

Pioneering for You

wilo

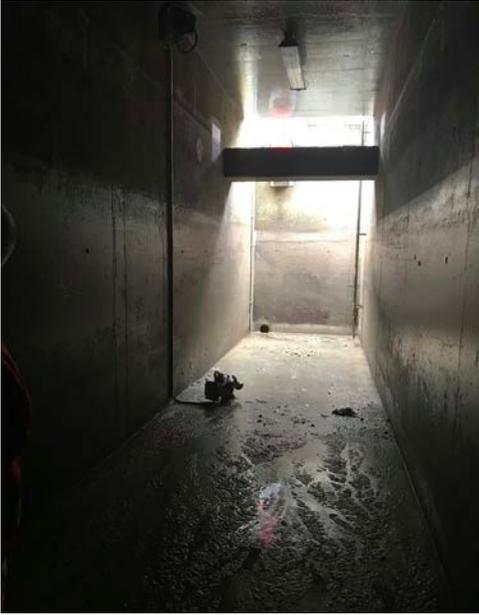
*Product brochure*

# Treatment Process Efficiency. Wilo Submersible Mixers.



## The treatment process.

Supporting all your mixing needs.



### Stormwater retention tank. Fully drained with direct-drive submersible mixers.

Stormwater retention tanks ensure the wastewater treatment plant not to overload hydraulically by the incoming rainwater and sewage. The rainwater collected is highly contaminated, especially after long drying periods and solids can settle on the tank floor often due to extended residence times. Direct-drive Wilo submersible mixers ensure continuous suspension of possible deposits. The compact design allows them to generate the right turbulences – even down to the very low water levels. That allows the stormwater retention tank to be drained completely.

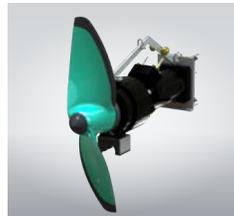


Wilo-Flumen OPTI-TR 20-1 to TR 40-1  
Wilo-Flumen EXCEL-TRE 20 to TRE 40



### Homogeneous sludge mixing with medium-speed submersible mixers.

Biomass is generally decomposed by micro-organisms in digestion tanks, to digested sludge and combustible digester gas under anaerobic conditions. The digested sludge is then thickened to further reduce the volume and water content. Medium-speed Wilo submersible mixers support the homogenization of the thickened sludge. Their single-stage planetary gears and PUR or stainless steel propellers permit plant-specific configuration. They are also easy to install with Wilo's reliable guide rail systems.



Wilo-EMU TR(E) 50-2 to TR 120-1

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



### Biological treatment/sludge activation. Deposit-free thanks to low-speed submersible mixers.

After mechanical treatment, about 60% – 70% of the contaminants are still dissolved in the sewage. Microbiological methods are used to degrade this sewage with organic contaminants. Wilo low-speed submersible mixers are used to implement the biological treatment process for suspending contaminants and generating flows in the activated sludge tank. With their two-stage planetary gears, 2- or 3-blade propellers and stands that can be positioned freely in the basin, they can be custom-configured for any requirements. For a deposit-free treatment process.



Wilo-EMU TR(E) 212 to TR(E) 326

# High-speed submersible mixers.

Make the most of tight spaces.



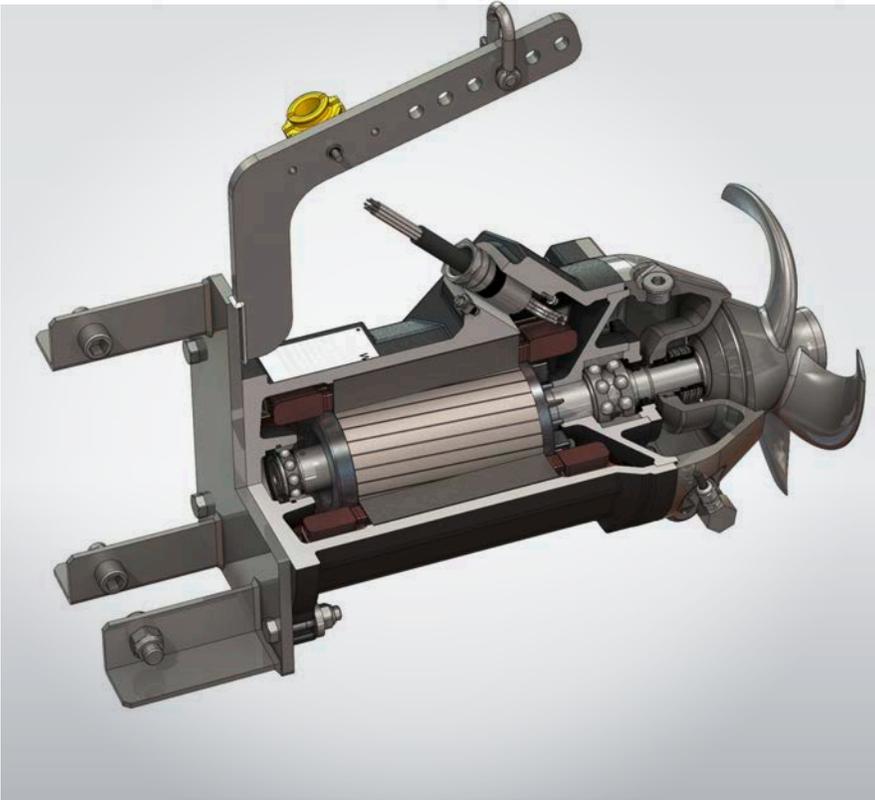
## Maximum performance in minimum space.



