



**Fristam**  
PUMPS®

Our philosophy is simple:  
we deliver only the best.

Fristam was established in 1868. In 1909 the great-grandfather of today's managing director, Wolfgang Stamp, and today's technical director, Joachim Friedrichs, took over. Back then the Hanseatic company produced all kinds of equipment for the dairy industry. The very first Fristam pump made of stainless steel was manufactured in 1931. Fristam's worldwide success has been based on three principles ever since:

quality, flexibility and innovation.



Joachim Friedrichs,  
technical director

Wolfgang Stamp,  
managing director

**True quality:** we manufacture our pumps predominantly from the purest cast and forged stainless steel 316 L.

#### THE BEST MATERIAL FOR OPTIMUM HYGIENE

Throughout the world Fristam is recognised as a manufacturer of stainless-steel pumps of the highest quality. We know from our long and extensive experience that there is no alternative to stainless steel. Only the use of stainless-steel pumps guarantees that the highest hygiene standards can be met, in the food industry as well as in biotechnology. In addition, thanks to its extraordinary solidity, our steel is ideal for all rotating and stationary parts. Fristam's solid design with a minimum wall thickness of 6 mm renders each pump dimensionally stable, absolutely reliable, exceptionally quiet and insusceptible to sudden changes in pressure – even at very high discharge pressures.

#### EXTREMELY RELIABLE AND PRACTICALLY MAINTENANCE-FREE

Throughout our manufacturing process we insist upon uncompromising quality on every individual production step, because we understand that only attention to the smallest detail will ensure the enormous lifespan of over 30 years for a Fristam pump. In daily service our high standards result in the most reliable and almost maintenance-free operation. Consequently, in the long run a Fristam pump will always be the most cost-effective solution for your company.



**Flexibility is quite simple:** we build each of our pumps considering your individual requirements.

**MADE TO MEASURE AND SPECIFICALLY TAILORED TO YOUR SYSTEM**

Just like you, we focus on one thing: the transported material. Consequently, we develop completely reliable solutions, perfectly adapted to your specific applications. Based on our tradition and many decades of experience, we have developed specific components for our pumps. They can be combined according to a smart modular design principle. This makes every Fristam pump a unique piece of equipment, able to be manufactured at short notice, and offered at a favourable price. Our unique wide range of pumps enables you to choose the optimum type for each point of operation, which will be specifically adapted to the individual characteristics of your products, processes and systems.



**Driven by innovation:** we want to make sure that Fristam pumps will always be the best choice for your company.

#### TODAY AND TOMORROW

In order to continue offering you not only custom-made but also innovative solutions, Fristam significantly invests in the research and development of forward-looking technologies. We also consider the interaction of a pump and its system, ensuring that the optimum solution is environmentally friendly, too. In addition, we constantly strive to expand our know-how and raise our quality standards even further. A matter of course for all of us at Fristam.







Fristam centrifugal pumps FP



Fristam centrifugal pumps FM



Fristam centrifugal pumps FPH



Fristam side channel centrifugal pumps FZ



Fristam positive displacement pumps FL/FL2/FL3



Fristam positive displacement pumps FK



Fristam positive displacement pumps FKL



Fristam shear pumps series FSP



Fristam powder mixer series PM

# The Fristam range of pumps

More than one hundred years of experience make Fristam one of the world's oldest manufacturers of pumps. We focus on providing solutions individually tailored to your system. Fristam pumps combine superior manufacturing quality and outstanding durability with an excellent cost-performance ratio.

## HIGHEST QUALITY OF MATERIALS

Massive parts with a minimum wall thickness of 6 mm provide for maximum reliability.

In order to guarantee the highest durability even with aggressive mediums, we manufacture our pumps from only high-grade, corrosion-resistant materials such as chromium molybdenum steel 316 L or titanium.

## ABSOLUTE HYGIENE SAFETY

High-grade seal-flush systems are designed specifically for operating under vacuum conditions, thus protecting both the medium from damage by contamination, and the environment from leakages.

Fristam pumps meet the world's strictest hygiene standards such as 3A and EHEDG.

## MULTIPLE USES

Biotechnology, brewing and beverage industries, chemicals, cosmetics, food, dairy, paper and cellulose, pharmaceuticals, sugar and confectionary industries. Please refer to page 30 for details.

## ROBUST DESIGN

The specific cover fastening and the solid design of each Fristam pump ensure maximum reliability and minimum downtime.

## EASY MAINTENANCE

All Fristam pumps' designs allow for easy access to their interiors, enabling you to dismantle and, if necessary, exchange worn parts quickly and safely.

## MAXIMUM RELIABILITY

A Fristam pump's extremely smooth run ensures outstanding reliability

and a very long life. The rotating and stationary parts' materials, along with their corresponding elastomers, are thoroughly checked for compliance with all required specifications and standards.

## EXCELLENT SERVICE

Seventeen international subsidiaries and numerous special agencies around the globe make sure that Fristam pumps operate reliably under all possible conditions. Our commitment to the highest standards extends to after-sales services and spare-parts delivery.

## LOW LIFE CYCLE COSTS

Fristam pumps are very low in maintenance and energy consumption. Combined with their long operating life, they produce substantially lower costs and significantly higher profits.



Impellers from the Fristam FP

## Fristam centrifugal pumps FP

The specific profile of their impellers provide for a steady, smooth flow with minimal secondary swirl even at high flow rates. Universal use, gentle product handling, robust, easy to maintain, durable, economical. The Fristam FP's well-thought-out design provides you with the optimal solution to your specific requirements.

### OPTIMUM FLEXIBILITY

Fristam FP pumps are ideal for creating customised solutions. The various sizes of this series have been specifically designed with the possibility of modifications in regards to products, processes and applications.

Their low NPSH values render them suitable even for unfavourable conditions of intake.

Fristam centrifugal pumps FP are fully suitable for CIP and SIP.

### HIGH EFFICIENCY

All pumps of the FP series are characterised by high efficiency, low energy consumption and minimal operating and maintenance costs.

