

Boost efficiency and reliability

In a drive to minimise costs and environmental impact, the power industry is moving away from traditional shell-and-tube solutions and towards state-of-the-art plate heat exchangers. **Alfa Laval**, a leading global provider of such systems, can help customers meet these demands while optimising performance.

Alfa Laval supplies a wide range of solutions designed to increase the efficiency and reliability of any turbine-driven power plant, focusing on heating, cooling and condensing systems. Its compact, cost-effective systems are designed to enhance the performance and energy efficiency of power plants, from conventional thermal plants to the most advanced integrated-gasification combined-cycle installations.

Building on a solid process and application know-how, Alfa Laval's objective is to help customers reduce operating and investment costs, boost plant uptime, and extend the reliability and service life of key systems.

Alfa Laval has dominated the market for plate heat exchangers since they were launched in the 1930s. Focusing on the auxiliary-system side, supplying equipment such as plate heat exchangers for lubricating-oil cooling and separators for lubricating-oil cleaning, Alfa Laval also offers solutions for the main power-generating process.

Compact feed water preheating

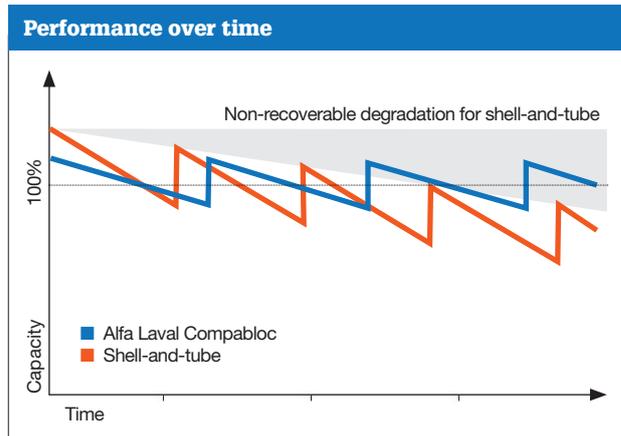
The feedwater preheaters from Alfa Laval, using the all-welded plate heat exchanger Compabloc, has been developed to meet the specific requirements of the power industry. It performs under any operating conditions in a power plant and complies with pressure vessel codes including PED and ASME VIII div 1. Its distinct advantages, compared with traditional shell-and-tube solutions, are:

- **Tighter pinch point:** leading to better utilisation of the latent heat in the condensate, which in turn means less extraction steam is needed to perform the same preheating duty or raise the feedwater temperature in the boiler. Both mean savings with higher electrical output or less fuel input.

The annual saving calculated as a result of using the Compabloc instead of shell-and-tube units at a steam turbine power plant, rated at 100MWe and with three low-pressure feedwater preheaters, was €110,000 (based on an average electricity price of €60/MWh and 350 days of operation).

- **Smaller size:** a Compabloc occupying a space of 1.2x2.0m or 2.4m² makes the same duty as a horizontal shell-and-tube occupying 1.2x10m or 12m². In addition, a free space of another 12m² is needed to enable the removal of the tube bundle whereas the service space needed for the Compabloc is only 1.5m on each side.

In comparison to a vertical shell-and-tube installation, the footprint is about the same, but the difference is that the Compabloc fits on one floor level whereas the



shell-and-tube goes through two or three floors, making the steel construction more complex and costly.

- **360° accessibility means 100% cleanability:** with a removable panel on each side of the Compabloc, 100% of the heat transfer area is accessible and can be restored to a thoroughly clean condition, making sure the power plant operates at optimal conditions year after year. Cleaning intervals are also longer than those of a shell-and-tube, as depicted in the figure above.

Case study

The ACCIONA group is one of Spain's largest corporations, operating in construction, energy, water and sustainable services in more than 30 countries. Recently, its energy division decided to include Alfa Laval components in two new biomass-fuelled power plants it was building in Miajadas and Briviesca, Spain.

These two projects, which also involved conversion from traditional shell-and-tube technology to modern plate heat exchangers, were developed by Spanish engineering and technology company GHESA. Alfa Laval Compabloc technology was selected for the feedwater preheater position in both plants.

Rafael Godoy, manager of the Miajadas power plant, said: "With the Compabloc, our process yields improve noticeably, and water reaches the boiler at higher temperatures. This provides better performance while using less biomass input.

"This equipment, which has been designed specifically to suit our needs, provides outstanding performance as well as being very compact." ■

Further information

Alfa Laval
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