

SULZER

Sulzer Pumps

Medium Consistency Technology from Sulzer Pumps



The Heart of Your Process

Rely on the Pioneers in Medium Consistency (MC[®]) Technology

Sulzer Pumps' success is founded on expertise. Our know-how and competitiveness is based on close cooperation with the world's leading pulp and paper producers, machinery suppliers and engineering companies. Our customers have access to the broadest pump product range for Pulp and Paper industry (PPI) applications featuring the latest advanced technology.

In many cases, Sulzer Pumps has been the first manufacturer to bring new innovations to the market. Sulzer Pumps is your choice for every pumping and mixing application for the lifetime of your mill.

Sulzer Pumps' MCE[™] pumping systems for medium consistency stock have proven to be the most reliable solutions for bleaching processes in chemical, mechanical and deinked pulp, and in other medium consistency stock applications.

Long-term expertise and innovative design and proven performance have established our pumping systems as the industry-leading solutions that also feature the best efficiency and lowest energy consumption on the market.

Sulzer Pumps utilizes application-related, fiber and energy saving patented Fluider[™] technology when selecting pumping solutions for pulp and paper mills.

Processes in pulp and paper mills involve the pumping of stock (Fig. 1). Stock with a high content of dry solids can be thick enough to support the weight of a human. Material of this nature has to be treated with heavy turbulence before it can be pumped. In order to achieve maximum efficiency, it is first necessary to effectively remove any air that might be present in the pulp suspension (Fig.2).



Fig. 1.

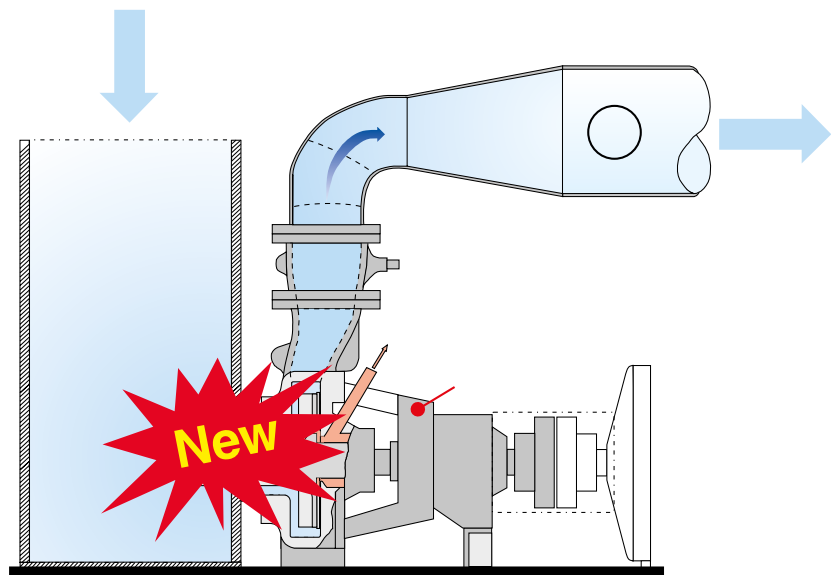


Fig. 2. MCE[™] Pump arrangement for the 8 to 18% consistency range.

During the washing and bleaching stages of the production process, the consistency of the stock is usually raised from the low-consistency range (0–8%) to the medium consistency range (8–18%). Typically, the consistency level is 4–16%, depending on the process. In the recycled-fiber deinking and mechanical pulping processes and in the washing stages of chemical pulping, it may even exceed 30%.

After dispersion, bleaching, and washing, the stock is diluted to a suitable consistency for pumping. During the bleaching of chemical pulp and the preceding stages, the pressure at the inlet side of the pump may be high, and the temperature can reach +130 °C (Fig. 3). Bleaching liquid and other process chemicals are simultaneously mixed into the stock during this stage.

