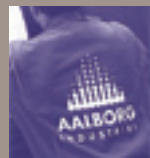




Creating better everyday conditions for people



1883

Swedish engineer and inventor Gustaf de Laval and his business partner Oscar Lamm establish the company AB Separator to manufacture and sell their centrifugal separator, which separates milk from cream.

1901

AB Separator becomes a listed company on the Stockholm Stock Exchange.

1913

Gustaf de Laval dies, aged 67, with 92 Swedish patents to his name. "The man of high speed" is engraved on his memorial.

1930s

The first heat exchanger is introduced. Development and production of heat exchangers is moved to Lund, where the company is headquartered today.

1963

The name of the company is changed from AB Separator to Alfa Laval. Alfa comes from the alfa discs which increase the separator's capacity.

1971

Alfa Laval enters the fluid handling business when it acquires a majority interest in the Danish company Lavrids Knudsens Maskinfabrik (LKM).

1991

Alfa Laval is acquired by Tetra Pak, which owns the company until 2000, when it is sold to Industri Kapital and then relisted on the stock exchange in 2002.

2011 -

Alfa Laval acquires Aalborg Industries and two years later the Norwegian company Frank Mohn which further strengthens Alfa Laval's presence within the marine and offshore markets.

# Improving lives through innovation

Alfa Laval has the vision of creating better everyday conditions for people – everywhere. Our products are used in industrial processes that are crucial for society, helping our customers optimize their processes to reduce energy use, protect the environment, and make food and pharmaceutical production safer.

Alfa Laval has grown to become a world leader within our key technology areas of heat transfer, separation and fluid handling. We have reached that position thanks to our innovative spirit, our early international expansion, and our ability to meet changing needs and conditions with new solutions.

Our company was founded on a single brilliant invention and innovation remains at the heart of everything we do. Today we are recognized as one of the world's most innovative companies and have a truly global presence.

In a world where saving energy, protecting the environment and securing hygienic food processing are becoming ever more important, our expertise and technologies are helping thousands of companies in dozens of industries meet tomorrow's challenges.

# Sustainability is at the heart of what we do

For more than a century, Alfa Laval has been providing customers with solutions that enable them to reuse and protect natural resources, such as energy and water, in their industrial processes. Our technologies are constantly improved and refined to optimize our customers' processes, reduce their environmental impact and reach their sustainability goals.

Alfa Laval is a performance driven company and as such works systematically to ensure that we are focusing on those sustainability areas with high risks and where we are able to influence to improve. While our main contribution to a more efficient use of resources comes from increased use of our products, we also endeavour to carry out our own operations as cleanly and efficiently as possible. Our Business Principles guide our commitment to human and labour rights, the environment and anti-corruption in all aspects of our activities worldwide.

# Applications everywhere

Alfa Laval's products are used in applications in a wide range of industries around the world. They play an important role in the production of chemicals, starch, paper, metals, sugar and ethanol.

They are used onboard vessels and in the engineering sector, mining industry and refinery sector, as well as for treating wastewater and creating a comfortable indoor climate. Alfa Laval products and solutions are also found in the food and pharmaceutical industries, where they secure safe and hygienic processes.

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Our key sectors are:

- Food
- Pharmaceuticals and healthcare
- Oil, gas and refinery
- Power, including diesel
- Petrochemicals
- Biofuels
- Heating, ventilation, air conditioning (HVAC)
- Refrigeration
- Marine
- Wastewater treatment

Whatever their industry and wherever they are in the world, our customers enjoy total peace of mind for the entire lifetime of their equipment through Alfa Laval Service.



# Technologies to trust

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Alfa Laval offers solutions built on the three key technologies of heat transfer, separation and fluid handling. Each technology is crucial for a wide range of industrial processes and we are the global leader in all three technology areas. Our products promise state-of-the-art quality and efficiency.

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## Heat transfer

Alfa Laval has a wide range of highly energy-efficient and durable heat exchangers for all heat transfer applications. Our solutions optimize energy utilization while minimizing downtime.

**Plate heat exchangers** are considered a mature technology, yet Alfa Laval is still pushing the limits. Having led the shift towards compact and energy-efficient solutions, we continue to develop new innovations such as laser welding and 100 percent stainless steel brazing. Our range includes gasketed plate heat exchangers, brazed plate heat exchangers and welded plate heat exchangers.

**Shell-and-tube heat exchangers** are designed to withstand very high temperatures and pressures in demanding applications. They are used in the petrochemical, power and marine industries, as well as refrigeration applications.

