

SULZER

Sulzer Pumps

Meeting Today's Challenges within Wastewater Treatment

Products and Solutions that Save
Energy and Increase Reliability



The Heart of Your Process

abs

Returning Clean Water to Source

Clean water is essential to people and environments the world over.

By providing effective solutions for wastewater treatment, we play a major role in returning clean water to its source.

ABS treatment products and services from Sulzer Pumps focus on energy saving, safety, reliability and efficiency of wastewater treatment processes.

Critical Demands

Wastewater treatment is demanding. Capital investments, operating costs, growing populations and environmental legislation are big concerns.

Choosing the most cost-effective solution from one of many equipment suppliers is not easy. Maintaining and upgrading existing treatment systems is no small task either.

The mission to protect a growing population and limited resources makes the choice of an experienced wastewater technology partner crucial.

The Solution Provider

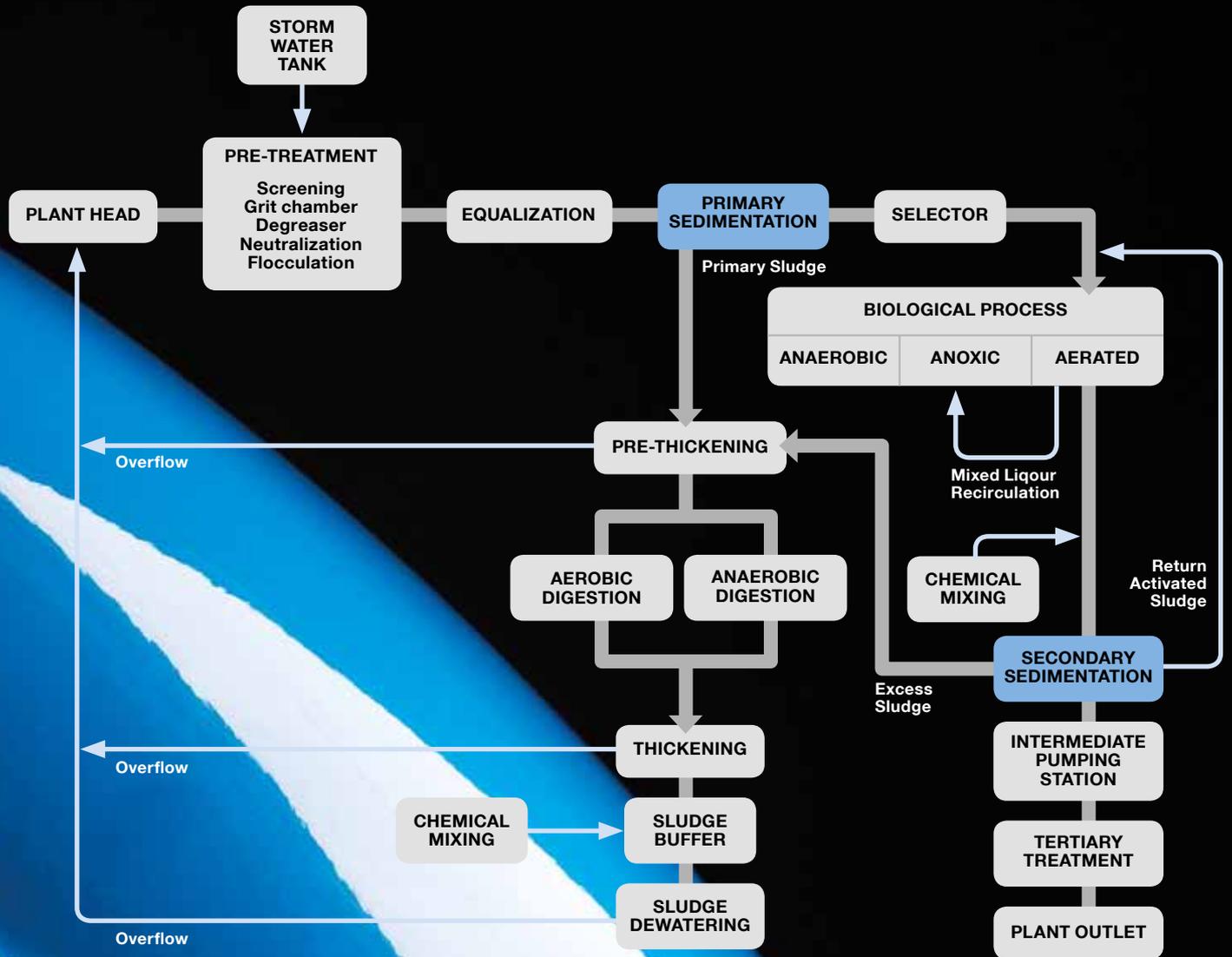
Wastewater professionals worldwide are working with ABS solutions from Sulzer Pumps to remove organic pollutants, phosphates and nitrates, to protect surface and groundwater, to ensure safe coastal and bathing water qualities, and to optimize sludge treatment.

