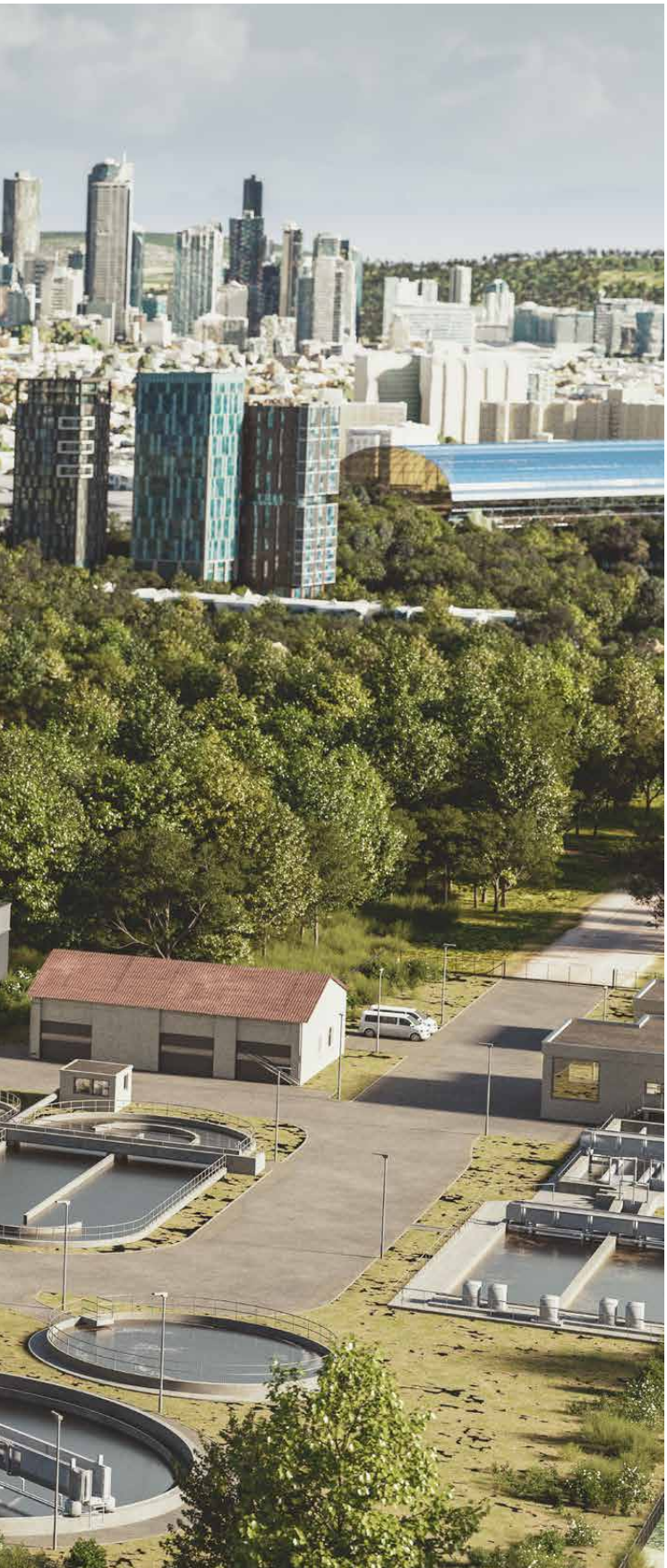
Pioneering for You

Product brochure
Wilo mixers and
recirculation pumps

Efficiency for your treatment processes

Reliable sewage treatment

You'll be treated well with us



You can rely on it

Our experts support you personally in every project phase, from design and dimensioning right through to commissioning and maintenance. We take a holistic approach to your system. This allows us to provide customised product solutions and set new standards for you in terms of technical performance, cost efficiency, security and durability – in all sewage treatment applications.

Wilo – the right partner to address your challenges

In view of global climate change, low energy consumption is a key issue in the market. The cost pressures on municipal or private suppliers are rising. The challenges are growing. These include increasing levels of solids in sewage, more and more regulations and stricter legal requirements. Against this backdrop, Wilo is a partner you can rely on fully in all areas.

This brochure introduces a selection of products for your efficient treatment processes.

The treatment process

Appropriate support for every one of your applications

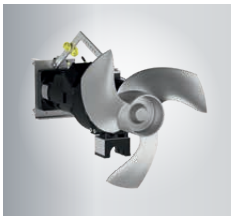
Stormwater retention tanks
Fully drained with directly driven submersible mixers

Stormwater retention tanks ensure that the wastewater treatment plant is not overloaded hydraulically by the incoming rainwater and sewage. The rainwater collected in it is highly contaminated, especially after long drying periods. Solids can then settle on the basin floor because of the often longer retention times. Directly driven Wilo submersible mixers ensure continuous suspension of possible deposits. The compact design allows them to generate the right turbulences – even down to very low water levels. This allows the stormwater retention tank to be drained completely.

Wilo-Flumen OPTI-TR 22 ... 40
Wilo-Flumen EXCEL-TRE 20 ... 40

Sludge treatment
Medium-speed submersible mixers enable homogeneity

Biomass is generally decomposed by micro-organisms in so-called digestion tanks to form digested sludge and combustible digester gas under anaerobic conditions. The digested sludge is then thickened to further reduce the volume and water content. Special height-adjustable removal mechanisms draw off the cloudy water. Medium-speed Wilo submersible mixers support the homogenisation of the thickened sludge. Their single-stage planetary gear and PUR or stainless-steel propeller enable plant-specific configuration. They are also easy to install and reliable with the special Wilo lowering devices.



Wilo-Flumen OPTI-TR 50 ... 120
Wilo-Flumen EXCEL-TRE 50 ... 90

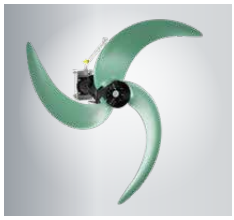
Efficient sewage treatment requires you as an operator to use machine technologies that meet the requirements of every stage in the treatment process.
We at Wilo support you effectively and efficiently.

Biological treatment / sludge activation Deposit-free with low-speed mixers

After mechanical treatment, about 60 to 70 % of the contaminants are still dissolved in the sewage. Microbiological methods are used to degrade this organically contaminated sewage. Wilo low-speed mixers are used to implement the biological treatment process for suspending contaminants and generating flows in the activated sludge tank. With their two-stage gears, two-blade or three-blade propellers, and extensive accessories, they can be custom-configured to meet requirements – for a deposit-free treatment process.