**Air heat exchangers** cover most types of refrigerants and most cooling applications.

**Spiral heat exchangers** are tailored for viscous and particulate products that cause fouling or corrosion. Their self-cleaning design makes them well suited for refineries, distilleries and petrochemical applications.

**Boilers** are used to heat and vaporize water to generate steam that can then be used for a number of processes. They are commonly used onboard vessels and can also be used for industrial applications.

**Thermal fluid systems** are fully closed systems used for heating fuel and tank cleaning systems, as well as central heating onboard vessels.



## Separation

Separation technology has been at the heart of our product range since 1883. Fluids, solids and gases are separated with high precision and low cost.

**High-speed separators** Alfa Laval's high-speed separators are trusted by customers in a range of industries, primarily for separating liquids.

**Decaners** Our decanter centrifuges, which work at slower speeds, are used in applications such as dewatering of sludge in wastewater treatment plants.

**Membrane filtration** The established solution for separating very small particles in the pharmaceutical, food and beverage industries. Also a trusted solution for wastewater treatment.



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## Fluid handling

Transporting and regulating fluids in an efficient and safe manner is crucial for many industries. Sanitary fluid handling in applications with stringent hygiene requirements has become one of Alfa Laval's specialities.

**Pumps and valves** Alfa Laval's range of pumps covers every need for gentle, precision pumping of all kinds of fluids of all viscosities in hygienic applications, while our valves regulate and redirect liquid flows reliably and hygienically.

**Tank equipment** Our tank equipment includes covers, agitators and mixers. Our range of tank cleaning equipment is the world's largest, offering advanced cleaning-in-place procedures for storage tanks onboard ships and in the food, pharmaceutical and other process industries.





INTERNATIONAL TRADE

# Solutions at sea

Maritime transportation has quadrupled in the last four decades. This trend will continue, creating new challenges. Alfa Laval solutions for reducing emissions, cleaning ballast water and generating heat are found on the majority of ocean-going vessels.

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Growing international trade is driving demand for transport. Shipping, which carries 90 percent of the goods that are moved around the planet, has environmental benefits over airfreight, but tough legislation is putting new demands on the industry. Alfa Laval offers a range of specialized products to reduce pollution and increase energy efficiency at sea.

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The zebra mussel, with its pretty patterned shell, is no bigger than a fingernail and is relatively harmless in its native waters in Eastern Europe. But this tiny mollusc has been devastating – and extremely expensive – for its adopted home, the North American Great Lakes, where it was carried in the ballast water of a ship in the late 1980s. Since then zebra mussels have upset ecosystems, threatened native wildlife, damaged structures, and caused other serious problems, costing in excess of USD 1 billion to date.

Alfa Laval's PureBallast system, developed in cooperation with Wallenius Water, offers chemical-free water treatment that protects against the threat of invasive species such as the zebra mussel. It is one technology out of many in our Marine & Diesel Division's environmental product range, which helps shipyards and shipowners tackle

ecological challenges and meets current and future legislation. But Alfa Laval's offer to the marine industry goes far beyond the environmental sphere, totalling 16 major product groups including waste heat recovery systems, boilers, high speed separators, freshwater generators and pumping systems.

Some Alfa Laval solutions used at sea are also trusted by customers in the onshore diesel power market, which uses similar engines. These power plants bring electricity to remote areas or communities where the grid is unreliable. On land and at sea, such products help us fulfil our vision of creating better conditions for people.

75%

The percentage of the global ocean-going fleet equipped with Alfa Laval's range of specialized products for ships.



The Alfa Laval Aalborg scrubber removes harmful sulphur oxide and particulate matter from ships' exhaust gases.



IMPROVING LIVING STANDARDS

# Living better

The average global life expectancy has risen to nearly 70 years. People are becoming healthier and enjoying a higher standard of living, which increases demand for processed foods, pharmaceuticals and healthcare. Alfa Laval supplies energy-efficient solutions that meet the highest hygiene and safety standards.

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A higher standard of living for many people around the world is leading to lifestyle changes and more consumption. It is boosting demand for processed and prepared foods, healthcare products and pharmaceuticals. These trends mean more demand for Alfa Laval products and solutions that improve shelf life, reduce waste and make pharmaceutical production hygienic and safe.

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Grocery shopping in India is not what it used to be. Traditional markets selling fresh meat, vegetables and fruit are rapidly being replaced by supermarkets with shelves stocked with ready-made baby food, canned fruit and frozen meals. These new consumption patterns, driven by improved living standards and a growing middle class, are being repeated in developing countries around the world.