### SPECIFIC CONSTRUCTION

Fristam pumps FP are designed with open impellers, with narrow gaps between the impellers and the cover.

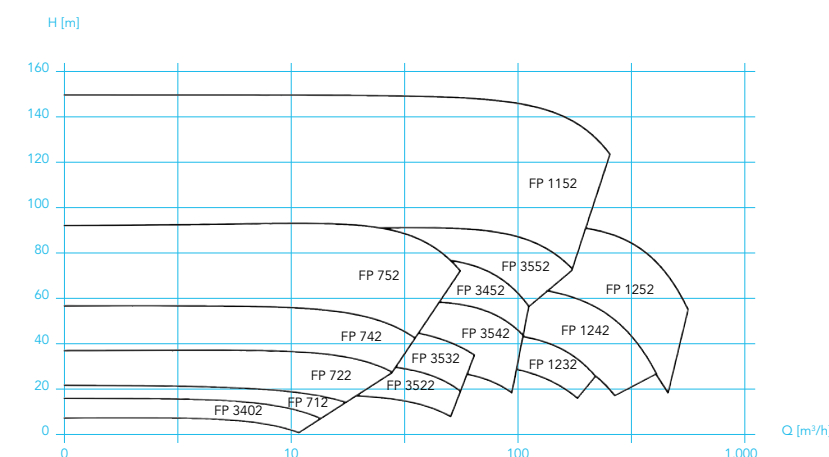
Combined with the flow-optimised pumping channel, these ensure minimal secondary flow, very gentle product handling even at high volumetric flows, and energy-saving operation.

The FPs' design makes them ideal for hygienic applications. The pumped medium may be homogenous, or contain air, gases or suspended solids.



### TECHNICAL DETAILS

- 14 different sizes
- System pressures up to 25 bar
- Discharge pressures up to 15 bar
- Flow rates up to 550 m<sup>3</sup>/h
- Viscosities up to 800 mPa s



Characteristic curves of the Fristam series FP;  $n = 2,900 \text{ min}^{-1}$



Impeller from the Fristam FM

# Fristam multistage centrifugal pumps FM

Perfect whenever highly sensitive products must be transported under high pressure. Hygienic, smooth running, robust, easy to maintain, durable, economical. Specifically designed for generating high delivery heads and operating under extreme pressure conditions.

## FOR CHALLENGING APPLICATIONS

Fristam FM pumps can be used under especially difficult conditions of high pressure, e.g. feeding filters, heaters and fillers as well as circulation and pressure boosting in ultrafiltration and reverse osmosis systems.

All Fristam pumps of the FM series are easy to maintain and very durable.

## SPECIFIC CONSTRUCTION

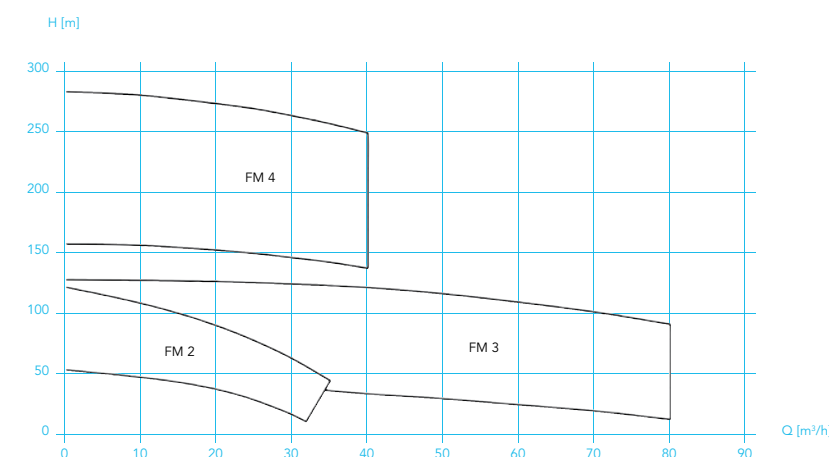
The FM are multistage pumps, specifically developed to generate high delivery heads, boosted by several successive pump stages.

Adhering to minimal production tolerances throughout our highly precise production process makes the FM series an exceptional product of superb industrial manufacturing.



## TECHNICAL DETAILS

- 3 different sizes
- 2 to 5 stages
- Impeller Ø up to 250 mm
- Discharge pressures up to 45 bar
- Flow rates up to 80 m<sup>3</sup>/h
- Viscosities up to 500 mPa s



Characteristic curves of the Fristam series FM; n = 2,900 min<sup>-1</sup>





Casing from the Fristam FPH

## Fristam centrifugal pumps FPH

A further development of the Fristam FP series, the FPH feature all their advantages combined with specific abilities for high-pressure applications. Hygienic, universal, gentle product handling, robust, easy to maintain, durable, economical. Because of their design, the Fristam FPH are easily adaptable to your system requirements.

### INDIVIDUAL ADAPTATION

The Fristam pump series FPH has been specifically designed with the possibility of modifications in regards to products, processes and applications.

FPH pumps feature an excellent suction performance and are fully suitable for CIP and SIP.

### SPECIFIC CONSTRUCTION

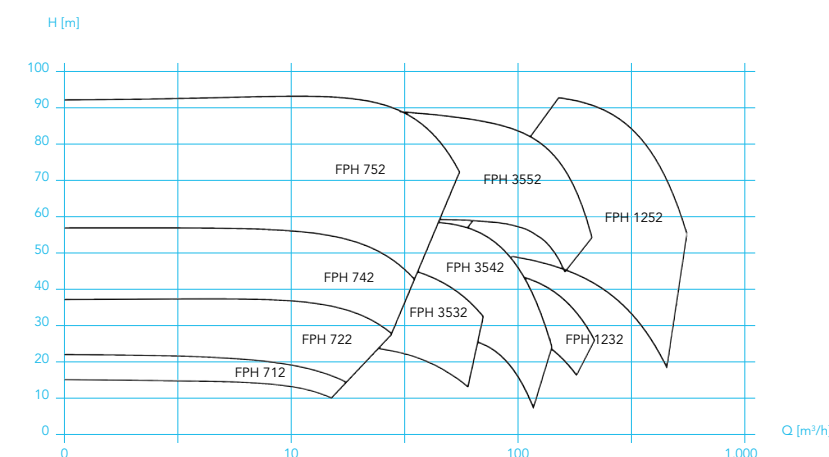
The Fristam FPH's design with its open impellers and a flow-optimised pumping channel ensures gentle product handling even at high volumetric flows.

