

PACKO EFFICIENT, SAFE AND RELIABLE

PACKO

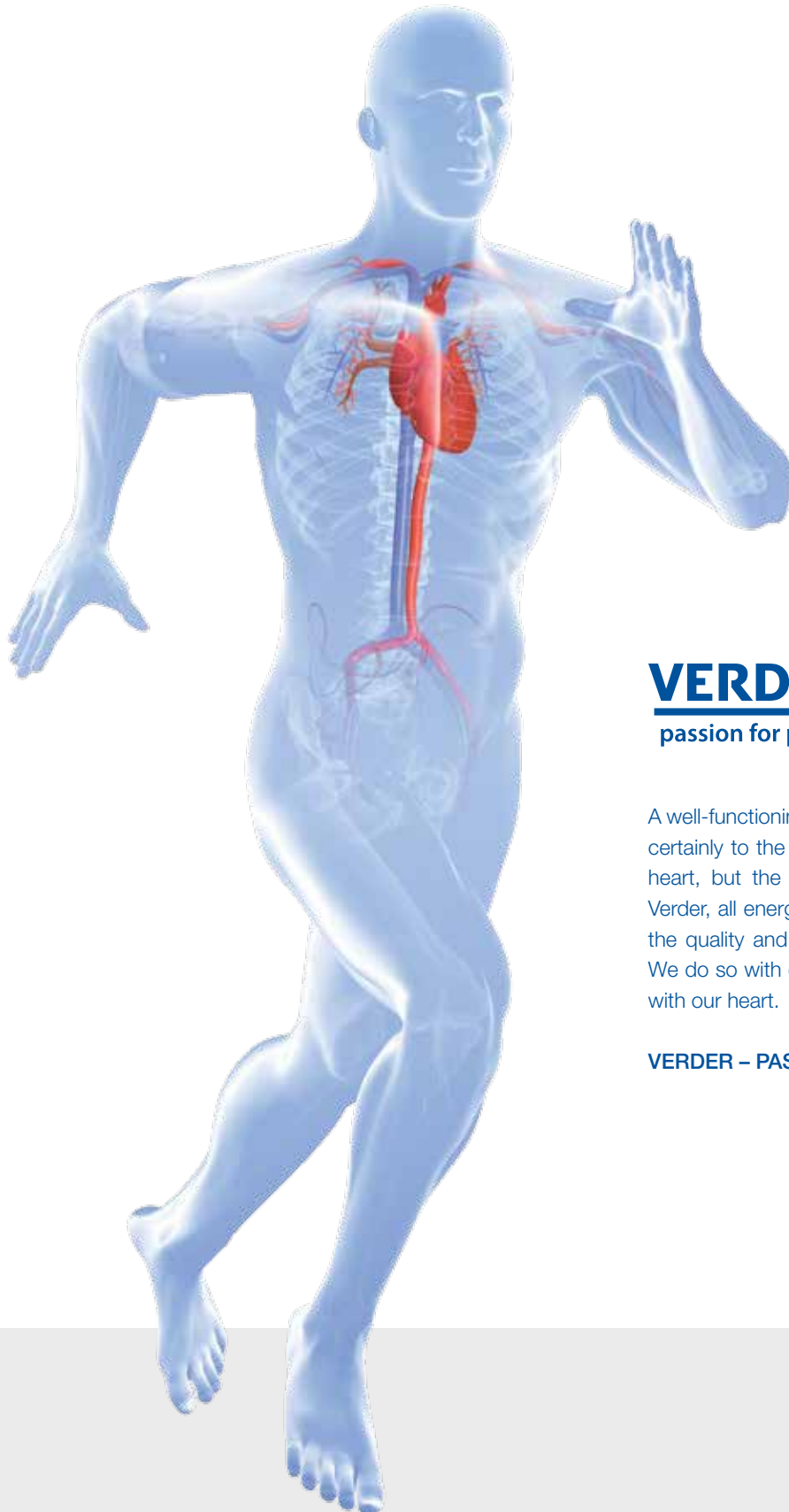
PACKO **PRODUCT OVERVIEW**

Stainless steel centrifugal pumps

Benefits

- *Cleaner & more resistant*
- *Lower energy bills*
- *Shortest downtimes*

VERDER
passion for pumps



VERDER

passion for pumps

A well-functioning pump helps you succeed. That applies certainly to the most important pump in life, the human heart, but the same goes for pumps in business. At Verder, all energy and attention is focused on improving the quality and performance of our pump and service. We do so with energy, dedication and most importantly, with our heart.