Shifts in shopping and consumption patterns are proving to be an important growth factor for Alfa Laval. Our pumps, valves, separators and heat exchangers are important components in food production, while our refrigeration solutions help keep food fresh during storage and distribution. This growth is not only being driven by increased demand, but higher safety standards being imposed on production processes. Alfa Laval has the technology

and expertise to meet these needs while reducing costs and environmental impact; tank cleaning machines that use 30 percent less water than other solutions; decanter centrifuges used in winemaking that reduce operating costs by 20 percent; solutions for olive oil producers that save energy and water and improve flavour.

Longer lifespans and higher incomes are also creating demand in the pharmaceutical industry, which Alfa Laval has served for more than 125 years. Our key technologies are designed and documented for biotech and pharmaceutical use and meet or exceed requirements on cleanliness, reliability and performance. Our magnetic mixers increase yield and minimize product contamination; our coolers eliminate contamination and reduce water use; while separators improve product recovery rates.

50%

The energy use reduction made possible for food and fruit processing plants using pumps from Alfa Laval.



Alfa Laval Hybrid Powder Mixer, a fast and efficient way to add dry ingredients into a product mix, even with high solid content.



ENERGY

# Energy efficient

The world's growing energy needs can be addressed in two ways: by increased production and improved energy efficiency. Alfa Laval has an extensive range of energy-related products for both approaches to this global challenge.

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Greater focus on the bottom line and high energy prices are driving companies to search for new ways to optimize their processes. Increased demand for energy is also making new sources of energy, such as biofuels or deepwater oil fields, more attractive. Combined with more stringent environmental regulations, these trends will drive demand for Alfa Laval solutions.

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A large steel works consumes roughly the same amount of energy per year as a major European city. If such a plant could achieve just one percent reduction in energy consumption the savings in terms of cost and emissions would be huge. With the world's energy needs expected to rise by more than 30 percent between 2010 and 2030, demand for efficient solutions will become ever more important.

Combining the process know-how of Alfa Laval's engineers with the knowledge of plant operators may be one way to improve energy use in a plant's process. Waste heat produced in one part of the process can often be used in another part of the plant by applying one of Alfa Laval's highly efficient heat exchangers, thereby lowering the overall energy use of the plant.

Energy accounts for a large part of Alfa Laval's business, from the extraction and refinement of oil and gas to power production. Our highly efficient heat exchangers and separators are crucial to these applications, making an important contribution to global energy production. They are also used in a large number of other processes where they help lower energy consumption and emissions.

The world's growing demand for energy is also encouraging the growth of alternative energy sources, such as making biofuel from waste. Alfa Laval products are involved throughout the biofuel production process, from heating and cooling to mixing and separation.

We are proud to be playing our part in securing future energy supplies, strengthening rural economies, and reducing CO<sub>2</sub> emissions and environmental impact.

# 25%

The energy use reduction made possible for an oil refinery replacing shell-and-tube technology with Alfa Laval's compact plate heat exchangers.



Our Packinox design is the largest type of plate heat exchanger in the world, reducing both emissions and energy use.



One  
million m<sup>3</sup>  
per day

The total freshwater  
capacity installed by  
Alfa Laval.

ENVIRONMENTAL FOCUS

# A tall order

Mankind's negative impact on the environment is becoming ever clearer and individuals, businesses and governments are taking determined steps to green their activities. Alfa Laval supplies technologies to help them clean up their act.

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More intense focus on environmental issues is driving tougher regulations and increasing demand for products that reduce energy and water consumption, and emissions to air and water. Alfa Laval's heat exchangers are renowned for their energysaving performance, while our decaners play a role in treating the wastewater of millions of people. And our environment-related offer does not stop there.

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Buildings account for between a quarter and a half of global CO<sub>2</sub> emissions, so you don't need to go far from home to find opportunities to tackle climate change. With new studies published almost daily on the effects of global warming on our planet and its inhabitants, action is needed in all areas of human activity, from making buildings more energy efficient to increasing use of alternative fuels. Alongside voluntary steps taken by individuals and businesses, more legislation and regulations are being introduced which are driving demand for environmentally friendly technologies.

Alfa Laval is committed to the goals of saving energy and protecting the environment. Our products are involved in treating water, reducing carbon emissions and minimizing water and energy consumption. Over the past 60 years Alfa Laval has performed more than half a million heating installations and

over 10,000 cooling installations. We provide energy-efficient district heating and cooling – often using waste heat from other processes, thermal storage solutions that save energy and money, and heat exchangers for zero-carbon geothermal heating systems.