The pumped medium may be homogenous, or contain air, gases or suspended solids.



### TECHNICAL DETAILS

- 9 different sizes
- System pressures up to 80 bar
- Discharge pressures up to 13 bar
- Flow rates up to 550 m<sup>3</sup>/h
- Viscosities up to 800 mPa s



Characteristic curves of the Fristam series FPH;  $n = 2,900 \text{ min}^{-1}$



Impeller from the Fristam FZ

# Fristam side channel centrifugal pumps FZ

Reversible, self-priming, high-precision pumps for complete evacuation of tanks and lines. Hygienic, universal, robust, easy to maintain, durable, economical. The optimum solution whenever high suction capacity is required.

## OUTSTANDING PERFORMANCE

Fristam FZ pumps have the ability to continuously transport products containing large amounts of air or gas without becoming airlocked.

This not only enables the FZ to minimise contamination between different products but also to completely empty tanks and lines.

Their excellent suction capabilities prevent product residues from remaining in the system for long.

## PERFECT DRAINING

By removing remaining product, foam and solutions from the lines, the FZ pumps make the pumping process more efficient.

## SPECIFIC CONSTRUCTION

Fristam's self-priming FZ pumps operate according to the side channel principle. Impellers with radial blades in conjunction with hydrodynamically optimised side channels transmit the pressure energy to the product.

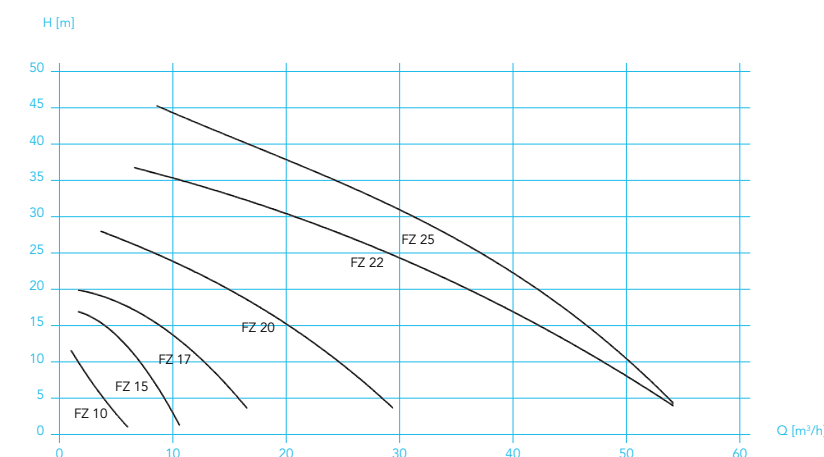
The stable impeller and narrow sealing gaps ensure an outstanding suction capacity.

The FZ's symmetric design allows for a reversal of the rotating direction.



## TECHNICAL DETAILS

- 6 different sizes
- System pressures up to 15 bar
- Discharge pressures up to 6.5 bar
- Flow rates up to 64 m³/h
- Viscosities up to 5,000 mPa s



Characteristic curves of the Fristam series FZ; n = 1,450 min⁻¹

# Fristam rotary lobe pumps FL / FL2 / FL3

The series' specific hydraulics reduce shearing and ensure especially gentle product handling under discharge pressures of up to 12 bar. Hygienic, robust, easy to maintain, durable, economical. While being extremely compact, Fristam series FL pumps are fully suitable for CIP and SIP.

### GREAT VARIETY

The wide range of Fristam's FL series enables you to choose the optimum type for your points of operation, specifically tailored to the characteristics of your products, processes and systems.

All models offer a wide array of optional features, from heating or cooling jackets to relief devices in the covers.

### SPECIAL CHARACTERISTICS OF THE FL3

Fristam's FL3 pumps feature unique helix-shaped tri-wing rotary lobes. They ensure an almost perfectly steady product stream, with exceptionally gentle treatment of your medium.

The FL3 is designed for both product handling and cleaning of the system (CIP).

### SPECIFIC CONSTRUCTION

All of the FL series' pumps have a state-of-the-art system of low-slip lobes rotating free of contact in opposite directions, thus ensuring high efficiency even with low viscosities or at high temperatures.

The FL's symmetric design allows for a reversal of the rotating direction, enabling the pump to transport materials in both directions.

Models 50–130 are designed for pumping horizontally as well as vertically, and allow for top, bottom or side mount. Various types of connection, such as flange, clamp or thread, can be chosen freely. Along with the pumps' bi-directional rotation, this ensures complete flexibility of installation.

Because of their well-thought-out construction principle, Fristam FL pumps are extremely easy to maintain.