VERDER – PASSION FOR PUMPS



THE VERDER GROUP

- 1 Company
- 26 Countries
- 55 Years of expertise
- Global network
- Local distributors
- In-house service & maintenance
- A solution for every application

The Verder group is a family owned business formed over 55 years ago in the Netherlands; the group consists of a worldwide network of production and distribution companies. Group companies are involved in the development and distribution of industrial pumps, pumping systems, high-tech equipment for quality control, research and development into solid material (solids sample preparation and analytical technologies). The Verder Group employs over 1600 people and has an annual turnover in excess of 380 million Euros.

Among the most successful of Verder's technologies is its innovative Packo stainless steel centrifugal pump range.

Packo Stainless steel centrifugal pumps

Verder is manufacturer of the Packo stainless steel centrifugal pumps. The first pumps were developed for dairy, where hygiene and cleanability are very important. Since then the Packo program has been expanded steadily. The program now consists of a balanced program of pumps for food, breweries, pharmacy and general industry.

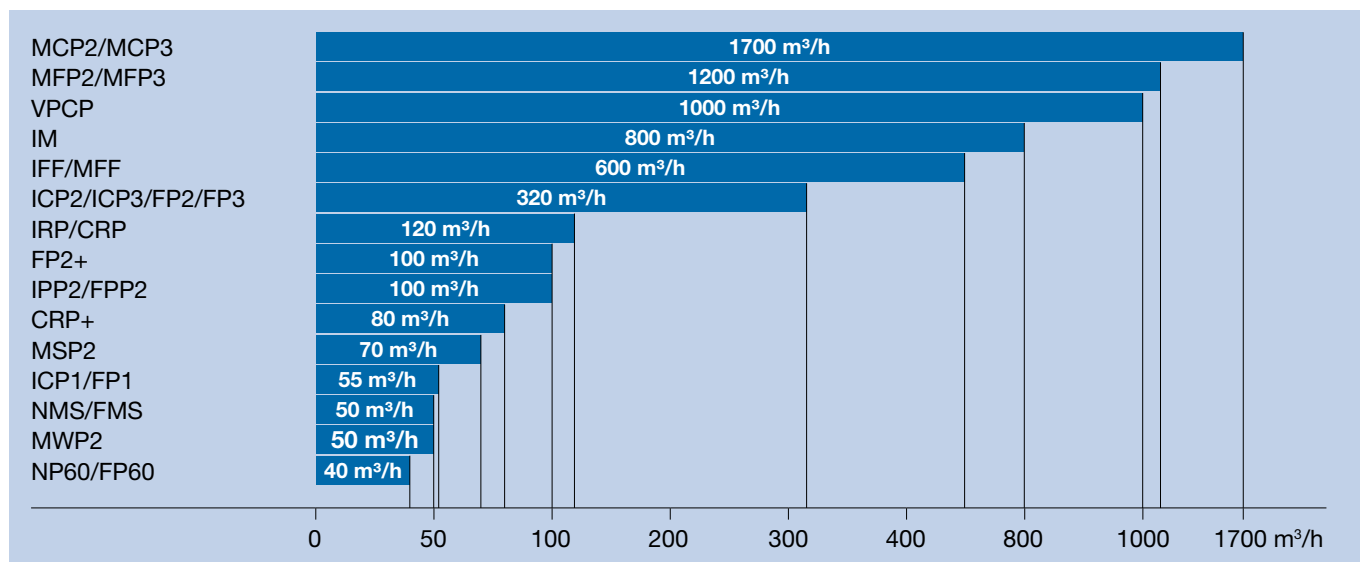
The stainless steel pumps are manufactured at our production plant in Diksmuide (Belgium). At this plant also components for milking machines are produced. The electropolishing division is also located in Diksmuide. At the plant in Diksmuide 130 people are employed and per year more than 10,000 pumps are produced.

