

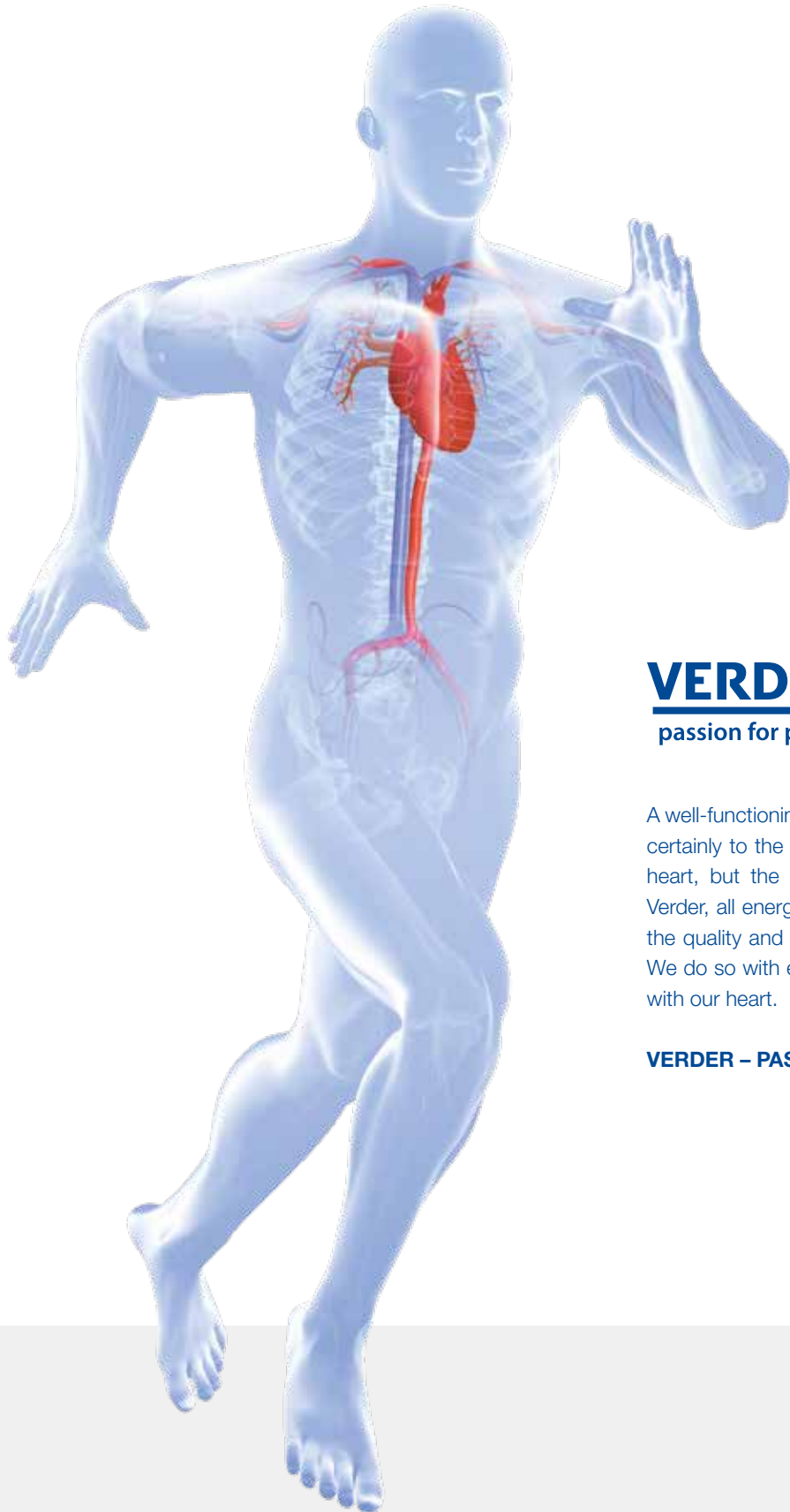
## VERDER HYGIENIC PUMP PROGRAM

Centrifugal pumps | Rotary lobe pumps | Twin-screw pumps | Circumferential piston pumps | Air operated double diaphragm pumps | Peristaltic pumps



### Your benefits

- Best cleanability
- Certified quality
- Best fit pumping solution



## **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 pumps and service. We do so with energy, dedication and most importantly, with our heart.

