At the heart of dairy

Dairy applications in good hands
Turning potential into profit

Alfa Laval has been at the heart of the dairy industry since the 1890s, when our continuous milk separator and continuous milk pasteurizer laid the foundation for the industry. Our ongoing mission is to secure hygienic conditions and optimize production. We know the dairy applications, as well as the trends and developments affecting the industry. We also have the offering to support them. Our global and local presence, comprehensive offering, and world-class support ensure we can help you capture the opportunities of today and tomorrow.

A world of opportunity
Trends in society are having a major impact on the dairy industry. There are challenges, as well as tremendous opportunities for those who can respond with flexibility and efficiency. Changing consumer habits have a strong influence. Increasing affluence means greater demand for value-added products such as flavored milk and drinking yoghurts. There are now more consumers than ever, with greatly differing demands on variety and value.

The busy lifestyles associated with increasing urbanization fuel demand for long-life milk products, while the trend towards healthier eating boosts sales of products such as yoghurt and fortified milk.

Regional trends
Research indicates that the overall global dairy market will be strongly driven by emerging regions, with Asia Pacific, Eastern Europe, Latin America, the Middle East, and Africa accounting for approximately 86% of global market growth in absolute retail value terms in the period 2010-2015. These regions offer both dynamic growth and respectable market sizes. Global growth in liquid dairy products is projected at 30% between 2010 and 2020, with developing countries accounting for more than half of this. Yoghurt products are expected to increase by over 20% in developed markets.*

Variety is key
Growth in emerging and developed markets is driven by different categories. Milk products are driving growth in emerging markets, while in developed markets, yoghurt, cheese, and innovative value-added products present the major opportunities.

The Global Dairy Industry – top 3 key findings

| Organic market expansion: local advantage | Expanding into new markets with own products requires high levels of local market knowledge. It takes time to become established enough to exploit opportunities. |
| Geographic market diversification: central to corporate strategies | Global dairy players face slow or declining sales in core developed markets due to the recession and market saturation. Geographic expansion provides access to new markets. |
| Portfolio diversification: paramount in dairy | A balanced product portfolio across various price platforms, with strong positions in high-margin growth categories, is a major objective for global dairy players. |

Capturing the opportunities requires presence in a wider range of categories, as well as a regionally focused strategy. Balanced portfolios with a choice of products at different price levels have also proved resilient during the economic downturn.

Responding to the challenge
Consumer trends lead to some clear implications for dairy processing. Plant efficiency is critical in the long-term, with increasing commodity, utility, and labour costs squeezing profits. Product diversity is essential, and food safety has never been more important. Sustainability is becoming a cornerstone of processing operations, driven by consumer and government demands.

Source: Euromonitor 2010.


On the pulse of the industry
Our changing world means enormous potential for the dairy industry in the years to come. The key to capturing the opportunities is a clear understanding of regional and global trends, an awareness of the challenges these opportunities present to dairy processors, and high production efficiency and flexibility.

To ensure our sanitary components support these challenges and provide the leading support for dairy applications, we strive to address these four key industry needs:

- Supplying products to consumers at a competitive price;
- Getting the most from raw materials;
- Reducing waste and emissions;
- Delivering safe and hygienic products.

The focus of our channel network is on being close to our customers and helping them to capitalize on opportunities created by geographical trends. We work with our channels to understand market trends. Combined with in-depth application and process knowledge, this enables us to develop the right solutions.
Liquid dairy products
Liquid dairy products is a varied category that includes pasteurized and UHT white milk, as well as formulated flavoured products. Economic growth is putting these products within the reach of millions of new consumers; hygiene is essential to ensure confidence in food safety. Gentle product handling is also important – especially for cream and condensed products, such as sweetened condensed milk – where fat loss must be minimized, while flavour mouth feel must be preserved.

With proven reliability and energy efficiency, our range of valves maximizes flexibility and safety. This helps to achieve the low operating costs and low total cost of ownership required for good margins in competitive markets.

Cheese
Global consumption is increasing steadily and export markets are strong. Successful production demands preservation of milk quality during sensitive processes, as well as elimination of fines, in order to secure high quality and yield.