PACKO HYGIENIC CENTRIFUGAL PUMPS



Packo hygienic centrifugal pumps are used in many industrial sectors. The mechanical surface polish degree determines where a Packo pump can be applied. Verder offers the general Packo pump series for vegetables, potatoes, frying oil, meat, fish and the hot process part in the brewing industry. The majority of these general Industrial pumps comply with 1935/2004 EC. For higher hygienic demands like dairy and hygienic food industry, the Packo food and pharmaceutical pump series are available. Most of these pumps have hygienic certificates such as EHEDG or 3A. The highest mechanical surface polish is used for applications in the pharmaceutical, cosmetic, biotech and semiconductor industry. Electropolishing is standard for all the Packo pumps. Apart from these important food market segments Packo Pumps also found their way in general industry, water treatment and biogas applications.

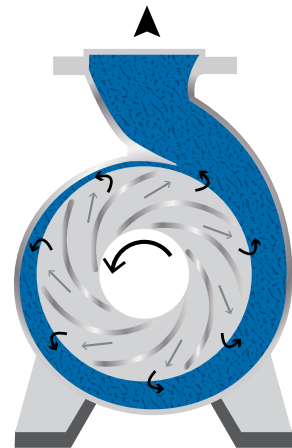
Packo Performance Overview





How does a **centrifugal pump** work?

The principle of a standard centrifugal pump is based on a rotating movement of the impeller in a stationary pump housing. The impeller is connected to the shaft and is powered by a motor. The liquid enters the pump axially inside the heart of the rotor. When the impeller turns, the liquid is moved out through the centrifugal force. Through the discharge flange the liquid is moved out of the pump.



What are **your benefits** using a Packo hygienic centrifugal pump?

Cleaner & more resistant

- *Standard electropolishing*
- *316L or higher*
- *3A certification*
- *EDEDG certification*
- *1935/2004 EC*



Lower energy bills

- *Highest pump efficiencies*
- *Lowest NPSH values*
- *High volume capacity with BEP's up to 87%*
- *MEI compliance*



Shortest downtimes

- *Standard IEC motors*
- *Standardized mechanical seals to EN12756*
- *Easy, modular, maintenance friendly concept*

PACKO STAINLESS STEEL CENTRIFUGAL PUMPS

Efficient, safe and reliable

Packo stainless steel centrifugal pumps are high-efficient quality pumps. The range includes series for industry, food and pharma, depending on the requirements. The difference between the respective series is in their surface quality and connections.



Surface treatment!

Welds are polished by hand and electropolished to produce a surface suitable for the most demanding hygienic applications in the food, cosmetic and pharmaceutical industries. Due to the electropolishing process, the surface benefits from greater resistance to corrosion and is easy to clean.

Options

- Self-priming design
- CIP return pump (for gas/water mix)
- ATEX

Industrial pumps

- Material 316L
- Industrial and hygienic connections
- Modular design
- Best energy-balance thanks to optimal pump hydraulics
- Electropolished surface treatment
- Max. flow: 1,700 m³/h
- Max. system pressure: 40 bar



Food pumps

- ➔ Material 316L
- ➔ Hand-polished internal weld seams
- ➔ Certified compliant with 1935/2004 EC
- ➔ Hygienic connections
- ➔ Surface quality of $Ra < 0.8 \mu m$ or $Ra < 3.2 \mu m$
- ➔ Electropolished surface treatment
- ➔ Max. flow: 1,200 m³/h
- ➔ Max. system pressure: 40 bar