Cost-effective solutions for new plants or refurbishments of existing installations are the strength of Sulzer Pumps. Our application know-how vouches for the optimal selection and combination of products and services for each unique application.

Maximized Efficiency and Minimized Cost

Our service program covers all aspects of operation and maintenance of pumps, mixers, aeration systems and automated controls from initial pumping station design to propositions on complete treatment facility management – and everything in between. The program helps treatment plants to achieve optimal life cycle economy.





Contents

Mixers and agitators	8
Aeration systems	10
Submersible, dry-installed and recirculation pumps	12
Technology	16
Services	18

A Range of High-Performance Solutions



Ever-increasing demands at different levels are driving the development of the wastewater industry.

At the global level, this involves climate change, reduced carbon emissions and tighter legislation on pollution. Business level drivers include reducing operational and energy costs, and improving service levels. And at the social level, lower water consumption, increased personal hygiene and environmental protection are important goals.

This is why the wastewater industry is turning to its suppliers to help meet these demands being placed on it.



Reliability, Less Energy, Reduced Carbon

In general, the reliability of equipment, process and operations is still the number one business market driver within the wastewater industry.

Energy saving resulting from the ever-increasing cost of electricity along with the associated demand for reducing the carbon footprint are also important drivers that are expected to strengthen in the future.

There will also be a stronger focus on enhancing the performance of equipment through new thinking and advanced designs. For example, there is a drive to incorporate IE3 premium-efficiency or permanent-magnet motors in products to significantly reduce energy consumption and carbon emissions.

New mixer propeller designs are also required to increase mixing efficiency with less power input.

Meeting the Demands

We are well-equipped to meet the demands of the wastewater industry to install high-performance systems and equipment that can reduce energy consumption, carbon footprint and pump blockage, as well as state-of-the-art mixing & aeration technology that can make processes more efficient and secure.

We have already introduced a number of world-leading technologies, some of which are described in this brochure, that have been well-received by the market because they have been scientifically proven to save energy and optimize wastewater collection and treatment.

The ABS EffeX Revolution

Our world-leading technologies have been made possible by the ABS EffeX Revolution. This embodies continuous striving to design, develop and manufacture the most innovative and resource-conserving solutions on the market. It's about stretching the limits and achieving performances not possible before.

An ABS EffeX solution offers long-term product reliability, minimal maintenance and maximal equipment life cycles, as well as greater energy-saving to cut energy consumption and reduce the carbon footprint.

The vision of providing optimal life cycle economy by the ABS EffeX Revolution is based on future-proof designs resulting from thoroughly understanding the best technological solutions and ensuring they comply with, and even exceed, both current and forthcoming relevant legislation.

Benefit from the ABS 4-Step Process

We complement our innovative technology solutions and customer support with a range of on-site survey and assessment services to reduce energy and operational costs in a 4-step process comprising:

1. Collecting information and benchmarking
2. Analyzing data and agreeing on the right strategy
3. Implementing hardware and training
4. Measuring operating data and confirming performance

Working closely together on each of these steps is the secure route to improving your wastewater treatment plant.







Mixers and Agitators



It takes more than pumps to treat wastewater and bring fresh water to millions of people. Mixers and agitators are also needed.

We provide more water processing equipment and technology than any other pump manufacturer. We offer solutions that improve your water standards and decrease operational costs in one go.

Biological Process Know-How

ABS mixers and agitators play a major role in the biological processes of wastewater treatment plants. But removing pollutants and recovering clean water also demands expertise that cannot be manufactured.

Hands-on field work and R&D are in continuous interaction in our approach to development.

Over the years, we have built a unique knowledge base that we put to use in providing you with the best solutions. By combining innovative pumps, mixers, agitators, aerators, compressors and control instruments in an integrated solution, we optimize performance in terms of energy saving, reliability, efficiency and flexibility.

Return on Investment

The ABS range covers highly efficient agitators and submersible mixers. For many municipal and industrial mixing applications – blending, solid, suspension, dissolving, destratification and circulation – the modular mixer system, in combination with flexible mixer positioning and easy installation, guarantees a considerable saving on investment and energy costs.

Easy and Reliable

Patented solutions, including an innovative coupling system, guarantees an even higher process reliability and helps the plant operator to carry on inspection work quickly and easily.

Tailor-Made Service Offer

The ABS service program can be tailored to meet your exact requirements, making sure your plant operates in the most efficient way.