Alfa Laval’s components ensure gentle and effective heat treatment and pumping, essential for achieving optimum quality and yield. Our membranes offer the opportunity to make a variety of fresh and soft cheeses.

Ice cream mix
Producing ice cream mix requires a high degree of flexibility and efficiency, with the need to handle a variety of dry and liquid ingredients, adapt to seasonal demand fluctuations, and create an innovative and varied product portfolio.

Our wide range of hygienic processing components and tank equipment ensures efficiency and flexibility, helping processors make the most efficient use of raw materials and production capacity.

Whey products
Whey products have a wide range of potential uses, improving the nutritional value and texture of foods and health products. Key to maximizing the opportunities is the ability to effectively separate out and concentrate individual components to capture their specific characteristics.

Preserving the quality of the raw whey is essential, while effectively removing fines and fat residues.

Alfa Laval process equipment is tailored to the specific challenges of whey processing. We offer a wide range and scope of membranes for separation and concentration, helping end-product portfolio diversification and energy efficiency.

Milk powder
Milk powder products are a versatile, varied, and fast-growing category, covering both food production ingredients and consumer products. Preserving the quality and functionality of the raw material is of vital importance, especially in products such as infant formula.

The first step in powder processing is liquid handling and concentration. Alfa Laval’s membranes, centrifugal pumps, heat exchangers, agitators, mixers, instrumentation and Cleaning-in-Place equipment are all integral components for achieving energy-efficient and profitable processes, contributing to an end product of the highest quality.

Cultured milk and yoghurt
Yoghurt and cultured milk drinks account for approximately 20% of the value of global dairy consumption. This is a product category that places high demands on hygienic processing and heat transfer performance. Furthermore, the base product and ingredients, including large fruit particles, must be effectively handled in order to preserve product ingredient integrity.

These products are typically produced in continuous batch processes, where efficient changeovers are critical. Alfa Laval’s range of rotary lobe pumps helps to produce high quality product.
Optimizing every process

Alfa Laval’s comprehensive range of innovative sanitary components are key building blocks in dairy processes. The processes highlighted on these pages are important to dairy applications.

Milk reception and storage

Milk reception and storage demand uptime and efficiency. That means components with high reliability, easy serviceability, and both operational and energy efficiency.

Heat transfer

The right choice of heat exchanger is critical for a successful milk reception process. Alfa Laval BaseLine heat exchangers feature clip-on gaskets, which are easy to re-gasket on site. The same plates can be used in industrial and hygienic frames. Plates with two different pressing depths make it possible to optimize thermal efficiency and reduce investment cost. High legs give easy access to keep the environment clean. No dead spots means less bacteria growth, saving time and cutting Cleaning-In-Place CIP costs.

Fluid passage

Alfa Laval’s hygienic tubes, bends, tees, and reducers feature high-quality welding, with great strength, tight tolerances, precise angles, and outstanding uniformity.

Flow management

Optimal and reliable fluid handling can result in substantial savings and efficiency gains. Our valves ensure optimal flow in reception and storage before distribution to pasteurization processes.

Alfa Laval’s instrumentation portfolio includes dedicated tank and process instrumentation (flow, pressure and conductivity) to provide online input for process control, supporting production management, and quality control.

Higher plant capacity

MOLOKO, GORODETS DAIRY, RUSSIA. To increase capacity, improve efficiency, and comply with safety and hygiene requirements, Russian dairy producer Moloko planned to upgrade a 50-year-old dairy plant in the town of Gorodets. Thanks to Alfa Laval Mixproof Valves and many other components, a 50% increase in throughput was achieved. Plant capacity is up 50%. Production of whole milk, sour cream, yoghurt and ryazhenka (a baked cultured milk popular as a breakfast drink) has increased substantially as a result. www.alfalaval.com/moloko

Increased energy efficiency

MAJOR DAIRY, DENMARK. A study was made of energy consumption for agitators in 25 storage and concentrate tanks. Direct drive agitators were compared with Alfa Laval’s energy saving agitators featuring the EnSaFoil impeller. Potential savings in electrical power amounted to EUR 21,350 per year, giving a payback time of just 8.2 months. Specially designed for extra-low energy consumption, Alfa Laval agitators can reduce energy costs for agitation by up to 80%. www.alfalaval.com/dairydkg

Tank optimization

Alfa Laval’s Unique Mixproof Tank Outlet Valves protect the milk in the tank against contamination during CIP of tank emptying line. This enhances tank optimization.

