



New products for industrial pumping and mixing

How does Sulzer develop product portfolio to meet customer requirements? Being aware of the customers' criteria in selecting pumps and agitators for industrial processes is the first step. The second step is to translate this knowledge into product ideas and features. We can offer more reliable and energy-efficient products that save our customers a lot of costs over the product lifetime.

Last year, Sulzer introduced the new Inline Single Stage Centrifugal (SIL) pump range and the AGISTAR™ SSA agitator. Both were developed to provide better products for general and industrial applications.

When tradition meets innovation

When developing new products for the markets, engineers need the ability to look into the past and the future at the same time. Expertise is mainly based on empirical past values – in other words – the knowledge of the company that has been amassed over the years. Anticipating future needs and the ability to transform these needs into innovations is the key to successful product development. The main focus for both products was to reduce the energy consumption, increase efficiency and minimize the total cost of ownership (TCO).



Fig. 1 SIL pump with integrated motor.



Fig. 2 SIL pump with standard IEC motor.

New SIL pump range

Sulzer's portfolio contains process pumps for all industries – no matter how demanding the process is: big flows, high pressures, hot liquids, particle-containing suspensions, etc. The new SIL pump range is ideal for pumping clean or slightly contaminated liquids, viscous liquids up to 250 cSt, and fibrous slurries up to 1% consistency.

High efficiency leads to energy savings

The SIL pumps have new, highly efficient hydraulics resulting directly in energy savings. The components that most significantly contributed to the optimization of hydraulics were the casing and the closed impeller. The design of the sealing chamber improves the hydraulics as well. Outstanding is that the new hydraulic design ensures efficient pumping across the whole pump range.

Designed for reliability

High reliability and minimized maintenance pay off for the customers. Fewer parts equal less trouble. It is as simple as that. This is why a monoblock construction has been chosen, where the bearing unit between the SIL pump and motor is eliminated. The result is that the system is rigid, needs no bearing lubrication and less maintenance. The high reliability of the SIL's shaft sealing also contributes to the high reliability of the whole pump. An optimized sealing chamber and impeller-balancing holes guarantee improved conditions for the shaft seal. This results in a better lubrication of the seal and maximizes its lifetime. The rigid and reliable pump is available either with an integrated motor (Fig. 1) or with a standard IEC motor (Fig. 2). The SIL pumps are easy and fast to install, in either a vertical or a horizontal position. If the installed motor power is below 15 kW, they can be even installed without a baseplate – directly in-between the piping. The engineers attached importance to making the SIL pumps compact. Because the pumps require little installation space, it is easier for customers to fit the pumps into existing installations.

Minimized total cost of ownership

The market is asking for trouble-free operation and reduced total cost of ownership (TCO). How do SIL pumps meet this demand? Remarkable cost savings over the whole pump lifetime are achieved thanks to the low energy consumption of the SIL pumps. The monoblock construction reduces installation, operating, maintenance and spare part costs. The back-pullout design of the pump allows quick access for servicing without detaching the pump from the piping.



Regulations for energy-related products

The European Union has the strictest regulations around the world for energy consumption for standardized water pumps. These regulations for energy-related products (ErP) specify the minimum efficiency values for water pumps, with the target of reducing the energy consumption. The minimum efficiency index (MEI) defines the standard that has to be reached for newly installed pumps. All SIL pumps have been designed to exceed the MEI 0.4 requirement.



Water industry



General industry



Chemical industry



Pulp and paper



Power industry



Hydrocarbon processing



Oil and gas industry

Fig. 3 Industries for SIL pumps.

Market-driven design for the agitator AGISTAR™ SSA

When choosing a new agitator, the total cost of ownership (TCO) is a decisive factor for customers. For an agitator, the energy cost is the largest part of the TCO, as illustrated in Fig. 5. The hydraulics of the newly developed EX3 propeller leads to reduced energy consumption and costs. Breakdowns quickly increase the TCO. Therefore, all of Sulzer's design calculation consider first-class reliability for demanding industrial environments. Two patent applications are pending for AGISTAR SSA – a proof of Sulzer's innovative strength.

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The very first unit of AGISTAR SSA started operation in February 2017. Since then, it has been running trouble free with a low vibration level. Our client in Sweden reported substantial energy savings. The agitator operates with a variable frequency drive and the operating speed was reduced when installing the AGISTAR SSA. This resulted in a substantial cut of the energy bill, saving several kilowatts out of the installed 15 kW motor.

