Compabloc Condenser Solved Fouling Problem

Queensland Alumina, Australia

Heat exchangers are required for a broad spectrum of duties in the process of heating and cooling the circulating liquor stream. The Compabloc replaced the original carbon steel shell-and-tube heat exchanger in the precipitation area, where it is heating incoming process water with final flash vapour at 29 kPa abs.

Problems with Original Shell-and-Tube Unit
The excessive levels of fouling in the original shell-and-tube exchangers lead to regular cleaning every 6 months. The cleaning procedure took a week from start to finish. In addition to the fouling, the shell-and-tube heat exchanger also suffered from inter泄漏age due to extensive corrosion. In 2001 the plant and process engineers began looking for a new solution in order to solve the extreme fouling and corrosion.

Looking For a New Solution
As for many process industries using heat exchangers, the most important requirements for Queensland Alumina are:

- High thermal efficiency
- Low fouling and scaling
- Minimal space requirements
- Design flexibility
- Ease of installation
- Minimal maintenance

In discussions with Alfa Laval Australia it became clear that the Compabloc would satisfy all those requests.
The Compabloc replaced a shell and tube unit on a quarter of the footprint.

Operation of the Compabloc Condenser
To date the Compabloc has been in operation without any problems whatsoever. Besides the ease of installation and minimal space requirement, the low maintenance frequency is a benefit highly appreciated by Queensland Alumina.

Customer Comments
After 12 months of operation, the Compabloc was inspected and found to be clean. Brian Aikenhead, Area Supervisor, who was present at the inspection says: “There was no fouling whatsoever. It was clean as a whistle”. Phil Wheatley, Asset Owner Rep at Queensland Alumina, says: “The best thing about the Compabloc is that we haven’t had to worry about maintenance. Fouling or scaling problems just don’t exist”.

Low Fouling
The low fouling tendency of the Compabloc can partly be explained by the high turbulence, which minimize fouling and makes longer operating periods possible. The low levels of fouling can also be attributed to finer material; decreasing corrosion and promoting high shear stress rates along the heat transfer wall.

Compabloc condenser
Vapour enters from the top and condenses on the cold plates. The condensate is extracted from the bottom. Even though fully welded the Compabloc is easy accessible for inspection and cleaning on both the cold and the hot side by undoing the panels.

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.