Wilo-Flumen OPTI-TR 30

To prevent solids from settling in the basin on drainage, it must be mixed from the base and diffused. The high-speed Wilo submersible mixers have proven themselves in these applications. The direct-drive mixers are so compact that they are easy to install and submerge – Even in the tightest spaces. Retrofitting in existing constructions is a breeze. For special applications in pump chambers, Wilo submersible mixers can be installed on a standard guide rail system, suspended from the tank ceiling, or on the floor with a base plate.

Wilo submersible mixers are certified for explosive atmospheres according to FM standard.



## Maximum Performance, Minimum Footprint.

Direct-drive Wilo submersible mixer made from cast iron and precision-cast stainless steel propeller.

### Features & Benefits:

- Low clogging rate and reliable operation thanks to optimized hydraulics.
- Low-wearing, due to the use of stainless steel precision-cast propellers with the lowest cavitation tendency.
- A wide range of possible uses in diverse applications, even at high-interval running times.
- Reduction of the energy and operating costs due to the standard use of IE3 motors (TRE models) for the best possible thrust coefficient.
- High flexibility thanks to the most diverse installation options and accessories.

Technical data for Wilo high-speed submersible mixers



TR 20-1



TR 22



TR 30-1



TRE 30



TR 40-1

	TR 20-1	TR 22	TR 30-1	TRE 30	TR 40-1
<b>Propeller</b>					
Nominal diameter (inch)	8	8.5	12	12	15.5
Rated speed (rpm)	1650	1080/1680	840/1080/1690	1167	828/1110
Number of blades	3	3	3	3	3
Material	ASTM A351	ASTM A351	ASTM A351	ASTM A351	ASTM A351
<b>Seal material</b>					
Material, on the motor side	SiC/SiC	SiC/SiC	Nitrile	Nitrile	Nitrile
Material, on the media side	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC
<b>Motor data</b>					
Operating mode	Continuous duty (S1)				
Fluid temperature (°F)	37-104				
Ex-rated to FM	o	o	o	o	o
Premium efficiency motors (IE3)*	-	-	-	•	-

\*Based on IEC 60034-30.

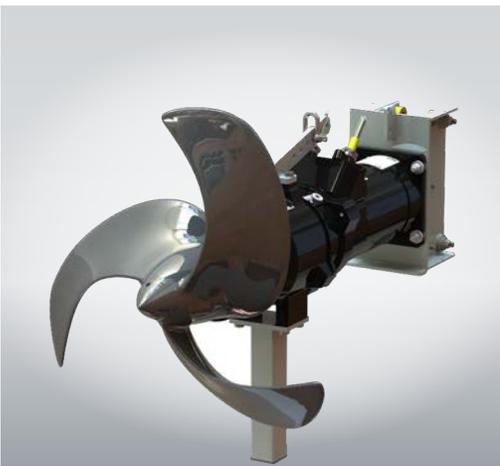
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## Medium-speed submersible mixers.

Get the right mix easily.



