



CSI

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Tank equipment for hygienic use

The complete line



Performance in good hands

Working with hygienic applications is a question of care, attention to detail and dedication to outstanding performance. Alfa Laval has a proven track record in delivering innovative solutions for hygienic applications based on our core technologies of separation, heat transfer and fluid handling.

Superior safety, gentle efficiency and uncompromising cleanliness are the hallmarks of our hygienic pumps, heat exchangers, valves and automation, tubes and fittings, and separation, filtration and tank equipment. Which is why so many customers in the food, biopharm and other demanding industries put process performance and hygiene in the capable hands of our experts, sales companies and partners worldwide.

Here you will find an overview of Alfa Laval tank equipment for hygienic applications. For complete technical details and product specification, contact your local Alfa Laval supplier or visit us at **www.alfalaval.com/tankequipment**

Tank optimization

Alfa Laval is the leading producer of components and solutions for tank equipment used in hygienic applications. For over a century, we have been working to ensure product quality and safety within the dairy, food and beverages, personal care and biopharm industries.

Complete tank equipment portfolio

Our portfolio offers a full range of components and solutions to enhance tank function, including:

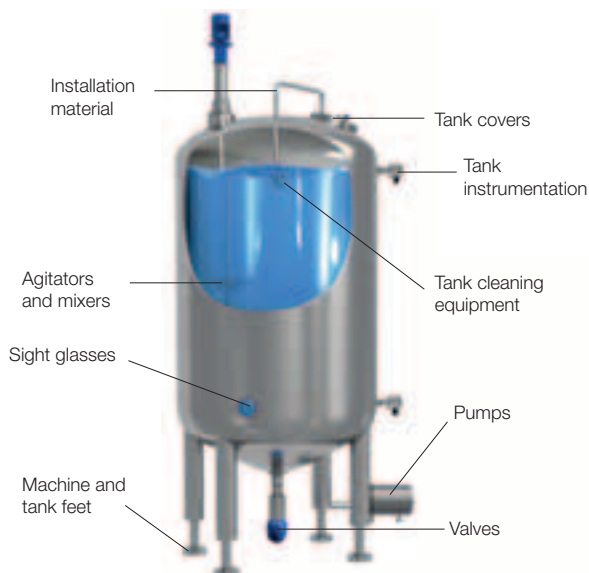
- Tank agitators and mixers
- Tank cleaning equipment
- Tank instrumentation
- Tank access covers
- Tank accessories

As a complement to our tank equipment solutions, we also supply other hygienic fluid handling components, such as valves, pumps, tubes and fittings.

The right technology for the tank

Alfa Laval provides everything to optimize tank operation – inside and out. This includes sharing our in-depth knowledge of mixing, agitation and cleaning.

We help you select the right technology to save valuable resources, such as water, energy, cleaning fluids and time. This translates into more uptime, higher yields and better profitability.



Beyond the tank

Alfa Laval's expertise goes well beyond the tank. Our wide range of equipment includes pumps, valves, heat exchangers, decaners and complete processing solutions.





Alfa Laval's energy-saving agitators are modular, which makes them easy to customize for specific applications.

Agitators and mixers

With a full range of agitators, rotary jet mixers, magnetic mixers and all the equipment to support them, we can help you determine the right mixing technology for your process requirements.

Matching the right mixing method to your needs ensures greater energy savings, superior cleanliness, and higher process efficiency in terms of reduced process time and/or higher yield. This translates into better use of raw materials and resources, improved product quality and less waste over the long term.

Alfa Laval Hybrid Powder Mixer

Boosting productivity and energy savings

The Alfa Laval Hybrid Powder Mixer combines pump and powder dissolving technologies in a single versatile unit. It is the only hygienic mixer capable of drawing powder into the unit while simultaneously pumping the resulting process liquid at pressures of more than 4 bar using a single electric drive.

When used in combination with the Alfa Laval Rotary Jet Mixer, it dramatically reduces energy consumption for the complete system compared to other powder mixing solutions that require up to four electric drives. In addition to significant energy savings, it also reduces processing time, thereby increasing productivity; it is also capable of mixing products at high dry matter concentration.



Agitators

Simply modular

With a flexible, modular design, Alfa Laval agitators enable you to tailor a mixing solution to your exact requirements. Our agitator range includes top-mounted units, with or without bottom support, as well as bottom- or side-mounted units. Modularity lends ease to installation and maintenance, and superior design ensures quality, performance and economy.