We cover all aspects of operation and maintenance of pumps, mixers, aerators, turbocompressors and automated controls from initial pumping station design to comprehensive framework agreements covering your every need.

Product Range

ABS Submersible Mixer RW

These mixers have an integral motor and are suitable for agitating, blending, mixing, dissolving and suspension of solids in municipal treatment plants, industry and agriculture. Sulzer Pumps offers highly efficient multipole and gear driven mixers with either standard or explosion-proof motor enclosures.

Propeller diameter:	200 - 900 mm
Motor range:	1.2 - 25 kW
Mixing flow max:	5,900 m ³ /h 1.63 m ³ /s



ABS Scaba Agitator

Scaba agitators are of a robust, modular design and can be combined with various types of drive units, seals and impellers. The special propeller makes the required process perform at the lowest possible power input. Treatment of highly polluted water or other biodegradable masses with high organic pollutants increases biogas and energy production using ABS Scaba agitators within anaerobic digesters.

Propeller diameter:	125 - 8,000 mm
Shaft diameter:	20 - 260 mm
Motor range:	0.12 - 200 kW
Mixing flow:	customized



ABS Submersible Mixer XRW 400 and 650



The ABS submersible mixer XRW with a permanent-magnet motor is another world first in the ABS EffeX revolution. Using IE3 equivalent permanent-magnet motors together with optimized and proven propeller designs enables the ABS submersible mixer XRW to achieve the lowest energy consumption possible for medium-speed mixing.

Users gain a total efficiency improvement of up to 35% compared with other existing medium-speed mixer designs.

Propeller diameter:	650 mm
Motor range:	5.5 - 10.0 kW
Mixing flow max:	0.83 m ³ /s



ABS Flow Booster SB

The ABS flow boosters SB are slow running submersible units with integral motors for gentle circulation and mixing of fluids in treatment plants and industrial applications. The flow booster is complete with monocast propeller blades and excellent self-cleaning properties, giving optimum operation with low energy input. The unit can be raised and lowered for inspection even in filled tanks.

Propeller diameter:	900 - 2,500 mm
Motor range:	1.4 - 4.6 kW
Mixing flow max:	4.3 m ³ /s



ABS Flow Booster XSB



This slow running mixer is yet another world first in the ABS EffeX revolution. Although the ABS flow booster XSB is the biggest of its type on the market for wastewater treatment, it cuts energy consumption by a remarkable 25%! It achieves this through a premium-efficiency motor, a highly efficient gearbox and a unique innovative design

that boosts mixer efficiency as proven by long and exhaustive testing.

Propeller diameter:	2,200 mm, 2,500 mm and 2,750 mm
Motor range:	5.5 - 7.5 kW
Mixing flow max:	6.2 m ³ /s



ABS Submersible Mixer SB 1200 KA

The ABS submersible mixer SB 1200 KA combines all the specific requirements of those treatment processes where the biofilm is bound on the surface of plastic carriers. The low tip speed in combination with a specially designed propeller, prevent any negative effects on the carrier material during the mixing. The energy cost is reduced thanks to a unique drive unit.

Propeller diameter:	900 - 1,080 mm
Motor range:	3.0 - 4.6 kW
Mixing flow max:	0.82 m ³ /s



Aeration Systems



Under the right conditions, nature is the most cost-effective catalyst you can employ for wastewater treatment. Providing perfect conditions for nature to work in a man-made environment with controlled processes requires coordination of technology and biology. We have the knowledge and experience required.

Top Efficiency at Lowest Cost

Our aeration systems only use compressed air to enhance the natural biological process.

Clever aeration and mixing solutions decrease reaction times. This way we can boost the air-to-liquid interaction to help you obtain top efficiency at the lowest cost while minimizing the environmental impact.

System Optimization

You can further improve treatment efficiencies while shrinking basin surfaces.

Existing or new plants with space limitations can increase the liquid depth of basins to be deeper than 12 m with an ABS solution from Sulzer Pumps.

We make use of our process knowledge in combination with the most complete range of equipment in the market. We help you select the best combination of air compressors, fine bubble diffusers systems, submersible mixers, self aspirating and pressurized submersible aerators and recirculation pumps. Combined with the state-of-the-art ABS turbocompressor HST, the system design can be optimized in terms of plant layout and energy consumption.

Our job is to help you increase plant productivity while reducing the life cycle cost.

Product Range

ABS Turbocompressor HST

The ABS turbocompressor HST provides pressurized air to the aeration system. The HST is an integrated turbocompressor based on a high speed motor driven by a frequency converter. No mechanical wearing parts or lubricants are used in the HST thus further minimizing life cycle costs. This is made possible by electronically controlled magnetic bearing technology which levitates the integrated rotor-impeller single-piece assembly.

