



Optimizing steel production

Alfa Laval solutions for steel and rolling mills







Focus on profitability

A highly competitive market, fluctuating steel prices and increasingly strict environmental regulations are just a few of the challenges steel producers face every day. To be profitable under these conditions you must keep optimizing every step of your production chain.

Alfa Laval has a long history of helping steel and rolling mills increase operating efficiency and cut costs using our solutions for heat transfer and separation. We supply heat exchangers for everything from process cooling to the most demanding duties involving highly corrosive media. And our separation equipment provides efficient sludge dewatering and oil cleaning, maximizing the recovery of valuable metals, water and oil.

Our experts can assist you from the initial idea stage and throughout the entire life cycle of your equipment. They make sure you get the optimum solution and help you adapt your equipment if your operating conditions change.

Qualified service is never far away when you choose to partner with Alfa Laval. Our global network of service centres and field service engineers make sure you get high performance throughout the entire life span of your equipment and minimum life cycle costs.

Contact us about how we can help you achieve your goals, or visit www.alfalaval.com/steel to learn more.

Outokumpu, Finland

When Outokumpu built its Tornio mill the company searched for a cooling solution with low operating costs and minimum environmental impact. To meet these requirements, Alfa Laval proposed a customized solution using air heat exchangers. Outokumpu found this to be a good solution from both a technical and financial perspective and a total of 16 Alfa Laval air cooled heat exchangers were installed at the plant.



Reliability and efficiency

Product quality, uptime and life cycle costs are high on every steel producer's agenda. Choosing the right cooling and separation equipment for your steel mill has a big impact on these factors. Our cooling, oil cleaning and sludge dewatering solutions give you high reliability, top performance and easy maintenance. Many of our installations have been running for decades and still deliver the same outstanding results as when they were new.

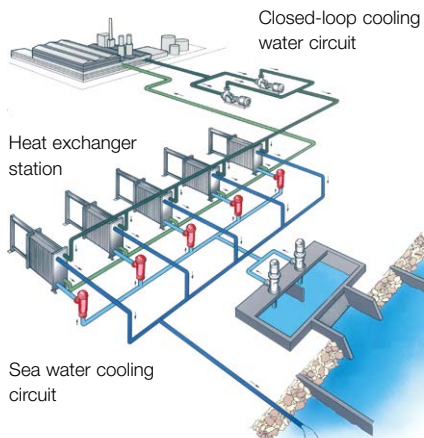
Process cooling

Steel production involves very energy-intensive process steps where precise and effective cooling is essential for reliable operation and product quality.

Alfa Laval offers a wide range of highly efficient gasketed plate heat exchangers that are perfect for all types of process cooling, for example cooling of blast, basic oxygen and electric arc furnaces.

Closed-loop cooling systems

Maintenance and CAPEX costs for process-cooling heat exchangers can be costly if water quality is low. A straightforward way to reduce these costs is to use a closed-loop cooling system with two independent cooling circuits.



Alfa Laval is one of the world's leading suppliers of gasketed plate heat exchangers for closed loop cooling systems. Our unique, patented technology offers:

- Efficient cooling
- Low CAPEX
- High flexibility, easy expansion
- Small footprint
- Low maintenance costs thanks to minimal fouling and easy service
- Reliable operation

Air-cooled heat exchangers

Air-cooled heat exchangers are the preferred choice when cooling cannot be accomplished using fresh water, e.g. where water is scarce.

Cooling water circulating in a closed loop cools the process equipment and is then cooled in air-cooled heat exchangers.

We offer several different types of air-cooled heat exchangers, such as dry air-cooled heat exchangers and wet surface air-cooled heat exchangers, with capacities up to 4 MW/unit.

All products combine high cooling power with low electricity consumption and noise levels.



Alfa Laval air coolers at Arcelor Mittal Ostrava

Air-cooled heat exchangers offer several benefits over cooling towers:

- No water consumption and no water cleaning system required
- Less fouling and no corrosion thanks to closed loop
- Lower repair costs and CAPEX
- Quick and easy installation

Installing air-cooled heat exchangers is an economical way to add extra cooling capacity when expanding your plant.

We offer complete modules for both expansions and green field projects, including a pumping skid, all piping and basic engineering work.

thyssenkrupp, Germany

To protect its cooling tower from oil-contaminated cooling water and avoid costly maintenance, thyssenkrupp installed two Alfa Laval M30 Double Wall heat exchangers with titanium plates in its Duisburg mill. The double wall design guarantees the oil-contaminated cooling water in the primary cooling loop cannot mix with cooling water from the cooling tower, and that no contamination can escape into the surrounding environment.



Oil cleaning

Cleaning and recycling industrial oils has a positive impact on operating cost as it reduces wear on equipment, prevents clogging, lowers oil consumption and cuts disposal costs. Using clean oils also reduces energy consumption as it lowers the friction in the equipment.

Alfa Laval high-speed centrifuges are ideal for cleaning all types of oils used in steel production, such as lubricating oil, bearing (Morgoil) oil, rolling oil, hydraulic oil and gear oil. Our high-speed centrifuges effectively remove both particles and water in a single operation.