Pharmaceutical pumps

- ➔ Materials: casing 316L - impeller fully machined 1.4435
- ➔ Aseptic connections
- ➔ Certified compliant with EHEDG and 3A
- ➔ Certified surface quality of $Ra < 0.4 \mu m$
- ➔ Electropolished surface treatment
- ➔ Max. flow: 90 m³/h
- ➔ Max. system pressure: 13 bar

THE EXCEPTIONAL STANDARDS OF PACKO PUMPS MAKE THE DIFFERENCE



Packo pumps

Electropolished surface



All stainless steel surfaces of the Packo range are electropolished. This increases corrosion resistance and facilitates improved cleaning.

Advantages of electropolished surfaces

- Improved corrosion resistance
- Reduced surface contamination
- Easier to clean
- Hygienic surfaces, no bacteria traps
- No discolouration of the welded seam
- Clean stress-free surfaces

Other pumps

Mechanical polished surface



Electropolished surfaces have extremely high corrosion resistance and optimum surface quality. This achieves optimum hygienic conditions that avoid deposit of bacteria and prevent germ formation.

Surface finish

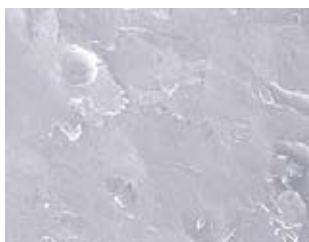
Electropolished surfaces

No bacterial traps and easier to clean

Mechanical polished / glass bead blasted surface

Risk of germ formation due to bacterial traps

Glass bead blasted surface



Vegetable and industrial pumps	Ra < 0.8 µm - Ra < 3.2 µm
Food and Pharma pumps	Ra < 0.4 µm - Ra < 3.2 µm



Best cleanability

EHEDG and 3A for food, pharma for standard and CIP return pumps.

Computational Fluid Dynamics

Product design with the most sophisticated software on the market.



Minimal stock

Standardized wear components.



Short downtimes

Easy, modular, maintenance friendly and robust design.



Worldwide availability

All wear parts are standardised to buy quickly at local markets.



Less wear cost

Less cavitation because of lowest NPSH values.



CAPDATA program

No standard component sales, but a calculated solution in your process.



Reliability

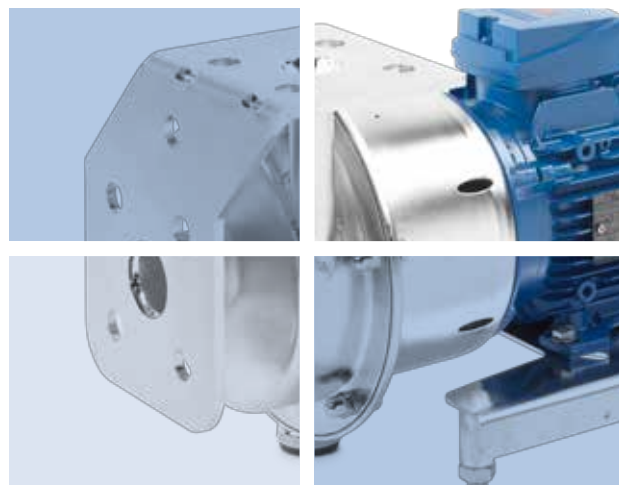
Trust in certification for a guaranteed reliability of your process.

PACKO INDUSTRIAL

Industrial stainless steel centrifugal pumps

The Packo industrial stainless steel pumps are highly efficient and have a low $NPSH_r$ value. All industrial stainless steel pumps are robust and easy to maintain. They are characterized by their modular design with interchangeable standard components. Also available as cantilever submersible pumps, vortex pumps and special pumps for water/air mixtures.