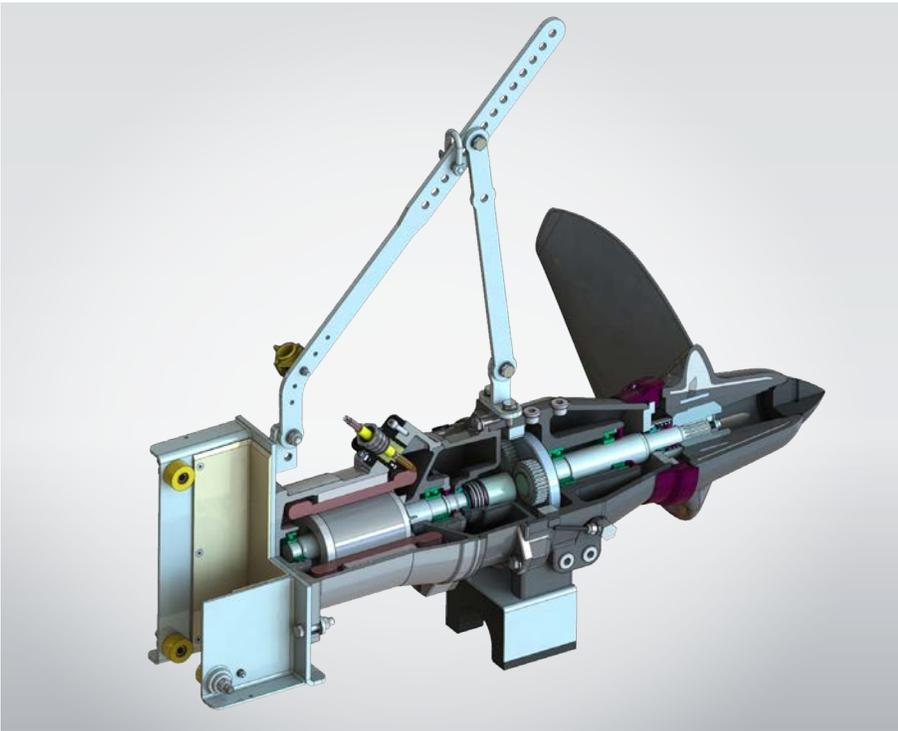
### Optimized Efficiency for every application.



Wilo-EMU TR 120-1

Wilo medium speed mixers are equipped with reliable single-stage planetary gears for smooth and efficient power transmission. This allows the thrust and speed to be adapted to the respective sludge properties in your system.

Customized solutions and support – From design, to configuration, commissioning and maintenance.



## Getting the Right Mix.

Wilo submersible mixer with single-stage planetary gear and propeller made from molded polyurethane or stainless steel.

### Features & Benefits:

- Secures your process. The large planetary gear ensures that the mixing forces are absorbed efficiently.
- Efficient energy usage. The innovative blade geometry ensures the best possible specific thrust coefficient. At the same time, this reduces your energy and operating costs.
- Works reliably. Thanks to rag-free operation with backward-curved incoming flow edge.

Technical data for Wilo medium-speed submersible mixers



TR 50-2



TR 60-2



TR 75-2



TR 80-1



TR(E) 90-2



TR 120-1

### Propeller

	TR 50-2	TR 60-2	TR 75-2	TR 80-1	TR(E) 90-2	TR 120-1
Nominal diameter (inch)	20	23.5	29.5	31.5	35.5	47
Rated speed (rpm)	133-569	169-570	156-274	190-332	116-237	168-205
Number of blades	3/2	3/2	3	3	2	2
Plastic material	PUR	PUR	PUR	PUR/GRP	PUR/GRP	PUR/GRP
Steel material	AISI 316Ti	AISI 316Ti	-	AISI 316Ti	-	-

### Seal material

	TR 50-2	TR 60-2	TR 75-2	TR 80-1	TR(E) 90-2	TR 120-1
Motor/sealing chamber	Nitrile	Nitrile	Nitrile	Nitrile	Nitrile	Nitrile
Gasket/gear chamber	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC
Gear chamber/pre-chamber	Nitrile	Nitrile	Nitrile	Nitrile	Nitrile	Nitrile
Pre-chamber/fluid	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC

### Motor data

	TR 50-2	TR 60-2	TR 75-2	TR 80-1	TR(E) 90-2	TR 120-1
Operating mode	Continuous duty (S1)					
Fluid temperature (°F)	37-104					
Ex-rated to FM	o	o	o	o	o	o
Premium efficiency motors (IE3)*	-	-	-	-	o	-

\*Based on IEC 60034-30.

• = as standard o = optional - = not available

## Slow-speed submersible mixers.

For your flow boosting needs.