**VERDER – PASSION FOR PUMPS**



## THE VERDER GROUP

- 1 Company
- 28 Countries
- 60 Years of expertise
- 5 Manufacturing companies
- Global network
- Local distributors
- In-house service & maintenance
- A solution for every application

*The Verder group is a family owned business established 60 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 and hygienic 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 1850 people and has an annual turnover close to 400 million Euros.*

With the hygienic brands Packo (Centrifugal, rotary lobe and twin-screw pumps), Verderair (Double diaphragm) and Verderflex (Peristaltic) Verder offers a complete portfolio pumps that offers solutions all over the hygienic market.

### Best expertise in broad hygienic solutions

*The in-depth knowledge, ensured by the hygienic specialists of our joint manufacturing companies, gives us the possibility to offer you the best solution for your hygienic process. With our well-known brands Packo, Verderflex and Verderair we have a wide range of hygienic pumping programs. We have various solutions for your process line creating a long lasting, cost effective, but most of all hygienic safe pump solution.*



# APPLICATIONS IN HYGIENIC INDUSTRIES

*Verder offers a wide program of pumps for hygienic applications in the food, pharma and dairy industry. Examples of the processes where our pumps operate successfully are listed below. Of course, there are many other areas in the hygienic market where our pumps can be applied.*

Beverage	pages
Hot brewing process	12, 18
Cold beer brewing process	12, 18
Filtration	12, 18, 22
CIP	12, 14, 18, 26
(Waste) water treatment	12, 24, 26



Food / Feed	pages
Mixing/dispersing	20
Brine injection	12, 14, 16
Fish & shellfish handling	22
Egg white/yolk handling	16, 18
Animal blood handling	12, 16, 18
Animal feed systems	22
CIP	12, 14, 18, 26
(Waste) water treatment	12, 24, 26



## Dairy pages

Collection, storage & unloading	14, 23
Filtration	12, 16, 22
Evaporation	12, 16
Heat Treatment	12, 16, 18
CIP	12, 14, 18, 26
(Waste) water treatment	12, 24, 26



## Vegetables & potatoes pages

Destoning, washing, cutting	12, 22
Transport of vegetables	22
Blanching	12
Frying	23
CIP	12, 14, 18, 26
(Waste) water treatment	12, 24, 26



## Biotech / Pharma / Cosmetics pages

Distilling	12, 14, 26
Purifying	12, 26
Injection	12, 26
Filtration	12, 14
CIP	12, 14, 18, 26
(Waste) water treatment	12, 24, 26



# HYGIENIC DESIGN PRINCIPLES AND CERTIFICATIONS



**European regulation about food materials and articles intended to come into contact with food. Guidelines about the traceability and the use of materials that do not deteriorate the colour, flavour, smell or taste of the properties of the food.**



Additional regulation on top of EC1935/2004 is the EC10/2011 for plastic materials and articles intended to come into contact with foodstuffs. It concerns a.o. ion exchange resins, rubber and silicones.

## **ASME BPE**

Standard for the design and construction of equipment used in the manufacturing of biopharmaceuticals and pharmaceutical industry.



The European Hygienic Engineering and Design Group has defined European standards for process equipment in hygienic environments. It concerns cleanability, engineering and design of process equipment.



This American standard specifies criteria for the design and fabrication of equipment that comes into contact with food. The guiding purpose of 3-A sanitary standards is to protect public health by using sanitary certified equipment.



ATEX is a European Directive (2014/34/EC) for explosion-proof electrical and mechanical equipment, components and protective systems. It concerns the manufacture of products which are used in potentially explosive atmospheres.



The American Food and Drug Association is an organization that gives references for food and pharmaceutical products to stipulate and classify substances that are compliant.



The United States Pharmacopeia (USP) has defined the minute standards to safeguard the quality of medicines and other health care technologies for pharmaceutical and bio-technology industries. There are guidelines for quality, purity, strength and consistency.



Minimum Efficiency Index, guideline for efficiency of pumps. This index gives a percentage from the sold pumps in the market on a certain moment with a low hydraulic efficiency on BEP. From 01/2015 MEI  $\geq 0.4$ . 95% of our centrifugal pumps complies to MEI.

