



# Compabloc saves energy in Ammonium Nitrate production

How an ammonium nitrate plant got more out of less

Case story

When a fertilizer manufacturer in Slovakia, built their ammonium nitrate evaporation system in 1999, there was one criteria above all others for the design. It had to be efficient. With that in mind, they discovered that Alfa Laval Compabloc heat exchangers could help keep both their evaporator cost – and their energy bill – down.

## Their bottom line just got a lot hotter

At the plant, two Compablocs are used to save no less than 5MW of energy by means of reduced steam consumption in the second effect evaporator.

By using Compabloc heat exchangers for preheating incoming 80% ammonium nitrate with 95% concentrated ammonium nitrate, they were able to save large amounts of energy.

In fact, without the Compablocs it would not be possible to concentrate the



Two Compablocs serving as ammonium nitrate interchangers in the evaporation section of the ammonium nitrate plant. The result? Substantial energy savings

## Fast Facts:

### The challenge

When they built their ammonium nitrate plant in 1999, the company was looking for the optimal solution in terms of a compact, robust and energy efficient solution.

### The benefits

- 5 megawatts of steam energy saved
- Possible to concentrate the ammonium nitrate without a substantial increase of the evaporator size and without significantly higher steam consumption.

### About the Solution

The Compabloc welded plate heat exchanger from Alfa Laval is suitable for operation in chemically aggressive environments and for handling high-temperature fluids. With accessibility to all heat transfer channels, maintenance is straightforward and efficient.

ammonium nitrate without a substantial increase of the evaporator size and much higher steam consumption.

### A perfect fit

The aim was to recover as much heat as possible from the concentrated ammonium nitrate. With this in mind, the selection of Compabloc heat exchangers was the logical choice.

The corrugated plate pattern and counter-current flow of the Compablocs makes them extremely efficient and suitable for energy recovery.

The counter-current flow enables crossing temperature programs, where the cold fluid can be heated to temperatures very close to those of the incoming hot fluid. The closer the temperature

## THE PROCESS



Alfa Laval heat exchangers are used in several positions in the Ammonium Nitrate production process. In addition to being used as ammonium nitrate preheaters, there are also Compablocs used as nitric acid preheaters and condensers.



A Compabloc heat exchanger serving as Cyclohexane preheater

Semi-welded Alfa Laval ammonia condensers in use since 2001



### About Compabloc

#### Superior heat transfer coefficient

- ASME and PED-coded design for up to 35 barg (500 psig) /350°C (660°F)
- Up to 330 m<sup>2</sup> (3,500 ft<sup>2</sup>) of heat transfer area
- Low pressure drop and high heat transfer coefficient makes it ideal for reboiler and condenser duties

#### Designed for Efficiency

- Corrugated plate pattern ensures optimized flow
- Extremely compact design saves on capital and installation costs
- Nozzles and pass configurations can be customized to meet particular requirements



A Compabloc heat exchanger for preheating of Nitric acid

approach between two fluids, the more heat recovered.

“Alfa Laval Compabloc heat exchangers are a perfect fit because they can easily deal with crossing temperatures. In fact, one unit can often replace several shell and tube heat exchangers with down to five times less area requirements,” says Magnus Edmén, marketing manager at Alfa Laval.

### Yes to compact solutions

In addition to the Compabloc heat exchangers, the company use Alfa Laval products for many other purposes in both their fertilizer and petrochemical plants. To name just two examples, semi-welded plate heat exchangers are used as ammonia condensers and Compabloc heat exchangers as cyclohexane preheaters.

### 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](http://www.alfalaval.com).