Hygienic performance

Designed for low-shear performance and uncompromising cleanliness, Alfa Laval agitators safeguard product integrity. All of our agitators are designed for use in hygienic processes. Our purpose-built agitators have smooth surfaces that promote optimal flow and specially developed impellers that support both maximum flow rate and gentle product treatment.

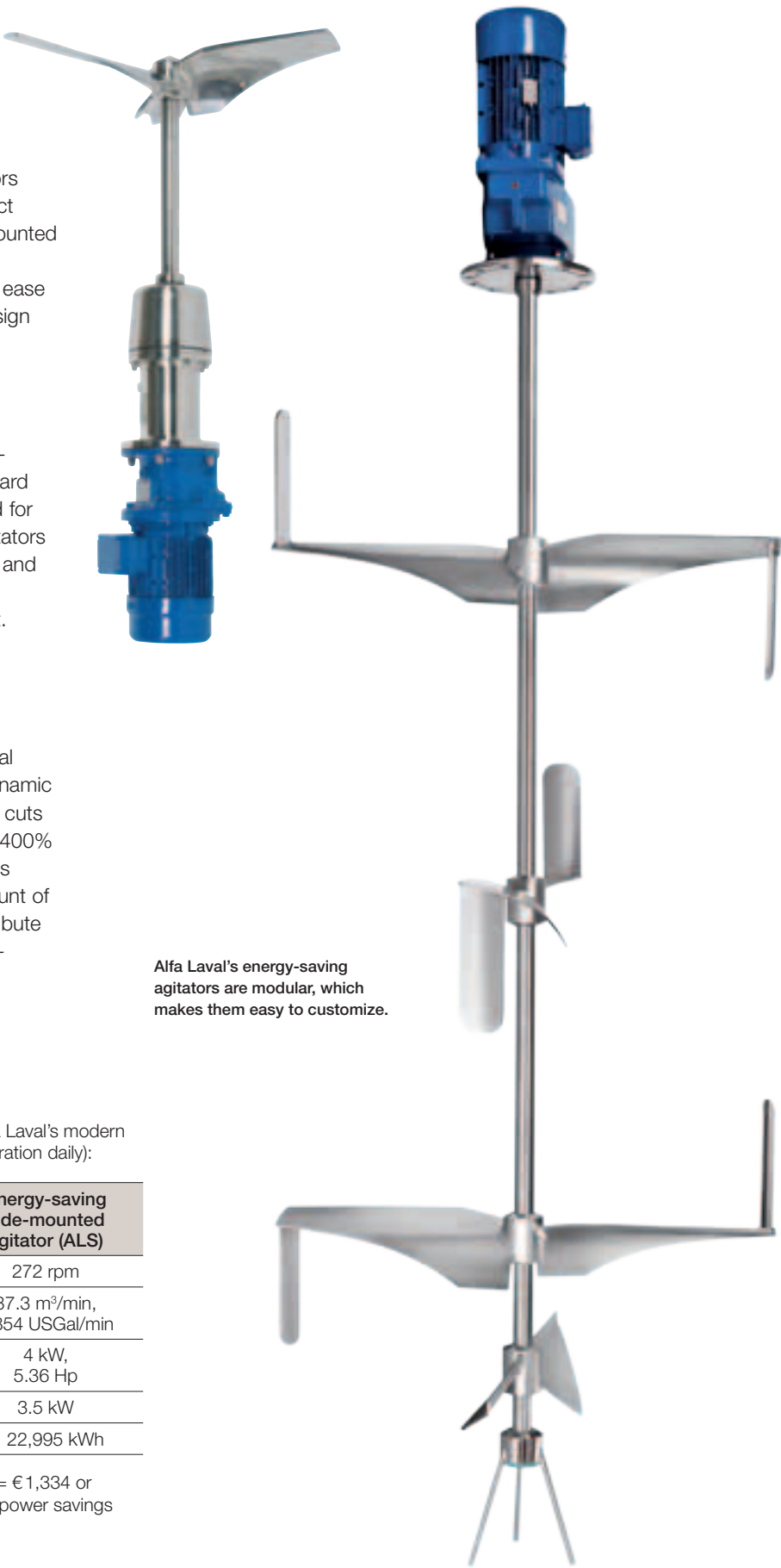
Energy efficiency

Superior performance and energy efficiency are hallmarks of our Alfa Laval EnSaFoil and Alfa Laval EnSaFerm impellers. Based on extensive fluid dynamic studies, the impeller design with its unique shape cuts power dramatically. The impeller, in fact, is up to 400% more efficient than those with standard pitch. This reduces energy consumption as well as the amount of heat absorbed by your product, which can contribute to additional savings if subsequent cooling at iso-thermal conditions is required.