# SUPERIOR FINISHING GRADES



*Every hygienic industry has its specific expectations and above all critical finishing requirements. Packo has 3 major finishing grades with matching couplings for the centrifugal pump range so that the pumps can very easily meet the necessary certificates within these specific industries without being overspec in terms of cost.*

## Industrial finishing

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- Rough finishing of internal welds
- Industrial couplings (EN 1092-1, BSP, ANSI and more)
- Electropolishing

## Hygienic finishing

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- Hand polished internal welds
- Hygienic couplings (DIN 11851, Tri-clamp, SMS, RJT and more)
- Electropolishing

## Pharmaceutical finishing

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- Hand polished wet pump parts up to a minimum roughness of 0.4µm, pharmaceutical couplings (Tri-clamp, and more)
- Electropolishing

### Electropolishing: a superior finish

Most austenitic steel alloys contain iron, 18% chrome and 8% to 10% nickel. The rich metals chrome and nickel are responsible for the chrome oxide skin which gives stainless steel a high corrosion resistance. By electropolishing, which is an anodizing process where the treated objects are hung anodically in baths filled with electrolyte and electric current. The chemicals dissolve the impurities and iron. By this process, the ratio of chrome and nickel on the surface improves, making the stainless steel chemically very inert due to the development of a chromium oxide layer on the surface. This results in a lower average roughness which makes products more difficult to adhere and avoids bacterial traps and increases the cleanability. In addition, the surface is given greater resistance to corrosion.

# THE HYGIENIC PROGRAM

Offering a wide range of hygienic solutions



Packo standard centrifugal pumps



Packo prime centrifugal pumps



Packo dedicated centrifugal pumps



Packo shear pumps and Verdermix



Packo rotary lobe & circumferential pumps



Packo twin-screw pumps



Verderflex peristaltic pumps



Verderair double diaphragm pumps



# OUR PRODUCTION COMPANIES

We are rightly proud of our production companies, with Verder brands being produced in 6 locations in Germany, United Kingdom, Belgium, Poland, South Korea and Italy. In-house pump production allows us to be more responsive to customer demands, assures the shortest lead times and maintains greater control over quality and costs. Our hygienic pumps are manufactured at:

## Packo – Belgium / South Korea

Our manufacturing company Packo specializes in stainless steel centrifugal pumps, rotary lobe pumps and twin-screw pumps. Packo is creating the highest quality hygienic and sanitary pumps for industrial, food and pharmaceutical applications. The centrifugal pumps are manufactured in Belgium. All centrifugal pumps are electropolished according to an in-house developed process method for surface treatment of stainless steel.

The method is finished with hand polishing techniques to achieve the highest quality pump specification for applications where compromise is not an option. Started in 1975 with dairy pumps, Packo Pumps has developed its portfolio to include models for many certified processes including FDA, 3A and EC1935/2004. The rotary lobe pumps and twin-screw pumps are manufactured in South Korea.

With a dedicated team and investment in advancing technology, Verder can offer its Packo pumps as a premium option for compliant applications. The Diksmuide plant produces not only pumps but also static and dynamic mixers.

## Verderflex – United Kingdom

Verder's British manufacturing facility comprises the development and production of the Verder house brand Verderflex (peristaltic pumps). The hygienic models that are developed by Verder UK engineering seek excellence from every aspect of the product and its journey to the customer. By implementing quality procedures at every point of design, build and service we seek to continuously improve and provide the best possible product. After four decades of development and production, it is still the goal to further improve the performance and build of every pump we make.

## Ponndorf – Germany

For more than 50 years, Ponndorf has developed and produced high quality hose pumps. The range of lubrication-free hose pumps are renowned for their rigid and solid construction. Ponndorf hose pumps are in use in numerous industries, such as in the food & beverage industry, the chemical and pharmaceutical industry, paper dye industry, surface coating, water and wastewater treatment.



# OUR HYGIENIC PUMPS

## Key players with highest hygienic standards

*The hygienic pumps from Verder are problem solvers for the hygienic market. We offer a high quality program of hygienic pumps, each having its own special advantages in specific application areas. Most pumps in our hygienic portfolio are manufactured in industrial, food or pharmaceutical versions. Our portfolio is extensive; we can offer a pump solution tailored to your specific hygienic process.*



### Corporate Qualities

- Priority orders
- Worldwide network
- Specific OEM features
- Own manufacturing
- In house engineering



### Support

- Digital pump selector
- Standard spare parts
- Strong logistic services
- Worldwide stock available

### Finishing levels

- **Finishing grades**  
Industrial - Food - Pharma
- **Hose & tube qualities**  
FDA CFR 21- EC/1935-2004  
Platinum Cured Silicone