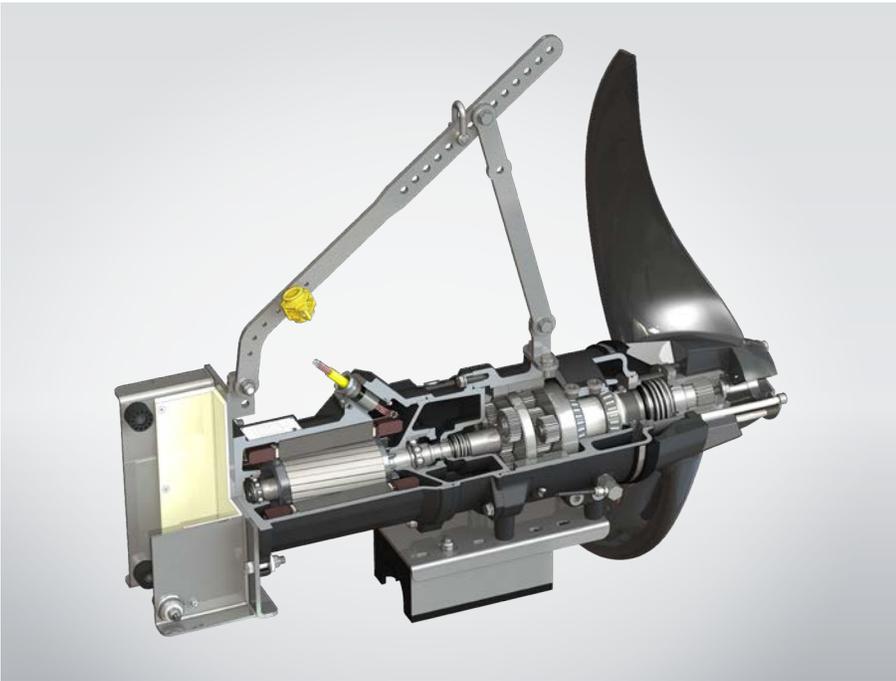


### Optimized agitation. Effectively suspended.



Wilo-EMU TRE 312

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 characterized by a two-stage planetary gear and a balanced propeller load. This guarantees smooth running. If the flow conditions are particularly unfavorable, Wilo submersible mixers with 3 propeller blades can be used. They guarantee a low propeller load even in unfavorable positions.



## Replace those Rag-Catchers!

Wilo submersible mixer with two-stage planetary gear and 2- or 3-blade propeller.

### Features & Benefits:

- Efficient. The innovative blade geometry and energy-efficient IE3/IE4 motors ensure the best possible specific thrust coefficient, reducing energy and operating costs.
- Reliable. Low wearing GRP/PA6 propeller is durable and innovative with hydrofoil design and self-cleaning operation.
- Smooth running thanks to the balanced propeller load – Even in high thrust ranges and aggressive flow conditions!

Technical data for Wilo low-speed submersible mixers



	TR 212	TR(E) 216	TR(E) 221	TR(E) 226	TRE 312	TR(E) 316	TR(E) 321	TR(E) 326
<b>Propeller</b>								
Nominal diameter (inch)	47	63	82,5	102	47	63	82.5	102
Rated speed (rpm)	68-96	34-78	25-58	19-50	64-154	39-76	24-54	25-43
Number of blades	2	2	2	2	3	3	3	3
Plastic material	GRP/Vinylester	GRP/Vinylester	GRP/Vinylester	GRP/Vinylester	PA 6C	GRP/Vinylester	GRP/Vinylester	GRP/Vinylester
Steel material	-	-	-	-	-	-	-	-
<b>Seal material</b>								
Motor/sealing chamber	Nitrile	Nitrile	Nitrile	Nitrile	Nitrile	Nitrile	Nitrile	Nitrile
Gasket/gear chamber	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC
Gear chamber/pre-chamber	Nitrile	Nitrile	Nitrile	Nitrile	Nitrile	Nitrile	Nitrile	Nitrile
Pre-chamber/fluid	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC	SiC/SiC
<b>Motor data</b>								
Operating mode	Continuous duty (S1)							
Fluid temperature (°F)	37-104							
Ex-rated to FM	o	o	o	o	o	o	o	o
Premium efficiency motors (IE3)*	-	o	o	o	□	o	o	o

\*Based on IEC 60034-30.

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

## The Ceram C0 coating by Wilo.

### Effective corrosion protection.



#### The advantages of the Ceram C0 coating are:

- Highly resistant to corrosive and chemical wear in the long term
- Extremely good wet adhesion of 2175 in<sup>2</sup> (15 N/mm<sup>2</sup>) on metal surfaces
- Tested by the “Bundesanstalt für Wasserbau” (German Federal Institute for Hydraulic Engineering) (BAW)
- Solvent-free

This unique 2-component coating offers the best possible protection against aggressive media compared with other coatings. Thanks to its increased resistance to corrosion, it effectively prevents wear and chemical corrosion and always ensures optimum functionality and performance. Wilo-Ceram significantly enhances the service life of submersible mixers.

