



Lower costs. More heat recovery. Less space.

What three Compablocs did in aromatics extraction

Case story

Three years ago, a Japanese petrochemical company began exploring options to increase capacity for the production of benzene and toluene at their plant in Japan. But they soon realized that a solution based on shell and tube heat exchangers would be too costly and would require difficult compromises. The company had heard about Alfa Laval's extremely efficient, compact Compabloc heat exchanger. And sure enough, Alfa Laval offered a better solution.

Why shell and tube couldn't do the job

The company extracts benzene and toluene from an aromatic-rich stream, using a Sulfolane unit based on a Shell/UOP license. The original plant had four shell and tube heat exchangers in series in the interchanger position. Those heat exchangers provided a total heat transfer area of 1200 m².

Using shell and tube heat exchangers to increase capacity as required, while at the same time improving heat recovery levels, would have required four larger units and more than 5000 m² of surface space. Installing such a system in the existing location was clearly impossible. It would have forced them to accept either a new location or lower heat recovery – or both – to make the shell and tube design work. Not to mention high installation costs due to the heavy weight of the equipment.

Almost too good to be true

Alfa Laval offered a solution that would keep the costs reasonable (both capital



The Compabloc is perfect for situations where minimal installation space is available and high heat recovery is desired.

outlay and installation), conserve space and increase heat recovery.

The Alfa Laval solution called for three compact Compabloc heat exchangers in parallel in the interchanger position and required only 950 m² of surface space. And the improved system could be easily installed in the same amount of space on the same platform as the old system. (See figure 1.)

Not only that, but capital outlay and installation costs for the Alfa Laval system would be lower than for the shell

and tube design. Particularly when the cost of relocating the system was taken into account.

Fast Facts:

The customer

A Japanese petrochemical company

The challenge

- Wanted to increase capacity for production of Benzene and Toluene at its factory in Japan

The benefits

- Highly competitive capital and installation costs
- More capacity in a small space
- Higher heat recovery

Aromatics extraction and fractionation unit

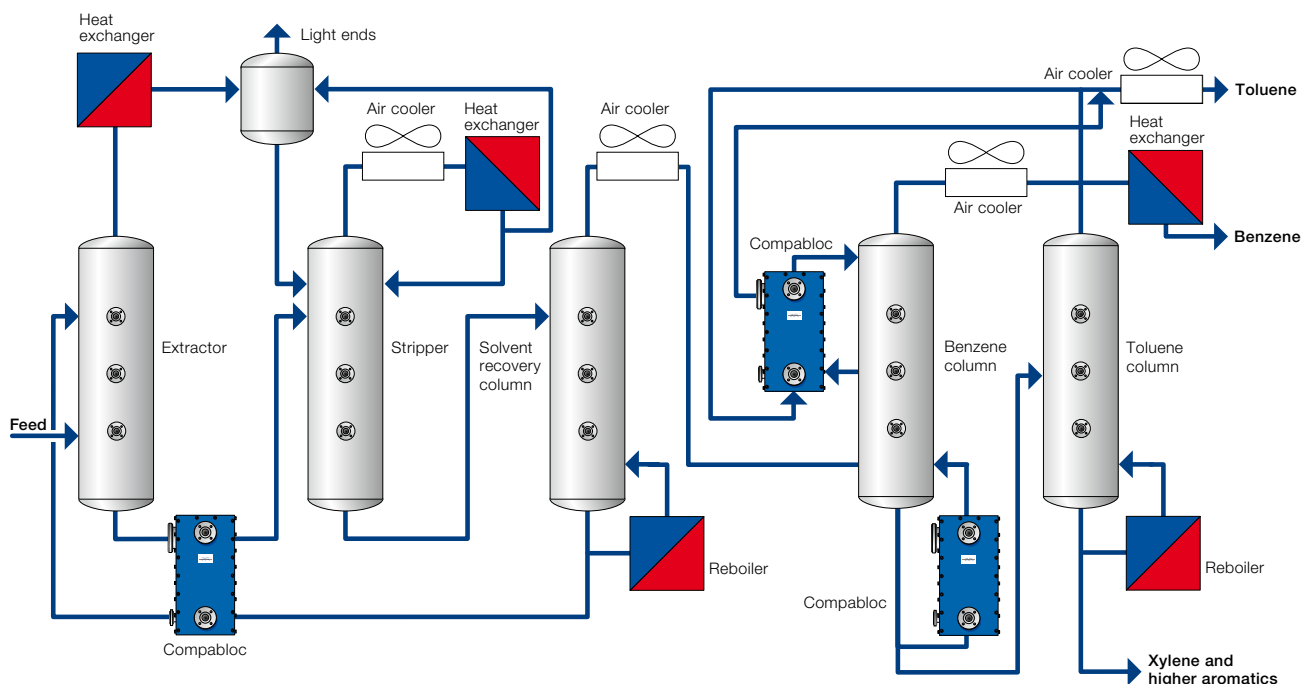


Figure 1. On the left: Three Compabloc heat exchangers in parallel in the interchange position. On the right: Two Compabloc heat exchangers in the separation position.

The process is described in i.a. Ullmanns Encyclopedia of industrial processes and in material published by UOP LLC on its website www.uop.com.

Plus, with the Compabloc solution, they recovered more heat and thus saved more energy.

550,000 USD in estimated additional annual savings

Because Compabloc is based on corrugated plate technology, it is possible to recover more heat. The new installation recovered 2.1 MW more heat compared to the original installation. Based on current natural gas prices and steam costs, Alfa Laval estimates up to 550,000 USD in additional annual savings.

In addition to the new system in the interchange position, the customer also needed to replace three reboilers in the separation position. For two of these positions, they chose to install Compablocs, which fit well into the available space.

Over a year and still going strong

The Compablocs have been in operation over a year now, and they are performing as expected in every way. When asked to describe why they chose Compabloc – and what benefits

they can attribute to their choice, representatives of the company had this to say: “We chose the Compabloc design because the initial investment compared favorably to the cost-effectiveness of the solution – also it could be installed in a small space and would minimize the revamp structure.

”We got a consistently quick response from Alfa Laval during the sales process, and we got the end results we wanted – increased capacity and higher heat recovery.”

About the solution

Three Alfa Laval Compabloc Heat exchangers in parallel are in operation in the interchanger position.

There are also two more used as reboilers in the separator position.

- Small size and low weight
- Fewer units required and lower installation costs
- High heat recovery resulting in lower emissions
- Long service intervals and easy service access for low lifetime costs

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.