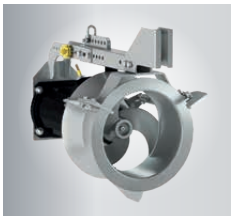
Efficient return flow between various basins with Wilo recirculation pumps

In upstream denitrification and cascade denitrification, the sewage from the mechanical treatment stage and the return activated sludge from secondary treatment first flow into the denitrification tank and then from here into the downstream nitrification tank. Here, recirculation pumps from Wilo efficiently pump the nitrate-containing sewage from the nitrification tank back into the denitrification tank. The new, highly efficient Wilo-Flumen OPTI-RZP and Wilo-Flumen EXCEL-RZPE series ensure reliable continuous operation. Installation can also be carried out on existing piping by means of specific connections and settings on the flow housing.



Wilo-Vardo
WEEDLESS

Wilo-EMU
TR 216 ... TR 326
Wilo-EMU
TRE 216 ... TRE 326



Wilo-Flumen OPTI-RZP 20 ... 80
Wilo-Flumen EXCEL-RZPE 20 ... 60

Fast-speed submersible mixers

Make the most of tight spaces

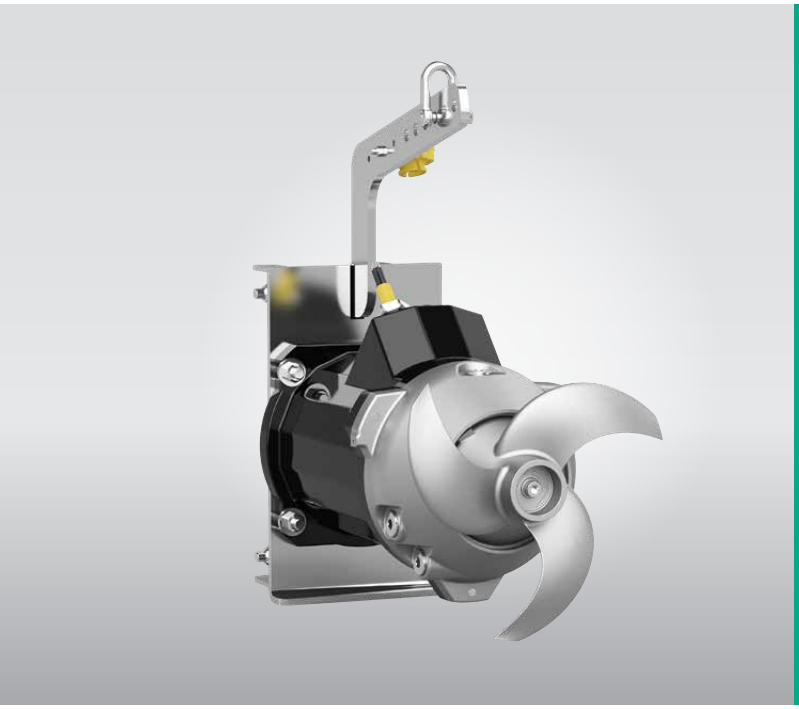
The sedimentation of solids occurs in basins and pump sumps. This sedimentation makes it much more difficult to carry out cleaning when draining the basins. In order to minimise sedimentation and to pump off the solids during draining, the solids must be regularly stirred up from the bottom and distributed in the fluid.

The high-speed Wilo submersible mixers have proven themselves in these applications. The compact design enables the mixers to be installed close to the basin floor.

The propeller, which is made of high-quality stainless steel, always ensures sufficient turbulence and therefore reliably prevents solids from settling. The optimised propeller geometry also ensures low-wear and low-clogging operation, even with long running times.

This minimises your cleaning work when completely draining stormwater retention tanks and pump sumps.

Wilo submersible mixers are certified for use in explosive atmospheres in accordance with ATEX and FM.



YOUR BENEFITS:

- → Optimised hydraulics ensure low clogging rates and reliable operation
- → Low wear by means of investment-cast stainless steel propellers with minimal cavitation tendency
- → A wide range of possible uses in diverse applications, even with long running times
- → Reduced energy and operating costs through use of IE3 motors (models of the Wilo-Flumen EXCEL series only) as standard for an optimal thrust coefficient
- → A diverse range of installation options and accessories ensure high flexibility

TECHNICAL DATA





Wilo-Flumen OPTI- ... Wilo-Flumen EXCEL- ...	TRE 20	TR 22	TR 28-1	TR 30-1 TRE 30	TR 40-1 TRE 40
Propeller					
Max. thrust (N)	105 – 185	180 – 400	370	220 – 530	520 – 950
Nominal diameter (mm)	200	220	280	300	400
Rated speed (rpm)	1416	915/1410	1361	915/1454	705/943
Number of blades	3	3	2	3	3
Material	1.4408	1.4408	1.4408	1.4408	1.4408
Seal material					
On the motor side	SiC/SiC	NBR	SiC/SiC	NBR	NBR
On the fluid side	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC
Motor data					
Fluid temperature (°C)	3 – 40	3 – 40	3 – 40	3 – 40	3 – 40
Ex rating (ATEX/FM)	o	o	o	o	o
IE3 motors*	●	–	–	● (TRE 30)	● (TRE 40)

*Based on IEC 60034-30

● = available o = optional – = not available

Medium-speed submersible mixers

Get the right mix easily

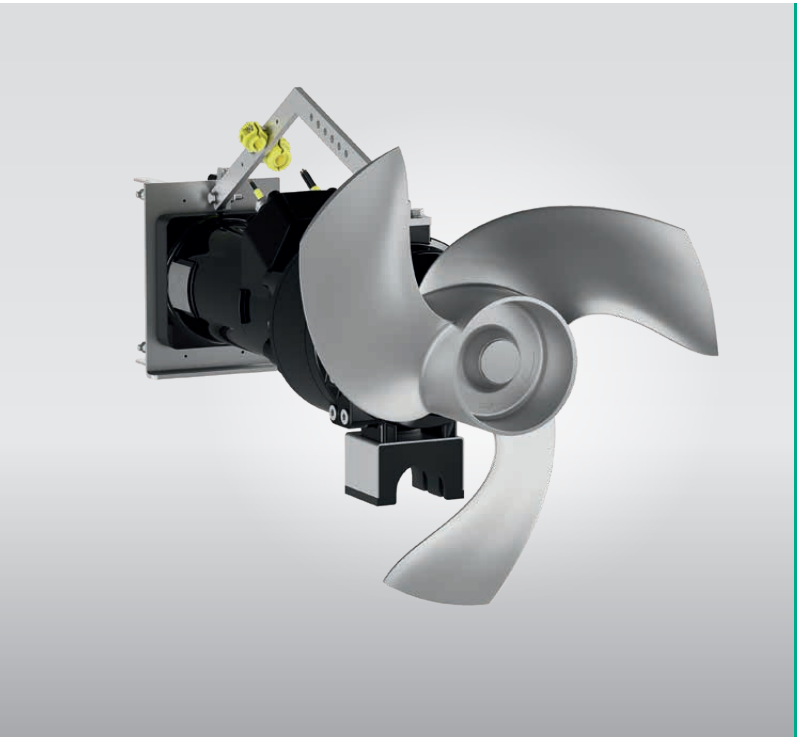
Due to the process technology, a wide variety of types of sludge are produced in the wastewater treatment plant process. These sludges are temporarily stored in suitable sludge silos or sludge piling containers for the further plant process. Depending on the wastewater treatment process, the sludge layers are regularly mixed.