Packo centrifugal, rotary lobe and twin-screw pumps

*Packo is specialized in hygienic pumps. Centrifugal, rotary lobe and twin-screw pump cover almost all application in situations where a hygienic pump level is required.*

Verderair HI-CLEAN pumps

*Verderair HI-CLEAN is a complete series double diaphragm pumps; air operated or electrically driven, which fits the application best.*

Verderflex peristaltic pumps

*Verderflex hygienic peristaltic pumps are perfect pumps for applications where additives are being dosed. Full control of dosing applications in the hygienic market.*



# PACKO STANDARD

## CENTRIFUGAL PUMPS

*This pump series can meet the high requirements of EHEDG and 3A certification. They excel in hygienic cleanability, reliability and are easy to handle. All Packo centrifugal pumps are configured to order, offering a huge range of pump configurations. The standard pumps are used in demanding applications such as dairy, food & beverage and pharmaceutical. This series is also perfectly applicable in industrial applications such as mining, chemicals and waste water. In fact at all duties where a high corrosion resistance is required.*

*Industrial, food and pharmaceutical finishing available.*



Packo Standard	FP	MFP	JCP
Max. flow [m <sup>3</sup> /h]	320	1800	83
Max. differential pressure [m]	220	75	80
Min. internal surface roughness [μm]*	0.4	3.2	0.4
Certifications*			

\* highest possible levels





# PACKO PRIME SELF-PRIMING CENTRIFUGAL PUMPS





The Packo prime pumps are a range of pumps especially configured for CIP return applications and truck unloading. Used in the most demanding applications in dairy, food & beverage but also in more industrial applications where liquid air-gas mixtures have to be pumped. Everywhere where a self-priming capability is required.

Depending on the liquid, gas/air quantity, solids laden fluids, and the self-priming or air-handling requirements there are models available as:

- pump with static degasser or an air screw
- side channel pump
- centrifugal liquid ring vacuum pump




Industrial, food and pharmaceutical finishing available.



Packo Prime	CRP	JEPS	MSCP	MSP
Concept	Centrifugal	Centrifugal/air screw	Side channel	Self-priming
Max. flow [m <sup>3</sup> /h]	150	54	40	70
Max. differential pressure [m]	75	45	75	43
Internal surface roughness [µm]*	0.4	1.6	3.2	3.2
Certifications*				

\* highest possible levels

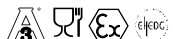





GFP
Defoaming
400
30
3.2
  

# PACKO ROTARY LOBE AND CIRCUMFERENTIAL PISTON PUMPS

Each series of the Packo rotary lobe and circumferential piston pumps is state-of-the-art. The pumps can be fitted with a variety of features and rotors to adapt to almost all hygienic pumping tasks. The pumps can be customized to meet the optimum function or performance to your process.



	ZL	ZP	TP	ZW
Concept	Rotary lobe pump	Circumferential piston	Truck pump	Wine pump
Max. flow [m <sup>3</sup> /h]	200	42.5	49	51
Max. differential pressure [bar]	20	15	15	8
Internal surface roughness [μm]*	standard 0.6 (option 0.4)	standard 0.6 (option 0.4)	0.6	0.6
Certifications*				

\* highest possible levels



The Packo dedicated tech rotary lobe pumps are developed and engineered for specific applications, such as:

✓ **Truck unloading**

The Packo TP is a light weight, high flow rotary lobe pump that can be executed with hydraulic motor connection.



✓ **Cheese curd pump**

The Packo ZL560 is probably the biggest cheese curd pump made to transfer high shear sensitive and viscous liquids.

✓ **Transfer of wine**

The ZW pump is executed with PE rotors to prevent galling from grape skins, seeds and stem.



ZLC	ZL560
Pharmaceutical lobe pump	Cheese curd pump
100m <sup>3</sup> /h	3500 l/min
20	4
0.4	0.6
	



# PACKO

## TWIN-SCREW PUMPS

All advantages of rotary lobe pumps and centrifugal pumps are combined in the JEC twin-screw series. This two-in-one operation pump series is excellent for pumping not only high-viscous liquids and pastes but also the thin-liquid cleaning fluids that are used for CIP cleaning. The pumps provide a pulsation free flow for gentle operation.

