



VERDERHUS®

Screw Centrifugal Pumps

Verderhus
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We put our heart into 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. In our transparent Verder organization all energy and attention is focused on improving the quality and performance of our pumps and our service. We do so with energy, dedication and - most importantly - with our heart.

VERDER – PASSION FOR PUMPS

Verderhus® Screw Centrifugal Pumps

Verderhus screw centrifugal pumps combine the best features of centrifugal and positive displacement pumps to define a new standard for low head, high flow pumping. Each Verderhus pump has a large clearance, screw impeller gently feeding product into the pump chamber and efficiently transferring it to the discharge line. The open impeller allows large solids to be easily pumped, whilst the screw design is ideal for high solid contents or viscous liquids and produces a high efficiency, low NPSH_r pump, lowering both energy use and ownership costs.



Additionally, the Verderhus pumps long fibres in suspension with much reduced clogging frequencies than conventional technologies, lowering blockage costs. With a reduced pump transit time and a low shear pumping action, wear from abrasive liquids and damage to sensitive polymer chains is much reduced. This makes the Verderhus the ideal solution for sludge and slurry transfer in biowaste energy plants, beer and food production, construction, mining, paper & pulp production, petfood processing and waste water treatment.

The Verderhus screw centrifugal pump development focussed on both high hydraulic efficiency and low operation costs to reduce total ownership costs.

The specially designed impellers ensure optimum efficiency is maintained when pumping viscous fluids reducing energy costs. The combination of reduced thru-pump transit time and hardened impeller and casing options significantly decrease abrasive wear. The very low NPSH_r requirement curtails maintenance costs caused by cavitation damage.

Flows	max 1500 m ³ /h
Head	max 55 mwc
Solid contents to	10% sludge, 30% slurry
Viscosities to	3000 CPS



Verderhus Advantages

- Abrasion resistant
- Adjustable impeller maintains long term efficiency
- Constant power as viscosity changes
- Dry well or submersible or vertical spindle pumps
- Gentle low shear pumping action minimises flocculent damage
- High efficiency pumping, BEP > 70%
- Large Ø Solids Pumping
- Low NPSH_r reduces cavitation damage
- Minimal clogging pumping long fibred fluids
- Premium efficiency IE3 motors
- Pumps entrained gas media
- Smooth pumping action reduces emulsification and foaming

Where can Verderhus be used ?

Screw centrifugal pumps are being successfully used in many industries, solving problems associated with traditional pumping solutions:

Biogas production systems

Food waste, manure, recovered oils

Chemical Processing

Abrasive Silicon Carbide Slurries, Salts

Construction

Cement, Additives and Aggregates

Food & Beverage

Bentonite, Cow Hides, Diatomaceous Earth / Kieselguhr Slurry, Compost, Fish, Gelatine, Hops, Malt and Mash, Meat Pulps, Organic Waste, Pet Food, Slaughterhouse Waste including Bones, Soups, Sugar, Vegetables in Suspension and Yeast

Industrial Processing

Carbon Pastes, Lime Slurry Recirculation, Plating Bath Phosphoric Acid Recirculation, and Gypsum transfer

Mining and Quarrying

Gravel, Kaolin Slurry, Sand in Suspension, Transferring Activated Carbon

Paper & Pulp

Cotton Slurry and Lime

Power Stations

Thick fluid streams including Fly Ash slurry

Waste Water treatment

Primary and Activated Sludge, Lime recirculation



Verderhus® working principle

The Verderhus screw centrifugal pump uses a corkscrew shaped impeller to feed the pumped liquid into a tapered casing or cone. The impeller then uses the centrifugal force created by the impeller's rotation to propel the pumpage away from the pump.

The open impeller design has low NPSH_r requirements, as low as 1mWc, reducing cavitation derived maintenance costs and allowing the pumps to tolerate bad piping conditions or operate in conditions too severe for conventional centrifugal pumps.

Each Verderhus screw channel impeller has a large vane clearance allowing large diameter solids, typically 80% of the discharge diameter, such as fruits and vegetables to be pumped, flowing through the impeller's smooth liquid path.