Wilo submersible mixers support homogenisation in many aspects:

- → Dimensioning based on customer requirements
- → Low-wearing propellers with propeller geometry that are resistant to clogging
- → Frequency converter operation ensures process reliability even with constantly changing system parameters

All these points contribute to optimum homogenisation of the sludge and ensure a consistent content of solids in the fluid while reliably preventing deposits in the sludge basin.

Wilo provides you with individual, customised solutions. We support you from the very beginning at the design stage, to dimensioning, right up to maintenance concepts. That means through every phase of your project.



YOUR BENEFITS:

- → Low-clogging propellers and large gear bearings ensure reliable continuous operation
- → High operational reliability by using low-wearing propeller materials
- → The best thrust to power ratio possible by means of optimised hydraulics with minimum cavitation tendency reduce energy costs
- → Standard-equipped with IE3 motor (Wilo-Flumen EXCEL)
- → Customer-specific configuration taking into account the system parameters
- → Operation with a frequency converter facilitates simple adaptation to the load cases
- → Simple replacement by means of adaptation to existing installations

TECHNICAL DATA



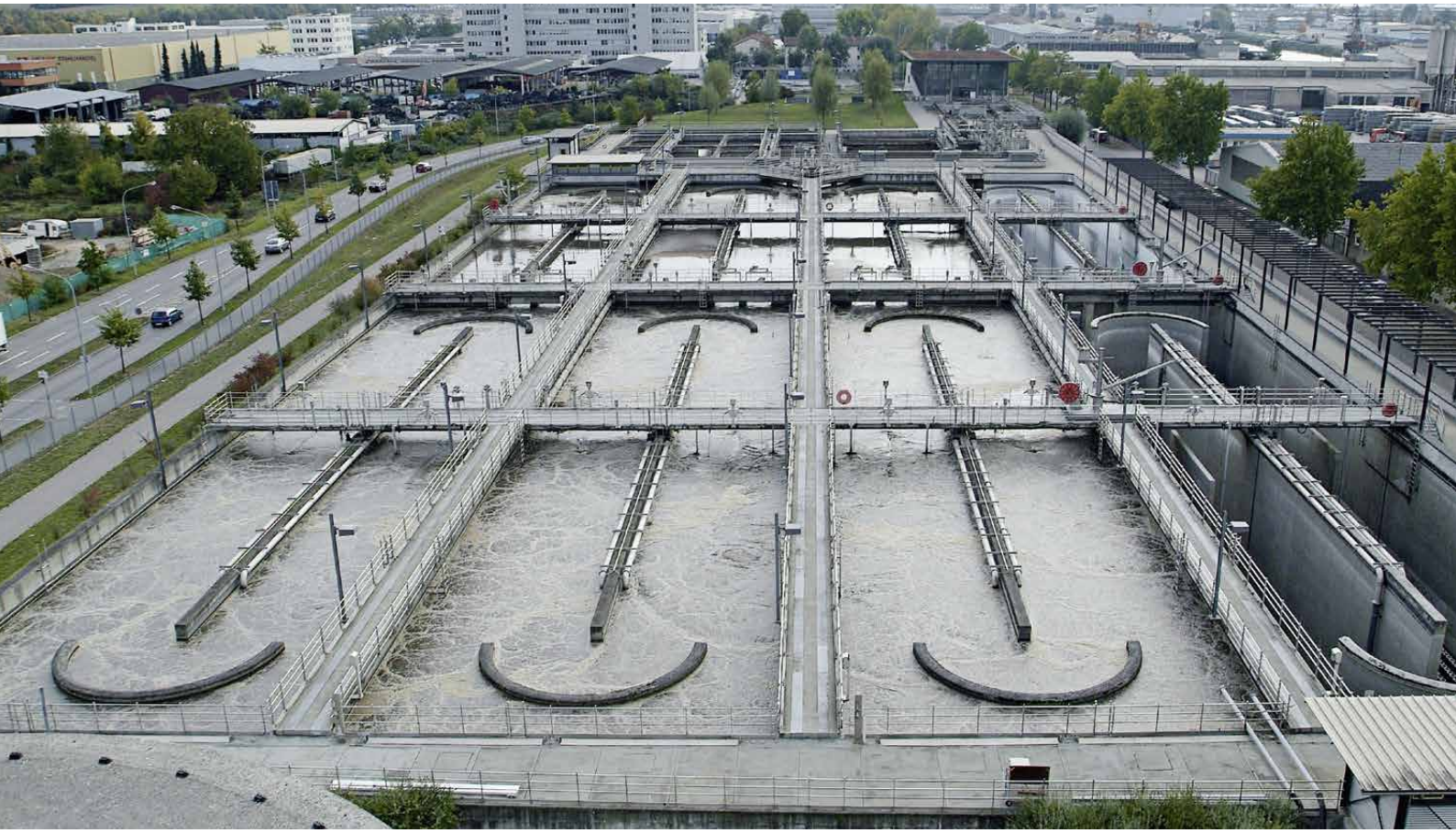



Wilo-Flumen OPTI- ... Wilo-Flumen EXCEL- ...	TR 50-3 TRE 50-3	TR 60-3 TRE 60-3	TR 75-2	TR 80-3	TR 90-2 TRE 90-2	TR 120-1
Propeller						
Max. thrust (N)	140 – 1850	225 – 2380	1100 – 3320	2140 – 4480	430 – 2120	2900 – 6150
Nominal diameter (mm)	500	600	750	800	900	1200
Rated speed (rpm)	132 – 481	132 – 430	156 – 274	227 – 336	98 – 251	176 – 272
Number of blades	3	3	3	3	3	3
Material	1.4408	1.4408	PUR	1.4408	PUR/GFK	PA6G
Seal material						
Motor / sealing chamber	NBR	NBR	NBR	NBR	NBR	NBR
Sealing / gear chamber	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC
Gear chamber / pre-chamber	NBR	NBR	NBR	NBR	NBR	NBR
Pre-chamber / fluid	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC
Motor data						
Fluid temperature (°C)	3 – 40	3 – 40	3 – 40	3 – 40	3 – 40	3 – 40
Ex rating (ATEX/FM)	o	o	o	o	o	o
IE3 motors*	● (TRE 50-3)	● (TRE 60-3)	–	–	● (TRE 90-2)	–
IE4 motors*	● (TRE 50-3)	● (TRE 60-3)	–	–	● (TRE 90-2)	–