	Max. flow volume	Max. differential pressure
Process pump NP60	40 m ³ /h	2,5 bar
Process pump ICP1	55 m ³ /h	2,7 bar
Process pump ICP2/ICP3	320 m ³ /h	12 bar
Massive process pump MCP2/MCP3	1700 m ³ /h	7 bar
Vortex pump IFF/MFF	600 m ³ /h	3 bar
Multistage centrifugal pump NMS	50 m ³ /h	16 bar
CIP return pump IRP	120 m ³ /h	7 bar
High-pressure pump IPP2	100 m ³ /h	7 bar
Wear-resistant centrifugal pump MWP2	50 m ³ /h	6 bar
Non-clogging pump VPCP	1000 m ³ /h	2 bar
Self-priming centrifugal pump MSP2	70 m ³ /h	3 bar
Cantilever immersion pump IM	800 m ³ /h	6 bar





NP60

- Low cost industrial stainless steel centrifugal pump
- Energy saving thanks to high efficiency
- Easy concept and maintenance

Max. flow volume	40 m ³ /h	Max. differential pressure	2,5 bar
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ICP1

- Best value for the money
- Energy saving- high efficiency
- Modular concept built up with standard components
- Easy maintenance

Max. flow volume	55 m ³ /h	Max. differential pressure	2,7 bar
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ICP2 / ICP3

- Robust execution in pressed stainless steel 316L
- High efficiency and very low NPSH
- Hygienic connections possible (ICP+)
- Easy maintenance

Max. flow volume	320 m ³ /h	Max. differential pressure	12 bar
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MCP2 / MCP3

- Robust design in cast stainless steel 316L
- Extremely efficient thanks to optimum pump hydraulics
- Easy maintenance

Max. flow volume	1700 m ³ /h	Max. differential pressure	7 bar
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PACKO INDUSTRIAL

Industrial stainless steel centrifugal pumps



IFF / MFF

- Stainless steel vortex pump with recessed impeller
- Ideal for pumping liquids with significant proportion of solids and/or long fibers

Max. flow volume	600 m ³ /h	Max. differential pressure	3 bar
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NMS

- Multistage industrial designed centrifugal pump
- Ideal for moderate flowrate and high pressure
- Complies with EU regulation 1935/2004 EC

Max. flow volume	50 m ³ /h	Max. differential pressure	16 bar
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IRP

- Industrial air handling pump for CIP return as well as for truck unloading applications
- High efficiency and low NPSH in comparison with a classic liquid ring pump
- Limited noise level
- Available with sanitary fittings (IRP+)

Max. flow volume	120 m ³ /h	Max. differential pressure	7 bar
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IPP2

- High pressure pump suitable for system pressures up to 40 bar!
- Made of solid, machined stainless steel 316L
- Especially for use in reverse osmosis applications

Max. flow volume	100 m ³ /h	Max. differential pressure	7 bar
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MWP2

- Robust design in wear resistant stainless steel
- Ideal for pumping corrosive/abrasive products

Max. flow volume	50 m ³ /h	Max. differential pressure	6 bar
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VPCP

- Made of stainless steel AISI 304
- Extremely large free passage
- Available up to outlet DN250

Max. flow volume	1000 m ³ /h	Max. differential pressure	2 bar
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MSP2

- Self priming pump with open impeller
- Ideal for pumping air containing fluids
- Complies with EU Regulation 1935/2004 EC.

Max. flow volume	70 m ³ /h	Max. differential pressure	3 bar
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IM

- Submersible cantilever pump without mechanical seal
- Available in IML, IMXL (long version) or IMO
- Particularily suitable for pumping liquids that are difficult to seal up to 200°C

Max. flow volume	800 m ³ /h	Max. differential pressure	6 bar
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PACKO HYGIENIC

Stainless steel centrifugal food pumps

The Packo hygienic food pumps meet the high demands of EHEDG and 3A certification. For this reason, these pumps are used in almost all demanding food applications such as in dairy and beverage production as well as in breweries and distilleries. The perfect-to-clean pumps are ideal for use in filtration/pasteurization plants and in yeast production.

