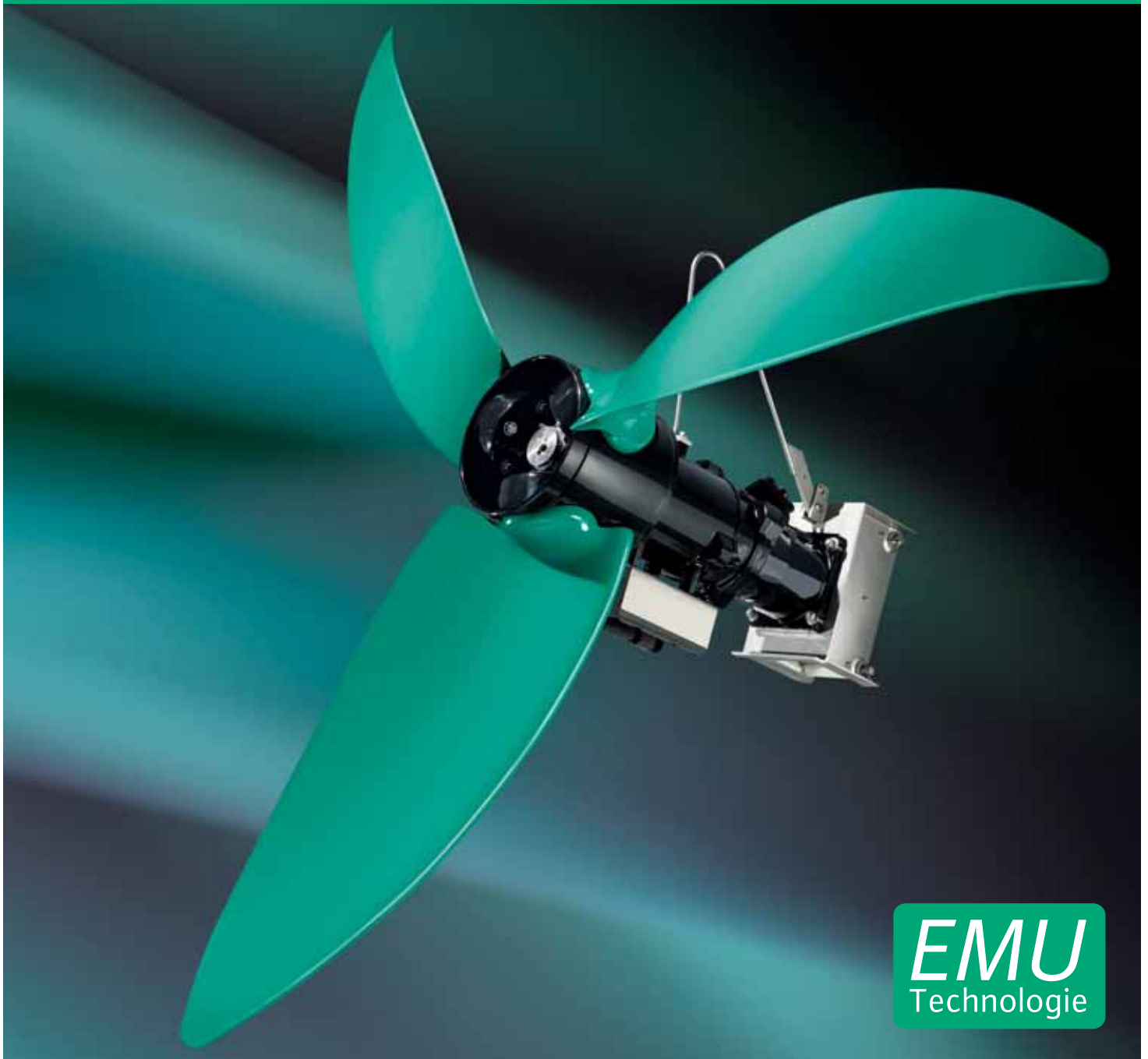


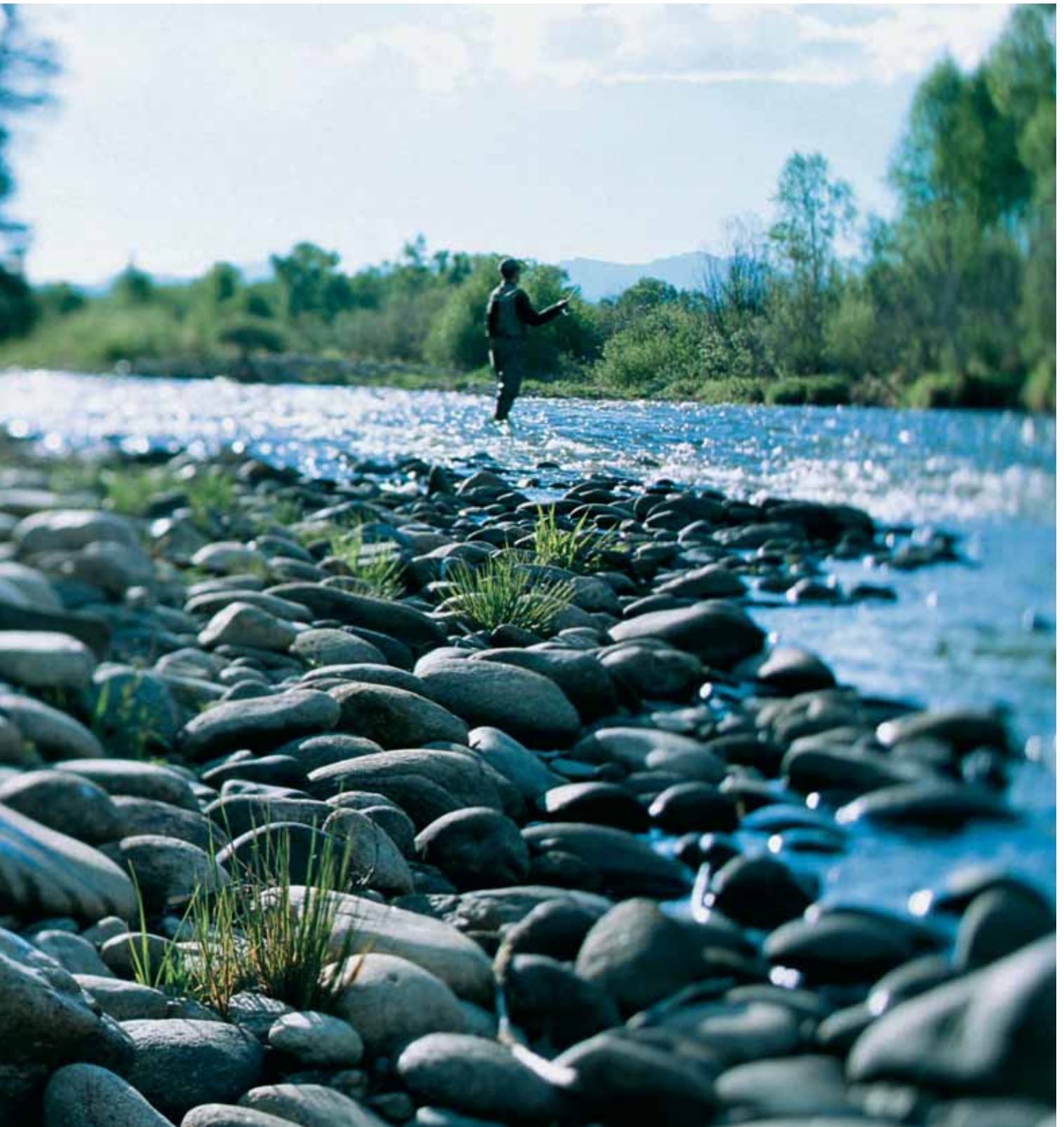
Submersible mixers.

Product overview.





Pumpen Intelligenz.



Wilo is synonymous throughout the world with the tradition of first-class German engineering. Due to the merger with EMU, Wilo pumps and systems set new standards in terms of technical performance and efficiency for municipal water and sewage management. With regard to the protection of the environment and the maintenance of resources,

sewage treatment in particular plays a major role. Continuous challenges, such as increasing solid contents in sewage, which hinder operating conditions for systems and devices, require new and innovative solutions to improve the processes and the corresponding products. Another factor is how to handle energy. In terms of global climate change,

low energy consumption, and thus also low life cycle costs, is an important issue and will be the most dynamic market topic of the future. The high-efficiency technology developed by Wilo offers an enormous potential for saving water resources and, in doing so, reducing costs. Far-sighted? We call that Pumpen Intelligenz.



Sewage treatment with Wilo.



