

It is a giant of imposing dimensions. The forming of its enormous plates is carried out in a dynamite-induced explosion under water. The Alfa Laval Packinox, the new acquisition in the company's range of heat exchangers for large capacities, **stands in a class of its own.**

TEXT BIRGITTA LUNDBLAD PHOTO ALASTAIR MILLER



A dynamite explosion needs a detonator. The plates of the Alfa Laval Packinox heat exchanger are formed by a unique method.

Simply

# dynamite

**W**hen Alfa Laval acquired the French company Packinox S.A. in March 2005, it greatly strengthened its competence within oil, gas and refinery applications. With its position as the world leader in large, welded plate heat exchangers for the hydrocarbon industry and its twenty years' experience in this field, Packinox had gained the recognition of having set the standard in the industry.

Today, Alfa Laval Packinox employs 150 people in its headquarters in Paris, its manufacturing and engineering centre in Chalon-sur-Saône in Burgundy and its sales offices in Beijing, Moscow and Houston, Texas.

Packinox made its breakthrough as early as 1980 by successfully combining the high temperature and high-pressure performance of shell-and-tube heat exchangers with the thermal and hydraulic efficiency of plate technology in a compact, large capacity design.

These qualities were particularly needed for the demanding operating conditions in refineries and the petrochemical industry.

"Our products are critical for our customers' operations", says François Croizette Desnoyers, head of marketing and sales at Alfa Laval Packinox. "We cooperate closely with them to create the best solutions for their particular needs. It is extremely important for us to have regular contact with both the engineering contractors and the end users so that we can contribute to their performance to the largest possible extent."

The Alfa Laval Packinox plate heat exchangers are used mainly for preheating and after-cooling substances for different catalytic processes. It can cope with extremely high temperatures and pressures. The most common application is catalytic reforming, a process that produces high-octane gasoline from naphtha (low

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octane gasoline). Other applications include processes that remove the sulphur in gasoline and diesel and production of petrochemicals used in manufacturing polymers and detergents.

**A giant with a small footprint** An Alfa Laval Packinox is enormous. On average, it is 18 metres long and 2.5 metres in diameter. The biggest unit built so far was 21 metres long, 6.10 metres in diameter and weighed 300 tonnes. Each unit includes hundreds of plates.

But huge as it is, it has an extremely small footprint in relation to its performance. Its heat exchange area can amount to 16 000 m<sup>2</sup> and one unit can replace up to twelve shell-and-tube heat exchangers. It efficiently transfers large amounts of heat and it is ideal for energy conservation since it can recover heat at much smaller temperature differences than alternative solutions.

To produce a plate heat exchanger as large as the Alfa Laval Packinox requires purpose-built facilities and specialized techniques. Manufacturing starts with the forming of the plates which can be 13 metres long and 2 metres wide. All plates are formed by explosion; a unique process. The plate is placed on a rig above the pattern mould used for that plate. The fuse is carefully placed over the plate in order to give the plate the exact pattern in the explosion. The whole package is lowered into a pool of water, and the fuse is detonated.

After forming, the plates are sent for welding. The plates are then stacked on the world’s largest bundle welding press where automated welds are performed.

In the assembly workshop the plates are welded together into the huge units. After passing a series of inspections, the plate bundle is inserted into a pressure vessel. Additional checks are carried out and the heat exchanger is prepared for transport.

**Customized solutions** Since one single Alfa Laval Packinox can replace several

shell-and-tube heat exchangers, it results in decreased capital costs. Transportation and installation costs are lower, and no piping duplication is required. Its relative compactness and lighter weight limit project costs for its foundation structure and its high thermal efficiency allows downsizing of process heaters, coolers and compressors.

The Alfa Laval Packinox offers excellent heat recovery with very low pressure drop. It also results in decreased operating costs by enabling other equipment to work less, saving fuel and energy. In addition it is a safe solution. Its double containment design and low number of flanges cut the risk of leakage thereby reducing any fire hazard and promoting safer working conditions.

Each Alfa Laval Packinox is built according to special customer requirements and

the size, plate pattern and other parameters vary from one unit to the other. “Since each customer’s needs are different, every project is a new challenge. How do we design the best possible solution adapted to that particular customer’s conditions?” says Technical Manager Pierre-Xavier Bussonnet. “We have developed sophisticated and powerful software for calculating the optimum design and predicting the effects of different operating conditions.”

“Our vigorous R&D activities are of great importance for our success. They are based on close cooperation between our sales team, our thermal and mechanical engineers and, naturally, our customers. They inspire us to new achievements all the time,” Bussonnet concludes.



▶▶ [www.alfalaval.com/here/packinox](http://www.alfalaval.com/here/packinox)

This enormous unit was built for paraxylene production in India.