The combination of the pump's cone taper, the large vane clearances and the smooth liquid path promotes product movement from the impeller's inlet towards the discharge section minimising blockages. This also minimises a product's transit time through the pump reducing abrasive wear caused by grit, silicon carbide and similar fine solids in suspension, with the pump able to handle solid contents as high as 30%. Additionally, each Verderhus screw centrifugal pump has external screws that allow the impeller – casing clearance to be adjusted to maintain the pump's hydraulic efficiency and minimise power usage.

The Verderhus impeller only makes a glancing contact with the pumped product giving the pump a very low shear pumping action unlike traditional centrifugal pumps where the tangential contact gives a high shear, chopping action. The Verderhus impeller's low shear action avoids product damage and is ideal for transferring flocculants without particle size reduction or for transporting crystalline liquids, such as activated carbons, with minimal structural damage.





OVERVIEW OF PUMP MODELS

9 sizes of Verderhus screw centrifugal pumps are available with suction sizes from DN 50 to DN250 and DN50 to DN200 discharge sizes

Suction Size	Discharge Size Options				
	DN50	DN80	DN100	DN150	DN200
DN50	✓				
DN80	✓	✓			
DN100		✓	✓		
DN150			✓	✓	
DN200				✓	
DN250					✓

Flow range max 1500 m³/h (420 l/sec)
 Head max 55 mwc

Pump Variants

The Verderhus® screw centrifugal pumps can be provided in several formats depending on the installation conditions: close and long coupled versions for "dry" pumping; vertical spindle designs with the pump head immersed in the liquid stream or fully submersible pumps.



Verderhus® B Close Coupled Pump

Verderhus® BH Base plate mounted

Horizontally mounted close coupled pump with optional base plate



Verderhus® BV Vertical execution

Vertically mounted close coupled pump mounted on a standard duck foot



Verderhus® L Long Coupled or Bareshaft Pump

Verderhus® LH Long Coupled

Horizontally mounted long coupled pump with optional base plate, coupling and foot mounted motors



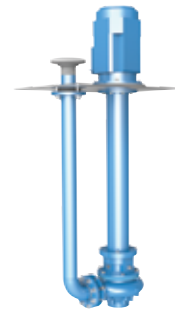
Verderhus® LV Long coupled with V belt drive

Long coupled pump with the addition of a V belt drive for speed control



Verderhus® RV Vertical Spindle Pump

Immersed Verderhus® pump head connected to motor by vertical spindle



Verderhus® T Submersible Pumps

Verderhus® TA Automatic Coupling Submersible

Submersible pump including motor with automatic guide rail coupling

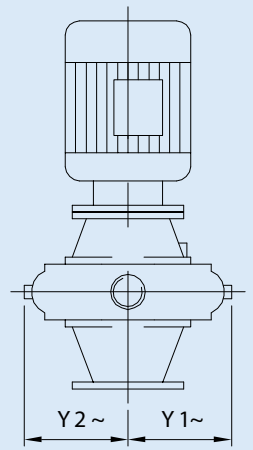
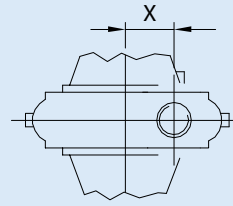
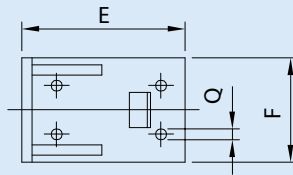