An ideal selection of durable and economic submersible mixers that are also able to cope with problematic fluids, intelligent accessories and the expertise of our experienced staff, as well as active support, from the planning stage up to installation and beyond, are reasons why the operators of the water treatment system in Heilbronn have opted to cooperate

with Wilo. Another aspect is the energy efficiency of our submersible mixers.

24 Wilo submersible mixers are installed in the water treatment system in Heilbronn (500,000 EGW) population equivalent. Their energy-efficient application in the circulation of the activated sludge tanks saves up to 25% energy.



Technology and service.

From dimensioning to accessories.

Dimensioning, consultation, project planning.

Regardless of the individual applications, the aim of every mixer process is to achieve optimum mixing – in other words, to ensure operation without deposits in the water treatment process. For this, a technology is required that is able to cope with all requirements reliably, with a high degree of energy efficiency and in a predictable manner. The solution: Wilo submersible mixers.

The fully submersed design allows the flow pulse to take effect from the most favourable hydraulic point and thus improve the economic efficiency of the mixing process!

That is made possible by a combination of the following:

- Computer-based design
- The simulation of flow profiles
- Practical trials in a realistic test environment

Of course, during consultation and project planning, Wilo customers also benefit from the broad experience of our staff members and the continuous further development of our products. Wilo offers three basic types of submersible mixers for various different applications.

- Directly driven, high-speed mixers
- Medium-speed mixers with single transmission ratio
- Low-speed mixers with double transmission ratio

Select software.

WILO selects submersible mixers with the help of modern design software precisely for your specific application, and can therefore offer you the most economic solution.

Wilo customer service.

The support of our customers has a long tradition at Wilo. A major component of our partnership philosophy is our Wilo customer service, which is unique in the market. 52 Wilo customer service technicians are there for you with their practical support in all of Germany 365 days a year. Your Wilo customer service technician on site offers you all conceivable support.

To ensure the operational reliability of your installations and pump systems from the beginning, Wilo offers you a service that ranges from the dimensioning of the required products, on-site consultation, the installation of the units and commissioning to inspection.

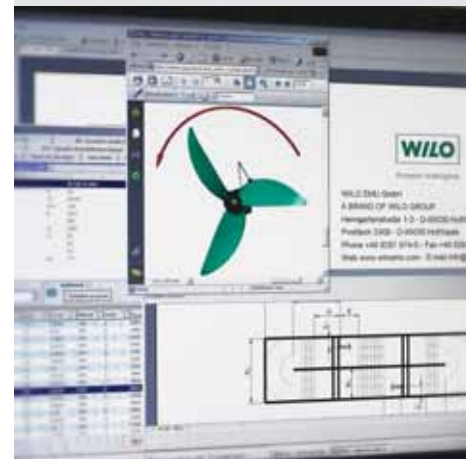
Wilo spare parts convince due to their familiar highest quality. In addition, we have all common spare parts in stock and we are able to deliver within 24 hours, if required. You are thus able to reduce your storage space and limit downtimes to a minimum.



Dimensioning, consultation, project planning

Optimum mixing processes due to:

- Computer-based design
- The simulation of flow profiles
- Practical trials in a realistic test environment



Wilo Select

- Our "Mixer Select" design software can be used to find the suitable and most economic solution for almost every application quickly and simply