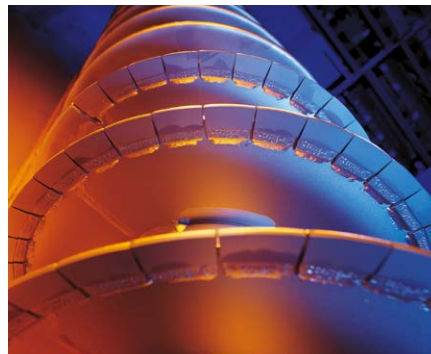
Oil cooling

Alfa Laval plate heat exchangers are used for cooling all types of industrial oils. Our double-wall plate heat exchangers eliminate the risk of oil mixing with the cooling medium. If a leak should occur, the double-wall design prevents costly damage and pollution of the environment.

Scale recovery and water cleaning in rolling mills

The large amounts of cooling water used in a rolling mill means good water recovery is crucial for operating economy.

Alfa Laval decanter centrifuges efficiently remove scale and ferrous particles from cooling water. This ensures wear on the machinery is minimal and that as much recovered material as possible goes back into production.



Tungsten carbide tiles protects the decanter conveyor against erosion

Dewatering sludge from wet gas scrubbers

Alfa Laval decanter centrifuges are also an excellent choice for dewatering sludge from gas-washing scrubbers. The resulting cake is very dry with up to 75% w/w solids, keeping costs for transportation and disposal low.

Benefits of decanter centrifuges

Compared to traditional filter technologies a decanter centrifuge offers the following benefits:

- Greatly improved working environment, no need for manual cleaning of filters and dust is contained within the machine
- Compact installation, perfect for expansion where available floor space is limited
- Continuous, automatic operation
- Lower labour and maintenance costs



Alfa Laval Service – Extending performance

Alfa Laval's global service network keeps you competitive by minimizing costs and maximizing your return on investment. Alfa Laval Service offers a wide range of services to support you throughout the entire lifecycle of your equipment. Whatever your equipment's type or age there are options to safeguard or enhance its operation. The Alfa Laval 360° Service Portfolio offers full

support – from planning, installation and commissioning to advice on the best replacement if the time comes. We also offer customized service agreements – Alfa Laval Performance Agreements.

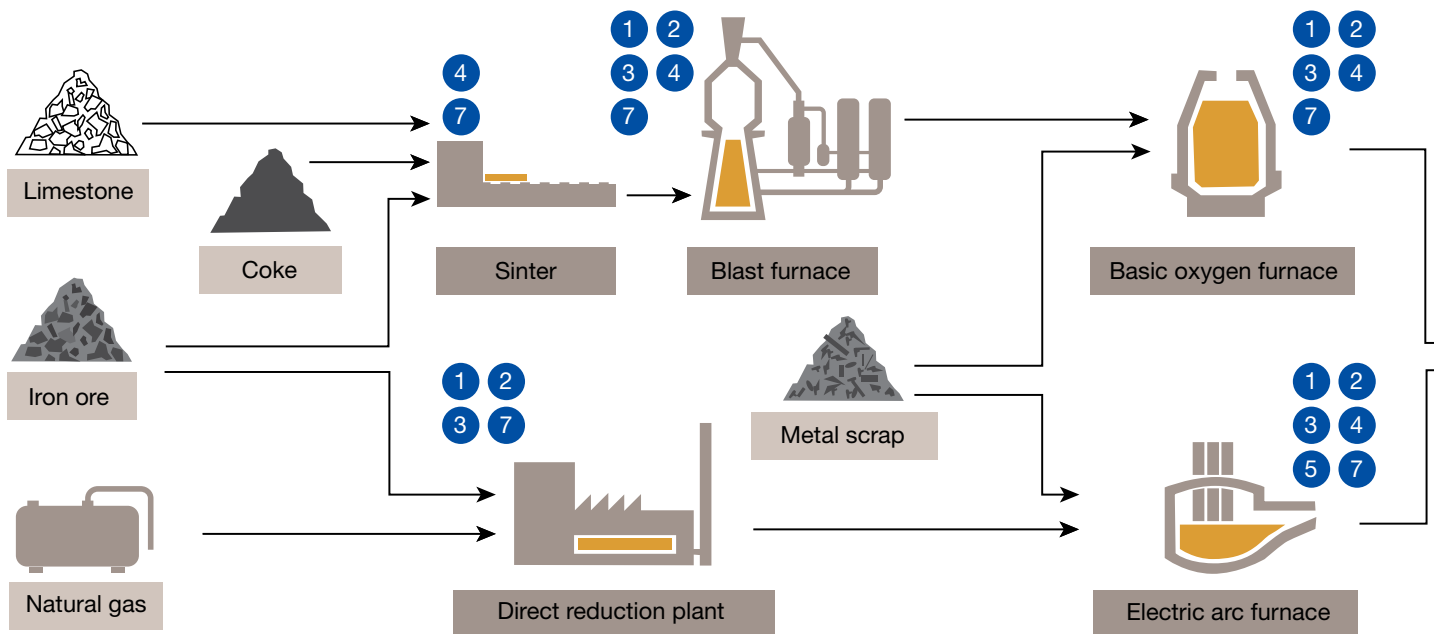
Our global service network has a strong local focus and service specialists ready to assist you in nearly 100 countries.