The optimized drive technology controls the machine's rotational speed, thus achieving optimal operating efficiency and minimizing energy consumption. Full local and remote control of flow and pressure within the whole operating range is possible.

Air flow range:	1,000 - 16,000 Nm ³ /h
Pressure range:	30 - 125 kPa
Noise level:	65-80 dB



ABS Nopon Disc Diffuser System

ABS Nopon disc diffuser system offers a number of alternative membrane and porous aeration diffuser models that are easy to install and maintain. Special features that improve the operation reliability and efficiency include the non-return valve, available on all models and the sliding ring, available on the ABS Nopon membrane diffusers.

High oxygen transfer efficiency combined with low pressure drops makes the ABS diffusers extremely effective.

In the Nopon disc diffuser system MKL 215, air passes through pores in the disc to form medium-size bubbles when released through

the disc surface. In the Nopon disc diffuser system PIK 300, the membranes bulge out and slits open during aeration by the pressure of compressed air.

Net effective area:	0.025 m ² (HKL, KKI, MKL) 0,060 m ² (PIK, PRK) 0.186 m ² (DS 20)
Operating range:	0.5 - 15 m ³ /h (referred air t° = 20 °C and 101.3 kPa ambient pressure)



ABS Submersible Aerator OKI

ABS Nopon submersible aerator OKI is a heavy-duty unit with the capacity to operate both as an aerator and/or a mixer. This makes it suitable for discontinuous aeration processes, such as simultaneous denitrification, nitrification and SBR processes, even at depths of 12 m and in liquids with high dry matter content. The high pumping and mixing capacity of the OKI aerator makes it the right choice for SBR,

MBR and MBBR processes. Maintenance or changing the plant configuration is easy thanks to the OKI's liftability.

Oxygen transfer:	up to 405 kg O ₂ /h
Motor range:	3 - 37 kW



ABS Submersible Aerators TA and TAK

These products are suitable for wastewater treatment in municipal and industrial plants. Main application areas are mixing and equalization tanks and activated sludge tanks. Suitable also for SBR-reactors and sludge storage tanks at a water depth between 2 and 9 m. The aerator is free-standing on the bottom of the basin and hence can be installed without emptying the basin.

The self aspirating aerator has a very low noise level due to its efficient silencer. Compared to conventional surface aerators the submerged TA aerator creates no aerosol thus preventing formation of coliform bacteria. It produces fine bubbles and the oxygen transfer factor is high.

Oxygen transfer up to:	80 kg O ₂ /h
Motor range:	3 - 75 kW
Noise level:	48 - 75 dBa



ABS Venturi Jet Aerator

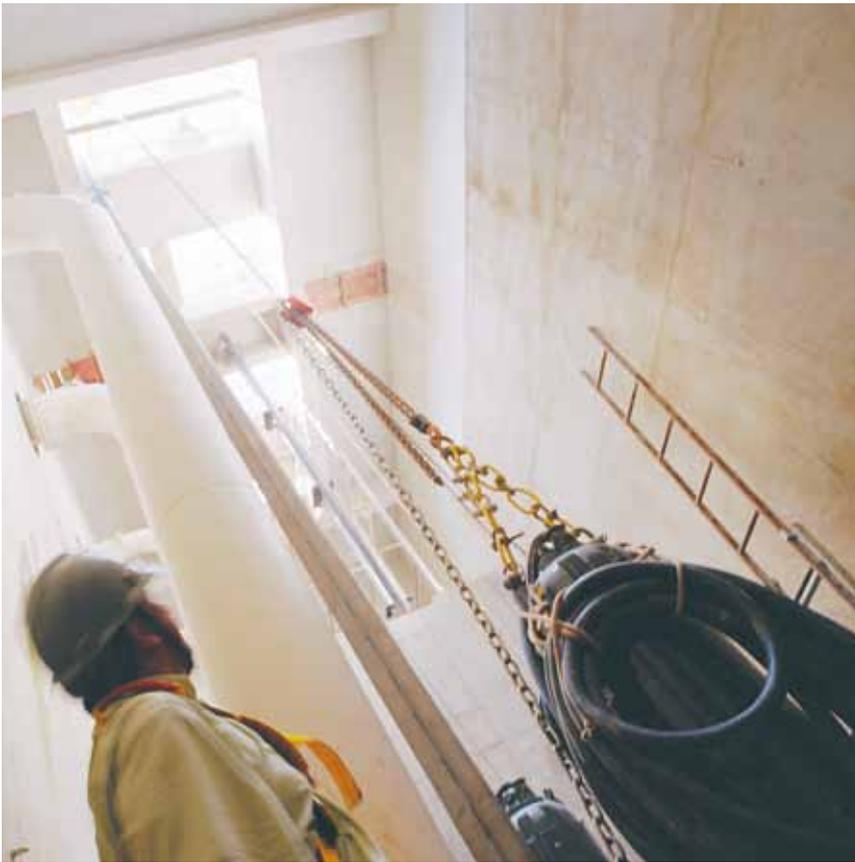
A unit ideal for mixing combined with aeration of municipal and industrial wastewater in small-medium plants. It is also suitable for use in equalization tanks where mixing and aeration reduce septicity and smell. Another application is cleaning stormwater tanks. The Venturi jet aerator is especially suitable for emergency or intermittent aeration tasks.