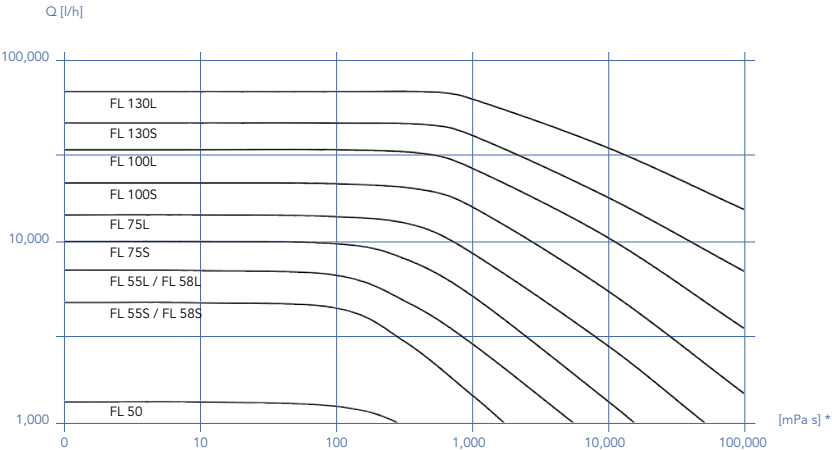


### TECHNICAL DETAILS

- 11 different sizes
- Discharge pressures up to 12 bar
- Flow rates up to 70 m³/h
- Viscosities up to 100,000 mPa s



Rotary lobes from the Fristam FL3 (upper right) and the FL2 (lower left)



Characteristic curves of the Fristam series FL \*) Viscosity



# Fristam positive displacement pumps FK

Optimum suction capacity and consistent handling even of highly viscous products at high discharge pressures of up to 20 bar. Hygienic, universal, gentle, robust, easy to maintain, durable, versatile, economical. The pistons' special shape guarantees almost perfect displacement and extremely gentle transportation of your product.

### HIGH EFFECTIVENESS

The Fristam FK's area seal principle between pistons, the casing with fixed hubs and the cover allow for highly effective operation with excellent suction performance at pressures of up to 20 bar.

FK pumps are designed for transporting products of high viscosities up to 1,000,000 mPa s.

Devoid of dead zones, Fristam FK pumps are fully suitable for CIP and SIP.

### SPECIFIC CONSTRUCTION

Positive displacement pumps of the FK series are characterised by extremely narrow gaps in their interior as well as by their area seal. They have excellent suction capacities and produce high flow rates.

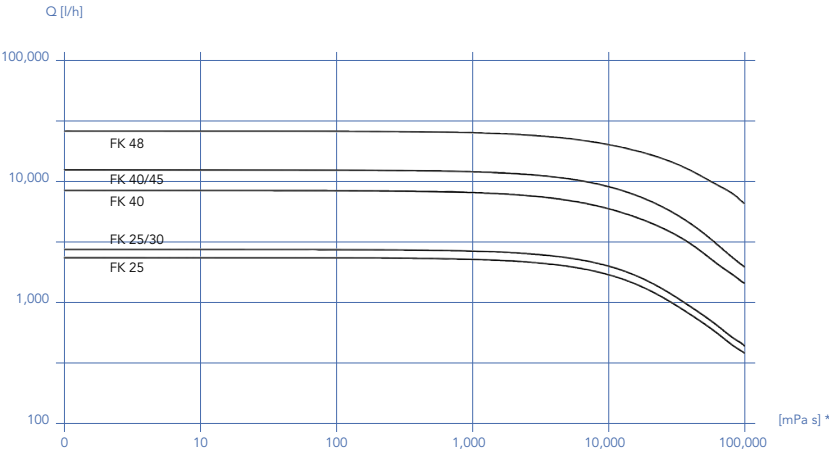
As a result of their compact sizes and Fristam's high level of manufacturing quality, they offer extreme reliability, very low downtimes and boast exceptional durability.

Wear parts can be exchanged quickly with only minor technical efforts.



### TECHNICAL DETAILS

- 5 different sizes
- Discharge pressures up to 20 bar
- Flow rates up to 25 m³/h
- Viscosities up to 1,000,000 mPa s



Characteristic curves of the Fristam series FK \*) Viscosity

Circumferential pistons from the Fristam FK



# Fristam positive displacement pumps FKL

Designed for maximum effectivity and reliability under extreme conditions, with powerful suction performances at discharge pressures of up to 35 bar. Hygienic, gentle, robust, easy to maintain, durable, economical. Fristam pumps of the FKL series are suitable for high flow rates of up to 120 m³/h, as well as for CIP and SIP.

### MAXIMUM DISCHARGE PRESSURES

Fristam FKL pumps are self-priming, and ideal for discharge pressures of up to 35 bar.

Because of their robust construction with maximised shaft diameter, minimised shaft length and symmetric pistons, these pumps can withstand very high pressures without deflection.

### OPTIMUM PRODUCT HANDLING

The specific shape of the FKL's circumferential pistons minimises squeezing and avoids damaging the product.

### SPECIFIC CONSTRUCTION

FKL pumps with their circumferential pistons are characterised by their solid design with extremely narrow gaps.