Verderhus® TP Portable Submersible

Submersible pump including motor with suction stand

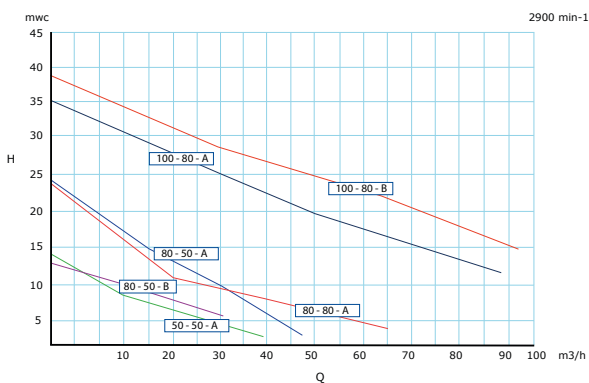


VERDERHUS® B SERIES

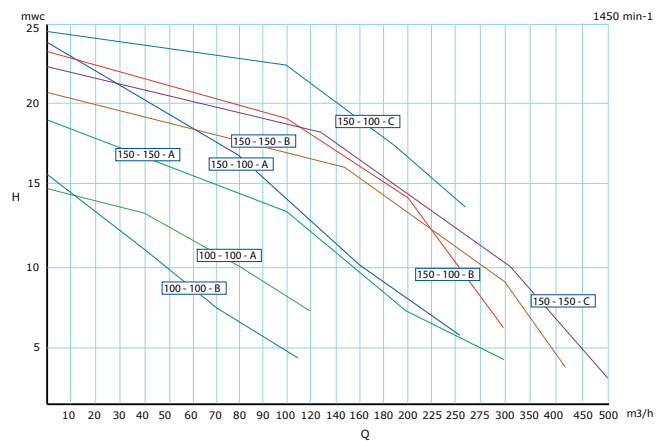


Technical details

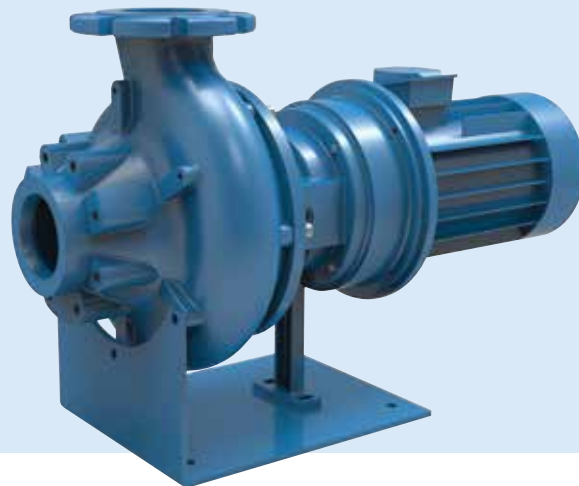
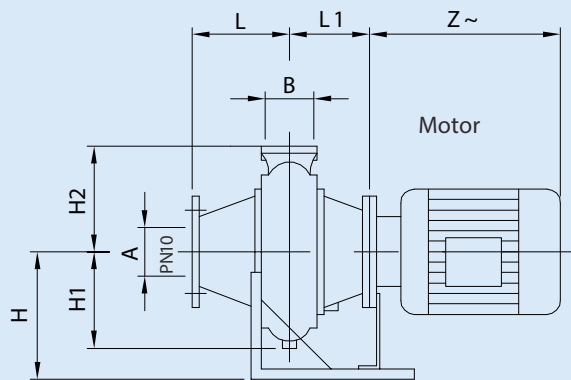
Type	Connections		Solids in mm	rpm	Flow Max.m ³ /h	BEP		Impeller Type	Motor Max. kW
	Suction	Discharge				η	Q _{opt.} (m ³ /h)		
50-50-A	50	50	~40	2900	39	62%	22	A	1.5
80-50-A	80	50	~40	2900	48	71%	31	A	1.5
80-50-B	80	50	~40	2900	32	69%	25	B	3
80-80-A	80	80	~64	2900	65	73%	42	A	3
100-80-A	100	80	~64	2900	87	62%	56	A	5.5
100-80-B	100	80	~64	2900	96	62%	69	B	5.5
100-100-A	100	100	~80	1450	108	78%	72	A	5.5
100-100-B	100	100	~80	1450	118	73%	79	B	4
100-100-C	100	200	~80	2900	216	72%	108	C	17
150-100-A	150	100	~80	1450	252	76%	170	A	5.5
150-100-B	150	100	~80	1450	295	76%	190	B	5.5
150-100-C	150	100	~80	1450	270	69%	155	C	5.5
150-150-A	150	150	~120	1450	320	76%	210	A	15
150-150-B	150	150	~120	1450	440	77%	280	B	15
150-150-C	150	150	~120	1450	500	77%	300	C	22
200-150-A	200	150	~120	1450	620	78%	400	A	30
200-150-B	200	150	~120	1450	720	78%	490	B	37
250-200-A	250	200	~160	1450	1030	78%	750	A	90
250-200-B	250	200	~160	1450	800	75%	530	B	75
250-200-C	250	200	~160	1450	950	75%	630	C	55