Jouni Lehtinen, General Industry Sales Management, Finland

Stir it up – with AGISTAR SSA

AGISTAR SSA is a side-mounted agitator that is installed through the tank wall (Fig. 4). The seal, bearings and motor are dry installed, which allows regular and easy inspection. The agitator generates a horizontal flow inside the tank, designed to meet the required process flow conditions. This type of agitator is used in many different industries but is very common in the pulp and paper industry.



Fig.4 Side-mounted agitator AGISTAR SSA.

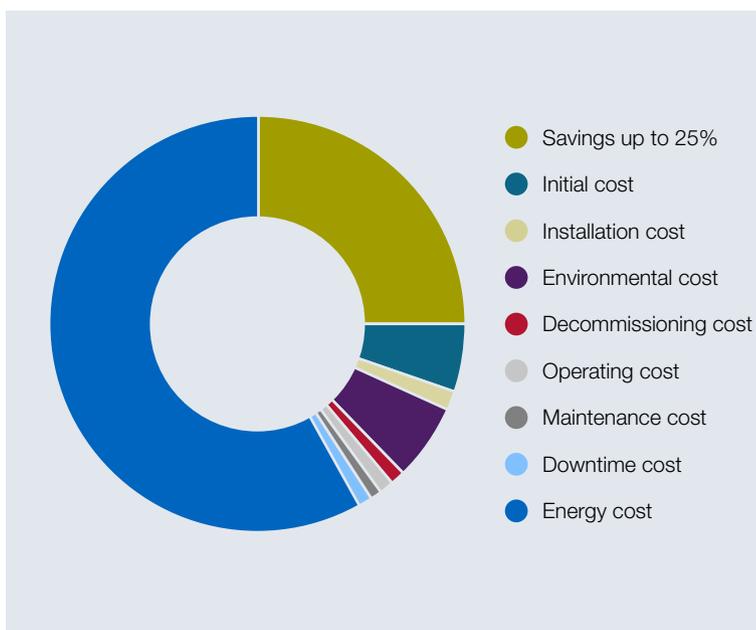


Fig. 5 Example of total cost of ownership for AGISTAR SSA agitator, used for a pulp tank, motor power reduced from 15 to 11 kW.



Fig. 6 The blades can be easily adjusted to different angles.

High flexibility thanks to modular design

AGISTAR SSA is currently available in a power span of 7.5 – 75 kW (10 – 100 hp). Its design is based on a modular system, and all the wetted parts are made of stainless steel. The agitator has a free-hanging shaft (cantilever type) and is equipped with a robust belt drive. To suit all types of applications, there are various seal options. Single and double mechanical seals are available from Sulzer, but seals from other suppliers can also be installed without modification.

The performance of the high-efficiency propeller is adjusted by installing the blades at about ten different angles. The blades are reliably fixed with six screws and bolts (Fig. 6). Because the customer can easily adjust the blade angles, power savings can be achieved without any investment at all. In addition, it is possible to improve the performance by modifying the rotating speed via the belt drive.

Tested propeller efficiency

To develop the new EX3 propeller, Sulzer engineers used the latest computational fluid dynamics (CFD) tools. After heavy load tests with a full tank of paper pulp in the test laboratory, the EX3 propeller was tested at different customer sites.

The new EX3 propeller has exhibited a better performance than the previous state-of-the-art MX4 propeller used in the SALOMIX horizontal agitator range. With a smart retrofit kit, the EX3 propeller can be either retrofitted on existing installations or installed to new SALOMIX units. The propeller can be used for various applications and results in either energy savings or increased capacity with the same motor.

Application know-how knocks off energy thieves

Even the most efficient propeller can be an energy thief. The agitator has to be selected properly to fit the actual application. The experienced Sulzer sales engineers know which agitator is suitable for different industries and can configure agitators accurately for customer-specific applications. A correctly dimensioned agitator can save energy costs.



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First class reliability

Continuous operation in an industrial environment normally amounts to about 8'600 hours annually. The bearing lifetime for AGISTAR SSA is designed to last 200'000 hours. This figure illustrates the reliability and rigidity of the complete agitator design. The shaft, seals, frame, drive system and the EX3 propeller are all designed for a long lifetime in tough conditions. The efficient agitator hydraulics creates thrust and turbulence — just where it is aimed. This results in fewer vibrations, and therefore prevents the whole system from wear and increasing tolerances.