Pumping

Alfa Laval LKH centrifugal pumps feature close tolerances, optimized internal design, and robust construction. They help increase productivity while providing gentle raw milk handling. With 14 models to choose from, finding the optimal size for the most efficient performance in each duty is more likely.

Storage

Plant flexibility and efficiency during production and CIP. The Unique Single Seat Valve range is built on a proven modular platform used in more than a million valves in service worldwide. Pressed from a single stainless steel disc, the valve body is extremely strong and durable, ensuring production safety. The enhanced performance of the actuator makes operation safer and more efficient.

www.alfalaval.com/dairydk
Mixing and blending

Precise and uniform mixing and blending is essential in many applications, contributing to an effective process and a high-quality end product. Optimal results demand a balance between power, control, and flexibility.

**Agitator solution**

The patented Alfa Laval Hybrid Powder Mixer is a versatile mobile unit ideal for applications such as fortified, recombined, and flavoured milk. It is designed to dissolve or mix in stabilizers, thickeners, and emulsifiers, and can dissolve recombined milk to more than 50% dry matter. A unique powder wetting and dissolving design assures a uniform end product with no lumps and a minimum of air. The mixer features a two-stage design with only one motor and frequency converter. Outlet pressure of four bar is achieved without a booster pump.

The dimensions of the Hybrid Powder Mixer are H 750 mm x W 826 mm x D 1340 mm. The weight of the complete unit is approximately 280 kg, mounted on wheels for easy handling. The motor is equipped with a VSD (18.5 kW) as standard. The maximum flow generated is 26 m³/h. Maximum powder capacity is approximately 3000 kg/h, and the funnel powder volume is 50 l. Media wetted steel parts are in SS 316L (1.4404) and Duplex steel. Funnel, table and frame are in SS 304 (1.4301).

**Rotary Jet Mixing**

The Alfa Laval Rotary Jet Mixer radically increases efficiency in applications such as flavoured, fortified, and recombined milk, whipped cream based on vegetable oil, dairy powders, and emulsifiers. These applications include large pre-batch blending tanks prior to spray dryers where milk powders, nutrients, and vitamins are mixed in, and where uniformity must be maintained from bottom to top, with as little energy input as possible. The mixer is positioned under the liquid surface.

The Rotary Jet Mixer is easy to install and scale up, and is highly flexible. It can mix liquids, powders, and gases into liquids, and perform impeccable Cleaning-in-Place (CIP).

Low maintenance costs

THE SERIOUS FOOD COMPANY, UK. This British producer of smoothies and desserts faced the challenge of quickly achieving a stable and homogeneous mixture of high-viscosity fruit purees and fresh-pressed high-fibre juice. By equipping three 15 m³ tanks with two Alfa Laval Rotary Jet Mixers each, they quickly achieved stable, homogeneous mixtures. This cost-effective design with low maintenance costs resulted in savings of EUR 12,000 per tank in investment costs.

www.alfalaval.com/seriousfoods
Pasteurization

Pasteurization processes demand high levels of safety, hygiene, and process control. Pasteurization of milk is a vital process, and compliance to relevant regulations and standards is essential. Following UHT treatment, aseptic conditions must be maintained. The quality of components is key, with good flow control and reliable and efficient heat exchangers playing important roles.

**Pasteurization**

**Performance day in, day out**

OLEŚNICE DAIRY, CZECH REPUBLIC. Established in 1937, the dairy processes 100,000 litres of milk per day. The dairy’s products include milk, butter, cottage cheese, and Akawi – a salty Middle Eastern cheese for which the dairy is internationally renowned. Pasteurizers are at the heart of the business, and the dairy replaced its existing heat exchanger equipment with the Alfa Laval FrontLine heat exchanger with Gemini plates. Reliability is key as they run 365 days a year. Another critical factor is to ensure no mixing of pasteurized and unpasteurized product. Alfa Laval FrontLine heat exchanger with Gemini double wall plates prevent contamination without the need for additional procedures or equipment.