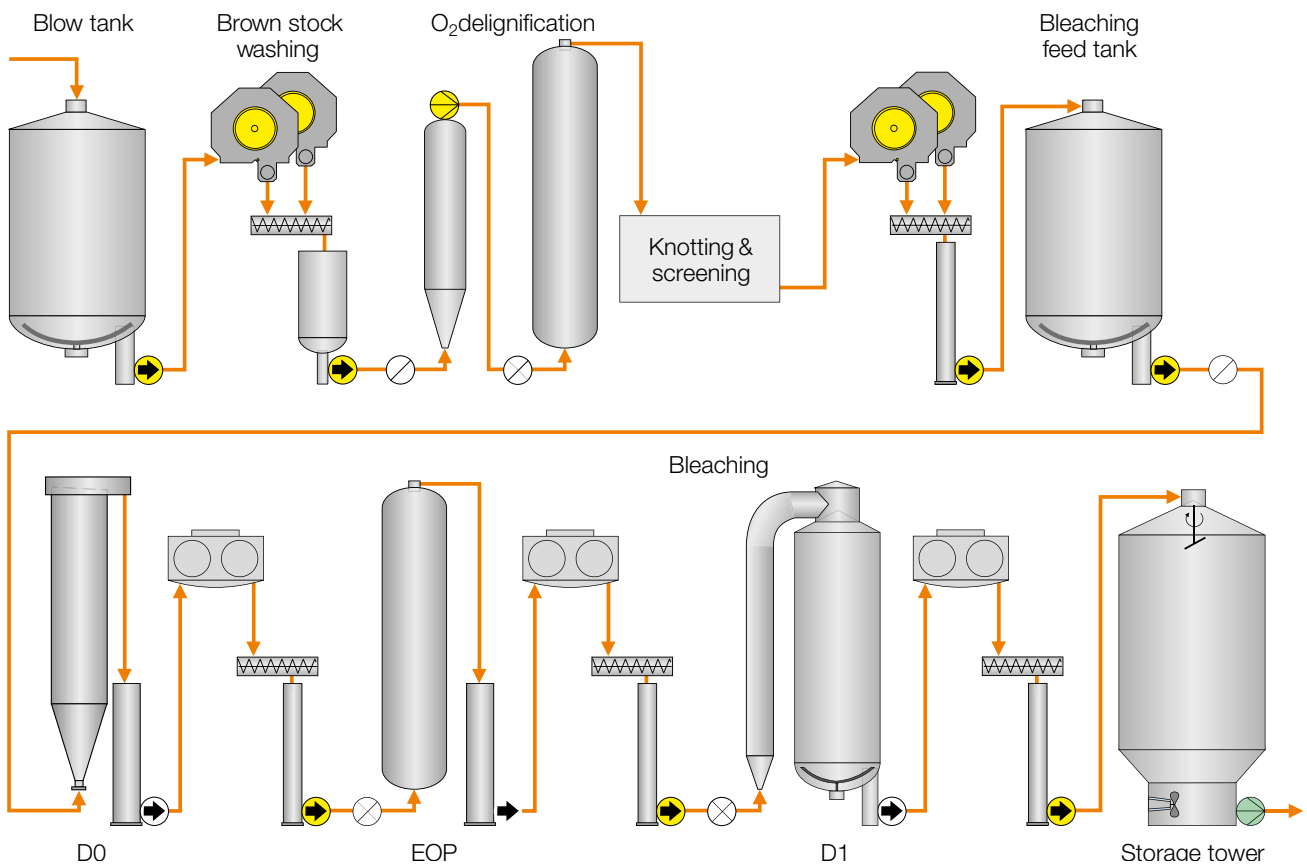


Fig. 3. A typical O₂ delignification and bleaching process in a chemical pulp mill. Sulzer Pumps produces equipment that fulfills all pumping and mixing requirements and enhances process efficiency by facilitating stable and reliable operation through reactors and towers.