Another pressing environmental challenge is access to fresh water. This crucial resource needs to be used more sparingly and reused where possible. Water treatment is another important process for which Alfa Laval has products and solutions. We supply complete systems, specially designed modules and individual components for use in wastewater processing. Our systems make a real difference. Alfa Laval has installed a total freshwater capacity of more than one million cubic metres per day.

98%+

The Alfa Laval PureVent compact centrifugal separator removes 98-99.9 percent of the oil in crankcase gases of diesel engines.



Hollow Sheet, our cutting edge membrane technology used in recycling of wastewater, provides high filtration and substantial energy savings, and reduces the need for cleaning.

# Global presence

Alfa Laval was one of the first truly multinational companies and today our global presence is broader than ever. We sell our products and solutions in around 100 countries and have our own sales organizations in over half of them. We have slightly more than 100 service centres around the globe providing our customers with prompt service and support.

**USA**  
Est. 1885

**Canada**  
Est. 1899

**Mexico**  
Est. 1957

**United Kingdom**  
Est. 1923

**Belgium, Netherlands  
& Luxemburg**  
Est. 1952

**France & Germany**  
Est. 1907

**Italy**  
Est. 1911

**Poland &  
the Baltic  
countries**  
Est. 1924

**Brazil**  
Est. 1959

**Argentina**  
Est. 1914

11

The number of  
strategically located  
distribution centres  
around the world.

450,000

The number of parts  
in our parts inventory system  
– some up to 100 years old.

42

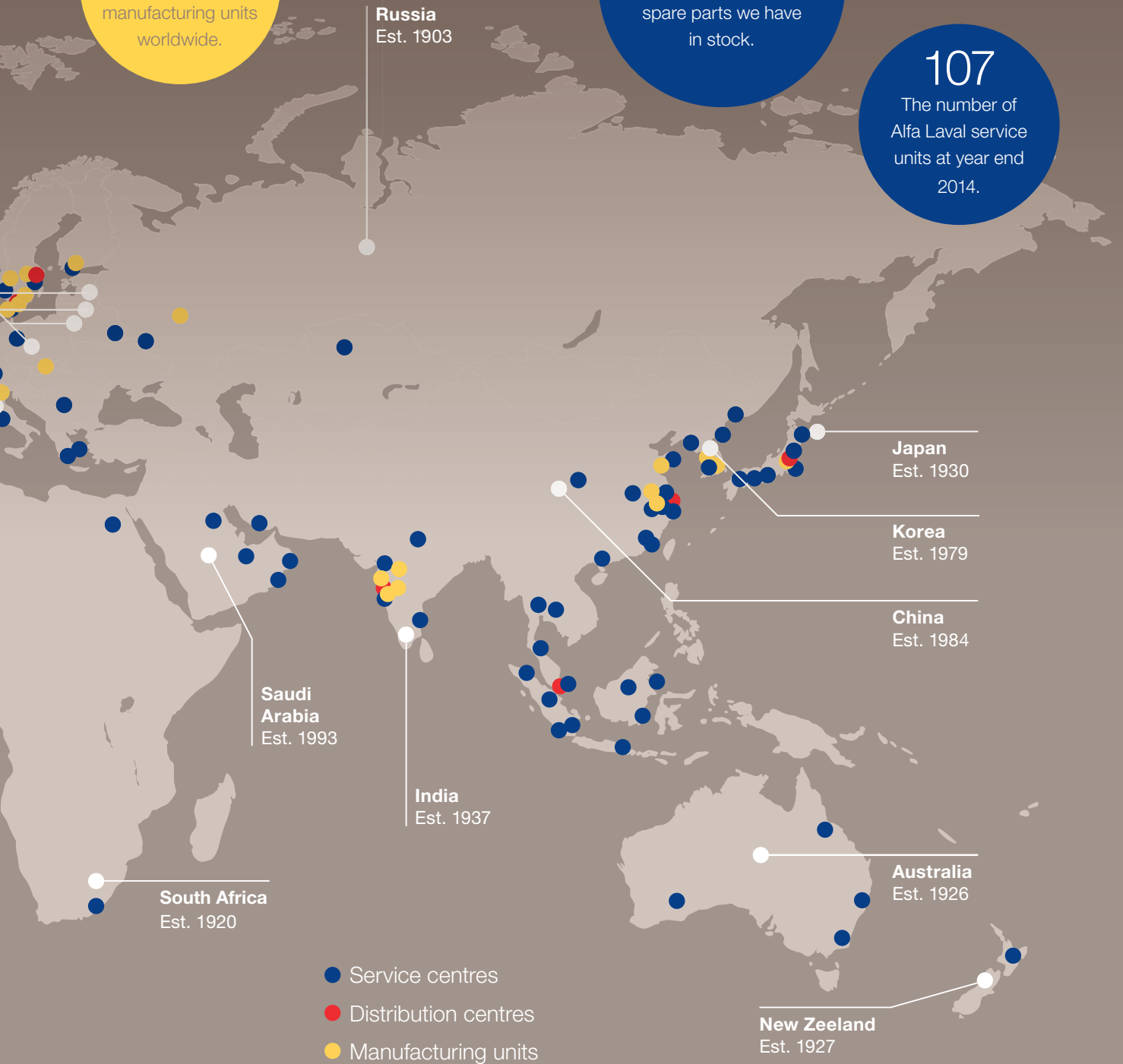
The number of major manufacturing units worldwide.