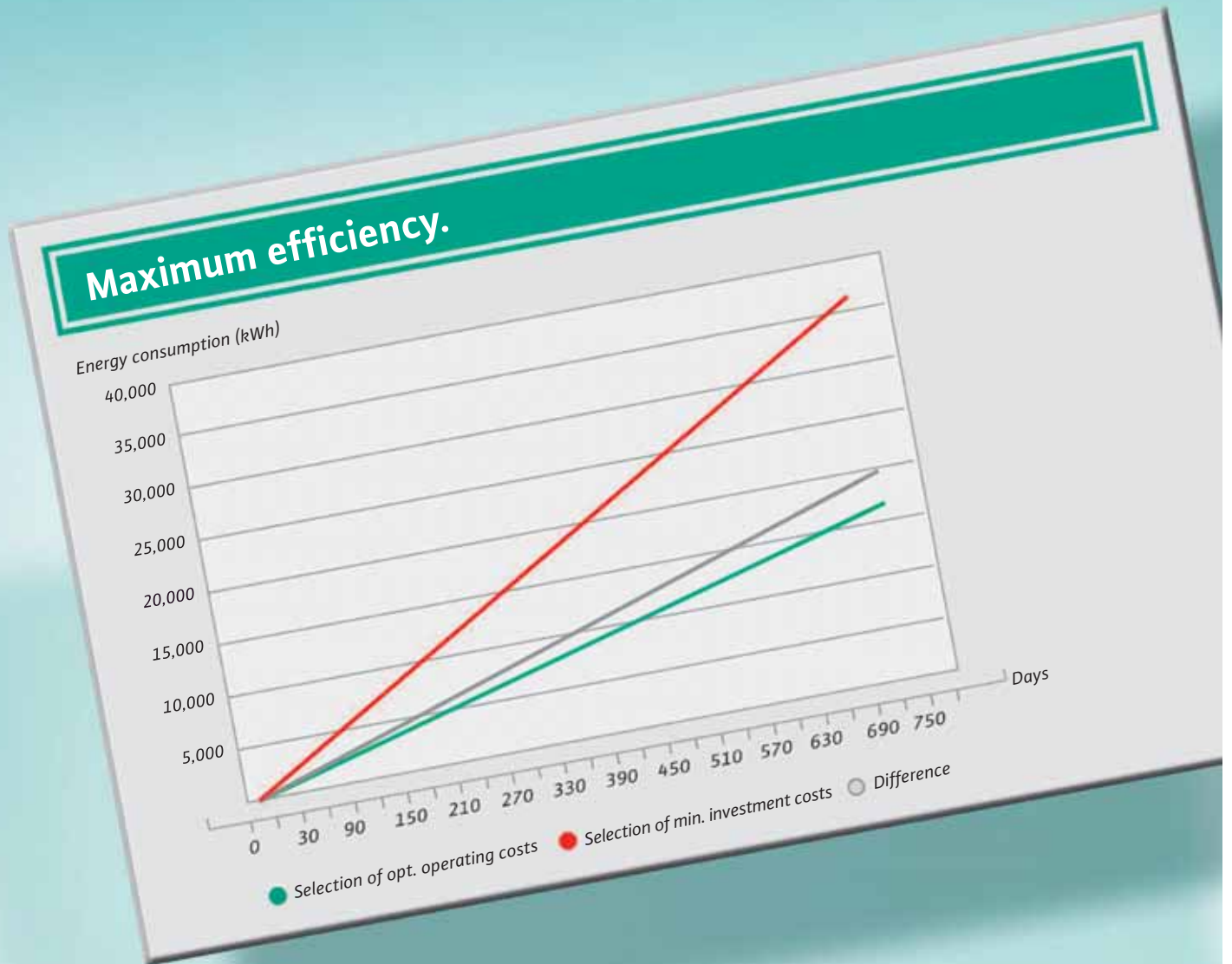


Factory customer service

- Whether for acceptance, commissioning or maintenance – Wilo's factory customer service is there for you in all of Germany 365 days a year

Save your energy costs.

Up to 30,000.00 EUR.



Tank volume	Selection of min. investment requirement	Selection of opt. operating costs	Difference	
2,950 m ³	3.64 W/m ³	1.7 W/m ³	1.94 W/m ³	
Energy savings				5,700 W
Annual operating time				8,760 h
Energy costs				0.15 EUR/kWh
Number of tanks				4
Total energy cost savings* per tank/year				7,490.00 EUR
That is equivalent to a total savings, with four tanks, of approx.				30,000.00 EUR

A small calculation example shows that considerable cost savings are possible with a mixer design optimised in terms of energy.

* at constant energy costs

Cost and energy efficiency.

The right choice.

For the operator of water treatment systems, it isn't easy to make a decision for the most economic mixing system. The least expensive investment price should not be the decisive factor under any circumstances. The economic comparison of mixers should take all relevant influencing factors into account. These include:

- Investment costs
- Installation and commissioning costs
- Energy and operating costs
- Maintenance and repair costs
- Operating failure costs
- Disposal costs

Energy costs.

Since many mixers are used for permanent operation, the energy costs have a considerable influence. The decisive parameters of submersible mixers are thrust (F) and the consumed electric power at the duty point (P_{1.1}). This allows important performance parameters to be determined.

Thrust performance ratio

The thrust performance ratio is defined according to the ISO 21630 standard. The thrust performance ratio is the quotient of the generated thrust and the consumed electrical energy. For the first time, it gives you the opportunity of an objective comparison with similar mixers.

