Compabloc increases preheating efficiency in light oil recovery section

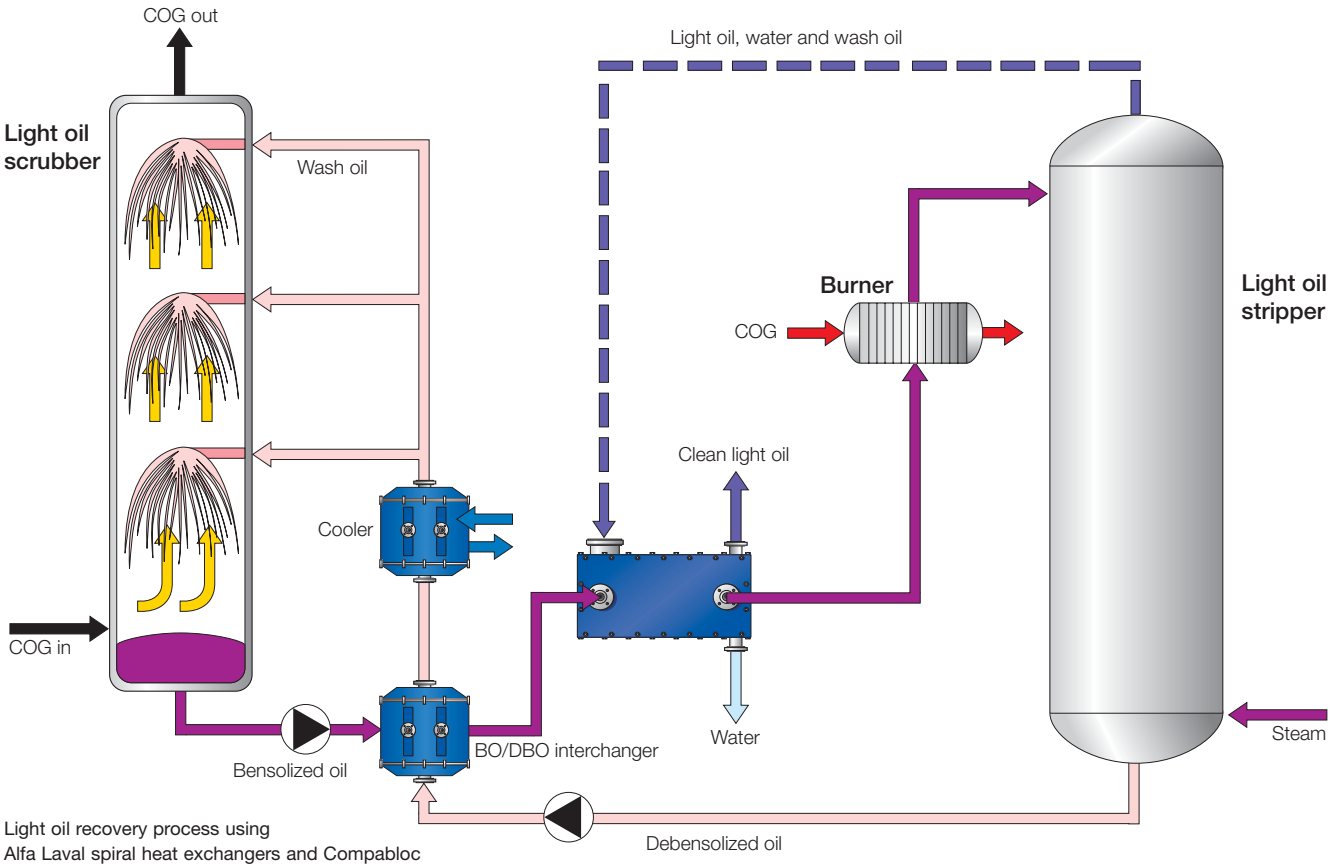
Avdeevka Coke-oven by-product plant, Ukraine **Case story**

The Avdeevka Coke-oven by-product plant in Ukraine is one of the largest coke-producing facilities in Europe. Some 7800 employees run the 339 hectare large production site and out of the 18500 tons of coke treated on a daily basis, 24 different by-products are received.

In the light oil (BTX – Benzene, Toluene and Xylene) recovery section of the plant, a scrubbing/stripping system is used to remove light oil from the coke oven gas (COG). In the scrubbing tower wash oil is sprayed over the COG and absorbs the light oil, forming bensolized oil (BO). In the stripping tower, the light oil is recovered by heating the bensolized oil and this oil, now called debensolized oil (DBO), is recycled to the scrubbing tower.

In order to recover heat, Avdeevka use the hot light oil vapors from the stripping tower to preheat the bensolized oil to 75°C before entering the stripping tower. At the same time, the light oil vapors are partially condensed. However, in this heat exchanger, the pressure drop was too high, giving rise to too much pressure being lost before the stripping tower. This pressure drop had to be reduced, and at the same time, the preheating efficiency should not. In fact, there was even a wish to increase the preheating efficiency as additional preheating had to be done in a burner by burning COG.

Two S&T heat exchangers replaced by one Compabloc resulting in better efficiency



Light oil recovery process using
Alfa Laval spiral heat exchangers and Compabloc

In 2003, plant management finally decided to buy one compact, fully welded Compabloc heat exchanger to serve as a dephlegmator (partial condenser) for light oil recovery. This Compabloc replaced two large S&T heat exchangers with a surface area of more than 400 m^2. With the Compabloc, all issues were solved as the pressure drop before the stripping tower was reduced and the preheating efficiency was increased, preheating the bensolized oil to 100°C.

The Chief Engineer, Mr. S Kaufman says: “A single Compabloc made it possible to save 100 m^3 COG per hour in the burner as the preheating efficiency was increased. The extraction of benzene from the wash oil is much more efficient and we are now dismantling our two old S&T heat exchangers because we do not need them any more.”

Alfa Laval and Avdeevka have been cooperating to optimize various processes in the COG plant. In 2001, two spiral heat exchangers were installed to replace eight S&T heat exchangers acting as debensolized/bensolized oil interchangers.

In addition to this, one spiral column (consisting of 3 spiral bodies) has been installed as final coke oven gas cooler. Finally, plate heat exchangers of various size and material are used in different positions in the plant.

Alfa Laval spiral heat exchanger used as BO/DBO interchanger

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