Comparison of a traditional agitator installation with Alfa Laval's modern ALS A agitator installation (based on 18 hours of operation daily):

| | Traditional agitator | Energy-saving side-mounted agitator (ALS) |
|--------------------|-------------------------------|---|
| Speed | 960 rpm | 272 rpm |
| Pumping capacity | 30 m³/min, 9,725 USGal/min | 37.3 m³/min, 9,854 USGal/min |
| Installed power | 11 kW, 14.75 Hp | 4 kW, 5.36 Hp |
| Power draw | 6.4 kW | 3.5 kW |
| Energy consumption | 42,048 kWh | 22,995 kWh |

Annual savings for electrical power (at €0.07 per kWh) = €1,334 or US\$0.1 per kWh = US\$1,905. Payback time based on power savings alone <17 months.



Rotary jet mixers

Modern mixing efficiency

Alfa Laval's rotary jet mixers are based on a revolutionary patented technology that mixes liquids faster and more effectively than conventional methods. Equipped with two or four rotating nozzles, the Alfa Laval Rotary Jet Mixer is positioned below the surface of the liquid in the tank. Liquid is withdrawn from the tank outlet by a pump and circulated via an external loop to the rotary jet mixer. It is then injected into the liquid by powerful rotating jet nozzles, ensuring coverage of the entire tank, including hard-to-reach corners. The result is rapid, effective mixing of the entire contents of the tank without causing batch rotation of the liquid, which means that no tank baffles are required.

Furthermore, additives in liquid, gas or powder form can be inserted into the loop, so that these are mixed into the contents of the tank – efficiently and consistently.

Fast return on investment

Versatile for use in virtually any industry, Alfa Laval's rotary jet mixers prove their worth time and again. Breweries, for instance, can reduce fermentation time by 30%, increasing ethanol yield and profits. Drink manufacturers can optimize mixing times compared to conventional mixing methods while cutting investment costs by 50%. Vegetable oil companies can dramatically increase product shelf life by reducing the oxygen content in the oil.



The Alfa Laval Rotary Jet Mixer injects fluid, gas or powder through rotating jet nozzles - without causing batch rotation.



Multipurpose mixing

A single tank is all that is required for a variety of compatible processes, including:

- Liquid mixing
- Gas dispersion (e.g carbonation or de-aeration)
- Powder mixing

Since there is less equipment to install, valuable space at production plants can be used to boost product yield and profits. And as a bonus, rotary jet mixers can be used as tank cleaning machines once the tank is empty.

Magnetic mixers

Friction-free operation

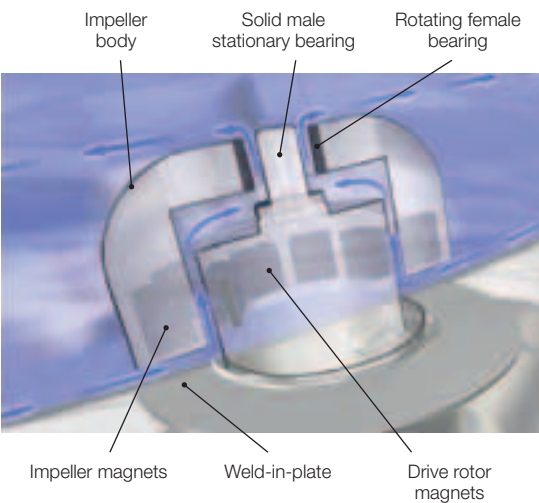
Alfa Laval's magnetic mixers feature a patented design that delivers friction-free mixing. The impeller levitates on a powerful magnetic field at all times, whether at standstill or in motion, so there is no direct contact between bearing surfaces. That, in turn, means the impeller can run dry and as a result mix effectively until all product is drained while ensuring minimal wear and maintenance.

Wide range of speeds

The levitation of the impeller and the eight-wing design make it possible to mix at various velocities. This flexibility enables the same mixer to handle a wide range of liquids and mixing duties, such as high intensity mixing and gentle product mixing.

Exceptional cleanability

Our magnetic mixers provide unparalleled hygiene due to its open design, seal-free construction, lack of entrapment areas and levitating impeller design. Since the impeller runs safely even when the tank is empty, there is seamless transition from mixing to cleaning so cleaning can begin once the last drop of product is drained.