*Based on IEC 60034-30

● = available o = optional – = not available

Low-speed submersible mixers
Provide targeted flows

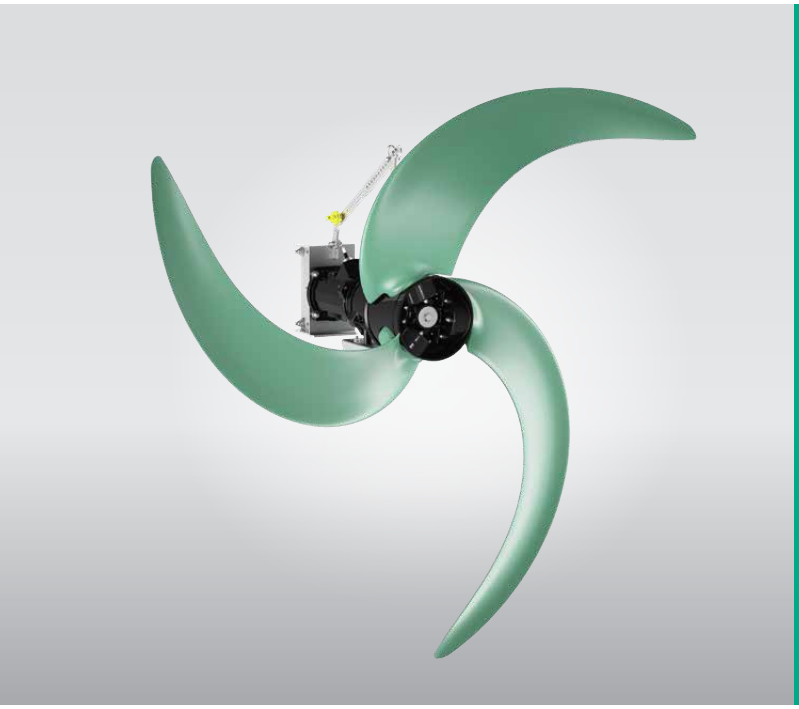


The sludge activation stage has to be moving at all times to support the microbiological processes optimally when treating sewage with organic content.

You can achieve the flow required with Wilo low-speed submersible mixers. They are characterised by a two-stage planetary gear and a balanced propeller load. This guarantees smooth running. If the inflow conditions are unfavourable, Wilo submersible mixers with 3 propeller blades can be used. They guarantee a low propeller blade load even in unfavourable positions.

In this way, we achieve the highest level of efficiency with maximum thrust in your system.

Wilo low-speed submersible mixers can also be retrofitted in your system at any time. They are suitable for different basin depths and geometries.



YOUR BENEFITS:

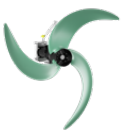
- → Efficient energy usage. The innovative blade geometry and energy-efficient IE3/IE4 motors ensure the best possible thrust coefficient. At the same time, this reduces your energy and operating costs
- → Consistently reliable. The low-wearing propeller is durable and impresses with its self-cleaning effect
- → The balanced propeller load ensures smooth running, even in high thrust ranges and when inflow conditions are unfavourable

TECHNICAL DATA









Wilo-EMU ...	TR 216 TRE 216	TR 221 TRE 221	TR 226-3 TRE 226-3	TRE 312	TR 316 TRE 316	TR 321 TRE 321	TR 326-3 TRE 326-3
Propeller							
Max. thrust (N)	470 – 2740	480 – 3400	500 – 3780	380 – 2300	810 – 3340	550 – 3500	1140 – 4250
Nominal diameter (mm)	1600	2100	2600	1200	1600	2100	2600
Rated speed (rpm)	32 – 79	21 – 59	16 – 48	59 – 154	38 – 78	21 – 54	21 – 43
Number of blades	2	2	2	3	3	3	3
Material	GFK/VE	GFK/VE	GFK/VE	PA6G	GFK/VE	GFK/VE	GFK/VE
Seal material							
Motor / sealing chamber	NBR	NBR	NBR	NBR	NBR	NBR	NBR
Sealing / gear chamber	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC
Gear chamber / pre-chamber	NBR	NBR	NBR	NBR	NBR	NBR	NBR
Pre-chamber / fluid	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC
Motor data							
Fluid temperature (°C)	3 – 40	3 – 40	3 – 40	3 – 40	3 – 40	3 – 40	3 – 40
Ex rating (ATEX/FM)	o	o	o	o	o	o	o
IE3 motors*	● (TRE 216)	● (TRE 221)	● (TRE 226-3)	●	● (TRE 316)	● (TRE 321)	● (TRE 326-3)
IE4 motors*	● (TRE 216)	● (TRE 221)	● (TRE 226-3)	●	● (TRE 316)	● (TRE 321)	● (TRE 326-3)

*Based on IEC 60034-30

● = available o = optional – = not available

Vertical mixers

They ensure optimal mixing

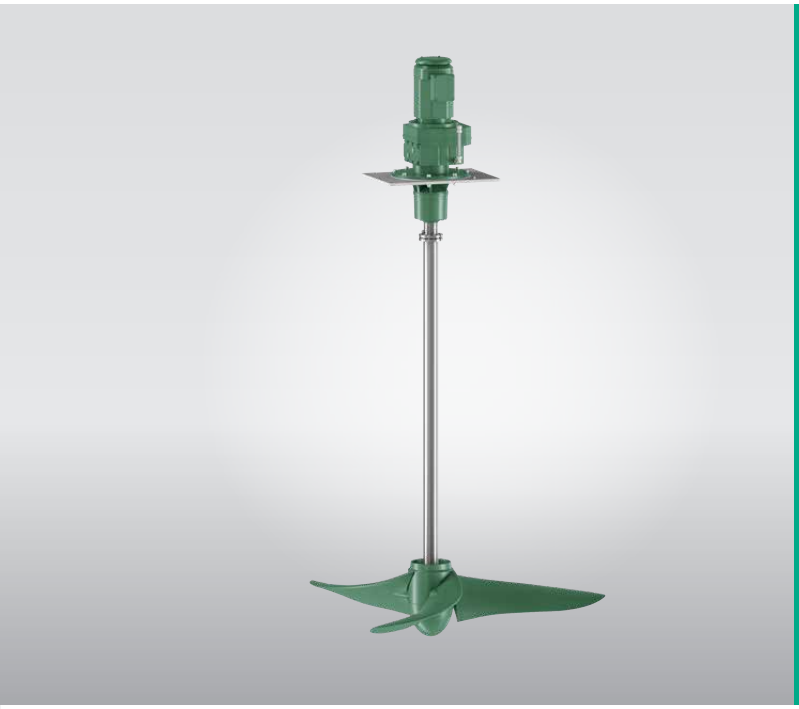
The sludge activation stage has to be moving at all times to support the microbiological processes optimally when treating sewage with organic content.