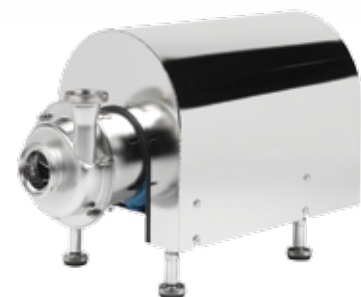
	Max. flow volume	Max. differential pressure
Process pump FP60	40 m ³ /h	2,5 bar
Process pump FP1	55 m ³ /h	2,7 bar
Process pump FP2/FP3	320 m ³ /h	12 bar
Process pump FP2+	100 m ³ /h	12 bar
Massive process pump MFP2/MFP3	1250 m ³ /h	7 bar
Multistage centrifugal pump FMS	50 m ³ /h	16 bar
High-pressure pump FPP2	70 m ³ /h	7 bar
CIP return pump CRP	120 m ³ /h	7 bar
CIP return pump CRP+	80 m ³ /h	7 bar



FP60

- Low cost hygienic pump executed in pressed stainless steel
- Energy saving thanks to high efficiency
- Easy concept and maintenance
- Complies with EU 1935/2004 EC

Max. flow volume	40 m ³ /h	Max. differential pressure	2,5 bar
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FP1

- The best value for money hygienic stainless steel centrifugal pump
- Energy saving with high efficiency
- Modular concept built up with standard components
- Easy maintenance

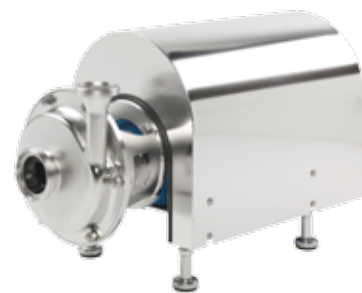
Max. flow volume	55 m ³ /h	Max. differential pressure	2,7 bar
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FP2 / FP3

- EHEDG certified
- Robust hygienic pump in pressed stainless steel 316L
- Energy saving and very low NPSH
- Easy concept and maintenance

Max. flow volume	320 m ³ /h	Max. differential pressure	12 bar
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FP2+

- EHEDG and 3A certified
- Robust sanitary pump in stainless steel 316L
- Energy saving and very low NPSH
- Modular concept built up with standard components

Max. flow volume	100 m ³ /h	Max. differential pressure	12 bar
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MFP2 / MFP3

- Robust hygienic execution in cast stainless steel 316L for high flow volumes
- Extreme energy saving thanks to optimum pump hydraulics
- Easy maintenance

Max. flow volume	1250 m ³ /h	Max. differential pressure	7 bar
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FMS

- Hygienic multistage pump
- Ideal for working at moderate flow level and high pressure
- Complies with 1935/2004 EC

Max. flow volume	50 m ³ /h	Max. differential pressure	16 bar
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PACKO **HYGIENIC**

Stainless steel centrifugal food pumps



FPP2

- Hygienic high pressure pump suitable for system pressures up to 40 bar!
- Made of solid, machined stainless steel 316L
- Especially for use in reverse osmosis applications

Max. flow volume

70 m³/h

Max. differential pressure

7 bar

CRP

- EHEDG certified CIP return pump
- Unique air handling concept
- High efficiency and low NPSH in comparison with a classic liquid ring pump
- Limited noise level

Max. flow volume

120 m³/h

Max. differential pressure

7 bar

CRP+

- EHEDG and 3A certified CIP return pump
- Unique air handling concept
- Limited noise level
- Easy maintenance

Max. flow volume

80 m³/h

Max. differential pressure

7 bar

PACKO PHARMACEUTICAL

Pharmaceutical stainless steel centrifugal pumps

Before Packo pumps are electropolished, all wetted parts of the Packo pharmaceutical pumps are polished by hand to a surface quality $Ra < 0.4 \mu m$. Also available is a CIP return pump for applications in the pharmaceutical industry. The pumps are suitable for SIP and available with various sealings. All pump materials are according to FDA and USP (Viton O rings excluded). Packo pharmaceutical pumps are certified compliant with EHEDG and 3A, and designed in line with ASME BPE guidelines.