The highest performance factors are achieved with low-speed mixers. Due to the large propeller diameter and the low propeller speeds, extremely high thrust values are possible at low power consumption.

Since the higher the generated thrust of a mixer, the better the mixing result. In terms of the requirements of a mixing process, the thrust is the decisive factor for the assessment of the performance of a mixer.

$$\text{Specific thrust power} = \frac{F}{P_{1.1}} \text{ [N/kW]}$$

Specific power density.

This parameter is the measure for comparing different mixer designs and gives an indication of the energy costs to be expected. In addition to the precise knowledge of the tank's geometry, the properties of the fluid, etc., the parameters of the mixing unit used are also required, such as thrust and the consumed electrical power at the duty point.

$$\text{Specific power density} = \frac{P_{1.1 \text{ tot.}}}{V_{\text{tank}}} \text{ [W/m}^3\text{]}$$

- F = mixer thrust [N]
- P_{1.1} = consumed power of a mixer at the duty point [kW]
- P_{1.1 tot.} = total consumed power of the installed mixers [W]
- V = tank volume [m³]

Special version – Ceram coating.

Units that come into contact with the fluid are subject both to highly corrosive as well as abrasive influences. Wilo Ceram, a solvent-free two-component coating, ensures safe protection and also increases the degree of efficiency.



Life cycle costs (LCC)

- LCC analysis is a particularly efficient method for comprehensive cost control
- For new systems or also for optimising existing installations



Highly efficient mixing technology

- Best thrust values with the most favourable performance factor
- Up to 10% energy cost savings*
- Maximum period of use at minimum maintenance costs



Ceram coating

- Unique Ceram C0 coating protects against abrasion and corrosion
- For a longer service life and reduced maintenance requirements
- More efficiency due to low friction losses

* compared to similar low-speed mixers



Wilo-EMU Miniprop and Uniprop.

High-speed submersible mixers.

Our high-speed submersible mixers, Miniprop and Uniprop, offer maximum performance in the smallest of spaces. Due to their compact dimensions, they are also suitable for narrow installation openings, such as in pump sumps or for subsequent installation in buildings. Due to the small propeller diameter, installation at the bottom of the tank is possible, which allows operation even at low water levels. For special applications in pump sumps, submersible mixers can be installed on the tank's wall or ceiling via a flexible pipe bracket.

The equipment: Make your own choice.

A thermal sensor and a one-chamber system belong to the extensive standard equipment. Depending on the field of application, with Miniprop and Uniprop submersible mixers, a distinction is made between PUR and stainless steel propellers. On request, the mixers can be equipped with an internal or external sealing chamber control. We recommend our Ceram CO coating for applications in abrasive and/or corrosive fluids. High-speed Wilo submersible mixers are also available as an option with explosion protection according to ATEX or FM. Wilo-EMU Miniprop or Uniprop submersible mixers can thus be configured according to the relevant field of application.

Wilo-EMU Miniprop.

These submersible mixers are particularly suitable for cleaning rain spillway basins, applications in pumping stations for dispersing deposits, for the destruction of floating sludge layers and for homogenising the contents of tanks in water treatment systems and in small reaction vessels.

Wilo-EMU Uniprop.

Fluids to be pumped, such as sludge with different dry matter contents and viscosity, are no problem for Wilo-EMU Uniprop submersible mixers. A special feature of this series is the guide carriage for vertical alignment. In addition, installations with fixed or flexible lowering devices are also possible with Uniprop. Wilo Uniprop submersible mixers are suitable for the widest range of applications in water treatment technology, industry, agriculture and water supply.



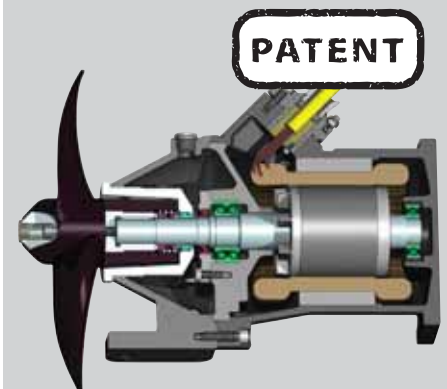
Wilo-EMU Miniprop TR 21

- Submersible mixer with optimum blade profile
- PUR propeller made of hard-wearing plastic



Wilo-EMU Uniprop TR 36S

- Heavy-duty propeller version for undefined fluids in rain spillway basins or pump sumps



Cut-away view of Wilo-EMU Uniprop

- Patented helix hub
- With self-cleaning effect
- No entanglement



Wilo-EMU submersible mixers.