Pumps to Cover the Full Range of Consistencies and Full Range of Applications

Sulzer Pumps' product portfolio comprises applications for every level of consistency—with AHLSTAR stock pumps covering the lower range. At the upper end of the range, highly efficient MCE™ pumping systems are used to handle the highest consistency fluids that can be pumped using centrifugal pumps. The LCE™ and KCE™ pumping systems produced by Sulzer Pumps were the first high-efficiency

pumping solutions designed specifically for the intermediate- (Semi-MC™) consistency range (6–10%) to be launched on the market. Prior to the introduction of these products, manufacturers had to use adapted low-consistency stock pumps or pumping systems designed for medium-consistency stock. Sulzer Pumps therefore developed and delivered energy-saving and fiber-protecting pumping solutions to cater specially

for intermediate consistencies. The power requirements of these systems are considerably lower than those of conventional products. The new solutions— mostly comprising a pumping system with a single drive unit—also feature simpler designs than previous systems.

Patented MCE™ Technology Reaches 70+% Efficiency Level

Our first MC® Pumps were brought into the market in the 1980's, followed by the 2nd generation in the early 1990's. The patented 3rd generation MCE™ pumps (Fig. 4) are now running in several pulp and paper mills around the world, and most of the high capacity, single line bleaching processes are equipped with Sulzer MC® pumps. Highest capacities for these pumps are up to 5,000 admt/d (Fig.5.).

Sulzer uses its patented Fluider™ technology and specially-designed impellers for pumps designed for intermediate and medium-consistency applications. Fluider technology, which uses twisted blades with changing pitch, is patented by Sulzer under certain claims in many countries (including Brazil, China, United States, Russia and many European countries) with priority dates as early as late 1990's, thus having a wide coverage of IPR protection.

Pumping systems with Fluider technology are most commonly used after washers, thickeners, filters, and reaction towers to pump the stock to the next process stage or to a washer. The pumping systems can also make sure that bleaching liquid or process chemicals are mixed into the stock efficiently. The main advantages of this technology include high levels of efficiency—

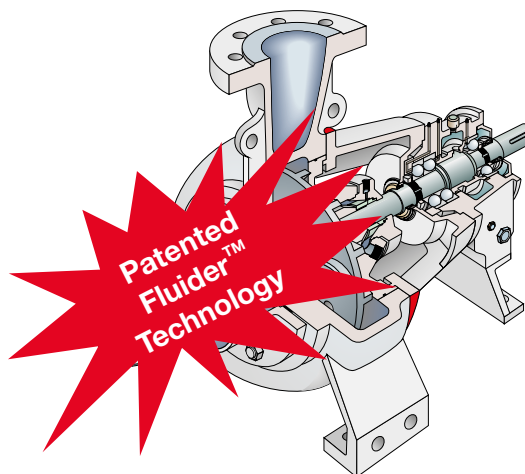


Fig. 4.

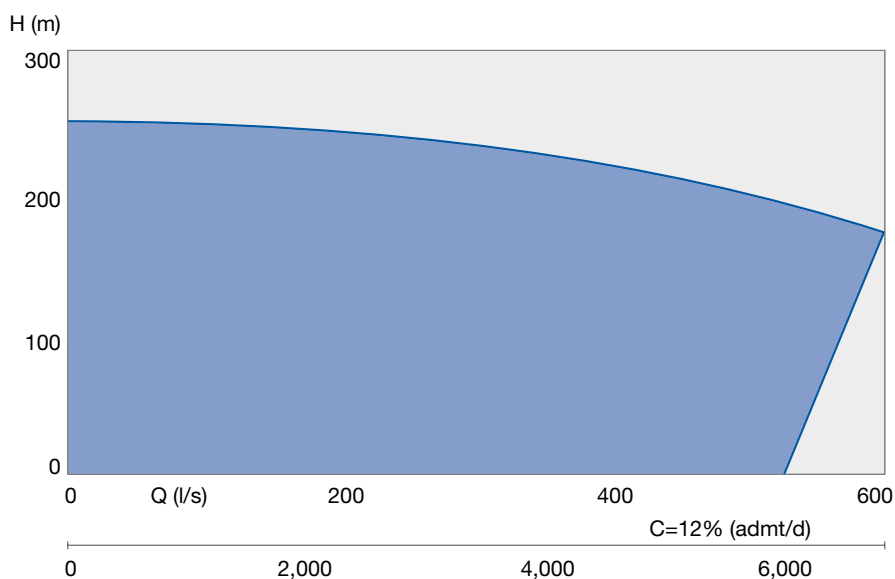


Fig. 5.