The patented impeller of Alfa Laval magnetic mixers levitates on a magnetic field, which greatly reduces friction and maximizes cleanability.

Improved profitability

Using the Alfa Laval Magnetic Mixer enables one biotechnology company to boost its bottom line.

| | |
|-------------------------------|--|
| Increased cell count | 30–50% |
| Increased out | Additional five batches of serum each week |
| Value of increased production | \$8,000 per week |
| Payback time | Within two to three weeks |

Tank cleaning

Regular cleaning is critical to product integrity, productivity and profitability. Alfa Laval has a broad range of tank cleaning solutions that contribute to low total cost of ownership.



Three technologies to meet every need

The Alfa Laval Static Spray Ball is the cleaning method of choice for low impact cleaning of water-soluble products. Cleaning requires long cycle times and large volumes of cleaning fluids and subsequently large volumes of waste water.

The Alfa Laval Rotary Spray Head uses the rotary motion and physical impact of the cleaning media to remove sticky residues from the tank interior.

The Alfa Laval Rotary Jet Head provides a high-impact jet stream in a three-dimensional cleaning pattern to clean tough residues. The result is a thoroughly clean tank using a fraction of the time, energy, water and cleaning chemicals required for other tank cleaning solutions.

By choosing the right cleaning methods, we can help you reduce the Cleaning-in-Place (CIP) time between production cycles. Although the static spray ball is the most widely used permanently installed tank cleaning device, there are measurable benefits to upgrading to dynamic tank cleaning, especially when the risk of contamination is high and hygiene is a critical factor.

Toftejorg tank cleaning equipment



Toftejorg SaniMicro



Toftejorg SaniMidget



Toftejorg SaniMidget SB



Toftejorg SaniMagnum



Toftejorg SaniJet 20



Toftejorg SaniJet 25

Why a technology shift pays off

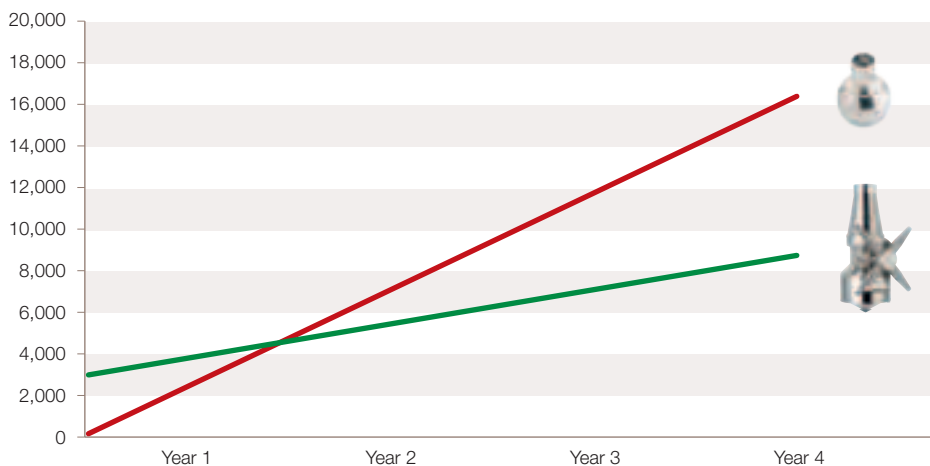
When tank cleaning machines are in place, it's often hard to imagine making a switch. But there are compelling reasons to upgrade traditional static spray balls to rotary jet heads.

Although the initial investment cost of a rotary jet head is much higher than a static spray ball, the rotary jet head delivers substantial long-term savings that continue to accrue after realizing full return on investment, which often occurs within less than a year.

Replacing static spray balls with rotary jet heads cuts cleaning costs and cleaning time. A brewery, for instance, reduced cleaning costs of a bright beer tank by 77% and cleaning time by 35% (see graph below). A pharmaceutical API manufacturer reduced tank cleaning costs by 88% and cleaning time by 59%. And a dairy cream producer reduced tank cleaning costs by 83% and cleaning time by 43%. The examples are many and the opportunities for savings enormous.

The dynamic movement and high impact force of the jets cut the costs associated with water, acid, caustic and disinfection by up to 70% and cleaning time by 50%. This leads to more production time and higher yields.

