Using process energy the smart way

Heat recovery in a paraxylene plant in Asia

Case story

Exchanging the existing air-cooled condensers for four Compablocs allowed a major paraxylene producer in Asia to increase heat recovery by more than 23 MW in its plant.

The company is constantly looking for new ways of improving energy efficiency. When its engineers learned about the benefits with Alfa Laval's compact heat exchangers they saw new possibilities for large energy savings.

Compact heat exchangers

Alfa Laval's compact heat exchangers offer much higher thermal efficiency then traditional shell-and-tubes, making them much smaller. They have a temperature approach as small as 2°C (3.6°F) and can operate with a crossing temperature program, allowing for more heat recovery and at a lower temperature. Compact heat exchangers open up new possibilities for recovering heat that has previously been regarded as waste.

New opportunities to save fuel

The paraxylene producer manufactures 500,000 tonnes per year and the plant is built under license from Axens.

The company decided to replace its existing air-cooled heat exchangers used for condensing overhead vapours from three of the plant's columns with four Alfa Laval Compablocs.

Two of the Compablocs were installed on top of the paraxylene recovery column and are now recovering 20 MW of waste heat, resulting in annual fuel savings of roughly 2.3 million euros.

The other two Compablocs were installed on top of the recycle and de-heptanizer columns in the xylenes isomerization area. These heat exchangers recover 3.7 MW, leading to roughly 430,000 euros in fuel savings per year.

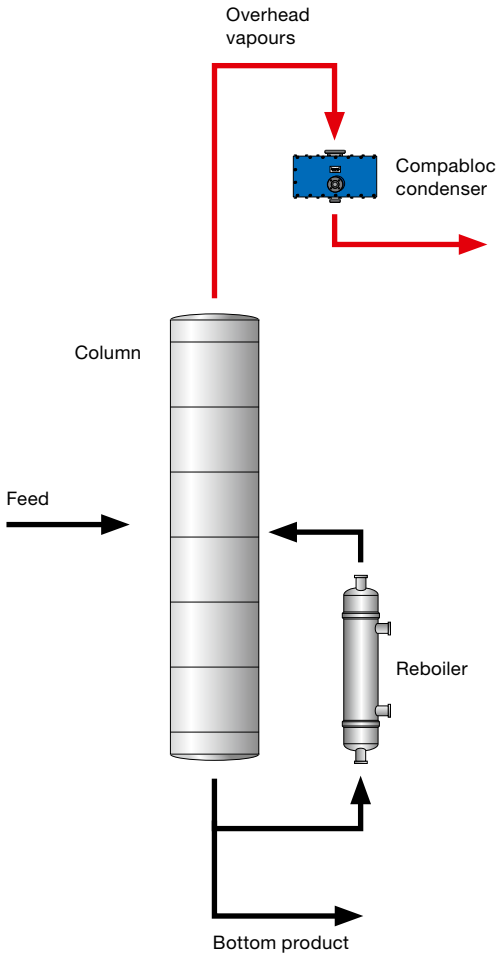
The payback time for the revamp, including the cost for installation, was less than one year.

Many uses for recovered heat

The recovered energy is used for preheating boiler feedwater, heat tracing of process equipment and district heating.

The new condensers have been in operation since 2012 and have been working according to specification ever since.

Process overview



Using four Alfa Laval Compablocs as overhead condensers, the company now recovers a total of 23.6 MW of heat, resulting in energy savings of roughly 2.7 million euros annually.

Fast facts

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

Superior performance
Its high turbulence and counter-current flow give Compabloc unrivalled thermal efficiency. It performs condensing duties 2-4 times more efficiently than traditional solutions. This means Compabloc condensers are compact and can be installed at the top of columns without problems.

This high efficiency minimizes cooling water consumption. Alternatively it lets you use warmer cooling water or subcool the condensate.

Low pressure drop
The short flow path and the large cross section give Compabloc a low pressure drop, making it an excellent condenser.

Minimal maintenance
Fouling is minimal in a Compabloc thanks to a 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 up to 100% performance after cleaning.

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.

Gas/liquid separation
If the vapour contains non-condensable gases, a Compabloc condenser can be configured with two passes, permitting gas/liquid separation in the condenser without the need for a separator unit.

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.