It is based on the injection principle: an effective air-water mix is produced, which results in optimum aeration and suspension of solids.

Water circulation, max:	500 m ³ /h
Air throughput, max:	550 m ³ /h
Motor range:	1.3 - 18.5 kW



Submersible and Dry-Installed Pumps



Wastewater treatment plants always need pumps for proper operation. From lifting the sewage up to the plant elevation to pressurizing the effluent against a river at high water, there are many different requirements for wastewater pumps of all sizes.

For biological wastewater treatment plants, Sulzer Pumps offers pumps for activated sludge return, mixed liquor recirculation, and for an intermediate lift into a tertiary treatment process. We also have extensive experience in stormwater retention applications as well as in stormwater bypass pumping stations.

Product Range

ABS Submersible Sewage Pump XFP Range

The ABS EffeX range of submersible sewage pumps has built-in IE3 premium-efficiency motors in accordance with IEC60034-30 to optimize motor efficiency. The main benefit is the highest efficiency available on the market without any impact on the risk of increased blockage often associated with hydraulic efficiency. The models are supplied for reliable and economic pumping of clear water, polluted water and heavily polluted sewage containing solids, faecal slurry and sludge in commercial, industrial and municipal applications.

This pump range includes a new impeller design called ContraBlock Plus, which ensures that the free solids passage is never reduced below 75 mm.

Flow max:	8,640 m ³ /h
Head max:	110 m
Motor range:	50 Hz, 1.3 - 350 kW 60 Hz, 2 - 400 kW



ABS Submersible Sewage Pump AFP (M8 & M9)

ABS submersible sewage pumps AFP (M8 & M9) are designed for reliable and economic pumping of heavily polluted sewage in industrial and municipal applications. The pumps have high efficiency water pressure-tight encapsulated fully flood-proof motors in standard or explosion-proof version.

They are equipped with a jacket cooling system as standard, and are suitable for both wet and dry installation.

Discharge sizes:	DN 300, 400, 500, 600, 800
Motor range:	50 Hz, 160 - 550 kW 60 Hz, 185 - 600 kW



Product Range

ABS Dry-Installed Pump AFC

A dry-installed sewage pump for horizontal or vertical installation with air-cooled IEC motor. It is suitable for the pumping of wastewater and sewage from sites. Pull-out design allows easy removal of motor without disconnecting pump from pipework.

Discharge sizes:	DN 50, 80, 100, 150, 200
Motor range:	3 - 22 kW



* Optional



ABS Dry-Installed Sewage Pump FR

A pump for handling unscreened sewage in municipal and industrial applications. The back-pull-out design utilizes standard electrical motors and a dry-running capability is possible with a double seal arrangement.

The pump can be supplied with optional equipment where self-priming is required.

Discharge sizes:	DN 50, 80, 100, 150, 200
Motor range:	3 - 55 kW



* Optional



ABS Submersible Mixed Flow Column Pump AFLX

The AFLX series is a range of submersible mixed flow column pumps for direct installation in discharge pipes that save space and installation costs. They are intended for large flows and moderate heads for stormwater, land drainage and flood protection. The AFLX can handle sewage from commercial, municipal and industrial sources as well as liquids containing solids

material. The robust design and quality materials ensure high reliability and hydraulic efficiency up to 88%.

Discharge sizes:	DN 600 - 1,200
Motor range:	50 Hz, 11 - 350 kW motor IE3. Up to 650 kW standard motor. 60 Hz, 11 - 400 kW motor IE3. Up to 700 kW standard motor.



ABS Submersible Propeller Pump VUPX

These pumps are ideal for applications where large volumes of waste or process water have to be pumped up to heads of 12 m. They are compact and can be installed vertically to save space. They are ideal for various applications. The compact units are lowered into standard steel tubes and need no anchoring.

The robust design and quality materials ensure high reliability and hydraulic efficiency up to 88%.

Discharge sizes:	DN 600 - 1,400
Motor range:	50 Hz, 11 - 350 kW motor IE3. Up to 650 kW standard motor. 60 Hz, 11 - 400 kW motor IE3. Up to 700 kW standard motor.