Target-optimised application due to modular system.

Wilo-EMU Uniprop submersible mixers have a modular design. Wilo thus has the fitting unit for almost every application. That increases the degree of efficiency, ensures the long service life of the mixer and reduces energy costs.

Wilo-EMU Uniprop: Safety in series.

A thermal sensor and a three-chamber system belong to the standard equipment of our Uniprop submersible mixers.

The gear shaft is made of saltwater-resistant stainless steel 1.4462.

A protective sleeve and the propeller's geometry reliably prevent any entangling.

The mechanical seal is corrosion-protected by a stainless steel bush. PUR or stainless propellers, the external sealing chamber control, a Ceram C0 coating for applications in aggressive fluids or an explosion protection according to ATEX and FM are optionally available. A special feature of the Wilo Uniprop series is the optional guide carriage, which enables the vertical alignment of the submersible mixers.

The well thought out modular system.

With all Wilo submersible mixers, the submersible motor, the gear and the propeller form a compact unit of individual components that enable the precise adjustment of the mixers to the required performance data. With all of our units, ideal mixing results are based on modularly applicable propeller diameters and speeds.

Due to the use of 4, 6 or 8-pole submersible motors and various gear transmission ratios, the propeller speed may vary between 90 and 600 rpm. The optimum adjustment is worth the trouble, since it minimises propeller wear. Installation is possible on flexible lowering devices or fixed stands.

Applications in a wide range of different tank geometries is thus possible at all times without any problems. The lowering device also provides the benefit of being able to operate the mixer at different horizontal angles and – with additional auxiliary hoisting gear – at different heights.

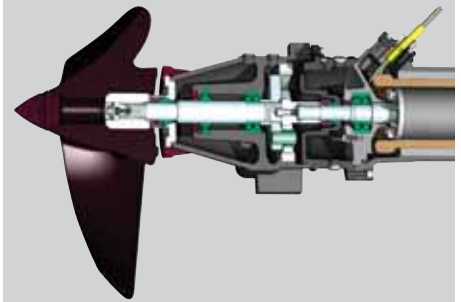
If it is mounted on a tripod, the submersible mixer can be installed freely in the tank. If you mount this stand on a concrete plate, subsequent installation in the full tank is even possible.

Due to the modular system used by Wilo, the motor, the gear and the propeller can be combined in many ways so that a large range of submersible mixers and pump curves are available.



Wilo-EMU Uniprop TR 75-2

- Standard version with PUR propeller for a wide range of applications
- Here with sliding carriage for sludge applications