Investment and operating costs (in EUR)



Using rotary jet head technology instead of static spray ball technology can reduce operating costs up to 77% and cleaning time by up to 35%.



Toftejorg TJ 20G



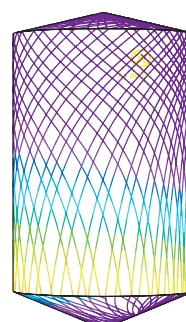
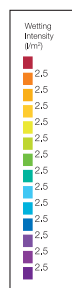
Toftejorg TZ-74



Toftejorg SaniMidget
Retractor



SSB Retractor



Let us analyze your needs

Our TRAX software simulates the performance of a Toftejorg rotary cleaning machine in your tank, before installation, by illustrating detergent distribution and wetting intensity. Using this information we can determine the configuration of the equipment in your tank that will provide the highest cleaning efficiency.

Tank instrumentation



Alfa Laval can provide a full assortment of tank instrumentation to fine-tune the processes in your tank and boost efficiency. To ensure successful production, you can take advantage of our weighing systems, flow transmitters, level switches and conductivity sensors as well as solutions for pressure, temperature and more.

Weighing system

Our innovative weighing system features integrated electronics for quick and easy installation without requiring a costly mounting kit. Our load cells remain unaffected by welding voltages or overloads of up to 300%.

Level switch

Design and engineering ingenuity can be seen in our level switch, whose sensor is insensitive to foam or residues of sticky materials. Furthermore, the teach-in feature enables the user to employ the switch for more than one type of product.

Tank cleaning validation

Ingenuity is also built into our Rotacheck system, which provides automated quality control and electronic verification of the 360° impact coverage of Alfa Laval rotary jet heads during Cleaning-in-Place (CIP). Visual light indication and electrical signals for PLC control system enable operators to be aware of the CIP performance.

Flow meter

Our hygienically designed electromagnetic flow meter enables accurate detection of liquid flow in various process installations. It has a high accuracy, even if the viscosity of the liquid changes.

Conductivity sensor

Alfa Laval's conductivity sensor has high accuracy even at very low conductivity and flow rates, and can be remotely controlled. It has an extra feature of an integrated temperature sensor for temperature compensation.

Temperature and pressure gauge

Our thermometer and pressure gauge are designed to fulfil the demands in sanitary and pharmaceutical production. Thanks to the robust design, they have high resistance to corrosion, damp, vibrations and wear. They have high accuracy and long term measurement stability without recalibration.

Alfa Laval's instrumentation, connections and casings are certified to the relevant standards for use in hygienic processes. Our instrumentation combines reliability with efficiency and practicality in set-up and maintenance.

Tank instrumentation and accessories



Weighing System UltraPure



Flow Transmitter



Level Switch



Conductivity Sensor



Rotacheck+



Temperature Transmitter

Tank accessories

As a complement to our tank equipment portfolio, Alfa Laval provides a full assortment of tank accessories, including tank covers, machine and tank feet, sight glasses and valves.

Access tank covers

More than 50 different types of oval, circular and rectangular covers provide quick, easy and convenient entry and access to tank interiors. Available with a variety of surface finishes and seal materials, these securely fit the openings of high-, non- and low-pressure tanks.

Alfa Laval LKD and LKDC covers are compliant with 3-A standards and are available with 3.1. material certificates. Alfa Laval HLSD-2 manways, for instance, are PED-approved for installation both above and below liquid level in pressure vessels with pressures up to 10 bar.

Machine feet and tank feet

Alfa Laval machine feet and tank feet provide sturdy and adjustable support for free-standing tanks and vessels. For quick and easy installation in hygienic process plants, these stand either directly on the floor or on a stainless steel base plate.

Sight glasses

Available in sizes to suit all needs, our range of accurate gage glasses provide direct distortion-free visual inspection and can be provided with or without halogen light fittings for both tank and inline installation.

Valves

To meet virtually any demand, Alfa Laval offers a broad range of valves – from aseptic diaphragm and butterfly valves to single seat, mixproof and check valves. The Alfa Laval Unique Mixproof Tank Valve, for instance, is ideal for cleaning of pipelines right up to the tank bottom while the Alfa Laval Unique Mixproof Horizontal Tank Valve fits into tight spaces.



Electronic
Pressure Gauge



Pressure Gauge
Transmitter



Sight Glasses



Pressure Cover HLSD-2



Pressure Cover LKDC
and LKDS



Tank Feet

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 to 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, foodstuff, starch and pharmaceuticals.

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



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