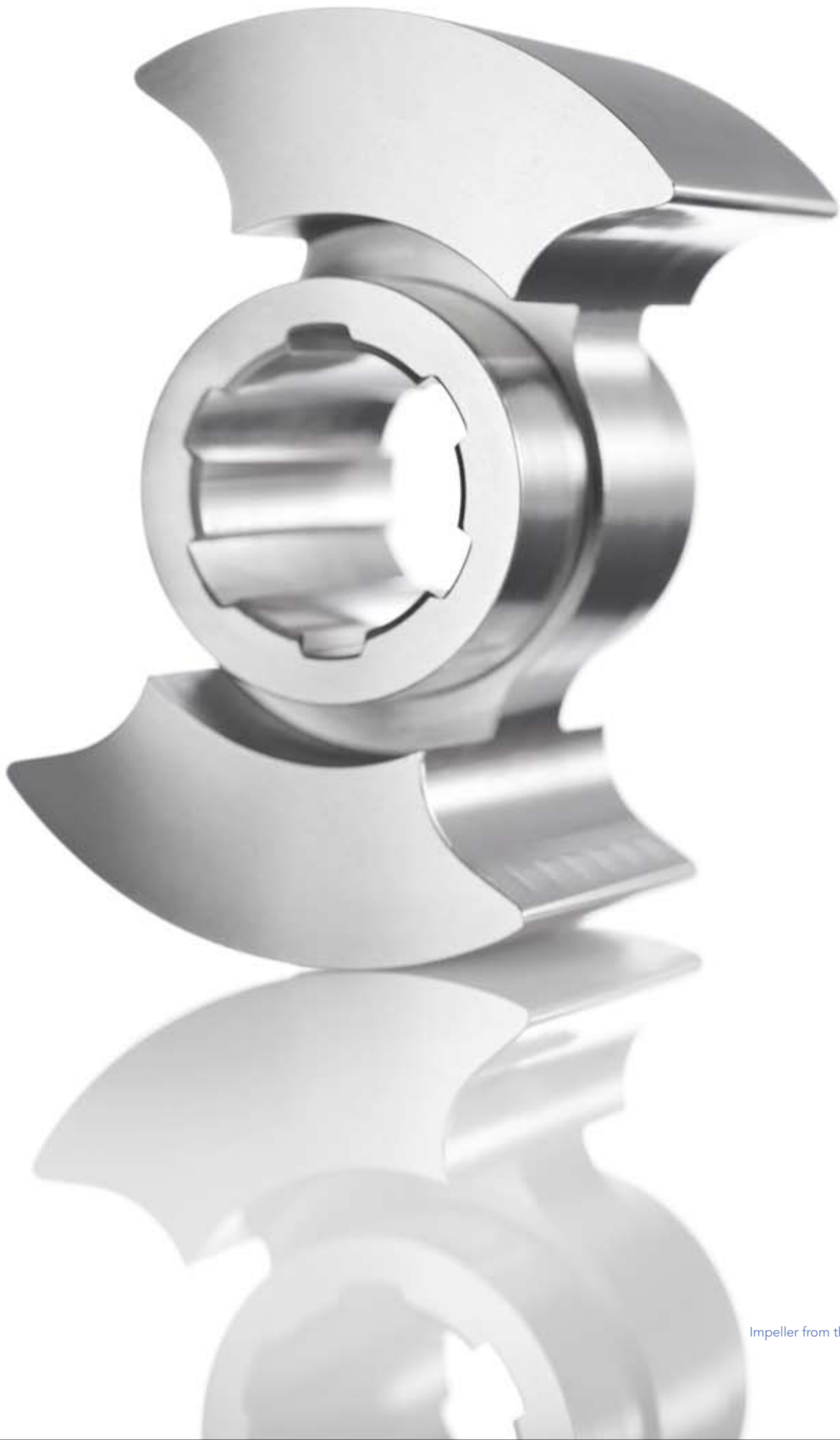
Their well-balanced construction principle minimises piston wear.

Because of the sophisticated shapes of their rotating parts, pumps from Fristam's FKL series can be easily maintained very quickly.



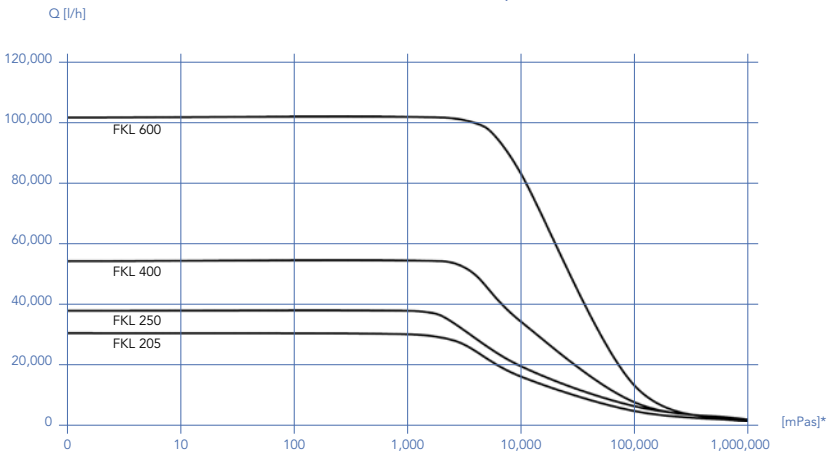
### TECHNICAL DETAILS

- 10 different sizes
- Discharge pressures up to 35 bar
- Flow rates up to 120 m³/h
- Viscosities up to 1,000,000 mPa s

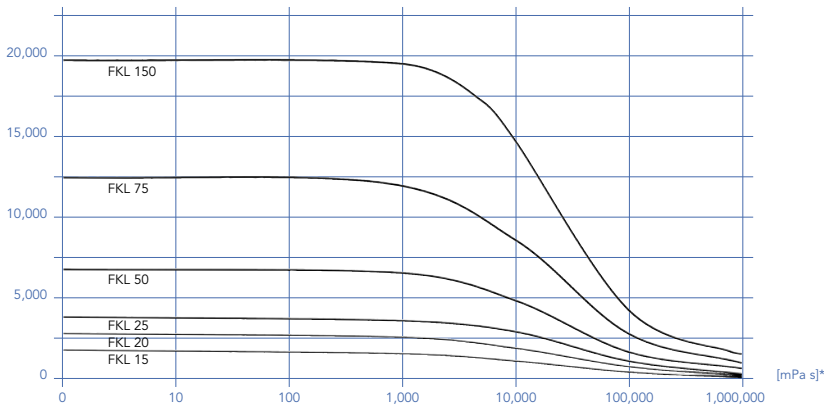


Impeller from the Fristam FKL

Series FKL 205–600



Series FKL 15–150



Characteristic curves of the Fristam series FKL \*) Viscosity



Rotors from the Fristam series FSP

## Fristam shear pumps FSP

A three-dimensional shearing process to continuously produce perfect blends of consistent quality. Hygienic, effective, robust, highly economical. Fristam shear pumps achieve incomparably homogenous products, reducing raw material input while considerably shortening processing times.

### EXCEPTIONAL PRODUCT TEXTURE

Fristam's FSP enables you to blend multiphase products efficiently, producing inseparable emulsions and absolutely homogenous end products. They prevent lumps and agglomerates in your product and produce consistent, repeatable results.

By improving disaggregation of ingredients, the shear pumps provide for considerable savings of raw materials.

