Alfa Laval helps Asturiana keep the steam on

Over three decades of success with Spiral Heat Exchangers **Case story**

With 1.2 million tonnes produced annually, Xstrata plc is one of the world's largest suppliers of zinc. The company's zinc smelter at Asturiana de Zinc in San Juan de Nieva, Spain accounts for half of their zinc production. Over the past thirty plus years, Alfa Laval has supported Asturiana de Zinc's growth with Spiral Heat Exchangers, which are easy to clean, offer minimal downtime and have excellent thermal efficiency.

Easier to clean, more efficient

Before Alfa Laval came into the picture in 1976, Asturiana de Zinc used a shell-and-tube heat exchanger. There were a number of problems with this heat exchanger. The cleaning process was complicated and required shutting down production, for example. Finally, when some tubes broke due to scaling, it was time to look for a new solution.

Asturiana chose to look upon this short-term setback as a long-term opportunity to improve efficiency. Less downtime and better thermal efficiency were the key benefits they were looking for in a new solution. With this in mind, it was critical that, unlike their previous solution, it would be simple to maintain and could be cleaned without having to halt production

The Alfa Laval Spiral Heat Exchanger is not only easy to clean, it offers increased heat transfer efficiency than that of a shell-and-tube heat exchanger. So as Asturiana de Zinc grew, they added more Alfa Laval Spiral Heat Exchangers. Today, not only is the original installation still running fault-free, but there are seven more Spiral Heat Exchangers installed in three production lines.

Fast Facts:

With the acquisition by Xstrata in 2001 of the zinc operations of Asturiana de Zinc SA, Xstrata has become one of the world´s largest producers of zinc concentrates and refined zinc.

The annual production is 1.2 million tonnes of Zinc for the whole Xstrata Zinc organization with the smelter at Asturiana de Zinc accounting for 460,000 tonnes annually.

Identical channels
One set of Alfa Laval Spiral Heat Exchangers at the Asturiana de Zinc plant. The top and bottom is identical so it's possible to simply switch channels and continue production while cleaning.

A view of all eight units of Alfa Laval Spiral Heat Exchangers at the Asturiana de Zinc plant in San Juan de Nieva, Spain. A Zinc Sulphate solution with concentration of 140 g/L is heated from 56°C to 82°C with 4 bar steam. The flow rate of Zinc Sulphate solution is 210, 000 kg/h.

The plant where production never stops

One of the challenges of zinc production is the scaling. During the process, zinc sulphate crystal deposits tend to get stuck on the surface of the heat exchangers due to the increase in temperature.

The Alfa Laval Spiral Heat Exchangers at Asturiana de Zinc make it easy to deal with this challenge because they have two identical channels. Hot fluids run through one while cold fluids run through the other. When the hot side gets dirty, it's possible to flip the units around and change the channel that the vapours run through. The dirty side can be cleaned by simply opening the bolts and applying steam. Production never needs to stop.

"The units are turnable so the cleaning is done by simply changing the circuits. This means that if the product side has to be cleaned then we make the change and the vapour goes through the product side. So the unit continues working and cleaning at the same time, and we avoid having to stop and clean", says the Asturiana de Zinc Technology Manager Francisco Tamargo.

A quality relationship

The ability of the Alfa Laval Spiral Heat Exchangers to meet all Asturiana de Zinc's needs has led to a long, successful relationship. "We use these units because they're very strong and very easy to clean and of course because the thermal efficiency is high", Tamargo says.

Equally important as the quality of the product, however, is the quality of the relationship with Alfa Laval. Tamargo points out that Alfa Laval doesn't just sell products. They also keep good contact with their customers after initial sales in order to make sure that the customer is satisfied and the units work as expected.

About the solution
Alfa Laval Spiral Heat Exchangers are used after the leaching process at the zinc smelter at Asturiana de Zinc.

- The eight units in three production lines are easy to clean and efficient.
- Identical channels allow for cleaning without interrupting production.
- Spiral Heat Exchangers offer two to three times greater efficiency than shell-and-tube heat exchangers.

SpiralPro

Design temperature
-100°C (-148°F) to 400°C (752°F)
Design pressure
Full vacuum to 100 barg (1450 psig)
Maximum heat transfer area
900 m^2 (9,688 ft^2)
Material of construction
Carbon steel, 316L/304/316Ti, 2205 Duplex, Titanium, Nickel alloys
Duties
Liquid-to-liquid or steam heater

Learn more at **www.alfalaval.com/spirals**

SpiralCond

Design temperature
-100°C (-148°F) to 400°C (752°F)
Design pressure
Full vacuum to 100 barg (1450 psig)
Maximum heat transfer area
2,500 m^2 (26,910 ft^2) (for stacked columns)
Material of construction
Carbon steel, 316L/304/316Ti, 2205 Duplex, Titanium, Nickel alloys
Duties
Vacuum condensation or evaporation

Unique features
Built with unique features that prevent fouling, Alfa Laval spiral heat exchangers ensure efficient, reliable performance with high uptime and low maintenance requirements.

SelfClean
Design that prevents fouling

RollWeld
Automated, reliable channel closures

HighP
A custom solution for high-pressure duties

ALOnsite
Qualified support at your facility

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.