Hot and cold water for free

Heat recovery in a styrene butadiene rubber plant in Asia

Case story

A mid-sized styrene butadiene rubber producer in Asia installed two Alfa Laval spiral heat exchangers and one Compabloc to recover waste heat from a stripping column. The heat is now reused in the plant and annual energy costs are estimated to be about 660,000 euros lower as a result.

Put waste heat back to use
Petrochemical companies across the world are competing in an increasingly tough business climate. Staying profitable requires plant owners to take every chance to reduce operating costs.

Recovering waste heat is a simple and straightforward way of cutting energy expenses. Using compact heat exchangers with high thermal efficiency allows you to recover heat from streams that have been deemed worthless before.

High thermal efficiency, a temperature approach as small as 2°C (3.6°F), and the ability to operate with crossing temperatures in a single unit means Alfa Laval compact heat exchangers deliver maximum heat recovery on minimum floor space.

New possibilities
Distillation and stripping columns are among the most energy consuming units in a petrochemical plant.

Heat in top vapours or gases is often treated as waste and cooled off. By installing an Alfa Laval compact heat exchanger you can recover much of this energy, put it back to use in your plant, or sell it externally, for example to a district heating network.

Heat recovered from stripping column
A mid-sized styrene butadiene rubber manufacturer in Asia installed compact heat exchangers from Alfa Laval to recover heat from stripping overhead process gas.

The gas has a temperature of about 100°C (212°F) and must be cooled down before further processing. Previously the heat was cooled off but now it is recovered in two stages.

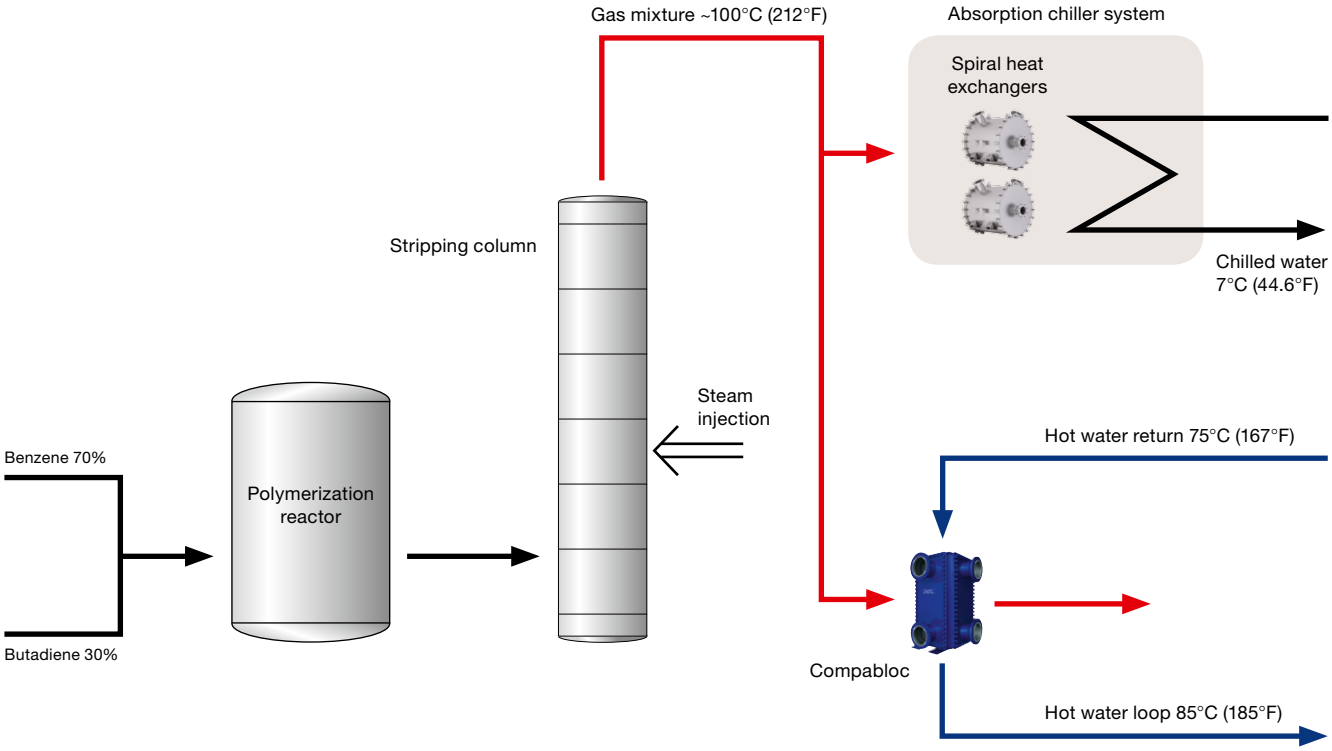
Hot water loop
The first use of the recovered heat is for a hot water loop serving various heat exchangers throughout the plant.

The hot gas passes an Alfa Laval Compabloc where the loop return water is heated from 75°C (167°F) to 85°C (185°F). The water was previously heated in a shell-and-tube using steam that had been throttled down from 10 to 2 bar. Using recovered heat instead saves the plant steam to a value of 500,000 euros per year.

Generating chilled water
The gas also passes two Alfa Laval spiral heat exchangers installed in parallel. The heat recovered here is used for producing chilled water in an absorption chiller.

The company replaced its traditional ammonia system with an absorption chiller in 2008. The previous system consumed 50 kWh of electricity per produced ton of butadiene rubber and the plant's engineers estimate the annual electricity costs dropped by 160,000 euros as a result of the revamp.

Process overview



Heat recovered from a stripping column is used for producing chilled water in an absorption chiller system and for heating the water in a hot water loop serving various heat exchangers throughout the plant. The revamp resulted in a total annual energy saving of about 660,000 euros.

Fast facts

Alfa Laval Compabloc and spiral heat exchangers – perfect for heat recovery duties
The all-welded Alfa Laval Compabloc and spiral heat exchangers have a solid reputation for reliability and high performance.

Superior performance
The high turbulence and overall counter-current flow give Alfa Laval compact heat exchangers unrivalled thermal efficiency. They perform heat recovery duties up to five times more efficiently than shell-and-tubes.

The high efficiency and small footprint of compact heat exchangers make them the perfect choice for installation in available spaces, for example on top of distillation columns.

Low pressure drop
The short flow path and large cross section give Compabloc and spiral heat exchangers a low pressure drop, making them suitable for use with gases and vapours, for example as condensers.

Minimal maintenance
Fouling is minimal in Alfa Laval Compabloc and spiral heat exchangers thanks to high turbulence. When they need cleaning you can either use cleaning-in-place equipment or open the units and clean the plates with a water jet. As it's easy to access all channels, they reach 100% performance after mechanical cleaning.

Designed and built for rough conditions
Compablocs and spiral heat exchangers 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.