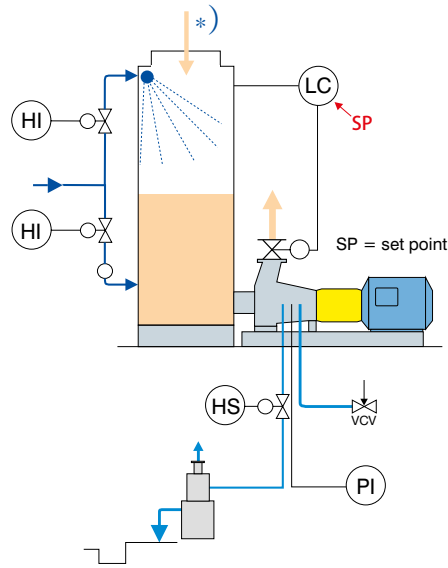


Fig. 6. Typical MC[®] pumping arrangements. The stock level in the dropleg is measured and controlled, thus providing constant operating conditions for the pump.

thus reducing power consumption—and its ability to maintain an exact turbulence level, which prevents the over-treatment of the fiber. MCE[™] medium-consistency pumps usually have integrated gas separation and either a built in or an external degassing system powered by a high-capacity vacuum pump. The Fluider impeller offers a third option that makes it possible to degas the fluid without a vacuum pump—a solution that does not require additional components or extra controls or drives. Another distinct feature of the Fluider impeller is its ability to work efficiently irrespective of the stock level in the dropleg (Fig 6). The dropleg is a barrel-like tank at the low-pressure side of the pump that ensures proper inflow conditions for the pump.

Energy Savings and Process Upgrades

Fluider technology is used successfully in production rate and process upgrades through the installation of a retrofit unit or the replacement of an existing earlier generation MC[®] pump. Piping changes are not necessary in most cases. (Fig 7)

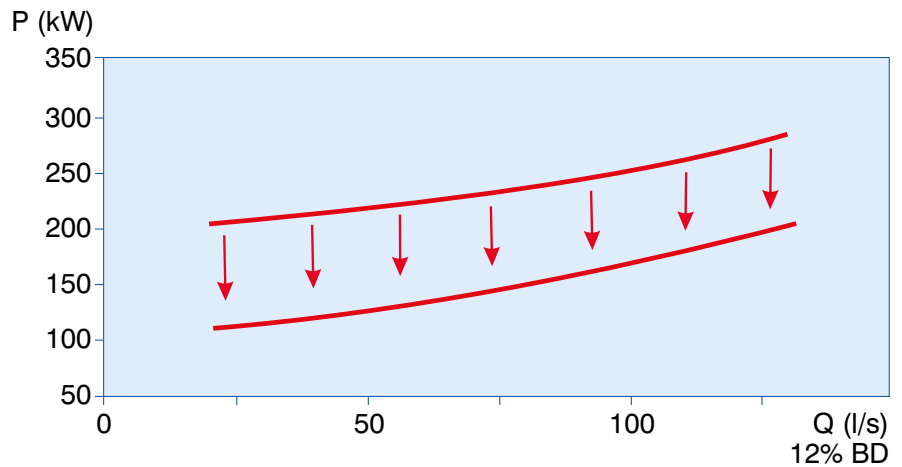


Fig. 8. Power Consumption savings.

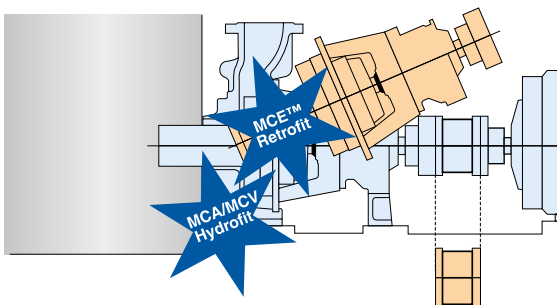


Fig. 7. MCE[™] Retrofit and MCA/MCV Hydrofit.