Flow range < 100 m³/h

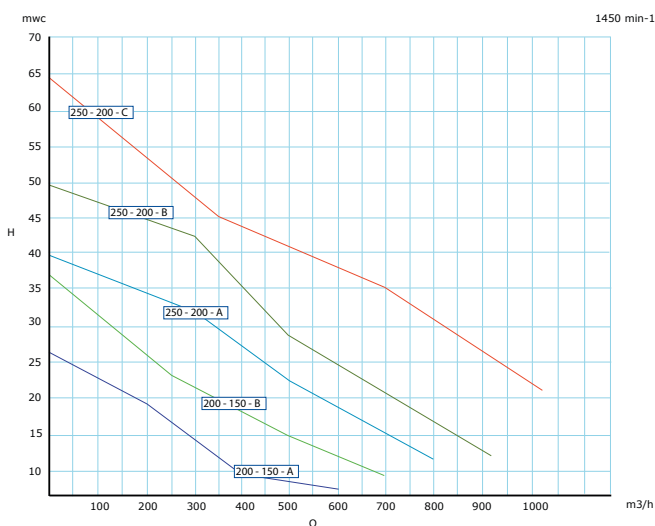


Flow range 100-500 m³/h



Type	A	B	E	F	H	H1	H2	L	L1	Q	X	Y1	Y2	Z~/kW	IEC
														mm/kW	Motor frame size
50-50	50	2"	250	150	160	110	105	98	164	14	70	110	110	250/1.1	70/80
80-50	80	2"										98	115	270/1.5	90
80-80	80	80	250	150	160	120	150	98	170	14	0	98	115	270/2.2	90
100-80	100	80	350	300	240	160	220	135	223	14	0	170	145	270/1.5	90
									285					420/5.5	
100-100	100	100	400	300	290	188	250	173	224	14	0	202	170	320/3	100
								300	420/5.5					132	
								300	533/15					160	
150-100	150	100	500	400	330	190	250	257	300	14	0	200	170	492/11	160
								300	533/15					160	
								251	400/5.5					132	
								296	533/15					160	
150-150	150	150	500	400	330	240	300	253	296	14	0	256	196	492/11	160
								296	533/15					160	
								262	400/5.5					132	
200-150	200	150	750	500	400	225	300	340	345	20	0	225	225	669/22	180
								370	669/30					200	
								427	725/37					225	
								345	492/15					160	
								443	938/75					280	
250-200	250	200	750	500	400	365	450	390	443	20	0	414	320	742/55	250
								443	938/75					280	
								443	938/90					280	

Dimension Z given for typical IE2 motor, check for extra length for IE3 motors



Flow range > 500 m³/h



Materials of construction

Housing	Cast Iron (GG25)	option 316 Stainless Steel
Impeller	Ductile Iron (GGG50)	option 316 Stainless Steel
Bearing housing	Cast Iron (GG25)	option 316 Stainless Steel
Shaft	Martensitic Stainless 1.4021	option 316 Stainless Steel

Sealing

Wear resistant, double “back to back” mechanical seals with intermediate seal cooling oil chamber.

Standard seal specifications	Rotating Face	Static Face	Elastomer
Product Side	SiC	SiC	Viton
Motor Side	Carbon	Ceramic	NBR

Conventionally, the product side seal surface faces towards the fluid and the motor side seal surface is towards the motor side.

Special order options include Gland Packing, API Seal Flushing schemes and special seal face material –elastomer combinations.

Motors

Verderhus pumps are normally supplied with IEC motors rated for 50Hz operation. Worldwide motor efficiency is a growing concern and Verderhus pumps are available with the latest high efficiency IE3 motors. Some models can be supplied with ultra efficient permanent magnet motors.

Motor order options include country specific voltages, NEMA C faced and ATEX certified motors plus hydraulic or pneumatic drives.