	Max. flow volume	Max. differential pressure
Process pump PHP2	90 m ³ /h	12 bar
CIP return pump PRP2	80 m ³ /h	7 bar

PHP2

- Certified surface quality of $Ra < 0.4 \mu m$
- Best energy balance
- Low NPSH_i value
- Certified compliant with EHEDG and 3A, designed in line with ASME BPE guidelines

Max. flow volume	90 m ³ /h	Max. differential pressure	12 bar
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PRP2

- CIP return pump for transfer of gas/water mixtures
- Low noise level and easy maintenance
- Certified compliant with EHEDG and 3A

Max. flow volume	80 m ³ /h	Max. differential pressure	7 bar
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Available certificates:

- FDA
- DIN EN 10204/2.1 or 3.1
- USP Class VI material quality certificates
- Performance measurements
- Roughness measurements

Additional certifications such as e.g. NPSH_i value, noise level or hydrostatic pressure test are available on request.



PACKO HIGH SHEAR PUMP

Extends the shelf life of your product!



The function principle

Thanks to the special designed stator, together with small clearance between rotor and stator, an important shear will be generated, resulting in a significant particle size reduction (between 1.4 and 2 μm)! A smaller particle size will result in a more stable final product!

The new, efficient high shear mixing method is based on the proven EHEDG certified pump series FP2 with open impeller and series FP3 with closed impeller. The Packo shear mixer pump is mainly used for in-line mixing, homogenisation and dispergation applications. The shear is generated between the rotor and an innovative and optimized perforated (patented) stator. The shear can be optimized and increased by raising the speed of rotation. Shear rates up to 100.000 s^{-1} can be achieved at a maximum speed of 3600 rpm!

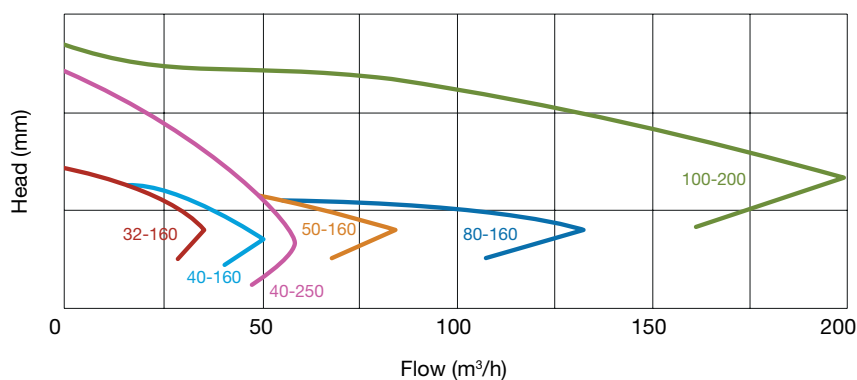
The shear creates a homogeneous mixture of two liquids with high difference in viscosity and/or density and to obtain a particle size reduction for emulsions and particles. In practice: this more homogeneous mixture creates more coherence to the particles and extends the shelf life of your product!