AHLSTAR - Excellent Performance for the Most Demanding Applications

Sulzer Pumps has developed revolutionary and innovative methods to improve pumping performance, including more reliable and effective hydraulics with higher efficiency and suction capability. Sulzer Pumps has developed effective simulation tools help quickly analyze various hydraulic designs. With our own full-scale laboratory, we can test the final design options in real operational conditions.



Fig. 9.

AHLSTAR process pumps, including the new large size (2,500l/s) (Fig 9) and high efficiency (93%+) pumps (Fig 10).

The capability to work with all types of liquids, makes this pump range particularly desirable for challenging pumping operations.

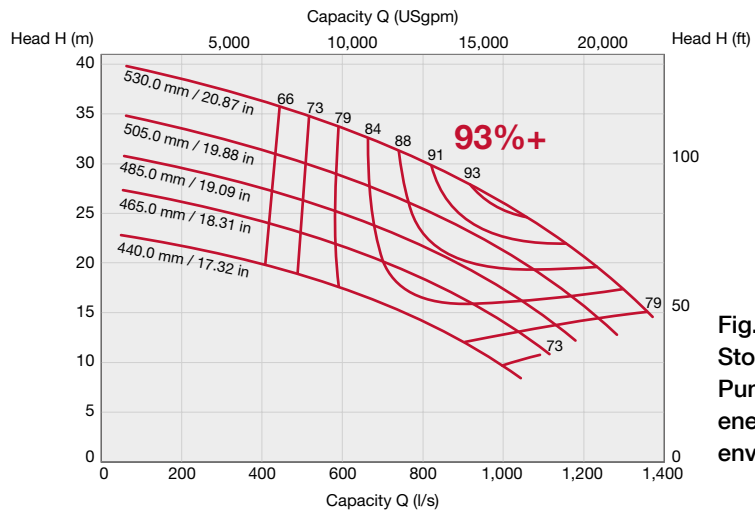


Fig. 10. AHLSTAR Stock Process Pumps – save energy, water and environment

Effective Management of Towers

The friction between stagnant and moving pulp in the storage towers can lead to uneven consistency distribution, resulting in consistency increases of stagnant pulp and the dilution of moving pulp. This difference in consistency leads to unequal retention times— with shorter times for moving pulp and longer times for stagnant pulp— which, in turn, lowers the quality of the product. Sulzer's SALOMIX® mixing technology allows for effective bleaching and storage tower management and ensures the even filling and emptying of the towers. The top entry spreader (TES) distributes the stock evenly when the tower is being filled, and agitators in the agitation zone at the bottom of the tower ensure the uniform consistency of the stock that is pumped from the tower. Sulzer Pumps has equipped 10,000m³ volume towers in Brazil and in China with record diameter agitation zones.