Compared with conventional dissolving processes in large tanks or boilers, the use of Fristam's FSP can cut processing times significantly.

The shear pumps are suitable for various batch sizes, and are fully CIP-capable.

### CUSTOMISED USES

As application possibilities vary in type and complexity, we offer process-oriented customised solutions, ranging from single units to large in-line installations.

### SPECIFIC CONSTRUCTION

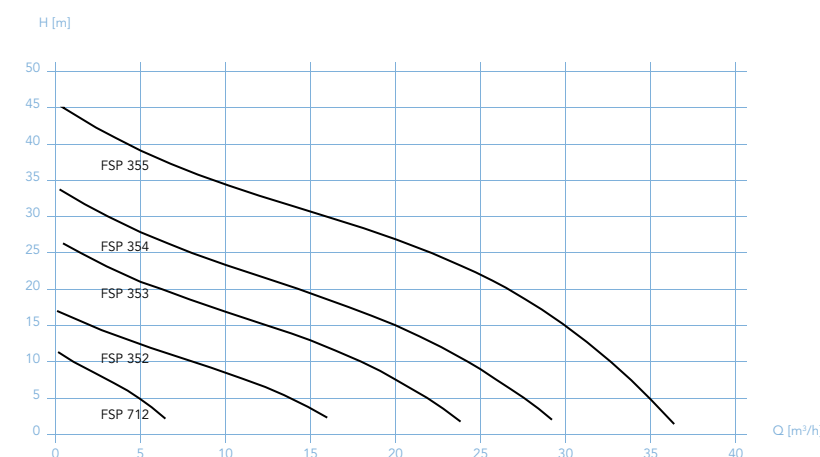
Fristam shear pumps were developed based on our proven centrifugal pumps of the FP series. In place of their impeller, a rotor-and-stator system draws inhomogeneous products through shearing clearances of just 0.3 mm at tip speeds of up to 38 m/s.

As a result of extremely high flow rates in the rotor-and-stator system, and the high shear rates of up to 125,000 1/s, multiphase products are blended with supreme efficiency.



### TECHNICAL DETAILS

- 5 different sizes
- Impeller Ø from 130 to 250 mm
- Shear rates up to 125,000 1/s
- Revolution speed up to 5,800 rpm
- Viscosities up to 100,000 mPa s



Characteristic curves of the Fristam series FSP



# Fristam powder mixer PM

The solution to all problems when mixing powders and liquids – for perfect, homogeneous and smooth textures. Hygienic, effective and highly economical. Fristam's powder mixer is the universal piece of equipment for dissolving, emulsifying and homogenising wet and dry ingredients into fluids.

## SHORTER PRODUCTION TIMES

Fristam PM powder mixers can dissolve powders in fluids on its first pass through the mixer, significantly reducing processing times.

Their exceptional homogenising performance and their compact frame make them ideal for dissolving:

- stabilisers in fermented milk products, e.g. gelatine in cream, pectin in cream cheese
- milk powder in shakes and ice cream
- concentrated milk proteins, oils and fats for regulating the fat content for dairy products and cheese
- starch, salt, sugar, Aspartame and other additives
- flavourings and citric acid
- protein powder for bakery products
- wheat and rye flour or coarse meal for producing dough, breakfast cereals and baking mixes
- pectin, CMC, carbopol, guar flour, locust bean gum, xanthan gum, carrageenan, alginate, etc.
- minerals such as calcium carbonate, bentonite or CMC for emulsions as auxiliaries in oil- or gas exploration.

## ON-SITE TRIALS

In addition to providing extensive process guidance, we offer our powder mixers for test runs.

## SPECIFIC CONSTRUCTION

Supported by a base frame, a self-priming centrifugal Fristam FZ pump is connected to a Fristam shearpump. From a funnel the powder is drawn directly into the fluid product stream. Passing through the shear pump, this premix is then homogenised, producing consistent batches.

A table of ergonomic proportions facilitates manual powder feeding.

If equipped with specific control systems, the powder mixers can be integrated into fully automated systems.

We can also supply adapters for fully- or semi-automatic feeding via big-bags, crew-converters and other conveyer systems.



## TECHNICAL DETAILS

- 7 different sizes
- Powder intake up to 15 t/h



Rotor from the Fristam FSP (left), impeller from the Fristam FZ

The best pumps for the best products:  
ideal solutions for all applications.

Around the globe Fristam stainless-steel pumps are used in leading companies in the food and beverage, pharmaceutical and chemical industries. The exceptional quality of construction and manufacturing makes our pumps ideal for transporting all kinds of products in numerous industrial processes.

## TECHNOLOGIES

## Acceleration and pressure build-up in carbonising, mixing, metering and cleaning systems

Bottle, barrel, drum and container emptying

Feeding evaporation and ultra-heat treatment systems.

### Feeding filters, heaters and fillers

## Carbonisation

## Cleaning systems / CIP

### Distillation and concentration

## Dialysis

## De-alcoholisation

## Degassing

## Emulsification and homogenising

## Extraction

## Fermentation

### Filling and dosage

### Filling and emptying of tank trucks

## Filtration

### Heating and pressure boosting

### In-line mixing

## Sampling in breweries

Residue emptying of product pipes

Supply, circulation and pressure boosting in ultrafiltration and reverse osmosis systems for water treatment, de-alcoholisation, separation of liquids containing harmful substances and recovery of product residues

Reverse osmosis

Transfer

## Water treatment

## PRODUCT GROUPS

Alcoholic beverages: liqueurs, wine, champagne, distiller's wash, spirits, alcoholic solutions

Biotechnology: cell suspensions, nutritive solutions, enzymes, toxic solutions, alcoholic solutions

Brewing: mash, yeast, beer, hot and cold wort, low-alcohol, non-alcoholic and waste beer, CIP solutions

Chemicals: photographic emulsions,  
acids, alkaline solutions, waste water

containing crystals, slightly contaminated liquids, chemically polluted industrial waste water, cleaning agents, adhesives

