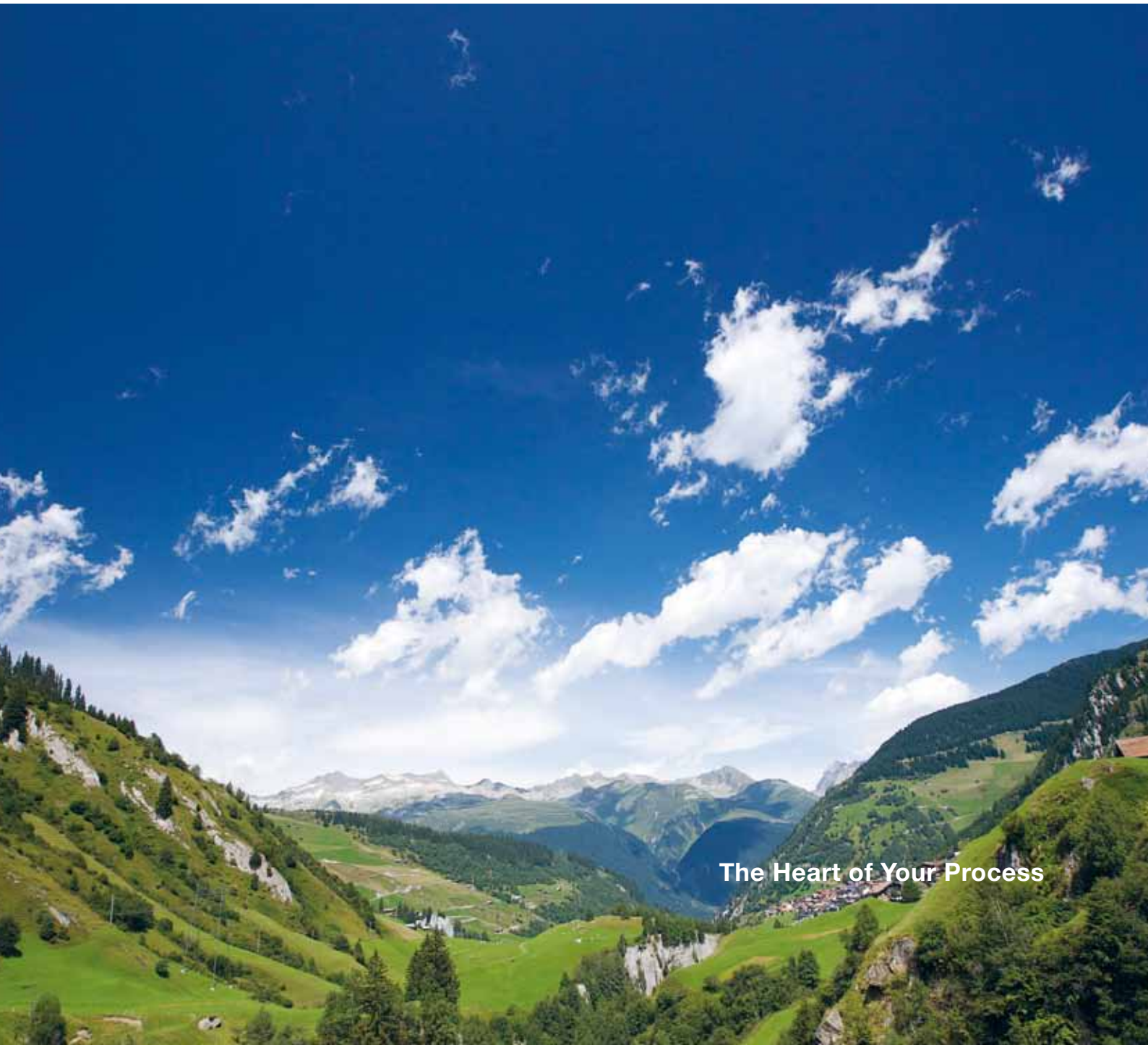


SULZER

Sulzer Pumps

Your Partner for a Cleaner Future: Sulzer Pumps for Carbon Capture and Storage



The Heart of Your Process



Customer Understanding and Proven Performance

As a global leader in pump design and manufacture, Sulzer Pumps is recognized for excellent product quality, performance reliability and proven technical innovation. We focus our expertise on providing a full line of pumps, equipment and related technologies to selected industries, including Oil and Gas, Hydrocarbon Processing, Power Generation, Pulp and Paper, Water and Wastewater and General Industry. Our Research and Development activities, process and applications expertise, and a thorough understanding of the markets we serve keep us at the leading edge of technical developments. The company has a network of 12 manufacturing facilities worldwide and sales offices and service centers in 150 locations globally.

As a leading supplier of pump solutions to key industries involved in the Carbon Capture and Storage (CCS), Sulzer Pumps has a history of strong customer relationships and proven market expertise. We draw on this customer understanding and extensive process know-how to expand our development of pumps and solutions for CCS.

Power Industry

Sulzer Pumps' technology is selected the world over to meet the demands of the power generation market. From industrial generating plants to the newest super critical and nuclear power stations, we are the preferred supplier of boiler feed, condensate, cooling water and other pumping systems and services. Our industry knowledge stems from decades of working with customers in private and national power generating companies to improve reliability, efficiency and profitability.

Pipelines, Gas Processing, Enhanced Oil Recovery

At Sulzer Pumps, we draw on our experience and expertise with critical applications in the Oil and Gas, and Hydrocarbon Processing Industries to deliver solutions for CO₂ transport and injection. As the global leader in pumps for the liquefied petroleum gas (LPG) pipeline industry, we have thousands of our pumps in operation on light hydrocarbon pipelines around the world.