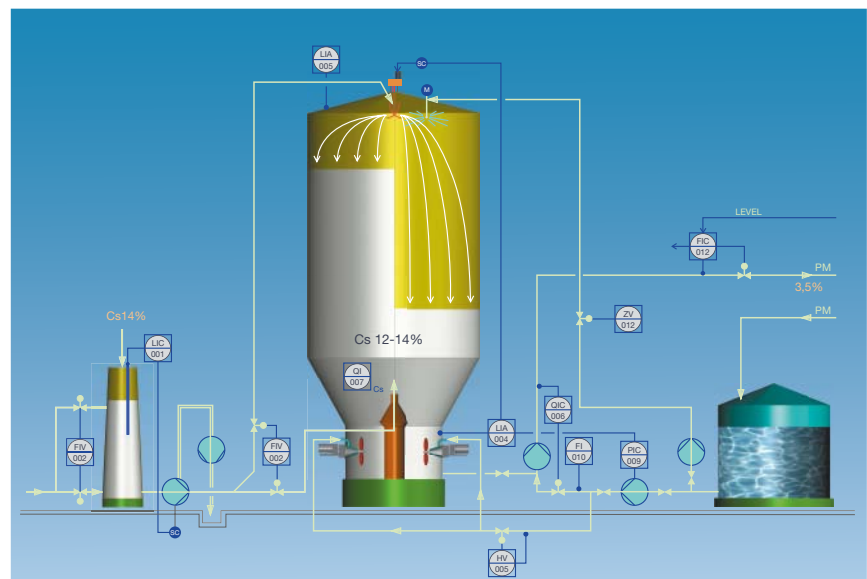


Fig. 12. The TES and the agitators with Dilcos at the bottom of the tower ensure continuous flow and equal retention times of the pulp. The patented Sulzer tower management solutions produce a quantifiable improvement in the quality of stock, e.g. its brightness.

Long Term Trusted Reliability

In addition to our MC Pumping Systems, AHLSTAR process pumps and Tower Management System equipment (like SALOMIX® agitators and TES Top entry Spreaders), our other significant innovations are ZPP headbox feed pumps and MBN multistage pumps.

We apply our own foundry expertise and deep metallurgical knowledge to developing equipment for applications requiring strong resistance to corrosion and wear.

The R&D work at Sulzer Pumps has resulted in many pump, mixer and agitator innovations for the pulp and paper industry. Over the decades, this continuous search for better pumping and mixing solutions has lengthened service intervals and prolonged pump life times in various applications. We are the forerunner in stock pumping and mixing over the whole consistency range from 0 to 18%.

SX Dynamic Chemical mixer (Fig 13) is our new chemical mixer.

Sulzer has been able to create stock pumping systems that have longer service intervals and consume less energy. To date, since 1850 we have delivered over 300,000 pumps and agitators.

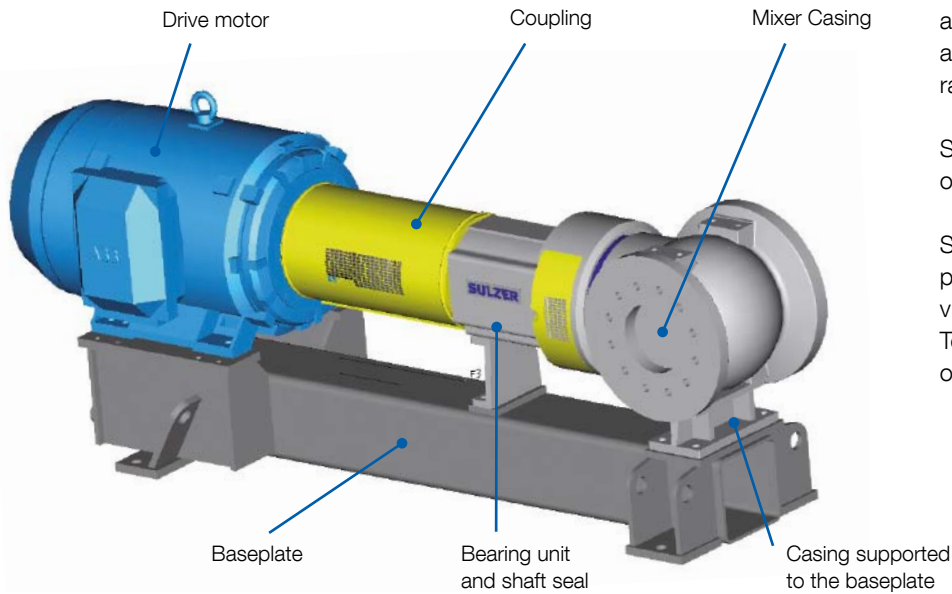


Fig. 13. SX Chemical Mixer design.

Research and Innovations



Fig. 14. Continuous investment in development and full-scale testing facilities

Research and development are always top priority at Sulzer Pumps. The world's largest R&D center specialized in PPI pumping and mixing is located in Kotka, Finland (Fig 14). We work closely with our customers to develop pumps and mixers that suit our customers' processes in the best possible way.

At our full scale PPI testing facilities, all process equipment can be tested under operating conditions controlled to closely match customer operations. We are also able to make pumping and mixing test runs based on customers' own furnish.

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