**Heat transfer**

Alfa Laval Clip Plate is designed for easy mounting, packing, and gasket replacement. Heat transfer is gentle, reducing burn risk to protect product quality and enabling longer running hours. Highly resistant to fatigue, it offers an extended lifetime and reduced risk of cracks. The deep channels reduce fouling and extend running time before Cleaning-in-Place (CIP).

**Pumping**

Alfa Laval LKH centrifugal pumps feature an exceptional hygienic design, featuring optimized internal geometry and profiled o-rings that are well suited to cleaning in place. LKH pumps are EHEDG certified and compliant with 3A standards. Rigid construction and close tolerances deliver high efficiency pumping, resulting in reduced product degradation. When product degradation is of the highest concern, Alfa Laval SRU rotary lobe pumps give the ultimate in gentle product treatment.

**Flow management**

**Pasteurized products**

Alfa Laval Unique Control LKB is an automation unit with a built-in valve actuator. Its reliable integrated sensing and control eliminates costly process interruptions. Unique Control LKB delivers stable operation at air pressures from three to eight bar.

**UHT products**

Alfa Laval’s complete range of aseptic valves combine simplicity in construction with reliable performance.

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Alfa Laval FrontLine heat exchangers reduce maintenance and increase uptime, with features such as hanging plates, interchangeable corners, and tightening bolts with ball bearings. There is only one gasket size, and re-gasketing can be done without removing the plates.

Pumping Alfa Laval LKH centrifugal pumps feature an exceptional hygienic design, featuring optimized internal geometry and profiled o-rings that are well suited to cleaning in place.

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UHT products Alfa Laval’s complete range of aseptic valves combine simplicity in construction with reliable performance.
Fermentation

Getting the most from raw materials is essential in production of cultured products and fresh and cured cheeses. Important issues include achieving maximum efficiency in continuous batching and maintaining hygienic processing conditions.

**Heat transfer**

The Alfa Laval FrontLine heat exchanger has been developed specifically for food applications. The flow pattern ensures full cleanability even for viscous products such as yoghurt.

Product texture is maintained without compromising heat-transfer efficiency. The footprint is small, and the design facilitates inspection for food quality compliance.

**Tank optimization**

Verification of the actual performance of the rotary jet heads can be done using the newest sensor technology, which measures the actual jet impact. The new EHEDG-certified and 3A-compliant Alfa Laval Rotacheck Basic and Rotacheck+ provide this feature.

**Pumping**

The low-maintenance Alfa Laval SRU rotary lobe pump features a non-contact design. It offers good hygiene and can be cleaned in place. The low-shear pumping action maintains product integrity. SRU configuration options enable optimized selection for pumps for base products and fruit additives with large particles.

The SRU core rotary lobe pump’s low-shear pumping action maintains product integrity.

**Filtration separation**

Alfa Laval membrane equipment enables solids standardization for yoghurt, cheese, and milk, simplifying processing and creating a more uniform final product. Soft cheese products can be concentrated to final product composition. Substituting whey drainage with an ultrafiltration step increases yield and shortens processing time.

**Flow management**

Alfa Laval Unique Mixproof valves enable the simultaneous flow of two different products or fluids through the same valve without risk of cross-contamination. The range and scope covers most requirements. The Unique Mixproof Horizontal Tank Valve can clean itself through the seat lift or the tank connection, optimizing the process and space requirements when mounted at the bottom or side of a tank.

**Buffer storage**

Alfa Laval Level Switch TE670 eliminates false signals from the sensor, giving more accurate and reliable measurement. It provides unsurpassed reliability in feedback regardless of product viscosity. Features include an easy teach-in function for difficult media. Our tank cleaning equipment, including spray heads and rotary jet heads, provides repeatable, fast and effective cleaning in fermentation tanks with agitators.
Separation and concentration

Reducing waste and emissions is an essential aspect of concentration processes. Achieving a good operating economy requires control over components’ energy consumption.