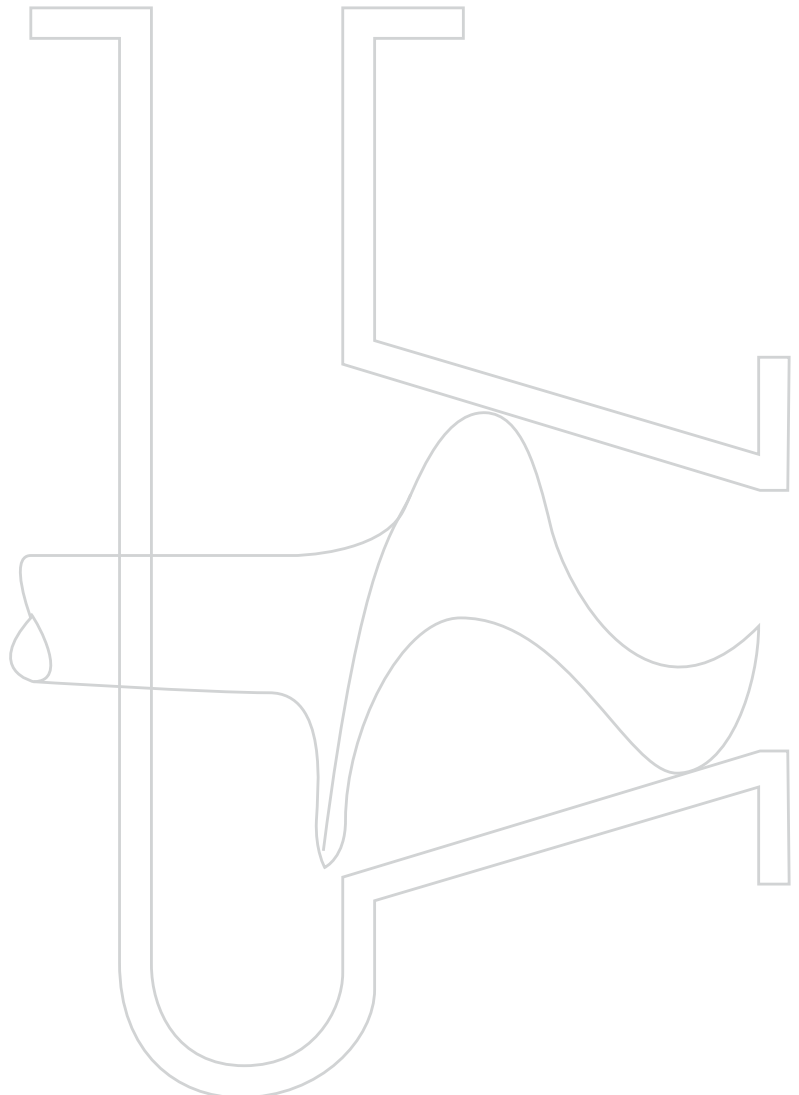
Pump Material Options

To pump abrasive and corrosive media to resist cavitation, Verderhus pumps material options include:

- ➔ 316 Stainless Steel Impellers and Casings
- ➔ ATEX Certified motors
- ➔ Coatings including PU and Rilsan®
- ➔ Tuffride® Ferritic Nitrocarburised case hardened Cast Iron impeller & casing (64HRC to 50µm)
- ➔ Plasma nitride hardened stainless steel impeller and casing
- ➔ Suction Cone Cutter grooves

Applications

- ➔ Activated sludge
- ➔ Agriculture
- ➔ Beverage industry
- ➔ Biogas production
- ➔ Breweries & maltings
- ➔ Chemical plants
- ➔ Coal-fired, oil-fired and nuclear power plants
- ➔ Composting and recycling processes
- ➔ Construction and tunneling
- ➔ Food processing
- ➔ Gelatine manufacture
- ➔ Incinerators
- ➔ Mining
- ➔ Oil Production
- ➔ Paper & Pulp industries
- ➔ Pet food production
- ➔ Remediation systems
- ➔ Slaughter houses
- ➔ Sugar industry
- ➔ Sewage sludge recirculation
- ➔ Sewage thickening systems
- ➔ Sewage water treatment plants
- ➔ Waste burning power stations
- ➔ Wastewater treatment plants



Pumping Lime



Lime slurry (Calcium hydroxide, Ca(OH)₂ or Kalkmilch) is used globally to correct waste water pH levels and to neutralize incinerator exhaust emissions.