The Packo twin-screw series offers highest flexibility, the hygiene standard is unmatched in this product area. The ZS sets the standard, the use of stainless steel in combination with optimally shaped and easy to clean surfaces is a huge benefit in any modern food production. The inner values are polished surfaces with a quality of <math><Ra\ 0.6\mu m</math>. Smooth transitions and large curves prevent product build-up and simplify cleaning and sterilization, in addition, better product handling is achieved.



	ZS	ZSC
Concept	Twin-screw	Twin-screw pharma
Max. flow [m <sup>3</sup> /h]	100	100
Max. differential pressure [bar]	12	12
Internal surface roughness [μm]*	0.6	0.4
Certifications*		

\* highest possible levels



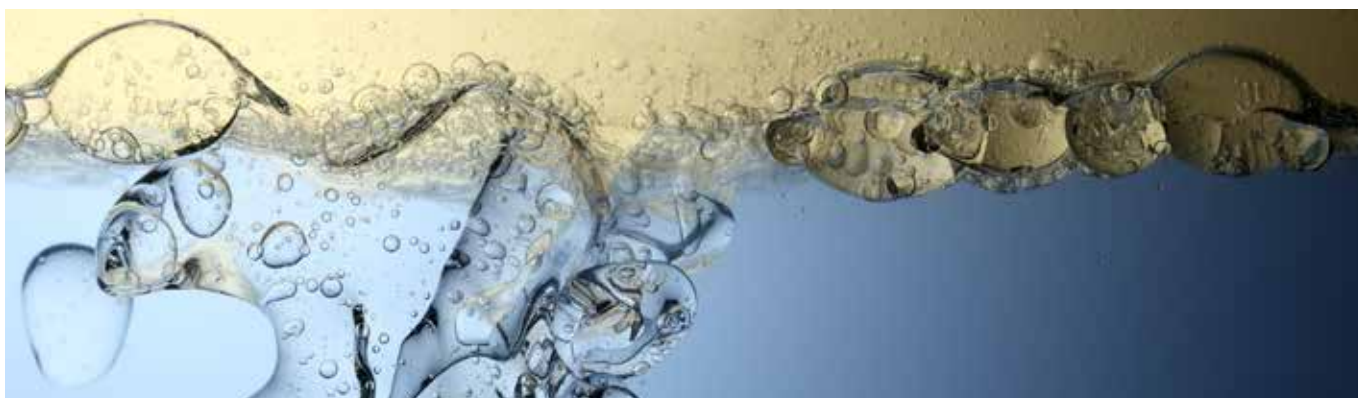
# PACKO SHEAR AND MIX PUMPS & MIXERS










The shear mix pump range consists of a high shear mixer with a patented stator for high flow and pressure and a homogenizer shear mixer for the dispersion of higher viscosities which can also be executed as a full unit. These shear mixers have the highest efficiency on the market, offering energy savings. The range is complemented with static and dynamic mixers. Shear mixer pumps and static mixers are mainly used for in-line mixing, homogenizing and dispersing.

Shear mixer pumps and static mixers are the best choice when the fluids to be mixed have:

- a large difference in specific gravity
- a large different viscosity
- a difficult mixing match

This series is also perfect for dispersing of solids in liquids and gas in liquids.



Packo Shear	SFP	JSB	Verdermix VMS
Concept	Shear mixer	Homogenization mixer	Static mixer
Max. flow [m³/h]	200	60	1500
Max. differential pressure [m]	55	-	-
Internal surface roughness [µm]*	3.2	1.6	0.8
Certifications*	  	  	  

\* highest possible levels





# PACKO

## DEDICATED PUMPS





The Packo dedicated centrifugal pumps are developed and engineered for specific applications. It is an application dedicated pump series for:

**Filtration:** The FPP pump with high inlet pressure or the FMS multi-stage pump when a high outlet pressure is required

**Animal feed processes:** The MWP pump which is a duplex pump with higher resistance against abrasive fluids

**Hydro transfer of food products:** The VPCP pump, a high flow pump, with the guaranteed lowest product damage on the market for the transport of e.g. vegetables such as potatoes and shellfish like mussels and prawns



Packo dedicated	FMS	FPP	MWP	VPCP
Concept	Multi stage	High inlet pressure	Duplex	Product pump
Max. flow [m³/h]	50	200	50	1000
Max. differential pressure [m]	215	70	60	20
Internal surface roughness [µm]*	3.2	3.2	3.2	3.2
Certifications*				

\* highest possible levels






✓ **Non-sealable liquids**

The IM cantilever pump handles all non-sealable liquids such as hot frying oil with care.

