# Let's talk numbers

Alfa Laval refinery thinking
can do wonders for your numbers

# Numbers with impact

In today's refinery business, there is a growing emphasis on finding cost-effective ways to expand capacity. Rapid payback is essential, and both operating and maintenance costs have to be kept to a minimum.

## Performance

Alfa Laval heat transfer equipment can be used virtually anywhere in your refinery, from condensing top vapours to recovering heat from deep-cut fractions.

High-efficiency equipment from Alfa Laval boosts capacity and improves energy recovery in revamp projects. For new process units, it keeps your overall project investment and installation costs down, while ensuring that your operating costs are kept at a minimum.

Alfa Laval is not only an equipment supplier,but also a solution provider. This means we provide our customers with high-performance heat transfer equipment along with the know-how and experience of our expert staff. They are available to work closely with you in implementing the upgrade plans for your refinery.

## Reliability

Alfa Laval has been active in the refinery industry ever since the early 1980s, and much of the equipment installed back then is still in operation today.

To date, Alfa Laval has supplied more than 350 Packinox heat exchangers for feed/effluent heat recovery in catalytic refining, hydro-treatment and aromatic processes.

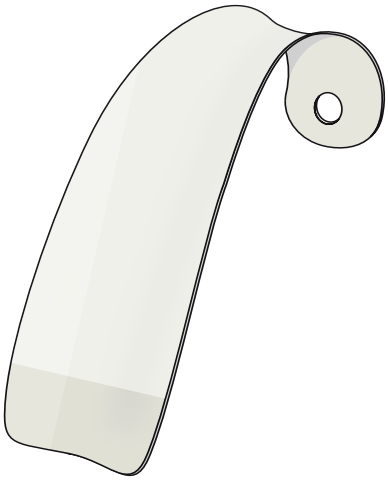
More than 500 Compabloc heat exchangers have been delivered for heat recovery, condensing and reboiling duties in the majority of standard refinery processes. These range from crude treatment via catalytic and thermal processes to treatment processes.

However, the most substantial gains can be achieved in heat recovery installations, or when space is limited or weight considerations are crucial, or materials that are highly resistant to corrosion are required.

Almost 150 Alfa Laval spiral heat exchangers are currently in service worldwide, either as vacuum condensers or in duties characterized by heavy fouling. These include desalter interchanging and cooling FCC or visbreaking bottoms.

Most of this equipment falls within your refinery's standard 5–10-year service programme, and no intermediate service is needed.

# What's in it for you?

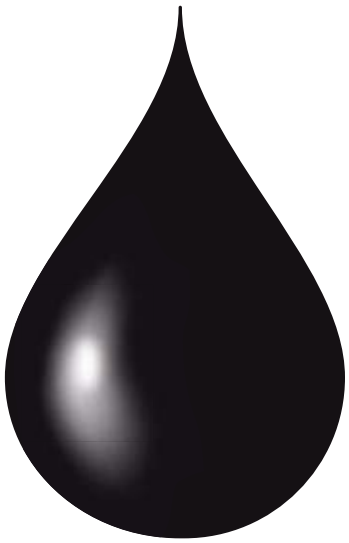


## Installation savings

For any energy recovery duty, using highly efficient Alfa Laval plate heat exchangers drastically reduces the surface area and the number of units needed.

In addition, the compact assembly of the heat transfer surfaces means that this equipment is much smaller and lighter, with an extremely low hold-up volume.

This results in significant savings on piping and installation costs, especially when equipment is to be located high above ground – when serving as a top condenser, for example.



## Energy savings

High-efficiency Alfa Laval plate heat exchangers make it possible to recover the maximum amount of energy, thereby substantially decreasing the hot approach temperature.

Increasing the feed temperature means less energy is needed for the fired heater, thus drastically reducing fuel consumption. This means savings on both fuel and emissions.

With highly efficient, compact heat exchangers, it is also possible to recover energy from fractions where doing so is physically impossible using only traditional heat transfer equipment.

## Service savings

Using Alfa Laval heat exchangers that feature highly turbulent flow patterns with no stand-still zones means that operating intervals can be significantly extended.

The overall fouling tendency in the plant is reduced still further by using corrosion-resistant materials such as stainless steel or other exotic material such as titanium.

For duties that involve suspended solids, the Alfa Laval spiral heat exchanger design, with its single heat transfer channel, is the ideal way to drastically reduce – or even eliminate – service needs.

When service is needed, the Compabloc and the spiral heat exchanger designs provide complete access to the heat transfer surfaces, thus reducing service and maintenance time and costs.

# Products

## Compabloc heat exchangers

| | |
|---|---|
| Max. surface area | 845 $m^2$ |
| Max. dimensions | 1,75 x 1,75 x 3,45 m |
| Max. design pressure | 42 barg |
| Max. differential pressure | FV - 42 Barg |
| Max. design temperature | 400°C |
| Materials | Stainless steel, 254 SMO, nickel alloys, titanium |

Compabloc and Packinox heat exchangers combine the advantages of plate heat exchangers with those of traditional shell-and-tube heat exchangers.

They feature extremely efficient heat transfer properties, making it possible to recover a maximum of energy while using only a minimum of space.

Because the Compabloc and Packinox heat exchanger designs are fully welded – with the heat transfer surface protected by a shell – high operating temperatures and pressures are possible and aggressive media can be handled.

## Packinox heat exchangers

| | |
|---|---|
| Current max. surface area | 16 000 $m^2$ |
| Current max. dimensions | 6 x 20 m |
| Current max. design pressure | 160 barg |
| Max. differential pressure | 50 bar |
| Current max. design temperature | 560°C |
| Materials | Stainless steel plates low alloy steel shell |

## Spiral heat exchangers

| | |
|---|---|
| Max. surface area | 500 $m^2$ |
| Max. dimensions | 2,4 x 2 m |
| Max. design pressure | 40 barg |
| Typical max. differential pressure | FV – 21 bar |
| Max. design temperature | 400°C |
| Materials | Any material that can be cold formed and welded |

Alfa Laval spiral heat exchangers are specifically designed for applications characterized by a high degree of fouling.

One single heat transfer channel and no stand-still zones mean that any tendency for particles to settle is avoided because they are simply flushed away.

At the same time, the spiral flow in counter-current mode ensures high-efficiency heat transfer, making these units especially well suited for heat recovery duties.

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