The process

Lime slurry is used to neutralize incinerator emissions and remove Dioxins and similar hazardous chemicals.

The problem

The existing vortex tank feed

pump had to be serviced every month because abrasive wear caused by the lime slurry.

The solution

The Verderhus B close coupled pump has been running for 36 months without any maintenance.

Pumping Kaolin Slurry



Kaolin slurry is a highly abrasive, viscous mineral clay widely used in the ceramic industry.

The process

Kaolin is the main component of porcelain and the slurry is transferred into moulds before firing in a kiln.

The problem

The previous 2 stage progressing cavity pump experienced severe wear, due to highly abrasive

kaolin slurry, resulting in replacement of the rotor and stator combination every 3 months.

The solution

A Verderhus LV long coupled pump with a belt drive is in continuous operation and the maintenance cost savings have already recovered the initial capital outlay.

Pumping Industrial Oils



A UK manufacturer required precise blending and gentle handling of lubricant oils, critical to all types of industrial processes.

The process

A 220cPs anti-foaming additive lubricant is transferred between tanks.

The problem

Previously a series of centrifugal pumps, each with a 4kW motor, transferred a 220cPs anti-foaming

additive lubricant mix between tanks. The viscosity was too high for the closed impeller design requiring an over-sized pump resulting in high-energy costs and frequent planned pumping maintenance cycles.

The solution

An initial Verderhus 80 x 50 A pump proved it could pump the lubricant blend whilst drawing only 1.25kW, a 70% power reduction and has resulted in the installation of a further 7 pumps.

Pumping Malt



A Bavarian Brewery produces malt, an extremely difficult medium to pump.

The process

The malt is pumped at 120-130 m³/h against a head of 10 – 12 mwc.

The problem

The customer previously used a semi-open vortex impeller pump. After the pump was stopped, the solid content of the malt solution

changed resulting in clogging issues on pump restart. This required both the pump and pipe to be opened and to be cleaned.

The solution

An initial Verderhus 150 x 100B close coupled pump was installed, ran without problems and the satisfied customer ordered an additional 4 Verderhus pumps.

Pumping Salt and Lime Suspension



An industrial waste water treatment plant pumps a highly corrosive, abrasive Salt and Lime mixture.

The process

Lime is added to brine based waste water to neutralize the factory's total waste which passes through the transfer pump.

The problem

The corrosive mixture also produces a salt-lime impeller

deposit on the up to 1 mm thick needing cleaning and preventative maintenance every 2000 hours.

The solution

A Verderhus pump was supplied with Halar® or ECTFE coated wetted parts and now has annual cleaning and preventative mechanical seal changes. The Verderhus pump operates 5 hours a day for 3 years without any additional maintenance, reducing the 5-year life cycle cost by 35%.

Pumping Quartz Sand



A Bulgarian industrial mineral mining and processing company, located near Sofia, specializes in quartz sands, feldspars and pegmatite's, fire clay, fluorite, quartz and asbestos.

The process

The raw materials, containing 13% quartz sand, are washed, sieved, and pumped to a sedimentation area.

The problem

Previously, the company used

a back pull-out, open impeller, vortex centrifugal pump but the very abrasive sand water mixture caused such severe rotor wear that the rotor had to be changed every week.

The solution

A Verderhus B 150 x 100A close coupled pump was supplied with a soft Polyurethane coating.

After 4 months intensive use a routine contact parts inspection showed minimal wear.