Vertical mixers from Wilo ensure you achieve the required degree of mixing. They are characterised by a two-stage gear and a balanced propeller load.

For system-specific applications, 2- or 3-blade mixers with mixer shafts are available in various lengths with customer-specific building connections.

This ensures your processes will be highly efficient.

Wilo vertical mixers are always ready to support your process.
They are suitable for different basin depths and geometries.



YOUR BENEFITS:

- → Optimum agitation in basins of different designs
- → Wear-resistant propeller material ensures process reliability
- → Standard IE3 and IE4 motors facilitate low energy consumption
- → System-specific thrust direction with flow direction to the basin floor or to the medium surface
- → System-specific dimensioning

TECHNICAL DATA

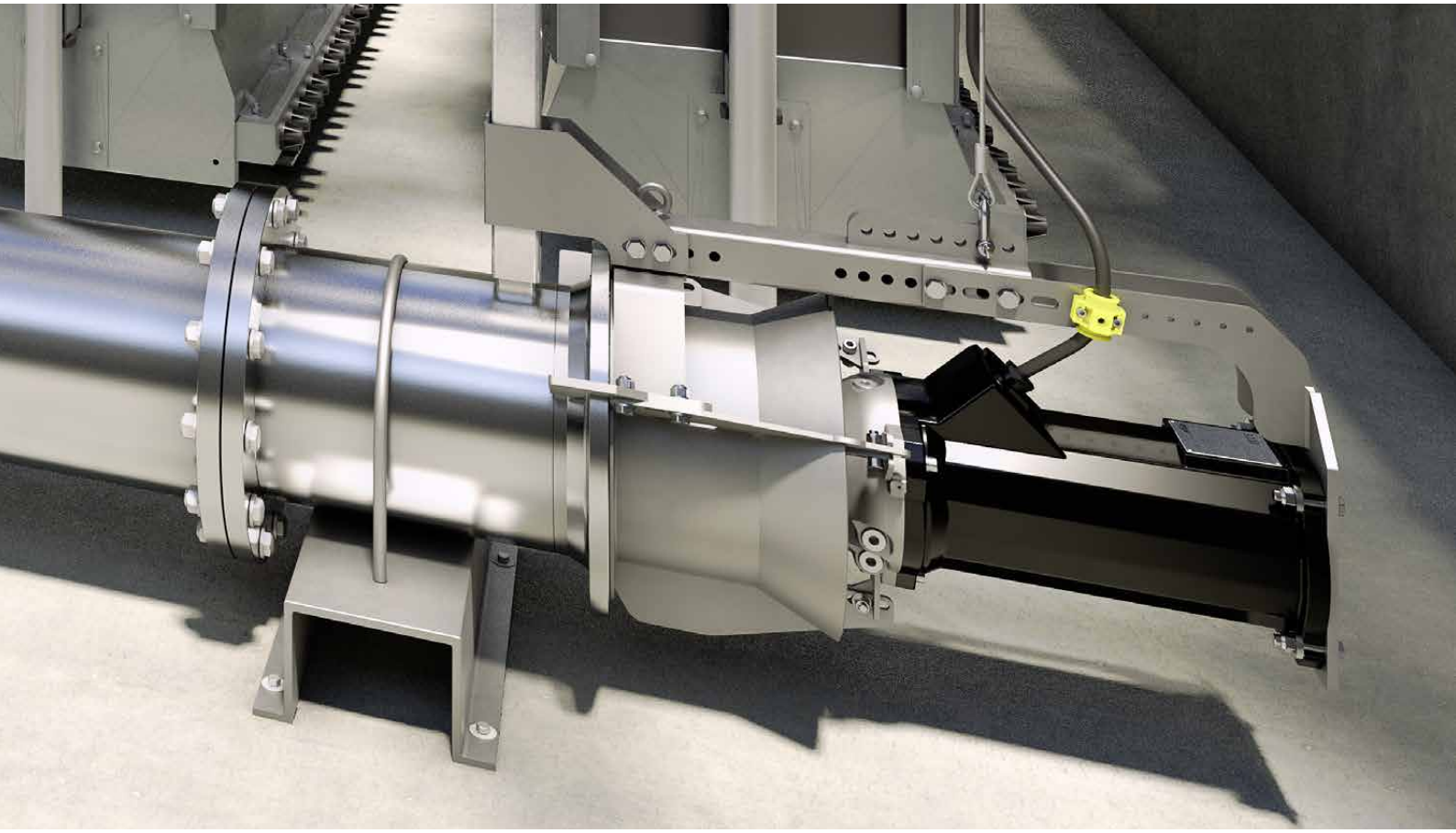
Wilo-Vardo ...	WEEDLESS-VM.F15 ...	WEEDLESS-VM.F20 ...	WEEDLESS-VM.F25 ...
Propeller			
Max. thrust (N)	115 – 1095	265 – 2915	250 – 4315
Nominal diameter (mm)	1500	2000	2500
Rated speed (rpm)	16 – 40	16 – 42	12 – 42
Angle of attack of propeller blade: 40°	●	●	●
Angle of attack of propeller blade: 35°	o	o	o
Propeller blade material	PUR	PUR	PUR
Mixer shaft material	A4 (AISI 316L/316Ti)	A4 (AISI 316L/316Ti)	A4 (AISI 316L/316Ti)
Motor data			
Rated power (kW)	0.75 – 4	0.75 – 7.5	0.55 – 7.5
Fluid temperature (°C)	3 – 40	3 – 40	3 – 40
Ex rating (ATEX/FM)	o	o	o
IE3 motors*	●	●	●
IE4 motors*	●	●	●