NLMK, Russia

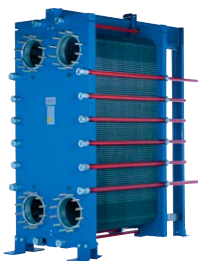
Having suffered from problems with water in bearing oil causing frequent production stops and costly damages, NLMK decided to upgrade its bearing oil cleaning plant to a system from Alfa Laval. The new system uses a high-speed separator to clean the oil and a heat exchanger for preheating the oil to improve separation efficiency. Since the revamp NLMK has had no problems with water or solids in the oil and saves both energy and time with the new system.



Process overview



1



Gasketed plate heat exchangers

- High thermal efficiency
- Available in many sizes and materials
- Quick and easy service
- Robust design
- Excellent for closed loop cooling systems

2



Air-cooled heat exchangers

- Perfect alternative when water cooling is not possible
- Closed loop system
- Easy installation
- Low operating and maintenance costs

3



ALF filters

- Protect heat exchangers from debris and marine life
- Reduce maintenance costs for heat exchangers
- Fully automatic operation (backflushing)

4

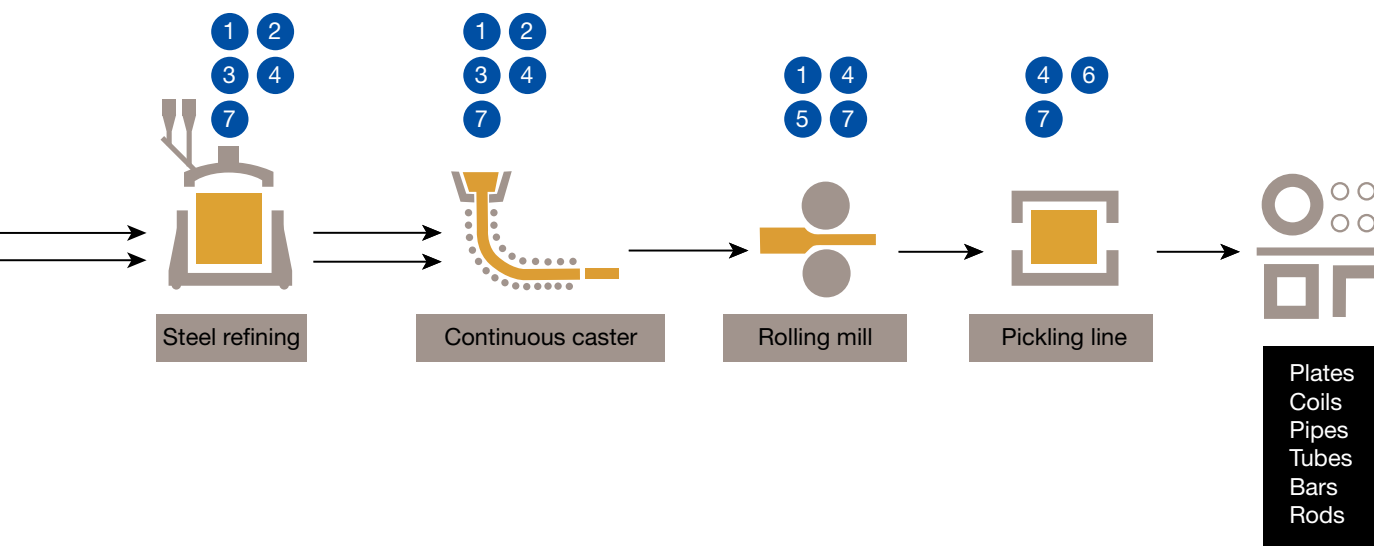


Decanter centrifuges

- Excellent for separating slurries
- High cake dryness
- Separation of two phases
- Robust design with protection against

Outokumpu ferrochrome plant, Finland

The highly abrasive and sticky nature of the sludge from one of the gas scrubbers at Outokumpu makes it very challenging to dewater. The plant has used Alfa Laval decanters for this task for many years and since 2012 three Alfa Laval P2-600 decanter centrifuges dewater the sludge. The plant personnel are very satisfied with the high cake dryness.



5



Oil cleaning module with high-speed separator

- For cleaning of all types of oils, e.g. bearing oil and rolling oil
- High separation efficiency resulting in clean oils
- Sturdy design for reliable operation

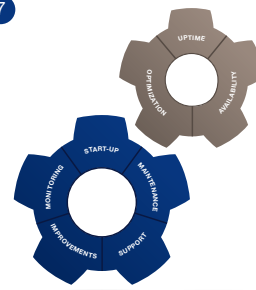
6



DIABON® heat exchangers

- Plates made of graphite
- For use with highly corrosive media such as acids used in pickling lines
- Small footprint

7



Alfa Laval Service

- Maximum performance and return on investment throughout your equipment life cycle
- Adapt equipment as conditions change
- Reliable uptime

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

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com.