Dairy products: butter, yoghurt, raw milk, whey, cream, skimmed milk, milk concentrate, whey concentrate, set milk, cream cheese

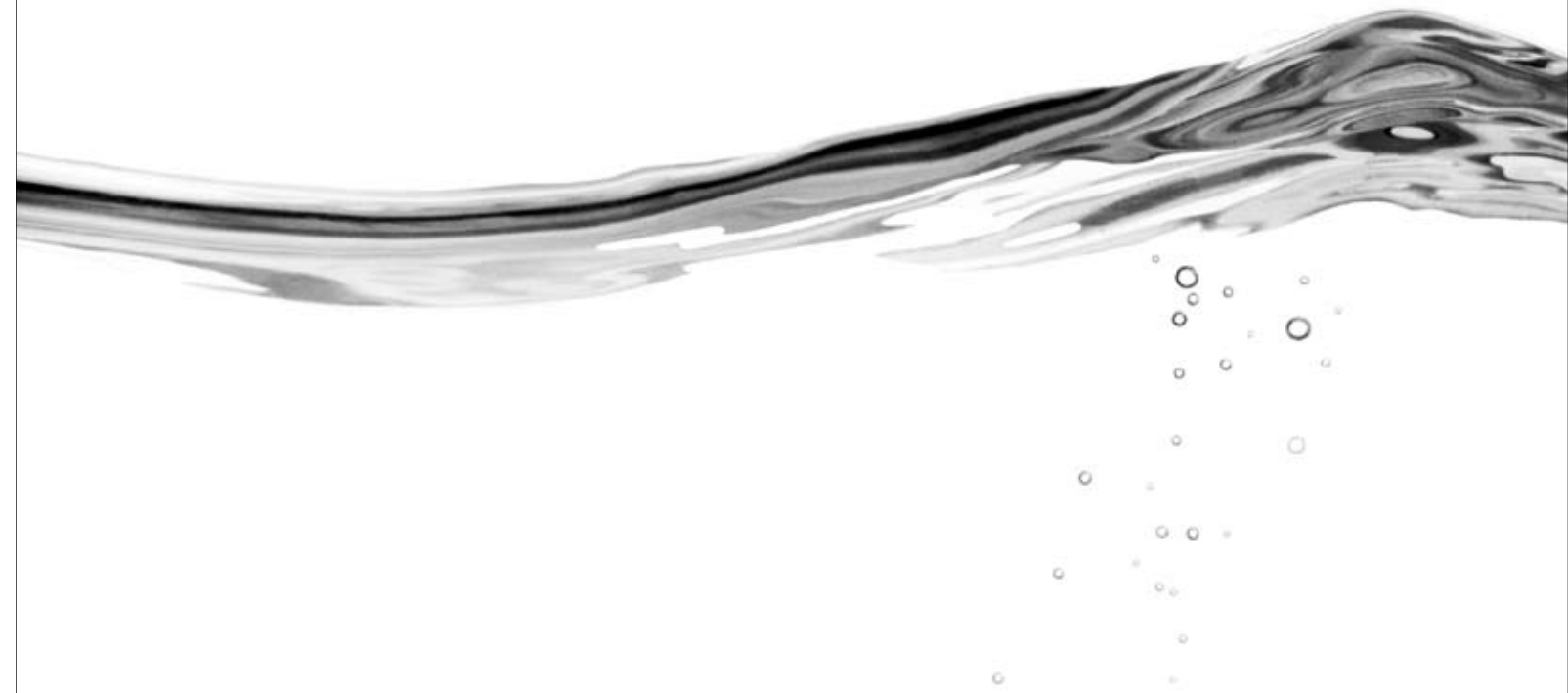
Foods: animal and vegetable oils and fats, vinegar, sauces, flavourings, brine, meat broth, tomato juice, vegetable juice, mayonnaise, whole egg, bread and pasta dough

Non-alcoholic beverages: syrup, concentrates, fruit juices, mineral water, sodas and mixed drinks containing CO<sub>2</sub>, concentrates with fruit pulp

Paper and cellulose: glues, starch, resin and kaolin solutions

Pharmaceuticals: pure water, infusion solutions, blood, lotions, plant extracts, perfumes, ethanol, enzymes, special pastes, tooth paste

Sugar and confectionery: liquid sugar, molasses, starch solutions





# Whenever you need us, we'll be there: by your side.

Fristam is a cosmopolitan company, acting globally. Consequently, we regard it as a matter of course to be at your disposal with our world-wide distribution and customer services network in every industrial corner of the planet.

## SPECIFIC LOCAL KNOW-HOW

With our subsidiaries and numerous special agencies, we make sure that you are well taken care of around the globe.

Our employees' know-how extends not only to many years of industry experience but also to profound knowledge regarding local specifics of the respective countries.