*Based on IEC 60034-30

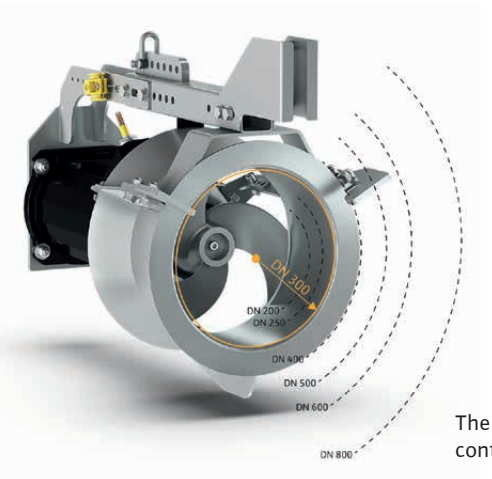
● = available o = optional – = not available

Recirculation pumps

Efficient recirculation between the individual cleaning phases



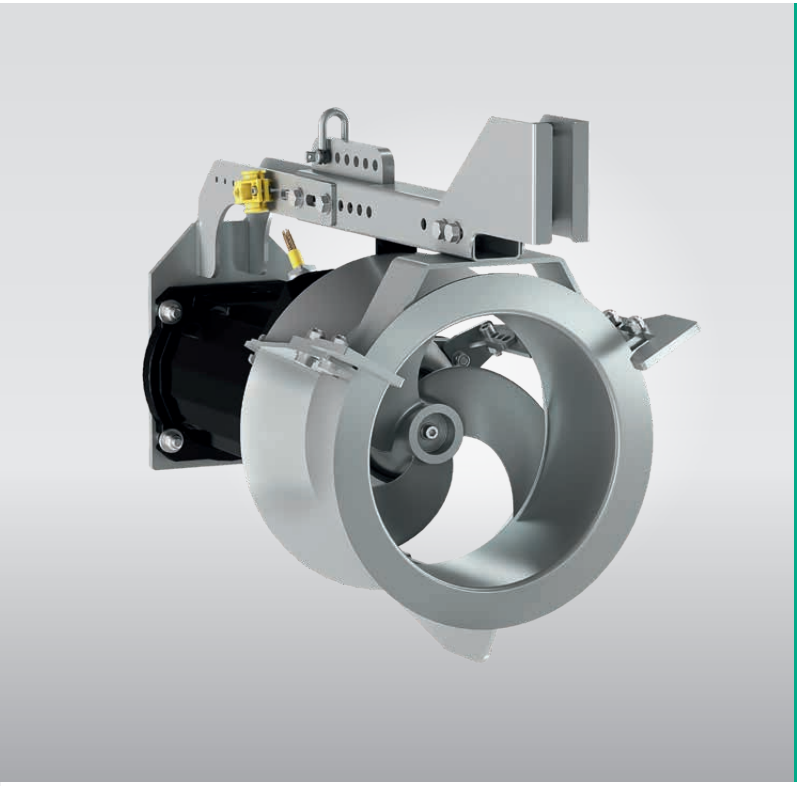
In upstream denitrification and cascade denitrification, the sewage from the mechanical cleaning stage and the return activated sludge from secondary treatment first flow into the denitrification basin.



The right connection for every pipe size – continuous from DN 200 to DN 800

They then flow from here into the downstream nitrification basin. Here, recirculation pumps from Wilo efficiently pump the nitrate-containing sewage from the nitrification tank back into the denitrification tank.

Reliable sewage transport in your wastewater treatment plant with high volume flow at low delivery head.



YOUR BENEFITS:

- → Low-clogging propellers and the non-clog design of the flow housing ensure reliable continuous operation
- → High operational reliability by using low-wearing propeller materials
- → High pump efficiency reduces energy costs
- → Customer-specific configuration taking into account the different pipe diameters and volume flows
- → Simple adaptation to the system parameters through operation with a frequency converter
- → Lowering devices and screwless coupling facilitate easy installation and removal, even when the basins are filled
- → Simple replacement by means of adaptation to existing installations

TECHNICAL DATA

Wilo-Flumen OPTI- ... Wilo-Flumen EXCEL- ...	RZP 20-1 RZPE 20-1	RZP 25-3 RZPE 25-3	RZP 30 RZPE 30	RZP 40-1 RZPE 40-1	RZP 50-4 RZPE 50-4	RZP 60-4 RZPE 60-4	RZP 80-3
Hydraulics							
Delivery head (m)	0.1 – 1.6	0.1 – 4.9	0.2 – 4.7	0.2 – 2.5	0.2 – 2.25	0.35 – 1.55	0.22 – 2.25
Volume flow (m^3/h)	20 – 370	30 – 750	40 – 920	50 – 1130	108 – 2160	144 – 2808	270 – 5400
Large pipe connection	DN 200 / DN 250	DN 250	DN 300	DN 400	DN 500	DN 600	DN 800
Material, flow housing	1.4571	1.4571	1.4571	1.4571	1.4571	1.4571	1.4571
Material, propeller	1.4408	1.4408	1.4408	1.4408	1.4408	1.4408	1.4408
Installation type							
Standard with lowering device	●	●	●	●	●	●	●
Flange connection, screwed	●	●	●	●	●	●	–
Motor data							
Fluid temperature (°C)	3 – 40 °C	3 – 40 °C	3 – 40 °C	3 – 40 °C	3 – 40 °C	3 – 40 °C	3 – 40 °C
Ex rating (ATEX/FM)	o	o	o	o	o	o	o
IE3 motors*	● (RZPE 20)	● (RZPE 25)	● (RZPE 30)	● (RZPE 40)	● (RZPE 50-4)	● (RZPE 60-4)	–
IE4 motors*	–	–	–	–	–	–	–

*Based on IEC 60034-30

● = available o = optional – = not available

Varied accessories

We have the right accessories for your process

The more options you have to customise your unit for your requirements, the more likely that you get the treatment performance you want. That is why we offer a wide range of practical accessories for every Wilo product.

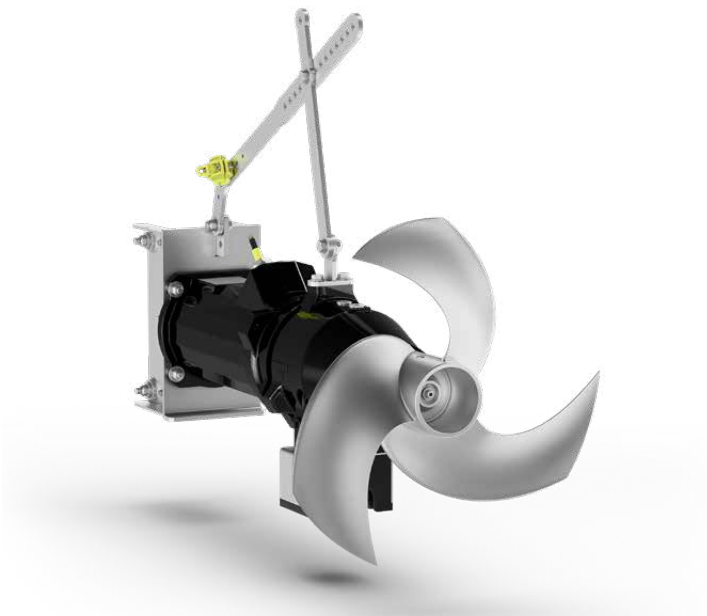
Wilo Ceram coating

Effective protection from corrosion and abrasion

You need to be able to depend on reliably functioning machine technology in every treatment stage of your wastewater treatment plant. That is the only way to guarantee a trouble-free treatment process. The units are exposed to corrosive and abrasive influences due to the nature of the plant. These influences stress the surface and material structures and can reduce the service life of the units. Process reliability can be significantly impaired by a malfunction.