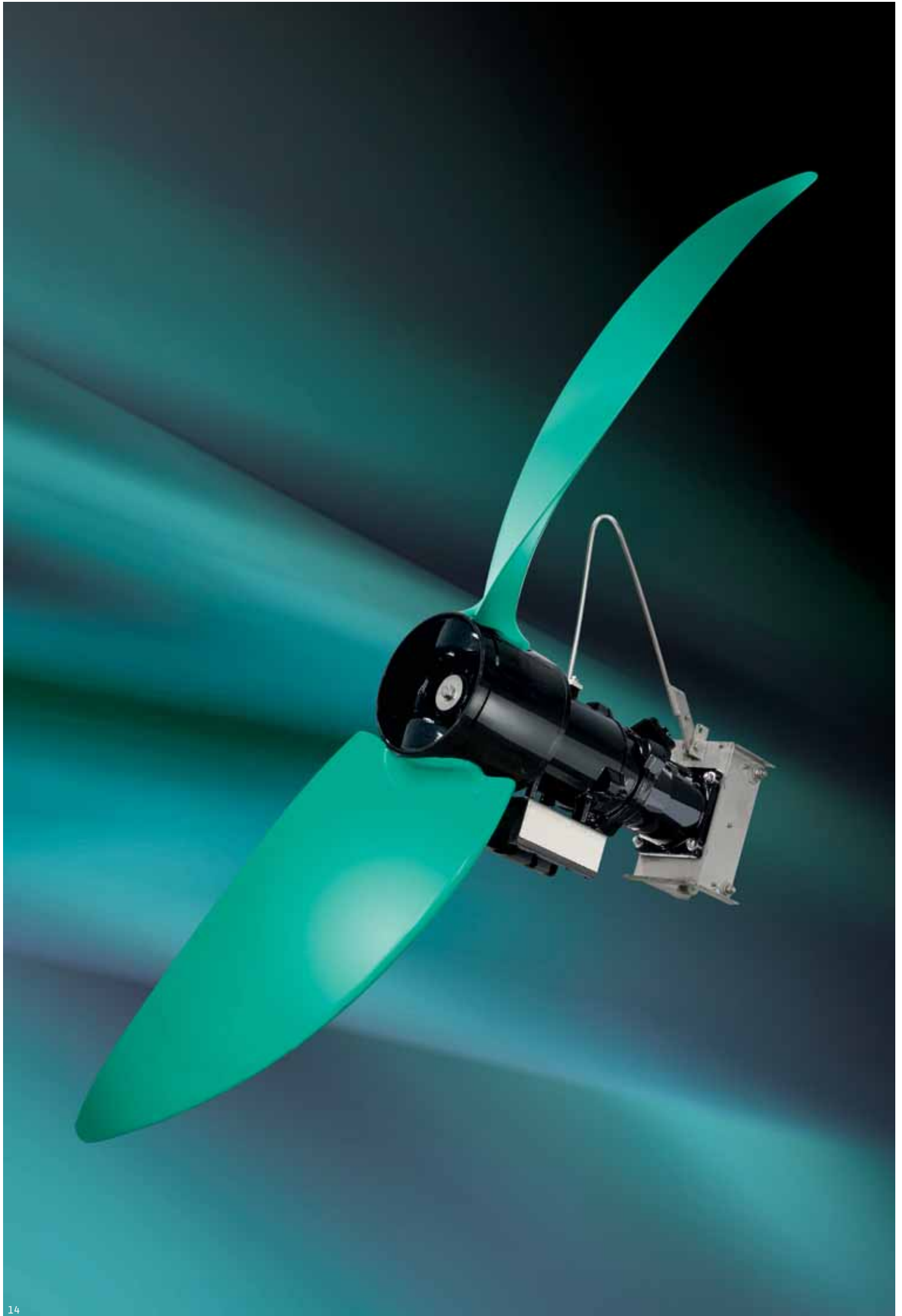
Cut-away view of Wilo-EMU Uniprop

- The special feature of Wilo submersible mixers is the planetary gear with a special prechamber for collecting leaking water



Modular design

- Modular system for all Wilo submersible mixers, from Uniprop to Megaprop – always the right solution



Wilo-EMU Maxiprop and Megaprop.

Low-speed submersible mixers.

Wilo offers different low-speed submersible mixer models:

- Maxiprop with two-blade propeller
 - Megaprop with three-blade propeller
- Different blade loads occur here with the same thrust. With the Wilo-EMU Megaprop, the load is distributed among three propeller blades. That ensures smooth operation even if inflowing conditions are unfavourable. Extremely durable one-piece laminated GRP blades ensure maximum periods of use and minimum maintenance costs. They can be replaced individually. "Slow runners" are ideal for creating a directed flow in water treatment systems and for suspending solids. In activated sludge tanks, biological phosphorus removal tanks and denitrification tanks, they prevent activated sludge from settling. That results in a wide range of applications in water treatment technology, industry, agriculture and water supply.

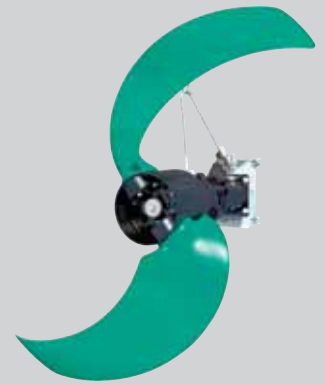
Equipment.

Wilo-EMU Maxiprop and Megaprop submersible mixers are available with propeller diameters of 1,600 mm to 2,600 mm. Depending on the submersible motor (4, 6 and 8-pole motors are available) and the transmission of the planetary gear, propeller speeds between 17 and 60 rpm are feasible. The resulting mixing forces are absorbed by the oversized gear mounting and not passed on to the motor bearings. A thermal sensor and a three-chamber system belong to the extensive standard equipment. The gear shaft is made of saltwater-resistant stainless steel 1.4462. The standard protective sleeve, the hub closing ring and the well-designed propeller geometry reliably prevent any entangling. The counterering of the mechanical seal is pressed into a stainless steel bush to prevent any corrosion. The submersible mixer is optionally available with explosion rating according to the ATEX or FM standard. The submersible mixers are equipped with an external sealing chamber control as an option. We recommend our Ceram C0 coating for applications in abrasive and/or corrosive fluids.