Efficient pumping

MAJOR DAIRY, DENMARK. In a recent system audit, Alfa Laval proposed the replacement of two pumps, each with a 100 kW motor, with Alfa Laval LKH pumps equipped with variable-speed drives and a rated power of 75 kW per pump. The new pumps will pay for themselves in less than a year through EUR 36,000+ in annual energy savings, and will also reduce annual carbon emissions reductions by 100,000 kg.
Cleaning-in-Place

Quality in Cleaning-In-Place (CIP) is essential in the dairy industry. Efficiency is the key, both in terms of cleaning result and economy. CIP economy is dictated by cost and time. Reducing waste is critical; correctly configured and efficient cleaning, pumping, and heating equipment is needed to disperse the cleaning fluid properly to work on the surfaces.

Heat transfer
Alfa Laval AlfaNova is a fusion-brazed, all-stainless-steel plate heat exchanger with superior mechanical strength. Corrosion resistant, it withstands extreme thermal and pressure fatigue, as well as aggressive CIP. Our FMC gasketed plate heat exchanger is specially designed for applications where steam is used – usually to heat water or CIP liquids.

Tank optimization
For cleaning jobs where more impact is required, the Toftejorg rotary jet head offers the highest standards of efficiency, reliability, and hygiene. It provides 360° high-impact coverage over a defined time period. Verification of the actual performance of the rotary jet heads can be done using the newest sensor technology, which measures the actual jet impact. The new EHEDG-certified and 3A-compliant Alfa Laval Rotacheck Basic and Rotacheck+ provide this feature.

Superior cleaning
LLANDYRNOG CREAMERY, UK. One of the UK’s largest hard cheese processors increased the efficiency of its raw milk tank cleaning operations by 35% while reducing water usage by 30%. Static spray balls in six raw milk storage silos were replaced with Alfa Laval Toftejorg Sani-Mega rotary spray heads. Cleaning times have been slashed from an average of 43 minutes to 28 minutes per silo, and standards of cleanliness have significantly improved. Tank heat-up time prior to CIP was maintained.

www.alfalaval.com/llandyrnogdairy
At your service

Our global channel network consists of our Global Alliance Partner, Tetra Pak, and multiple channels to assure optimal market coverage. Whatever you need, wherever you are, Alfa Laval’s components and expertise are always on hand.

Unsurpassed reliability
An investment in quality is an investment in reliability. Alfa Laval hygienic components and solutions are designed and sized right from the start. When supported by maintenance programmes and Alfa Laval parts, they deliver low cost of ownership and true peace of mind over the long term.

Strength and security
Our partners’ ability to act independently, combined with Alfa Laval’s broad portfolio and organizational resources, creates a one-stop shop with world-class distribution strengths. Alfa Laval logistics ensure reliable and accurate delivery. And with the troubleshooting guidance of Alfa Laval’s competence centres as a complement to our partners’ own skills, even the most stubborn issues can easily be resolved.

All the right tools
All our partners’ fingers are advanced resources and documentation built on Alfa Laval’s unique understanding of hygienic components and processes. Using our sizing, design, and optimization tools, our partners can select optimal components, taking into account such factors as product composition, viscosity, and thermal conductivity.

Computer-Aided Selection software
Alfa Laval Computer-Aided Selection software (CAS) helps to quickly and easily identify the pump, heat exchanger, valve, and tank cleaning configuration best suited to each particular process. CAS includes drawings, article numbers, and spare parts lists, quickly and easily compiling ordering lists as well as streamlining maintenance and service procedures.

Computer-Aided Design (CAD)
Our CAD portal offers dimensional drawings of many Alfa Laval components. Any user can download 2D and 3D CAD drawings in both neutral and native formats.

Dairy documentation
Detailed product data sheets are available for all Alfa Laval components. Standard Alfa Laval documentation comprises equipment instruction manual, including declaration of conformity to required EU directives, safety, installation, operation and maintenance instructions, as well as technical data and lists of parts and service kits. Alfa Laval components have EHEDG certification or comply with hygienic design guidelines. Many key components also comply with 3A standards.

Rheology laboratory
Our laboratory provides a thorough understanding of individual fluid behaviour, contributing to correct sizing of pumps and heat exchangers, and precise seal specifications, as well as optimizing system design. This ensures the selection of the right component the first time, potentially reducing both capital investment and lifecycle costs.

