



Compabloc condenser solves VOC problem

Ciba Specialty Chemicals Company saves money and the environment Case story



A Compabloc condenser ensured full compliance with the latest emissions requirements without upgrading the scrubber.

Ciba Specialty Chemicals North America is part of the worldwide Ciba Specialty Chemicals group based in Basel, Switzerland. The Ciba Specialty Chemicals plant in West Memphis, Arkansas manufactures water treatment chemicals mostly for use by the pulp and paper industries.

VOC overload problem

As part of the company's drive to improve environmental quality, the West Memphis plant funded a project to remove emissions of volatile organic compounds (VOCs) from its stack vapours.

The problem was that the existing scrubber was frequently overloaded with volatiles. This gave rise to both emissions into the atmosphere and a strong odour. To avoid, if at all possible, having to invest in a new scrubber that would mean a substantial investment, Ciba decided to look for an installation that would condense the problematic VOCs before they even reached the existing scrubber unit.

Why Compabloc?

The engineers at Ciba therefore evaluated several types of condensers for the job, including shell-and-tube heat exchangers. The final selection fell on an Alfa Laval Compabloc condenser, on account of its compactness, superior efficiency and low cost. In fact, the shell-and-tube candidate for this condensing assignment was more than twice the size of the Compabloc unit. It would have been difficult to fit onto the elevated platform that was available for the installation.

In addition, the specially designed heat transfer surface used in the Compabloc unit increases condensing efficiency by as much as four times compared with shell-and-tube equipment. The corrugated pattern of the welded plates increases the turbulence, which results in a high heat transfer coefficient throughout the unit as well as reducing any tendency towards fouling. As a result, the Compabloc unit not only requires a smaller heat transfer surface, but it also reduces costs.



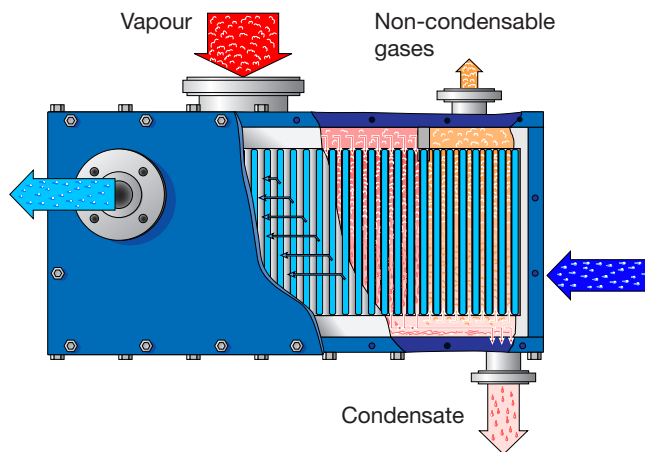
The compact design of the Compabloc heat exchanger made it possible for Ciba to mount the unit on an elevated platform, in the most economical way.

Two-pass condenser solution

Because Ciba wanted to remove as many of the VOCs from the vent as possible, the company opted for a custom-designed two-pass Compabloc condenser unit. In effect, this two-pass design operates as two condensers in series, ensuring that the non-condensable gases that leave the condenser are cooled.

VOC problem solved

Since installing the Compabloc condenser, Ciba has seen a significant drop in emissions, and according to a recent stack analysis, "volatiles detected were almost zero". The plant operators also note that the odour has disappeared. Ciba's site engineer states, "Because the Compabloc condenser is so efficient at condensing volatiles from our reactors, it has saved us more than USD 100,000 by not having to purchase a new scrubber to ensure regulatory compliance. Overall, we are very happy with the Compabloc condenser."



Compabloc two-pass condenser. The second pass is used to subcool and extract the non-condensable gases.

Key facts about Compabloc

The Compabloc is a high-efficiency all-welded compact heat exchanger designed for aggressive or hazardous process services. It is available in six sizes with heat transfer areas ranging between 0.7 to 320 m² (7 to 3 450 sqft). The heat transfer area is made up of a pack of corrugated plates alternatively welded to form the media channels. The plate pack is supported by an upper and lower head and four side panels, which accommodate the connections. The 100% welded plate pack extends design limits and offers improved reliability. Because there are no inter-plate gaskets, compatibility concerns are eliminated, and maintenance and operating costs are reduced. Access for inspection and cleaning is fast and easy.

Plate materials

Stainless steel 316L, 304L, 317L, 904L
 Avesta 254 SMO, AL6XN
 Titanium, Pd-stabilized titanium
 Alloy C276, C22, B2, C-2000

Specifications

Design pressure min/max: Vacuum/35 bar(g)
 (500 psig)
 Design temperature min/max: -30/350°C (-20/660°F)
 Connections: ANSI or DIN flanged
 Codes of construction: ASME (with or without
 U-stamp) & PED

How to contact Alfa Laval

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