The Verder Liquids division worldwide

AT **Austria** Wien

BE **Belgium** Aartselaar

BG **Bulgaria** Sofia

CH **Switzerland** Basel

CN **China** Shanghai

CZ **Czech Republic** Praha

DE **Germany** Haan

DK **Denmark** Rødovre

FR **France** Eragny s/Oise

GB **United Kingdom** Castleford

HU **Hungary** Budapest

IN **India** Pune

IT **Italy** Vazia

NL **Netherlands** Groningen/Vleuten

PL **Poland** Katowice

RO **Romania** Bucharest/Sibiu

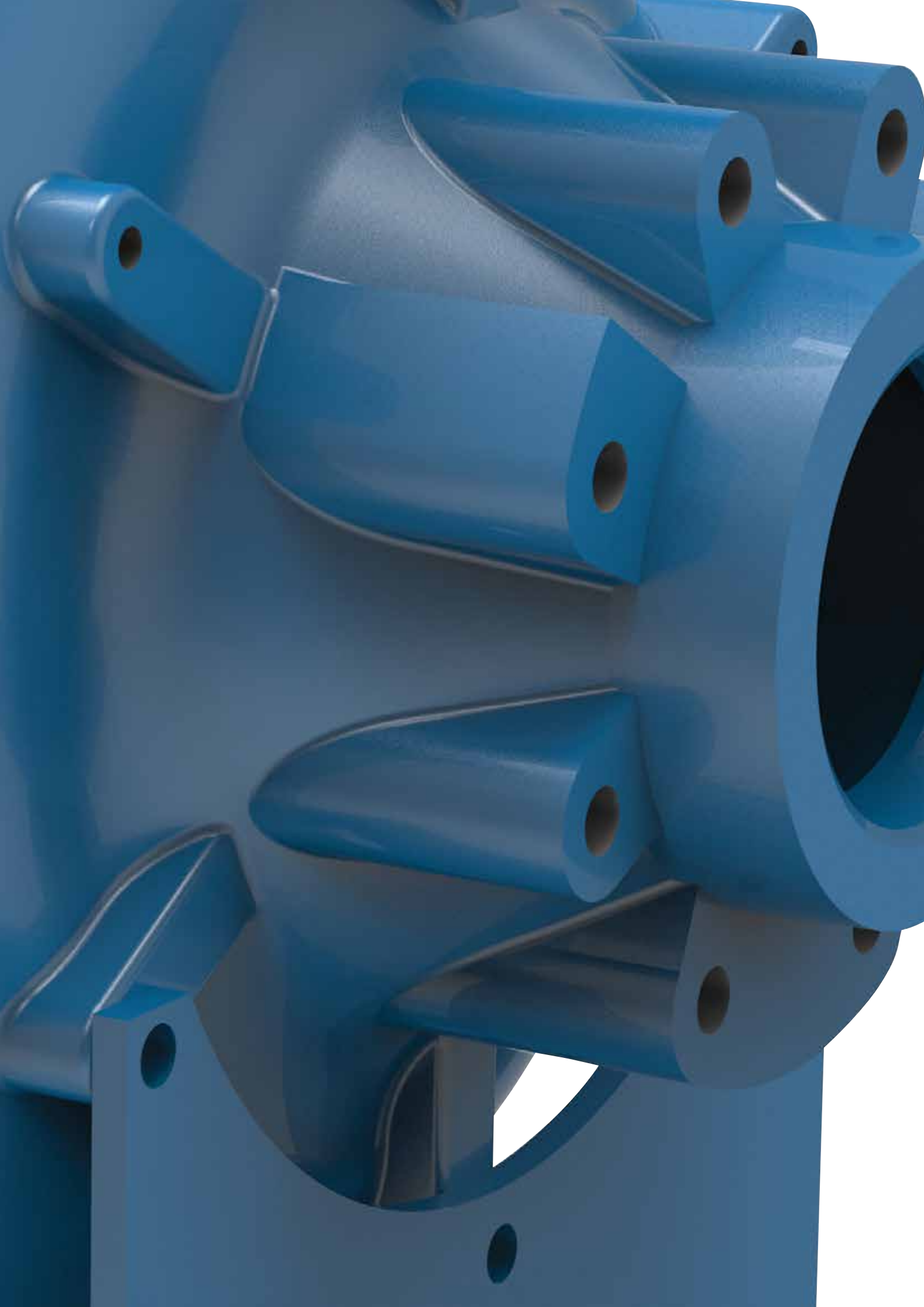
SK **Slovakia** Bratislava

TH **Thailand** Bangkok

US **USA** Macon (GA)

ZA **Republic of South Africa** North Riding







Any questions? For more information, please visit our website www.verderhus.com or call on tel.: +44 (0)1924 221 020.

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