## Accessory Selection.

### Highly customizable.

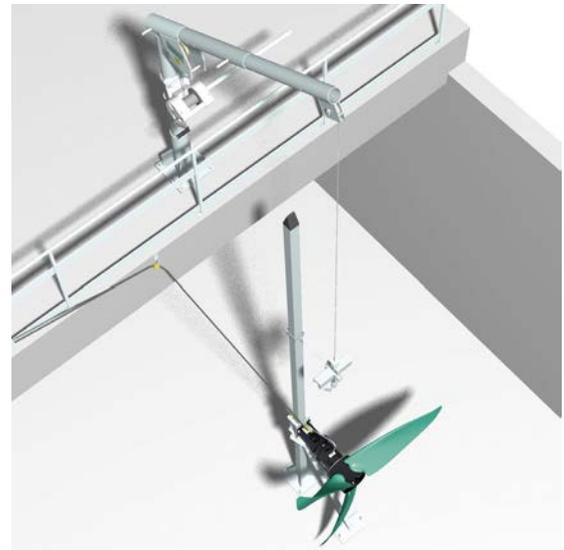
#### The choice is yours.

The more options you have to customize your Wilo submersible mixer for your requirements, the more likely that you get the treatment performance you want.

#### Hoists and Guide rail systems

The perfect position in the basin boosts the efficiency of your mixer. Our range includes flexible systems for wall mounting or rigid stands, which even allow free positioning in the basin.

The LGA-tested portable hoists by Wilo enable you to lift and lower submersible mixers securely from the basin at any time. Our range of portable hoists features a reach of up to 10.5 ft, and a bearing capacity of up to 1100 lb. For easy repositioning, some models can be dismantled into compact single components. You can choose from devices in the following materials: steel, galvanized, A2 steel (AISI 304) and A4 steel (AISI 316TI). We also offer matching manual winches made of aluminum or stainless steel.



#### Advantages for you:

- Optimum mixer positioning for the required treatment process
- Easy to install and ready to use quickly
- Reduced maintenance costs: the Wilo submersible mixer can easily be removed from the tank for maintenance.

# Maximum efficiency.

## You can count on it.

### We make your purchase predictable.

The energy costs should have a significant influence on the purchase decision. After all, you generally use your submersible mixers in continuous duty. Important parameters for this are the thrust (F) and the consumed electric power at the duty point ( $P_{1,1}$ ). For an objective comparison of the mixers, the specific thrust coefficient per ISO 21630 is defined as a quotient of the thrust generated and the electrical energy consumed for this.



### Wilo-EMU TRE 312. Saves costs even in continuous duty.

The blade geometry and highly efficient submersible motor ensure energy efficiency – even in energy-intensive continuous duty. Thus, achieving annual energy operating costs.

### Highly efficient mixing technology:

- Maximum thrust values at minimum power consumption
- Short ROI period thanks to maximum energy efficiency
- Maximum service life with minimum maintenance costs

### Sample calculation for submersible mixer Wilo-EMU TRE 312

Framework conditions		
Number of basins	3	
Number of submersible mixers per basin	2	
Running time	10 years	
Comparison of mixers	Wilo-EMU TR 90-2.24-4/12	Wilo-EMU TRE 312.138-4/17
Nominal propeller diameter	900 mm	1200 mm
Propeller speed	241 rpm	138 rpm
Thrust	1960 N	2020 N
Power consumption $P_{1,1}$	4.7 kW	3.5 kW
Calculation of energy cost savings		
Difference in power consumption $P_{1,1}$	3.5 kW – 4.7 kW	1.2 kW
Energy savings per basin	1.2 kW × 2	2.4 kW
Annual operating time in hours	365 d × 24 h	8.760 h
Energy costs		USD 0.10/kWh
Energy cost savings per basin/year*	8760 h × USD 0.10/kWh × 2.4 kW	USD 2102.40
Energy cost savings for 3 basins/year*	USD 2102.40 × 3	USD 6307.20
Total energy cost savings of the system*	USD 6307.20 × 10 years	USD 63072.00
Calculation of the ROI period		
Investment costs for the TR 90-2.24-4/12	6x USD 8800.00	USD 52800.00
Investment costs for the TRE 312.138-4/17	6x USD 12210.00	USD 73260.00
Extra costs for efficiency class IE3 (based on IEC 60034-30)		USD 20460.00
Energy cost savings for 3 basins/year*		USD 6307.20
ROI period for extra costs**		24 months



\*Energy costs calculated at a constant rate of USD 0.10/kWh.

\*\*Only the pure energy costs are considered in the ROI calculation.



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