Compared to other coatings, the Wilo Ceram coating offers the best possible protection against aggressive fluids. By means of its increased resistance to abrasion and corrosion, it effectively prevents wear and chemical corrosion, thus ensuring optimum functionality and performance.

Wilo Ceram significantly increases the service life of your units.



Wilo Ceram coating – very good adhesion when wet (15 N/mm²) and abrasion resistance (9 y)

RESISTANCE FOR CERAM C0

Designation	Temperature range	Resistance*
Sewage, alkaline (pH 11)	+40 °C	1
Sewage, slightly acidic (pH 6)	+40 °C	1
Sewage, highly acidic (pH 1)	+40 °C	1
Ammonium hydroxide (5 %)	+40 °C	3
Decanol (fatty alcohol)	+20 °C	1
Decanol (fatty alcohol)	+50 °C	1
Ethanol (40 %)	+20 °C	1
Ethanol (96 %)	+20 °C	3
Ethylene glycol	+20 °C	1
Heating oil, diesel	+20 °C	1
Compressor oil	+20 °C	1
Methyl ethyl ketone (MEK)	+20 °C	3
Caustic soda (5 %)	+20 °C	1
Caustic soda (5 %)	+50 °C	2
Sodium chloride solution (10 %)	+20 °C	1
Hydrochloric acid (5 %)	+20 °C	2
Hydrochloric acid (10 %)	+20 °C	2
Hydrochloric acid (20 %)	+20 °C	3
Sulphuric acid (10 %)	+20 °C	2
Sulphuric acid (20 %)	+20 °C	3
Nitric acid (5 %)	+20 °C	3
Toluene	+20 °C	2
Cooling and industrial water	+50 °C	1
Xylene	+20 °C	1

* For an overall layer thickness of min. 400 µm
1 = resistant
2 = resistant for 40 days
3 = overflow-resistant (immediate cleaning recommended)

Wilo-Control CT-Mix

On-site control unit for load- and demand-based control of Wilo submersible mixers and recirculation pumps

For efficient operation in biological treatment, mixer speeds are often controlled in a process-oriented manner. Our on-site control unit Wilo-Control CT-Mix with an integrated frequency converter allows up to three mixers to be controlled in accordance with the process and speed.

This means the Wilo-Control CT-Mix can control the current operating conditions, operate each mixer separately and be easily integrated in an existing control centre.

Auxiliary lifting equipment

For easy installation

Our auxiliary lifting equipment make it easy to install our units. The units can also be pulled out of the basin whenever necessary. This makes it easier for you to service the units at any time.

- → Projection up to 3.2 m
- → Bearing capacity up to 500 kg
- → Completely made of stainless steel 1.4571

Lowering devices

For optimal positioning

Submersible mixers must be optimally positioned; recirculation pumps must be connected exactly to the pressure pipe. Our lowering devices solve these requirements with ease.

Fixed tripod units are also available for free placement of the submersible mixers in the basin.

We will be happy to support you and help you configure the suitable equipment for your unit.

