



Compabloc boosts capacity and cuts CO₂ at Dow

Dow Wolff Cellulosics, Zwijndrecht, Belgium

Case story

Dow Wolff Cellulosics, Belgium, has installed two Compabloc compact heat exchangers from Alfa Laval for different duties in one of the plant's solvent recovery columns. The first unit, required urgently to replace a worn-out shell-and-tube reboiler, was delivered by Alfa Laval at extremely short notice and provided a substantial capacity increase. Calculations show that the second Compabloc, installed to heat the process feed to the column, will provide annual energy savings of 22,400 GJ and a reduction in CO₂ of 1,250 tonnes.

Dow is a diversified chemical company with 46,000 employees worldwide, delivering a broad range of products and services. Located in Zwijndrecht, Belgium, Dow Wolff Cellulosics manufactures HEC (hydroxyethyl cellulose) under the brand name CELLOSIZE™, which is primarily used as a paint thickener.

New reboiler urgently needed

One of the solvent recovery columns at Dow was equipped with two parallel installed shell-and-tube reboilers, one of which was giving satisfactory performance. The other had been repaired twice and it became clear during a maintenance shutdown that this unit needed to be replaced during the next planned production stop.

Concerned about the long delivery time for a customised shell-and-tube, Dow looked around for alternatives. The application is a challenging one since the product has an extremely high viscosity.

Compabloc – an efficient solution

After consulting Alfa Laval, the company confirmed that a Compabloc compact plate heat exchanger was the answer. The heat transfer discipline of Dow process engineering was also convinced that a plate heat exchanger, when properly designed, would be a good alternative for a shell-and-tube – even in this critical application. Compabloc, an advanced, fully welded plate heat exchanger designed for heat recovery, condensation, reboiling and gas cooling, could be delivered on time and would handle the duty efficiently.

Once installed and operating, it was confirmed that Compabloc provided the designed capacity increase.



Installed as a condenser in a solvent recovery column at Dow Wolff Cellulosics, the Compabloc compact heat exchanger is visible next to the air coolers.

Dow's Project Manager, Raf Croux: "It was great to be able to take delivery of a new reboiler at such short notice. But this was not our main reason for installing a Compabloc. We would not have chosen this technology if we did not believe in it."

Saving energy in the solvent recovery column

Parallel to replacing the reboiler, Dow was looking at ways of saving energy in the solvent recovery column. Here the top vapour was condensed by air fans and the company reviewed the possibilities of condensing part of this vapour by heating up the process feed to the column.

Again Compabloc proved to be the solution. Both sides are flammable and choosing a fully welded unit enabled Dow to avoid gaskets. As compact heat exchangers can reach a very close temperature approach the feed product could be heated as much as possible, leading to an estimated annual energy saving of 22,400 GJ under normal process conditions with a run-time of 8,000 hours per year. Taking into account the fact that the steam required must otherwise be generated by natural gas, the CO₂ reduction can be calculated as 1,250 tonnes per year.

In the pipeline...

Dow is currently investigating how more energy can be saved in its processes.



Operating as a reboiler in the solvent recovery column at Dow Wolff Cellulosics, Compabloc offers a substantial increase in capacity compared with the shell-and-tube heat exchanger it replaced.

Facts about CELLOSIZE™

CELLOSIZE™ hydroxyethyl cellulose polymers are non-ionic, water-soluble materials that can thicken, suspend, bind, emulsify, form films, stabilize, disperse, retain water, and provide protective colloid action. They are readily soluble in water and can be used to prepare solutions with a wide range of viscosities. CELLOSIZE™ polymers have outstanding tolerance for dissolved electrolytes.

Key Facts:



Design temperature
400°C (752°F), down to
-100 °C (-148°F)
Design pressure
From full vacuum to
42 barg (600 psig)

Maximum heat transfer area
840 m² (8,985 ft²)

Material of construction
316L, SMO254, 904L (UB6),
Titanium, C-276/C-22/C-2000

Learn more at www.alfalaval.com/compabloc

Duties

Heat recovery, cooling, heating, condensation, partial condensation, reboiling, evaporation and gas cooling.

Unique features

Compabloc is the champion of heat exchange thanks to unique Alfa Laval innovations that enable reliable, efficient performance, letting you save energy and improve sustainability.



SmartClean

Fast and efficient flushing of fouling material



C-Weld

Superior cleaning and extended performance



XCore

Advanced design for higher pressures



ALOnsite

Qualified support at your facility

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.