✓ **Truck unloading**

The RMO centrifugal pump ensures high flow, fastest loading time and lightweight truck applications in hygienic or industrial areas.

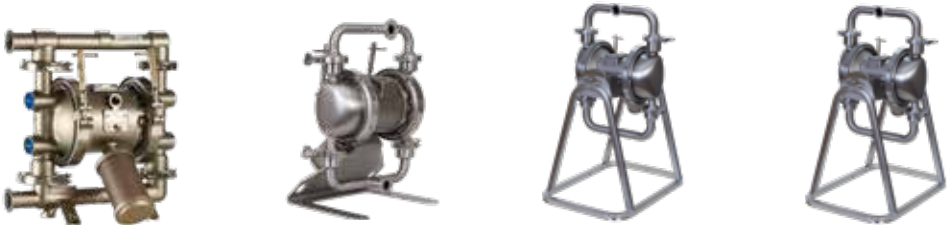


<i>IM(X)L &amp; IMO</i>	<i>RMO</i>
<i>Cantilever</i>	<i>Truck unloading</i>
800	250
60	30
3.2	3.2
 	  

# VERDERAIR HI-CLEAN DOUBLE DIAPHRAGM PUMPS

The Verderair HI-CLEAN pumps are designed for operation in food and pharma applications, The series consist of hygienic air (AODD) and electric (EODD) operated diaphragm and air operated piston pumps. When compressed air is not available, a unique electric driven series is available EODD), with all benefits of the normal AODD series, including automatic stalling against a closed discharge line! As a second advantage the pump can run in low pulsation mode.

The single piece manifold reduces clamps and areas for food or bacteria to hide. HI-CLEAN pumps come with an externally serviceable air valve. Due to the rotatable stand the pump can rotate 360 degrees for quick draining and servicing of the pump.



	FDA series	Sanitary ball series	Pharma series	3A certified
Max. flow [l/min]	606	870	870	870
Discharge pressure [bar]	8	8	8	8
Max. solids particles [mm]	6.3	19	19	19
Internal surface roughness [µm]	3.2	0.8	0.5	0.8
Certification				



✓ All series (except SP) also available as electrically driven model



<i>Sanitary Flapper</i>	<i>Sanitary Piston</i>
340	9,5
8	17
96.5	19
0.8	0.8

# VERDERFLEX HYGIENIC PERISTALTIC PUMPS

Verderflex peristaltic pumps are manufactured in ISO 9001, ISO 14001 and ISO 18001 accredited facilities in Germany and the UK. Verderflex pumps are used for precise, gentle, aseptic transfer of shear sensitive cultures, nutrient dosing, inter-reactor transfer using USP VI rated tubing.

The Vantage 5000 combines precision dosing with advanced compliance assistance including time stamped record keeping, security from USB backed up settings and records and reassurance of real time feedback and control to master controllers and PLCs. It is a perfect solution for precise and controlled single or batch inline dosing/filling applications.

The Rollit hose pumps are lubrication-free. This gives especially advantages in food and pharma applications because there is no contamination possible.



	<b>Vantage 5000</b>	<b>Rapide</b>	<b>Rollit</b>
<b>Concept</b>	Advanced dosing system	Compact transfer	High flow
<b>Max. flow</b>	6.600 ml/min	17 l/min	6.9 m <sup>3</sup> /h
<b>Max. discharge pressure [bar]</b>	7	2	2
<b>Functions</b>	<ul style="list-style-type: none"> <li>Record keeping</li> <li>Digital communication</li> <li>Analog feedback and control</li> </ul>		
<b>Food or pharma graded tubing and hoses</b>	<ul style="list-style-type: none"> <li>Platinum cured Silicone</li> <li>Verderprene</li> </ul>	<ul style="list-style-type: none"> <li>Platinum cured Silicone</li> <li>Verderprene</li> </ul>	Verderprene
<b>Certifications</b>			



VERDERFLEX<sup>®</sup>  
ROLLIT 25

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*Any questions? Visit our website*  
[www.verderliquids.com](http://www.verderliquids.com)



**VERDER LIQUIDS BV**  
Utrechtseweg 4A  
3451 GG Vleuten  
The Netherlands

**MAIL** [info@verderliquids.com](mailto:info@verderliquids.com)  
**WEB** [www.verderliquids.com](http://www.verderliquids.com)

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