Test and training facility
Customers have access to Alfa Laval’s world-class component demonstration, test, and training facilities. The facility has two full-scale production tanks and valve matrices connected to a CIP unit. Tests using product can be carried out for pumping, flow management, fluid passage, heating and cooling, and tank optimization.

Trustworthy service
Guaranteed performance, reliability, and hygiene are standard with Alfa Laval components. Each one is backed by the service and support from our global organization and local network of distributors, system builders, and contractors.

We combine the offering and advantages of a global brand with the individual attention of local sales and partners, creating a one-stop shop with the world’s largest accumulation of process expertise. In addition, we provide effective, time-saving tools that help you easily configure, size, and optimize your process components.
Dairy component innovation

A selection of Alfa Laval innovations

### Pumping

**Alfa Laval SX Rotary Lobe Pump**

Designed for use in sensitive and ultraclean applications. With optimized pump head geometry and multilobe rotors, SX pumps ensure low-shear operation with minimum pulsation.

**Alfa Laval LKHPF High Pressure**

Featuring a reinforced pump casing and back plate, high-pressure internal seals, and multiple heavy-duty studs, these pumps can handle inlet pressures as high as 40 bar. Their seals can be removed in a matter of seconds.

**Alfa Laval ClearFlow Impeller**

The ClearFlow impeller reduces pulsation and build-up of solids on the backplate, shortening time between CIP cycles. The scraper design minimizes friction and thus power consumption.

### Flow management

**Alfa Laval Unique Control**

A valve automation and control system featuring an integrated automation unit and actuator. Flow control is easy and dependable, with one-button “push and play” setup in one-fifth of the time it takes with other solutions.

**Alfa Laval Unique Mixproof Horizontal Tank Valve**

This valve handles large particles and can clean itself through seat lift and the tank connection, allowing users to optimize the process and space requirements when mounted at the bottom or side of a tank.

**Alfa Laval Unique Mixproof Large Particle Valve**

Ideal for cheese curd, quark, and yoghurt with fruit particles. This valve is capable handling of viscous products and large particles, eliminating the risk of product blocking and degradation.

### Fluid passage

**Quality assurance measures**

Total quality management. Premount inspection ensures dimensions and tolerances are to norm, with no batch variations. Raw materials and packing materials are certified. Alfa Laval offers all standards of tubes and fittings.

**Delivery options**

- **Single pieces**: Full product range readily available from one to nine pieces.
- **Box of 10**: Robust and labelled packaging secures the products.

### Heating and cooling

**Alfa Laval FrontLine**

The stainless steel frame is available in four sizes, making the design flexible in relation to volume and footprint. Frames enable operation at pressure up to 21 bar (290 psi).

**Alfa Laval Standard Clip plate**

Well-proven and extremely heat efficient, our Standard Clip plates meet the toughest requirements in dairy processing.

**Alfa Laval EnSaFerm**

EnSaFerm provides an efficient alternative to traditional frame agitators, reducing processing time by a factor of eight.

### Tank optimization

**Alfa Laval Hybrid Powder Mixer**

Versatile and mobile, the Alfa Laval Hybrid Powder Mixer features a two-stage design with one motor and frequency converter. It achieves four bar of outlet pressure without a booster pump.

**Alfa Laval Rotacheck sensor**

Verifies the cleaning process inside any hygienic tank cleaned by a rotary jet head. The patented teach-in and monitoring system ensures precise and reliable online monitoring of the cleaning head, minimizing downtime.

**Alfa Laval EnSaFerm**

EnSaFerm provides an efficient alternative to traditional frame agitators, reducing processing time by a factor of eight.

### Filtration and separation

**Alfa Laval Reverse osmosis and ultrafiltration membranes**

Alfa Laval has the capability to customize spiral sizes and membrane types for specified applications and performances.

**Alfa Laval Ultrafiltration pHt membranes**

Polysulphone/polyethersulphone on polypropylene. Tolerant of high temperatures and pH values.

**Alfa Laval Ultrafiltration GR73PE and GR82PE membranes**

Significant improvement in capacity compared to the GR61 and GR70 membranes from Alfa Laval.
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