50,000

The number of unique spare parts we have in stock.

107

The number of Alfa Laval service units at year end 2014.



# Solutions for the future

The pioneering spirit of our founder Gustaf de Laval is alive in the company today. Our constant strive for new and better solutions for our customers' industrial processes has been around from the start.

To enable us to develop tomorrow's industrial solutions and to strengthen and advance our already leading global position in heat transfer, separation and fluid handling, we invest heavily in R&D activities, both basic and applied, at our product centres around the world.

Our customer focus and the inventiveness of our employees will continue to drive us to create a better and brighter future for everyone through groundbreaking products and solutions.

# 1900

The number of patents held by Alfa Laval.



## Wine making

Foodec decanters from Alfa Laval streamline the wine-making process and reduce production costs. France's National Institute for Agricultural Research uses the decanter in a system that separates grape juice from the pips and skins instead of traditional pressing and clarification methods.

## Cellulosic ethanol

We have applied our extensive experience of sugar and starch-based ethanol processing to the production of ethanol from wood, forest residues and agricultural by-products. Alfa Laval supplies heat exchangers, tank cleaning equipment, evaporators and centrifuges to second generation ethanol plants.



# 35 to 40

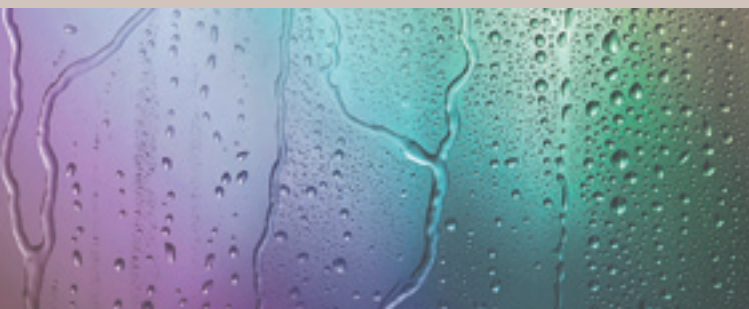
The number of new products launched each year.

## Solar power

Alfa Laval technology helps concentrated solar power (CSP) systems produce electricity even after the sun goes down. By adding a thermal storage system based on molten salt to a CSP system, the solar power plant can operate for 18 hours per day, rather than the 12 hours when the sun is shining. Alfa Laval ullage cleaning technology helps CSP plants achieve near zero atmospheric emissions.

## Natural refrigerants

Alfa Laval solutions enable a shift away from harmful refrigerants to environmentally friendly natural refrigerants such as CO<sub>2</sub>. CO<sub>2</sub> requires refrigeration systems to operate at several times the normal pressure of a classic refrigeration system, which puts new challenges on the components. Alfa Laval has a full range of heat exchangers to cope efficiently with these high-pressure systems.



## SOx and NOx

Our PureSOx and PureNOx systems remove harmful sulphur oxides (SOx) and nitrogen oxides (NOx) from the exhaust gases of large marine engines, helping ship owners to meet emission limits set by legislation.



### **Alfa Laval in brief**

Alfa Laval is a leading global provider of specialized products and engineered solutions.

Our equipment, systems and services are dedicated to helping customers optimize the performance of their processes. Time and time again.

We help our customers to heat, cool, separate and transport products such as oil, water, chemicals, beverages, foodstuffs, starch and pharmaceuticals.

Our worldwide organization works closely with customers in almost 100 countries to help them stay ahead.

### **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](http://www.alfalaval.com)