ABS Submersible Recirculation Pump RCP

These pumps are used for pumping and circulating activated sludge, especially for the denitrification/nitrification process. The self-cleaning propeller is intended for lightly polluted sewage and activated sludge. The hydraulic efficiency is very high when pumping large flows and low heads.

Unlike conventional axial flow pumps, the RCP recirculation pumps do not require expensive structures in the tank.

Flow max:	4,500 m ³ /h
Head max:	2.1 m







Advancing Technology with the ABS EffeX Revolution

The ABS EffeX Revolution embodies continuous striving to design, develop and manufacture the most innovative and resource-conserving solutions on the market. This has resulted in the application of new technology to save energy, reduce the carbon footprint, increase product reliability and make wastewater treatment processes more efficient.

Our strategy is to continuously introduce a stream of advanced ABS EffeX products that satisfies the increasing demands placed on the wastewater industry by the market and society at large.

Energy-Saving Solutions

In 2009, we were the first company in the world to introduce a range of pumps with built-in IE3 premium-efficiency motors in accordance with IEC60034-30 to optimize motor efficiency.

The ABS EffeX submersible sewage pump XFP range has since been recognized by wastewater treatment plants to fulfill their need of reducing both energy consumption and carbon emissions. Premium-efficiency motors are now also included in the slow running submersible ABS flow booster XSB mixers to significantly increase energy saving.

Another approach to energy saving resulting from the ABS EffeX Revolution is the IE3 equivalent permanent-magnet motor incorporated in the ABS submersible mixer XRW. This mixer offers long-term reliability, minimal maintenance and maximal equipment life cycles, but most of all, greater energy saving to cut power consumption.

Other Innovative Designs

Our range of ABS submersible sewage pumps XFP makes use of a completely new impeller design called ContraBlock Plus. This solution takes the best of the tried and tested ContraBlock designs and adds new functionality to ensure that the free solids passage is never reduced below 75 mm to give a further level of protection against blockage.

Our totally new propeller design with the ABS flow booster XSB gives a maximum thrust of more than 6,400 N from the 3-blade model. In addition to excellent mixing, this means that one mixer is now sufficient in most cases where two were required before.

Yet another innovative design is the robust 3-stage helical gearbox of this mixer, which provides high efficiency and very long operating life because of its new strong oil-lubricated bearing configuration with a calculated lifetime of more than 100,000 h.



Although the slow running submersible mixer ABS flow booster XSB is the biggest of its type on the market for wastewater treatment, it cuts energy consumption by a remarkable 25%!

It achieves this through an IE3 premium-efficiency motor, a highly efficient gearbox and a unique innovative propeller design that boosts mixer efficiency.



