



Crucial positions require compact solutions

Compabloc installed at ethylene oxide plant in China

When Sinopec Shanghai Petrochemical Company Limited (SPC), a subsidiary of Sinopec Corporation, revamped its ethylene oxide plant in Shanghai, solutions were needed for critical heat exchanger positions within the facility's absorption-stripping system. Size was a determining factor. For SPC, a solution from Alfa Laval requiring minimum space and offering high efficiency provided the answer for both positions.

Separating gases

The purpose of the absorption-stripping system is to separate ethylene oxide and carbon dioxide/unreacted ethylene (see figure 1). The two gases enter an absorption tower where the ethylene oxide is taken up by the absorption medium and the remaining gas exits the tower at the top. The absorbed ethylene oxide is then directed to a stripping tower. Here it is stripped from the absorption medium which is sent back to the absorption tower for re-use.

Two critical positions

Systems like these have two critical heat exchanger positions – the interchanger and the lean cooler. The interchanger recovers heat at the bottom of the stripper, while the lean cooler reduces the temperature of the regenerated absorption medium before re-entering the absorption tower. Both positions are extremely important to system capacity and efficiency.

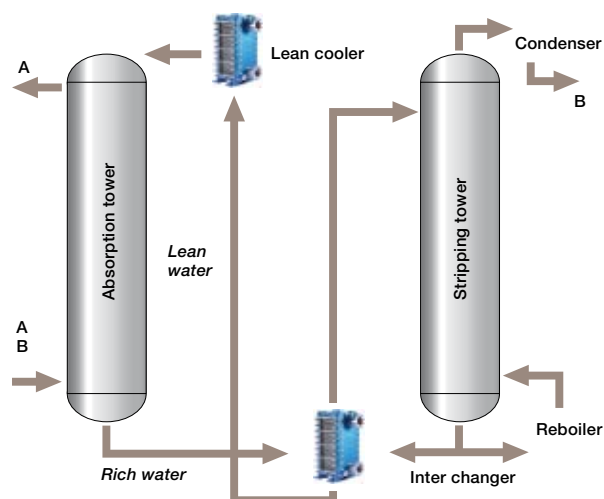


Figure 1. Absorption stripper system



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The challenge

As in most cases, the challenge facing SPC was to maximise heat recovery while minimising the heat transfer area. The inability of standard shell-and-tube heat exchangers to achieve counter-current flow in order to handle crossing temperatures in a single unit, made such a solution unlikely, as it would have required several large units installed in series.

“There was no way we were going to consider shell-and-tubes, because they would have been enormous,” says Mr. Wang, process manager at SPC.



Since their installation at the SPC plant in 2002, the Compabloc units have provided trouble-free operation.

The solution

SPC came to the conclusion that a compact plate heat exchanger with a counter-current flow pattern and capable of handling crossing temperatures was the most practical answer. The turbulent flow achieved in a compact heat exchanger results in exceptional heat transfer efficiency, so maximum heat recovery is achieved with a minimum area and number of units.

SPC's long relationship with Alfa Laval made their choice an easy one, selecting Compabloc welded plate heat exchangers for both positions.

"We have great confidence in Alfa Laval products because we have been using them for more than 20 years," says Mr Chen, Equipment Manager of the EO/EG Plant. "Our experience with the Compabloc welded plate heat exchanger gave us even greater peace of mind. We believe that it will have a long lifetime and that we don't have to worry about leakages."

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About Sinopec

An integrated energy and chemical company, Sinopec's main business covers oil and gas exploration, development, production and marketing. The company is China's largest producer and supplier of oil and petrochemical products, and second largest crude oil producer. Major products include gasoline, diesel, jet fuel, petrochemical intermediates, synthetic resin, synthetic fiber monomers and polymers, synthetic fiber and chemical fertilizer.

Alfa Laval's experience in EO/EG applications

Alfa Laval has sold units to EO/EG applications for over 20 years and to all the various, main processes. By using Compabloc, the benefits of an all-welded product in combination with high efficiency saves EO/EG producers money and maintenance.

More than 50 Compabloc units are in use within EO/EG plants today.



Key facts about Compabloc

Compabloc is a high-efficiency, all-welded compact heat exchanger designed for aggressive or hazardous process services. It is available in six sizes, with heat transfer areas in the range 0.7–320 m² (7–3450 sq ft).

The heat transfer area is made up of a pack of corrugated plates welded alternately to form the media channels. The plate pack is supported by an upper and lower head and four side panels, which accommodate the connections. The fully welded plate pack extends design limits and provides improved reliability. Because there are no interplate gaskets, compatibility concerns are eliminated, and maintenance and operating costs are reduced.

Access for inspection and cleaning is fast and easy.

Plate materials

- 316L, 304L, 317L, 904L, 254 SMO and AL6XN stainless steel
- Titanium, Pd-stabilized titanium
- C-2000, C-276, C-22 and B3 alloy

Specifications

Design pressure:
min. vacuum/max. 37 barg (520 psig)

Design temperature:
min. –50°C/max. 350°C (-20/660°F)

Pressure vessel code:
PED and ASME (with or without U-stamp)

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