



A tall order

Energy-efficient free cooling system helps cool South America's tallest building

Case story

Alfa Laval supplies cooling equipment to South America's tallest building. The energy-efficient solution is the first of its kind on the continent.

When completed, the 300-metre-high Costanera Center in the Chilean capital of Santiago will be South America's tallest building and the second-tallest in the Southern Hemisphere. Alfa Laval is supplying a cooling solution for the project which involves the use of cold water from a nearby river. The result is a unique, energy-efficient free cooling system.

"The building has become a symbol of the economy in Chile," says Sergio Cerda, Sales Engineer Refrigeration and Cooling at Alfa Laval Chile.

The height of luxury

The project, which has employed about 4,000 people, is in the middle of 2009 about one-third complete. The Costanera Center, which is owned by the Chilean retail group Cencosud, will consist of four skyscrapers. Besides the main Torre Gran tower with its two hypermarkets, a six-floor shopping mall with more than 200 stores, and two luxury hotels, there will be two more 170-metre-high office towers and an additional building that will be 105 metres high.

Fast Facts

The challenge: To cool a 300-metre-high skyscraper with river water.

The solution: For the free cooling and water condenser cooling system, Alfa Laval supplies six M30s with port filters, each with ALF-40 in the same pipeline. For the pressure breakers, Alfa Laval supplies a total of 16 large plate heat exchangers, T20 for 175Psi and 300Psi pressure design – each optimised for the specific thermal duties on each breaker level. For the heating and cooling water system, Alfa Laval supplies a total of 31 TL10 and M10 medium heat exchangers in the various towers and areas.

The result: The first cooling system of its kind in South America, in the continent's tallest building.



Photo: Pelli Clarke Pelli Architects

Costanera Center in Santiago, Chile is 300 metres high and an area of 280 000 square metres. The owner of the tower is Cencosud.

Alfa Laval Chile provides components for the cooling system for all four buildings. "Cencosud came to us because of our expertise," says Sergio Cerda. "They asked us what options existed for using water from the river, whose temperature can be just 6 degrees Celsius in the winter, for cooling. We carried out a study and proposed some alternatives."

The resulting solution uses water from the nearby Canal San Carlos. This is understood to be the first time river water has been used in this way for cooling in South America.

"Using river water makes the system very energy-efficient," says Sergio Cerda. "In this way, the customer saves a lot of energy."

Non-stop cooling

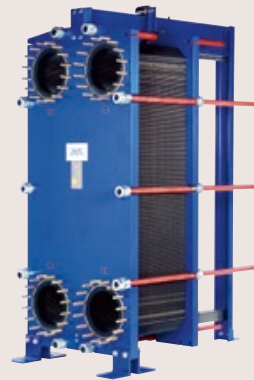
To guarantee system performance, Cencosud ordered the ALF Filter solution in each of the six M30 heat exchangers to ensure non-stop operation and to maximise the life of the plate heat exchangers.

Two of the project's challenges were the limited amount of space available for installing the equipment, and the sheer height of the buildings. Alfa Laval's solution included the installation of 16 pressure breakers – four in each building roughly halfway up – to alleviate the water pressure created in such tall buildings.

Product Facts

About gasketed plate heat exchangers:

Alfa Laval plate heat exchangers, with their compactness and reliability at high pressure, are ideal for use in tall buildings such as the Costanera Center. They boast high energy efficiency with a high heat transfer coefficient; they fit in limited spaces with a sixth of the load of a corresponding shell-and-tube heat exchanger; and maintenance costs are kept down thanks to easy access and part replacement and fast cleaning-in-place. Easy to install and requiring no concrete foundation, Alfa Laval plate heat exchangers also act as pressure breakers between zones in tall buildings.



About the Alfa Laval Filter (ALF):

ALF operates as an integral part of a cooling system, removing debris that can foul and clog plate heat exchangers and similar equipment. The filter provides protection for all downstream equipment, ensuring better performance along with longer service life, increased uptime and reduced maintenance costs. The ALF automatic flushing filter cleans the river water in this free cooling application.

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