



Upping uptime

Cutting maintenance in an ammonia plant

Case story

An Asian ammonia producer had severe problems with fouling in the lean/rich interchanger in its acid gas removal process. Problems disappeared when the existing coil-wound heat exchanger was exchanged for four Alfa Laval Compablocs. The new heat exchangers deliver stable performance and require minimal maintenance.

Uptime is crucial in all processing industries. With a high demand on the market for ammonia, production capacity and uptime are focus areas for all producers.

Problems with an existing heat exchanger

One of the major ammonia producers in Asia used a coil-wound heat exchanger as a lean/rich interchanger in its acid gas removal system.

This heat exchanger was regularly cleaned using a CIP process every 1-2 years. After some time, CIP cleaning did not bring the heat exchanger back to full capacity. Apparently there was fouling in the heat exchanger that could not be removed using CIP.

Since the coil-wound heat exchanger could not be cleaned mechanically the company had to replace the unit.

The company's engineers were searching for a solution that would require minimum maintenance and high efficiency. First, they tried using a shell-and-tube. But the performance of the new heat exchanger was insufficient and there was no room for installing a second unit.



Minimum fouling and easy cleaning

Alfa Laval proposed complementing the shell-and-tube with four Compablocs to boost capacity. The high thermal efficiency means a Compabloc is very small compared to a corresponding shell-and-tube and can normally be installed in existing spaces.

A Compabloc is less susceptible to fouling than a shell-and-tube thanks to its highly turbulent flow. Cleaning a Compabloc is easy and brings it back to 100% performance. Service personnel can either use CIP or clean the heat exchanger surfaces with a high-pressure water jet. All heat exchanger surfaces are fully accessible for mechanical cleaning. Since no tube bundle needs to be extracted, the required service space is minimal.

Compablocs are very suitable for heat recovery positions, for example as lean/rich interchangers. A Compabloc can operate with a crossing temperature program and a temperature approach as small as 3°C (5.4°F). This means a lot more energy is recovered compared to using a shell-and-tube.

Installation

The company installed four Compablocs in pairs in series with the existing shell-and-tube. The four Compablocs recover 14 MW.

Carefree uptime

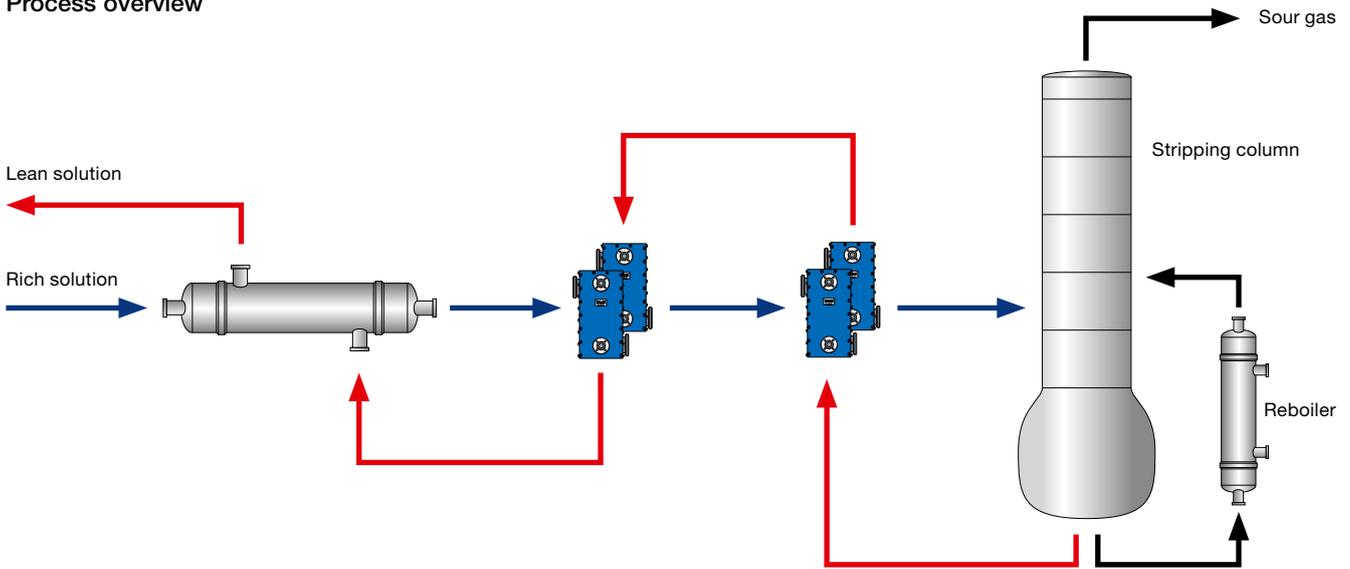
The Compablocs have performed according to specification, and after three years' operation there was still no need for cleaning. Pressure drops

were the same as when the heat exchangers were installed and thermal performance has dropped marginally. The plant's service engineers anticipate the Compablocs will need their first CIP cleaning after four years. The shell-and-tube is cleaned every 1-2 years using a high pressure jet.



Exchanging their existing coil-wound heat exchanger for four Alfa Laval Compablocs eliminated the severe fouling problems the plant struggled with before.

Process overview



The lean/rich interchanger in the acid gas removal system recovers heat from the stripping column and uses it to preheat the feed. Exchanging the existing coil-wound heat exchangers for four Compablocs resulted in dramatically reduced maintenance needs and increased uptime.

Fast facts



Alfa Laval Compabloc

The all-welded Alfa Laval Compabloc compact heat exchanger has a solid reputation for reliability and high performance.

Superior performance

Its high turbulence and overall counter-current flow gives Compabloc unrivalled thermal efficiency – up to five times higher than shell-and-tubes. This means Compabloc heat exchangers are compact and offer maximum capacity per installed area.

Minimal maintenance

Fouling is minimal in a Compabloc thanks to its highly turbulent flow. When it needs cleaning, service personnel can either use cleaning-in-place equipment or remove the panels and clean

the plates with a water jet. All channels are accessible for mechanical cleaning, meaning a Compabloc is back at 100% performance after service.

Designed and built for rough conditions

Compablocs are specially developed for operating with aggressive media and are available in a wide range of corrosion resistant materials.

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.