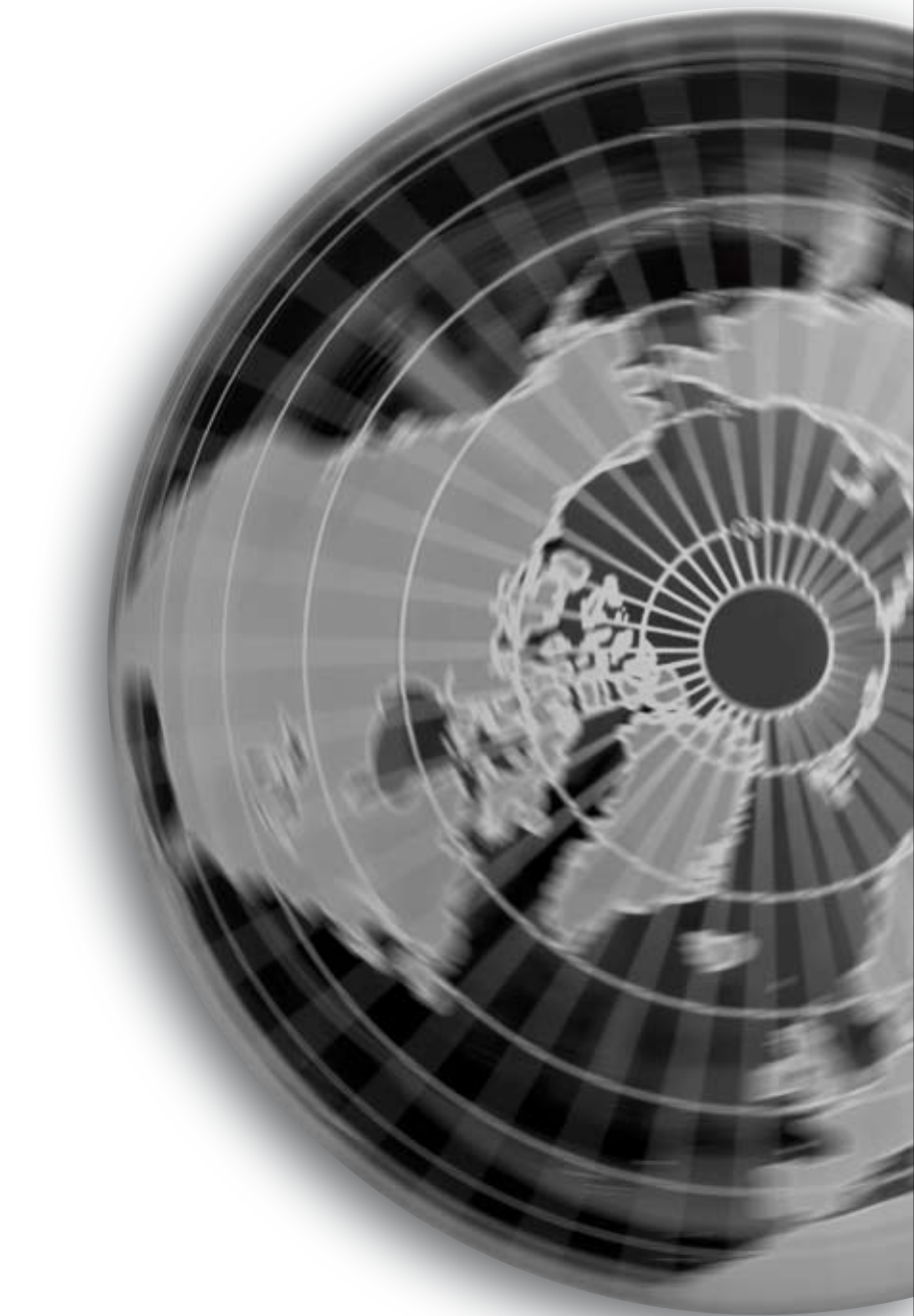
## HANDS-ON SUPPORT

Fristam's international presence ensures that you receive efficient service wherever, whenever.

In almost all industrial nations, qualified specialists will support you with their expertise as well as pumps and spare parts.

Which makes Fristam a reliable world-wide partner for stainless-steel pumps of the highest quality.

For international contact information, please visit [www.fristam.de](http://www.fristam.de).



## Good to know: we'll still remember your pump in 50 years from now.

We strive to offer you a comprehensive service. Each and every Fristam pump is specifically tailored to the individual requirements of its owner, making it a unique technical masterpiece – with very specific components.

### ACCURATE DOCUMENTATION

Throughout the design and manufacturing process, all details of each Fristam pump are meticulously recorded and documented.

Its specifications, from fundamental construction principles and the shape of impellers, down to every single gasket, are recorded in our archives system.

### FRISTAM SPARE-PARTS SERVICE

Fristam pumps are manufactured according to the highest standards, and are characterised by a high degree of reliability, durability and easy maintenance. However, should you ever need a spare part, we can provide it in no time at all.

We always keep an extensive stock of components at hand. If a specific piece is not available, we are able to manufacture it quickly according to the construction details kept in our archives – even in 50 years from now.

This system has proven itself highly effective for many decades. Ultimately, it guarantees unsurpassed operating reliability.



Fristam original parts are always delivered in original packaging.



# Under hand and seal: certified quality by Fristam.

Our pumps meet the highest international standards. Not only in terms of hygiene but also regarding operating performance and manufacturing quality.

### WORLDWIDE STANDARDS

Each Fristam pump meets all relevant quality norms. The respective certificates are on hand at Fristam's main offices.

### ISO 9001

Fristam is certified according to ISO 9001:2000. Consequently, you can expect superior quality in every aspect when acquiring a Fristam pump.

### FRISTAM SALES SERVICE

Our colleagues in the sales department will be happy to answer any questions, and provide you with in-depth information.



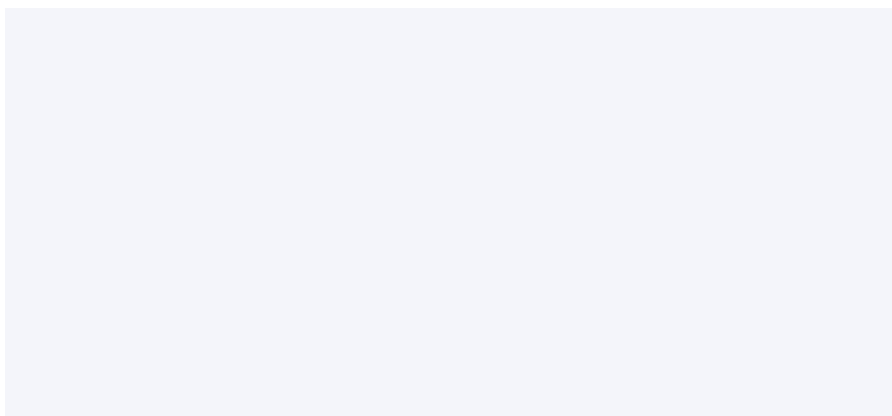




***Fristam***  
**PUMPS®**  
*Engineered For Lasting Performance™*

Special impeller from the Fristam FP





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