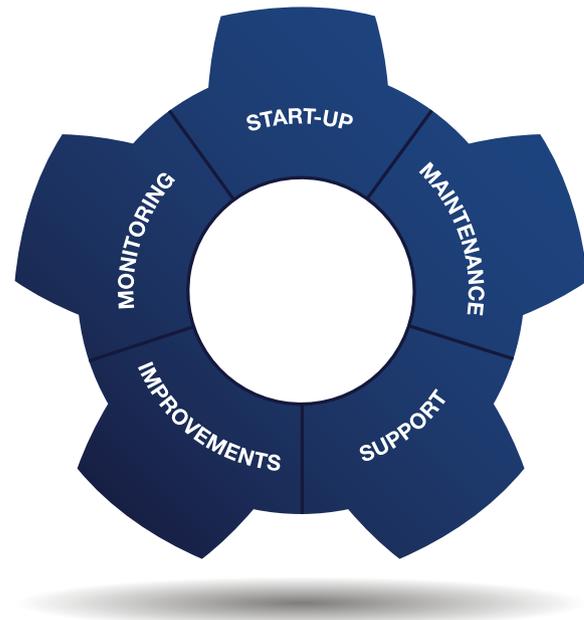
Alfa Laval's 360° Service Portfolio includes all you need to ensure high performance, uptime and operating efficiency.

We can help with installation and commissioning, regular maintenance, condition monitoring, troubleshooting and emergency supply of spare parts. Many of our services enhance your operations, including training, equipment upgrades and consultancy services where our process specialists advise you on plant or equipment optimization.

## Lifelong performance

Most of our decanter and disc stack centrifuges are upgradeable, offering you a future-proof solution with maximum performance over its entire lifetime.

Condition monitoring is a perfect complement to decanter and disc stack centrifuges. It helps you



predict maintenance requirements with great accuracy, thereby maximizing uptime and cutting service costs.

## Performance Agreements

Alfa Laval Performance Agreements are individually tailored service solutions that can include any of the services in our 360° Service Portfolio. They maximize return on investment and are based on a fixed yearly service cost, making budget work easy.

# Alfa Laval in the pulp industry

Apart from chemical recovery, we help pulp mills increase profitability and reduce environmental impact in many other ways:

- Maximizing heat recovery and cutting energy costs
- Reducing cooling water consumption
- Minimizing wastewater treatment costs
- Cutting cleaning water consumption
- Increasing production
- Oil treatment
- Reducing maintenance costs
- Increasing uptime
- Reducing installation costs
- Cutting operating costs

Visit our web site, [www.alfalaval.com](http://www.alfalaval.com) or contact your local Alfa Laval representative to learn more.



### **Alfa Laval in brief**

Alfa Laval is a leading global provider of specialized products and engineering solutions.

Our equipment, systems and services are dedicated to helping customers to optimize the performance of their processes. Time and time again.

We help our customers to heat, cool, separate and transport products such as oil, water, chemicals, beverages, foodstuffs, starch and pharmaceuticals.

Our worldwide organization works closely with customers in almost 100 countries to help them stay ahead.

### **How to contact Alfa Laval**

Contact details for all countries are continually updated on our web site. Please visit [www.alfalaval.com](http://www.alfalaval.com) to access the information.



[www.alfalaval.com/chemicalrecovery](http://www.alfalaval.com/chemicalrecovery)