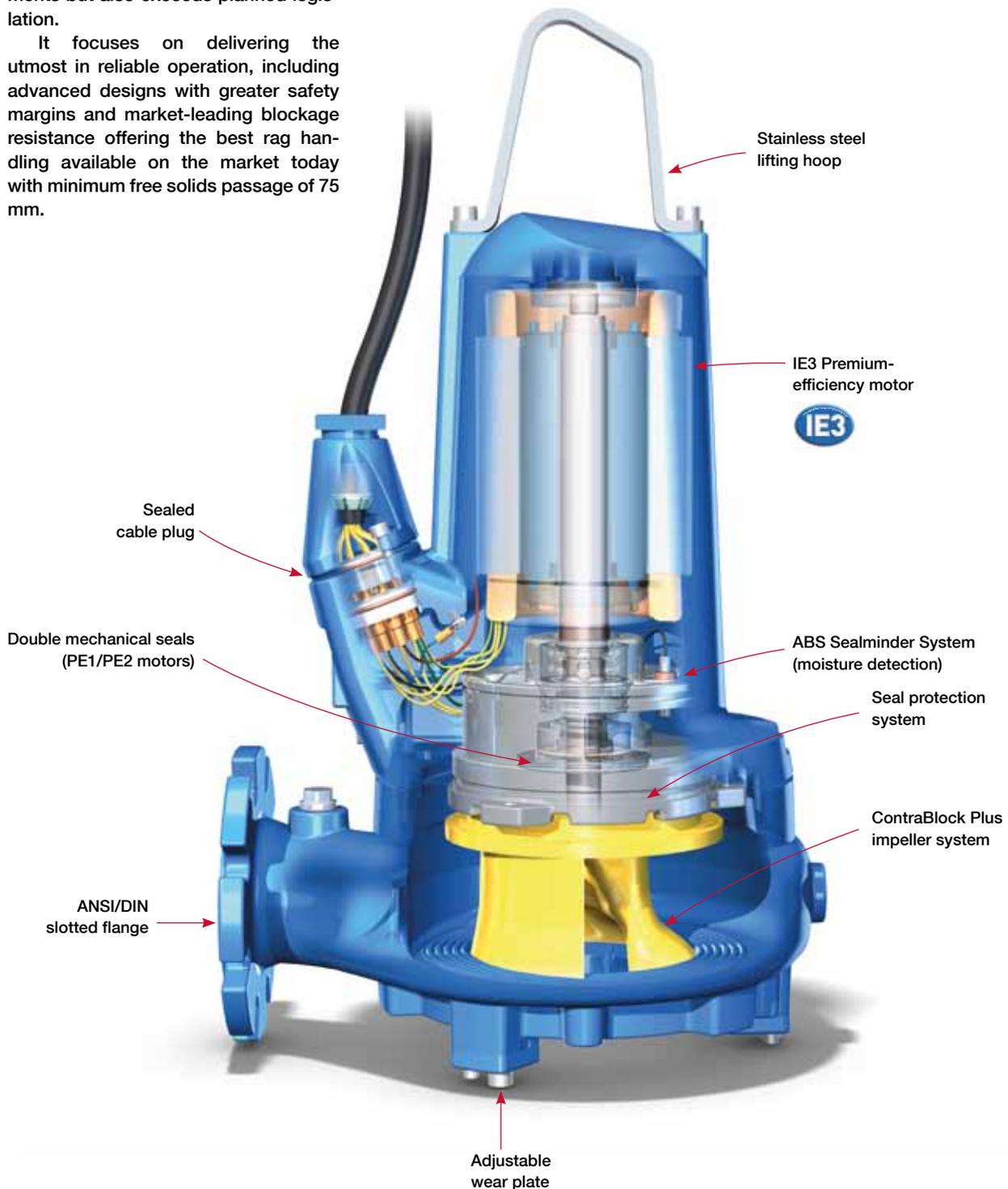
The ABS submersible mixer XRW has a permanent-magnet motor IE3 equivalent to achieve the lowest energy consumption possible for medium-speed mixing. Up to 35% energy can be saved compared with other existing medium-speed mixer designs.

A Completely New Design Concept

The new range of ABS EffeX submersible sewage pumps XFP is based on a completely new concept.

Available technology is pushed to the limit to achieve a design that not only satisfies today's stringent requirements but also exceeds planned legislation.

It focuses on delivering the utmost in reliable operation, including advanced designs with greater safety margins and market-leading blockage resistance offering the best rag handling available on the market today with minimum free solids passage of 75 mm.



A Range of Services to Prolong Your Equipment Lifetime

We provide a complete range of after-sales services ranging from a simple workshop repair right through to a complete operation and maintenance framework agreement for your wastewater collection network.

All our services have high-quality procedures, high health and safety standards and complete flexibility to meet your business needs.

Sulzer Pumps is not only the expert when it comes to supplying your equipment needs, but we can also support you throughout the equipment's life cycle with tailored service and maintenance programs to satisfy your particular needs.

Equipment Installation Services

Installing wastewater handling equipment is a complex and sometimes dangerous task. Incorrect or poor-quality installation work may never be spotted, but is often the root cause of high running costs, poor reliability and shortened equipment life.

Our Equipment Installation Services are performed by trained engineers who know how to work safely and arrive in vans equipped with all the tools they need. Our engineers can also show your personnel how to operate the equipment and make recommendations for the most cost-effective maintenance schedules. These services cover:

- Equipment Installation (mechanical)
- Equipment Installation (electrical)
- On-site commissioning and testing

Routine Maintenance Contracts

Regular maintenance of pumps and other water treatment equipment reduces major breakdowns and emergency call-outs. This means lower, more predictable costs – as well as fewer complaints and happier customers.



Planned Maintenance Services include a complete range of support activities. These range from contracts to regularly visit sites to check equipment condition to planned equipment overhaul to restore effective operation.

Working in conjunction with our customers' personnel, all work is completed efficiently and with the minimum of disruption on site. We take care of:

- On-site maintenance and repair
- Site and equipment surveys
- Energy management services

Spare Parts and Spares Kits

Keeping essential spare parts on hand – and instantly available whenever maintenance personnel need them – is a key element of an effective maintenance strategy. Sulzer Pumps has developed extensive central stocks and efficient logistics to guarantee quick deliveries for commonly used parts. Our software tools, backed up

with expert technical assistance, help with equipment identification and parts selection. To simplify administration you can buy Spares Kits, containing everything required to service your equipment. We can supply you with:

- Spare parts
- Spares kits
- Service kits
- Upgrade kits
- Strategic spares recommendations

Workshop Services

Sulzer Pumps has an extensive network of workshops, strategically located close to our customers to provide rapid response. Our workshops are staffed by highly trained engineers and fully equipped to repair and refurbish all types of pumps and wastewater treatment equipment. They also have direct access to technical support from our manufacturing centers if required.