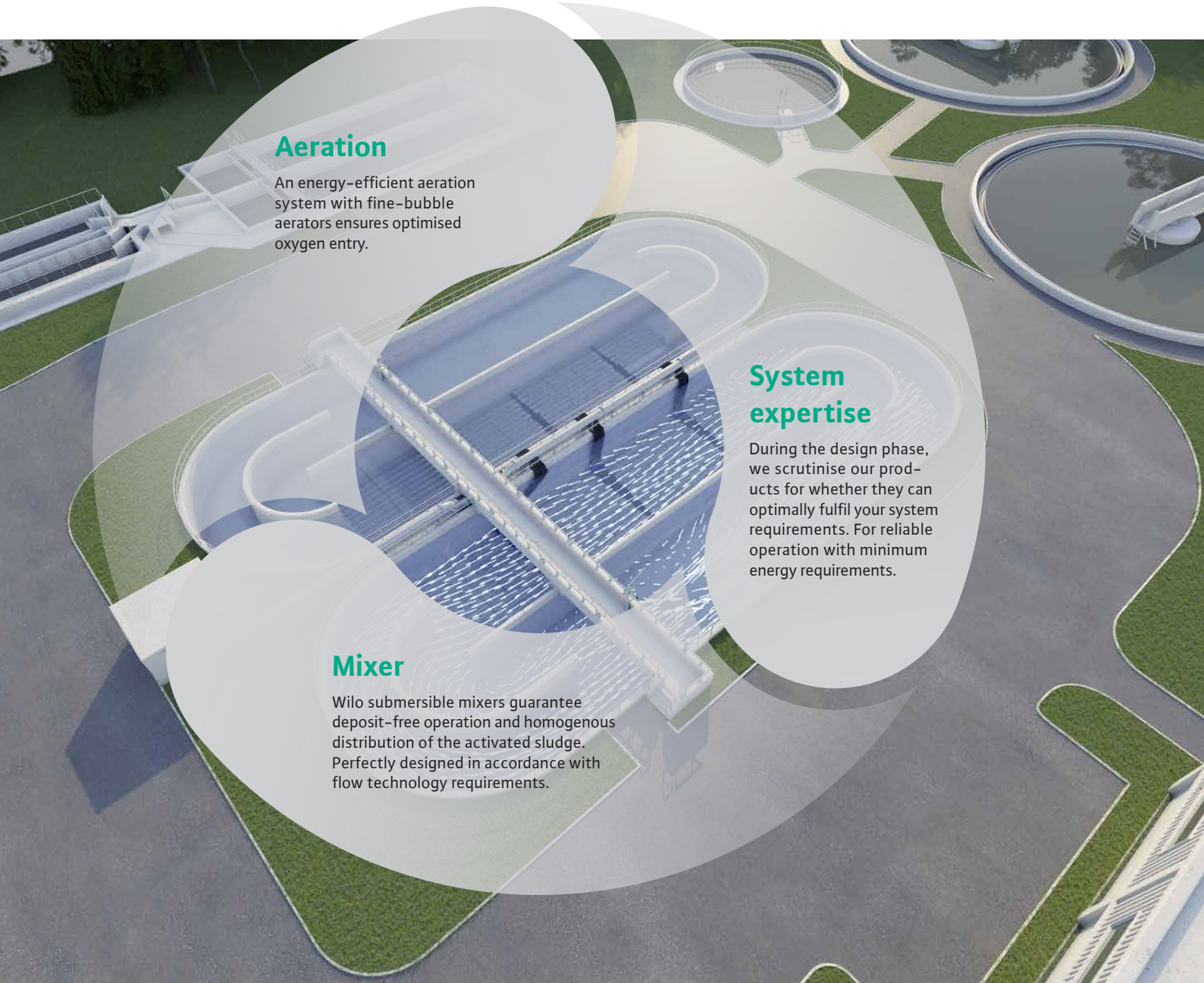
Biological sewage treatment

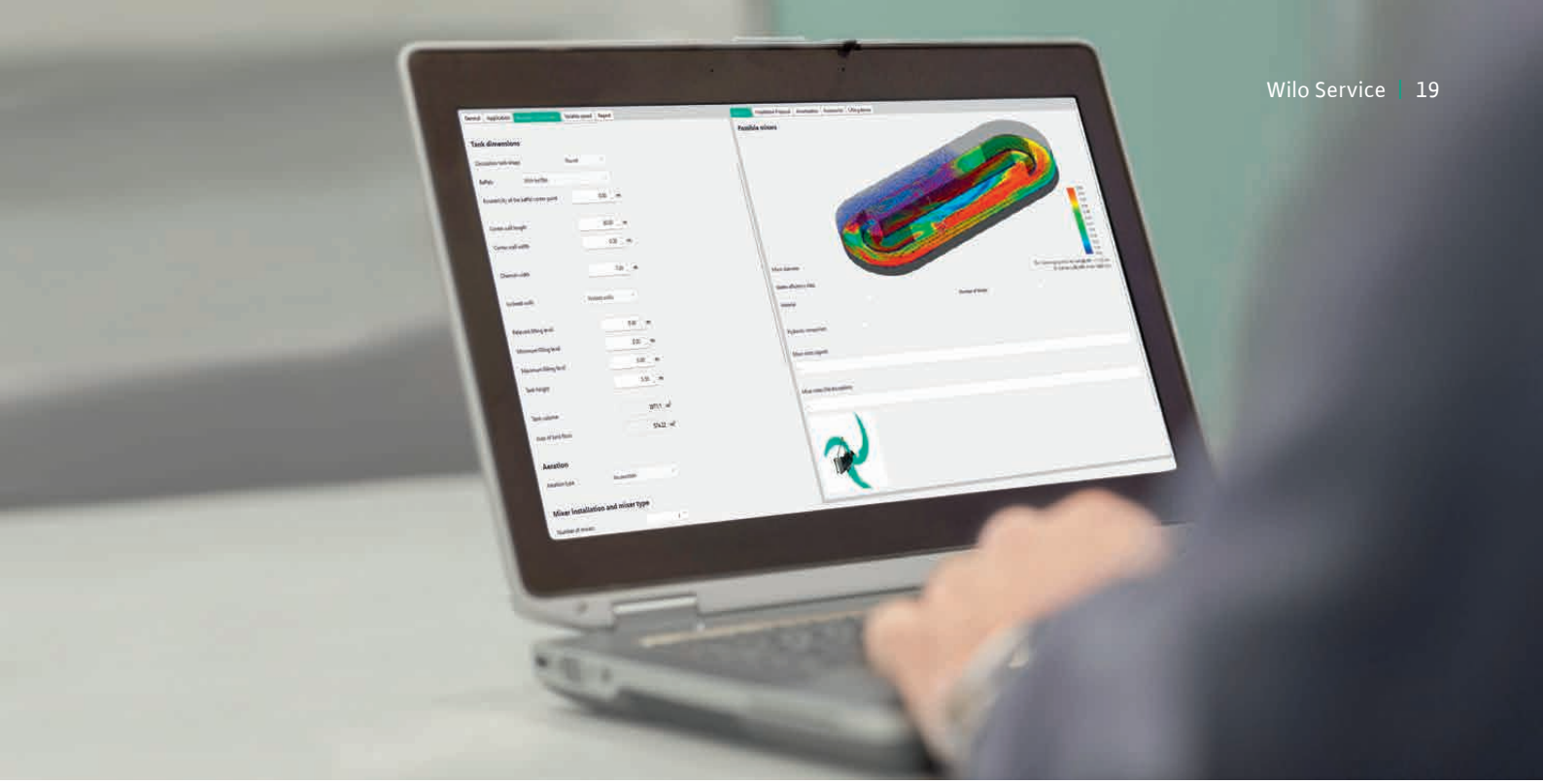
Optimal system operation using modern design methods and system expertise

The correct system-dependent design and installation of the mechanical technology is a basic requirement for efficient and operationally-reliable biological sewage treatment. Wilo uses modern software-aided design tools and methods. In order to select the right technology for your system, we use, among other things, the numerical flow simulation design method (CFD simulation).

In this precise analysis, we take into account your system-specific boundary conditions. This enables possible weaknesses to be detected in good time and optimisation approaches to be developed.

This means that you, as the operator, benefit from an expertly designed system in which all technologies and components are tailor-made and precisely aligned with each other to meet all requirements.





Wilo-Services

Enjoy our carefree package for partners

We always begin our customer consultations with an initial personal discussion. This way we can develop individual, bespoke solutions that meet your requirements perfectly. But our service goes far above and beyond that. We will be there to support you long after your purchase to help with repairs and maintenance.

Design smart with the help of our consultancy.

We are here for you to figure out exactly what you need. Based on this, our specialists develop a custom solution in close consultation with you.

You can count on our configuration.

We make our selections with the help of a modern configuration application to offer you the most economical solution possible.

You can rely on us for installation.

Qualified plant engineers with years of experience will carry out an extensive test and training phase of our pumps for you.

Your complete service package

Presales

- Local support
- Consulting support
- Product selection
- Select programmes
- Numerical flow simulations
- Flow calculation
- Pipe calculation
- Installation drawings
- Documentation

Sales

- Certification
- Acceptance testing at the factory
- Configuration
- Commissioning

Aftersales

- Local service in 60 countries
- Over 1200 Wilo technicians worldwide
- Bespoke maintenance concepts
- Customer-oriented spare part solutions
- Efficiency check
- Training

With the Wilo submersible mixer, you can rely on services tailored to your individual requirements.

Pioneering for You

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