Case story
Boliden, Sweden

New pipeline expands the use of recovered waste heat from copper smelting plant

Optimal performance in plate heat exchangers

Waste heat covering the entire need for district heating in the region of Skellefteå during the summer months will soon be a reality, thanks to a new pipeline that will connect the district heating network in Skelleftehamn with the network in the neighbouring municipality of Skellefteå. With a growing demand for more sustainable energy sources, Boliden, together with Skellefteå Kraft AB, is now installing a new €40 million transfer pipeline. This enables a future where waste heat will replace oil and peat to a much larger extent – a future where Alfa Laval is a key partner in running recovery operations at peak performance.

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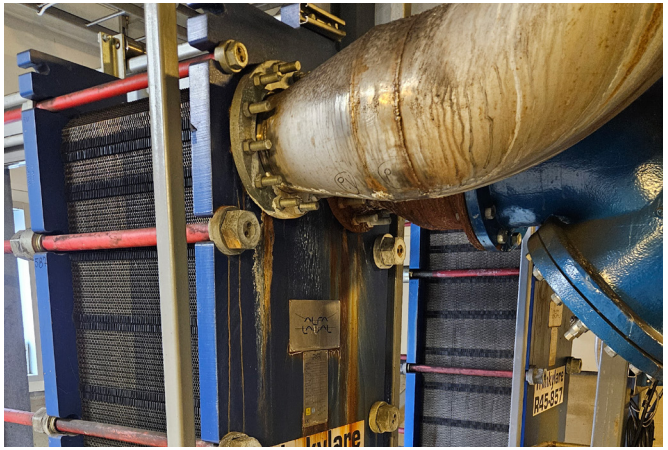
"For low-temperature recovery, the heat exchangers need to perform optimally to recover heat efficiently. This requires well-proportioned PHEs and adequate maintenance"

Lars Nilsson
Sales Engineer
Alfa Laval Nordic



"Of course, we are proud of this development in a more sustainable direction, and it's comforting to always have Alfa Laval by our side."

Ulf Degerstedt
Senior Advisor
Boliden Rönnskär

In northern Sweden, on the shore of the Baltic Sea, lies one of the world's most efficient copper producers, the Rönnskär copper smelting plant. Here, tonnes of brackish water from the Baltic Sea are pumped into hundreds of plate heat exchangers (PHEs) every day, working to cool the smelting processes.

"With optimal performance of the PHEs, the use of seawater for cooling can be lowered dramatically, while at the same time maximizing recovery of waste heat for district heating", Ulf Degerstedt explains, Senior Advisor at Boliden Rönnskär. "Our long-term partner, Alfa Laval, plays a central role in ensuring that the PHEs are operating optimally. Not only as a supplier of the majority of our PHEs, but also by monitoring and servicing all PHEs through a comprehensive service agreement."

Efficient waste heat recovery

As the use of waste heat for district heating grows, optimal waste heat recovery at the Rönnskär plant becomes even more important. With temperatures reaching over 1,000°C (1,800°F), the smelting processes create opportunities to recover heat in many forms, especially from hot gas streams. The most obvious opportunity is to produce steam in waste heat boilers, but large amounts are also available at lower temperatures when quenching gases. "When running a 24/7 operation, it can be hard to find time for maintaining the PHEs. But besides maintenance scheduled for planned stoppages, Rönnskär also has auxiliary PHEs installed, which allows main units to be taken out of service during production. This lets us do immediate maintenance when needed instead of waiting until the next planned shutdown, improving performance and recovery efficiency even further", says Lars Nilsson, Sales Engineer at Alfa Laval Nordic.

Partnership for a better future

Providing for Skellefteå's growing energy need, Boliden knows they can count on their collaboration with Alfa Laval to optimize PHE operations, today and in the future.

Benefits

- Optimized waste heat recovery
- Improved environmental performance
- Higher productivity due to increased uptime
- Longer PHE lifespan

Highest standard of service
Since the first service agreement signed with Alfa Laval in 2006, Rönnskär has relied on these service agreements for optimal PHE performance:

1. **Performance assessment**
   This service provides insight into the actual operating conditions. Alfa Laval measures heat transfer values and can predict exactly when maintenance is required.

2. **Cleaning-in-place**
   Alfa Laval cleans Rönnskär's PHEs based on the results of the Performance assessment. Using the right concentration of approved cleaning agents at the right temperature ensures top PHE operation. The cleaning process addresses the most common forms of fouling, as well as marine fouling from the cooling seawater.

3. **Reconditioning**
   "Alfa Laval also excels here", according to Degerstedt. "They swiftly replace gaskets and other parts to restore optimal function."

4. **Performance- and Visual condition assessment**
   Alfa Laval provides assessment and advisory services to optimize PHE performance. "Alfa Laval quickly identified several PHEs at Rönnskär that were oversized or undersized for their specific duty and has since redesigned them to improve operations", says Degerstedt. "Oversizing or undersizing PHEs directly affects water flow. Too low – a flow negatively impacts cooling efficiency and too high – a flow increases pumping costs unnecessarily."

Great water and energy savings
With Alfa Laval as a service partner, planned maintenance has led to fewer breakdowns and a substantial increase in uptime. But most importantly, water consumption has been almost halved, from 110 million tonnes of water per year to 60 million tonnes. This has also lowered the energy costs for water pumping by 15–20% since 2006.

Contact Alfa Laval

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