Installation:

As individual as your system.

Due to the individual modules, you can ensure that the Wilo-EMU Maxiprop and Megaprop submersible mixers meet your requirements precisely. In addition, Wilo will make an exact installation suggestion for your special application. The installation is performed according to the geometry of the tank on fixed stands, either free-standing or, for operating bridges that can be walked on, with an attachment point at the top.



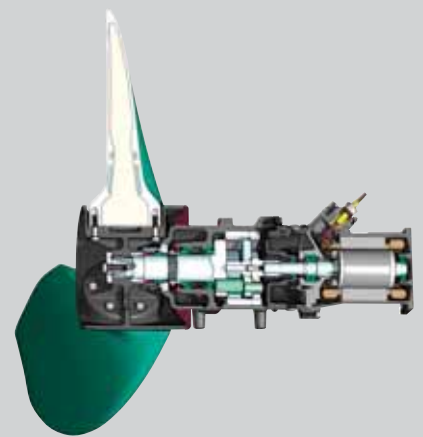
Wilo-EMU Maxiprop TR 221

- Low-speed submersible mixer with small propeller diameter
- One-piece GRP laminated blades for maximum periods of use



Wilo-EMU Megaprop TR 326

- Innovative blade shape for very smooth operation
- Self-cleaning effect due to backward bent blades
- Up to 10% energy cost savings*



Cut-away view of Wilo-EMU Megaprop

- Two-stage planetary gear for optimum efficiency
- Corrosion-resistant output shaft for high operational reliability

* compared to similar low-speed mixers



Wilо-EMU accessories.

All you need for intelligent installation.

Wilо offers a wide range of innovative accessories that are compatible with the submersible mixers. Wilо manufactures all accessory parts in its own factories. Planning aids, dimension and ITD sheets (technical engineering data) and accessory sheets in common file formats are available on request.

Lowering devices.

Optimum results can only be expected if a mixer can actually be fitted at the ideal installation location. That is why lowering devices that can be positioned freely are the prerequisite for a mixer version that is optimised in terms of energy consumption. Wilо's range of products provides you with flexible systems for wall-mounted installation as well as stands for free positioning in the tank. Mature technology and resistant materials ensure a high degree of stability and durability.

Auxiliary hoisting gear.

Wilо's LGA-certified auxiliary hoisting gear makes it easy to install our submersible mixers safely or lift them out of the tank for maintenance. Wilо offers auxiliary hoisting gear with a jib length up to 3.2 m and a load-bearing capacity up to 500 kg. To ensure safe and simple implementation, some models can be disassembled into compact individual parts. In addition, most types allow you to choose between galvanised steel, A2 steel (1.4301) and A4 steel (1.4571) as the material and between a two-gear aluminium winch and a stainless steel hand winch.

Other accessories.

Wilо's range of products is supplemented by extensive, practical accessories, such as e.g.:

- An additional polyamide rope slackening device for control and cable feed. It relieves the supply lines to the mixer.
- A separate rope protection (winding unit) for using an auxiliary hoisting gear at different installation locations.
- A catch hook or an automatic catch device for lifting and lowering submersible mixers. The rope is thus not constantly exposed to the fluid.



Lowering devices

- Can be swivelled or is fixed
- Resistant materials
- High degree of stability and durability



Auxiliary hoisting gear

- LGA-certified
- Wide range of different jib lengths
- Adapted precisely to Wilо submersible mixers



Accessories

- Wilо provides all accessories – from guide pipes, frames and sliding carriages to rubber buffers
- Adjustment to a wide range of different applications without problems.



Wilo location in Hof, Germany

WILO SE with currently about 6,000 employees has agencies in more than 70 countries. With its innovative quality products, Wilo is synonymous throughout the world with the tradition of first-class German engineering. More than 400 highly motivated staff members are employed at Wilo in Hof/Saale in Germany for the fields of municipal water supply, sewage disposal

and wastewater treatment. The main products include submersible mixers. Innovative concepts and the application of highly efficient technology are what distinguishes these products by Wilo. They are offered under the Wilo EMU brand via the international distribution network of WILO SE and set standards for energy efficiency and durability for a wide range of different applications.





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