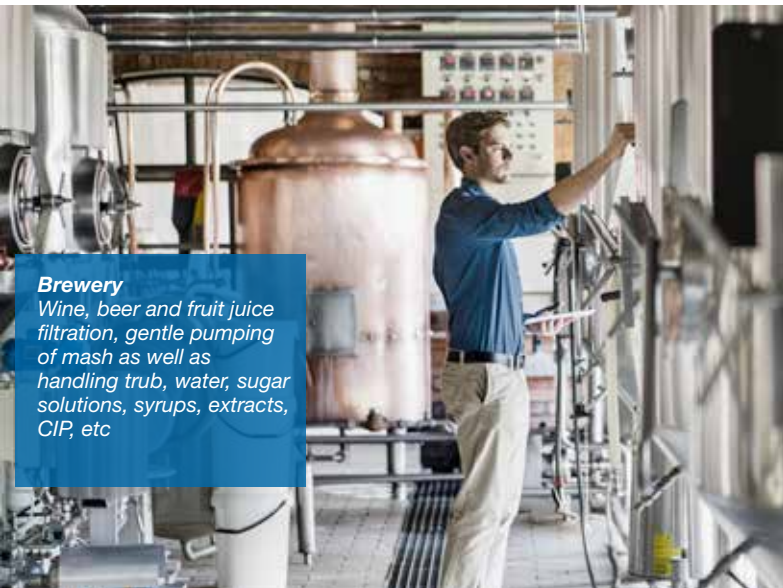
The benefits

- Effective with low energy bill : Extremely high efficiency
- Short downtimes: Easy maintenance, standardized components
- Tough conditions possible: ATEX available
- Cleaner: CIP and SIP possible
- One component: shear mixer & pump in one!

Performance curves at 2900 rpm



PACKO PUMPS: A **PUMP SOLUTION** FOR EVERY APPLICATION



Brewery
Wine, beer and fruit juice filtration, gentle pumping of mash as well as handling trub, water, sugar solutions, syrups, extracts, CIP, etc



Food & Dairy
Milk, whey, curd, brine, yeast, blood, CIP, etc



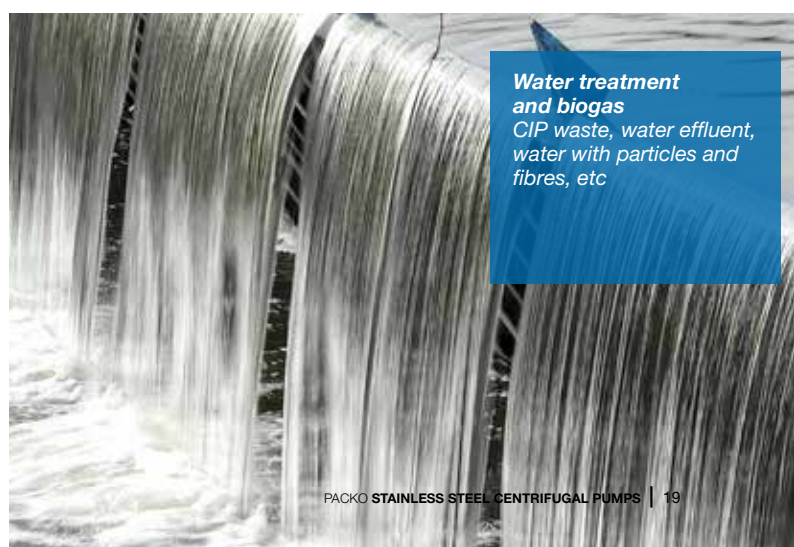
Vegetables
Transfer and blanching of potatoes, vegetables and frying oil



Pharmaceutical industry
Purified water, WFI, CIP, etc



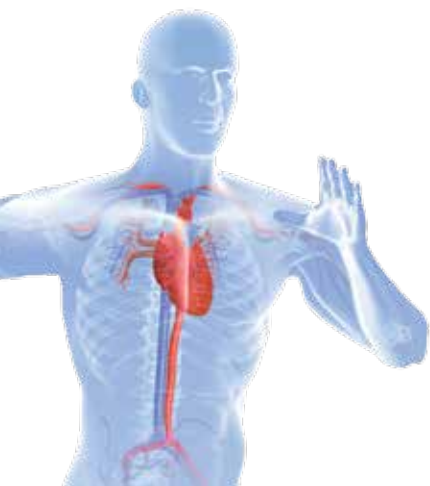
General industry and textile
Dyeing of textile and wool, surface treatment, industrial cleaning, biodiesel, bioethanol, solvents, animal feed, etc



Water treatment and biogas
CIP waste, water effluent, water with particles and fibres, etc



*Any questions? Visit our website
www.verderliquids.com.*



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