Workshop Repairs will restore high-value equipment to "as new" using only the manufacturer's original spare parts – increasing reliability and cutting energy consumption. In all, we can help you with:

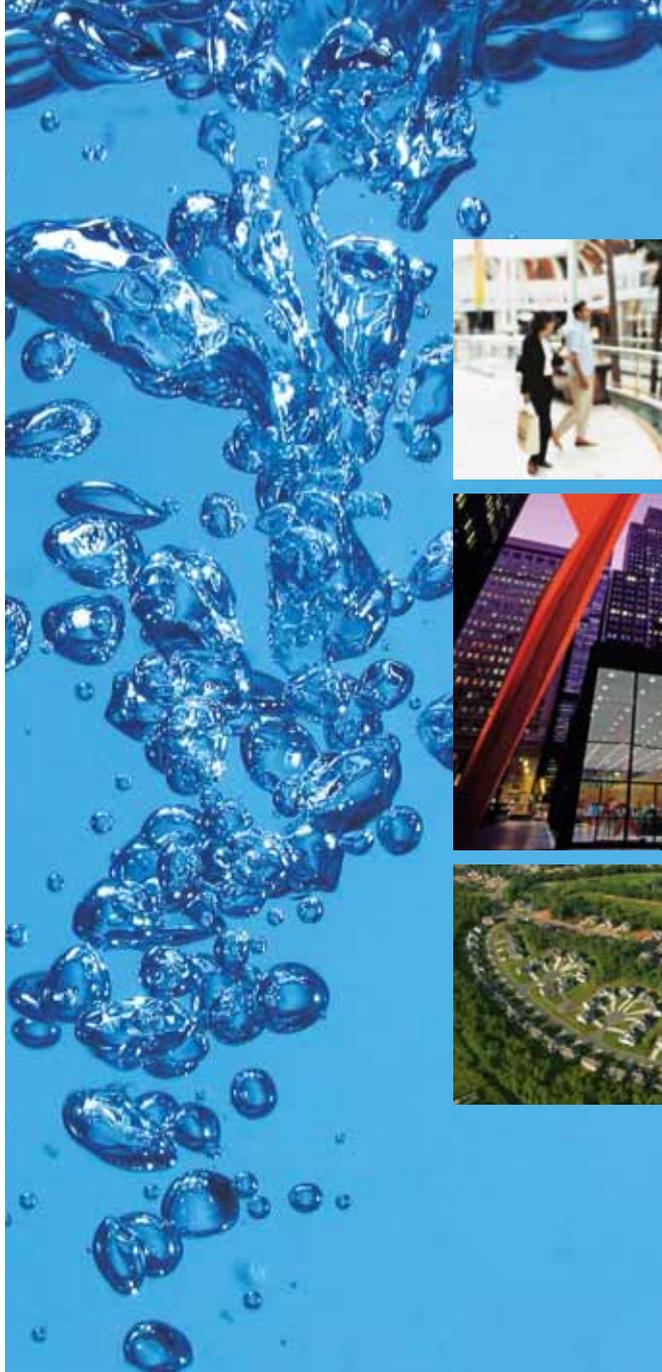
- Workshop repair (ABS equipment)
- Workshop repair (Non-ABS equipment)
- Explosion-proof equipment repairs
- Installation and removal
- Commissioning and testing after repair



Replacement and Upgrade Services

As equipment gets older, it costs more to run and almost certainly compares unfavorably with the latest products. Spare parts become expensive and lead times longer. Our technical support staff can help you identify and prioritize what to replace or upgrade, and when to do it. We will help you select the most appropriate replacement products. We will then agree schedules and prices for the replacement and upgrading work, and we can include taking full responsibility for installation and commissioning if required. We offer you:

- Replacement equipment
- Adapter brackets and guide-rail replacement
- Selection assistance and technical support
- Full contract management



The Wastewater Specialist

ABS is a brand within Sulzer and is synonymous with innovation and well-proven solutions for wastewater collection and treatment. Good customer relations have enabled us to build up extensive application expertise. We understand and solve the challenges of municipal, industrial, commercial and domestic end-

users worldwide every day. And we help professionals design, select, install and service wastewater systems of any type.

We take care of you throughout the life cycle of your investment – before, during and after.

www.sulzer.com



E10088 en 12.2012, Copyright © Sulzer Pumps

This brochure is a general product presentation. It does not provide a warranty or guarantee of any kind. Please, contact us for a description of the warranties and guarantees offered with our products. Directions for use and safety will be given separately. All information herein is subject to change without notice.