In remote, harsh environments, Sulzer Pumps has supplied some of the highest head centrifugal pumps in the world to inject natural gas liquids (NGL) into production fields for enhanced oil and gas recovery. Our high pressure pumps are also used to inject acid gas liquids back into the fields for environmental safety and enhanced production. In natural gas processing plants, Sulzer multistage pumps and hydraulic power recovery turbines are used to scrub H₂S, CO₂ and other contaminants from natural gas streams. We apply this proven technology to CCS activities at refineries, petrochemical and chemical manufacturing plants.



Solutions for the Carbon Challenge

At Sulzer Pumps, we apply proven pump technologies to create a cleaner, fresher future. Capturing CO₂ at the point of origin and transporting it for storage are critical steps for limiting industrial CO₂ emissions. We work in close partnership with our customers to apply our high-end technologies and optimize pump performance for more effective CCS.

Drawing on our experience in key markets, Sulzer Pumps develops highly efficient solutions that link conventional processes and carbon capture operations. Our full line of pump solutions gives our customers a competitive edge while safeguarding the environment.

Carbon Capture and Storage process overview:

- Power plant with carbon capture unit
- Transport
- Injection





A Full-line Supplier Creating Value for Customers

As a world leader in pump and auxiliary solutions, Sulzer Pumps has the in-depth understanding and full line supply to meet customer needs and add value through innovation and performance.

The right pump solution is essential for effective CCS. When pumping subcritical and supercritical liquid CO₂, successful processes demand the right choice of materials, wear parts, mechanical seals, and accurate calculations of performance factors. Sulzer Pumps' expertise and wide range of ISO 5199, ANSI B73.1 and ISO 13709 (API 610) pumps deliver industry-compliant and leading-edge technology to CCS processes. With the world's best production and testing facilities, our engineers are committed to continuously developing leading products.

Capture

Our pumps are used in CO₂ capture process during industrial manufacturing and in power generation. Sulzer Pumps broad range of single-stage pumps are designed to circulate both rich and lean liquid solvents used for post-combustion CO₂ capture.

For high-pressure pre-combustion processes, we supply high-energy, multistage pumps. In cold applications, such as air separation systems for Oxyfuels and Integrated Gasification Combined Cycle (IGCC) plants, we supply a range of pumps with low temperature materials and special sealing techniques.

Compression, Transport and Injection

We help customers improve efficiency during the last stage of CO₂ compression, and we provide reliable, proven performance in the high-pressure conditions of pipeline transport and injection systems. Our engineers have extensive experience with supercritical CO₂ and understand how temperature and density influence compression, transport and injection. Using special hydrotest techniques and applying our mechanical seal expertise, Sulzer Pumps helps customers manage challenges and reduce costs throughout the process.

Whether supplying proven pump systems to established carbon capture processes or partnering with customers to develop tailored solutions, Sulzer Pumps offers superior performance and reliability for the most efficient long-term operations. We also draw on the products, technologies and expertise in other Sulzer divisions to customize complete, value-added solutions. In addition, Sulzer Pumps offers products to address a variety of critical and non-critical power plant operations.



Color code for applicable process type



End Suction Single Stage Pumps

01 OHH Process Pumps

- The widest hydraulic performance coverage on the market, with the smallest size steps for highest performance across all applications. ISO 13709 (API 610)

02 AHLSTAR^{UP} Process Pumps

- With unrivaled experience in the process industry, the latest generation AHLSTAR^{UP} process pump meets the demanding pumping applications. ISO 5199 / 2858

03 CPT Process Pumps

- Designed to exceed ANSI (ASME B73.1M) pump standards for continuous operation in process industries for pumping clean, abrasive or corrosive liquids. ASME B73.1 (ANSI)

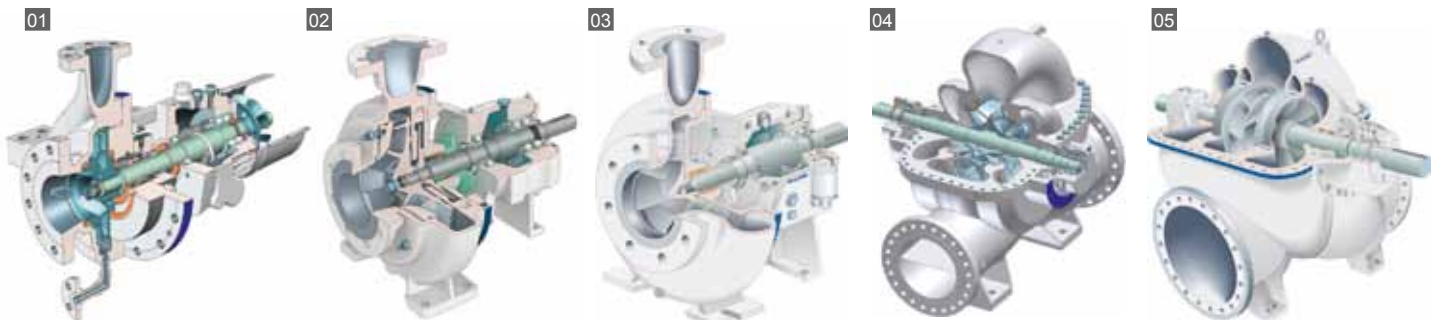
Double Suction Single Stage Pumps

04 SMN Auxiliary Pumps

- Designed for high flow rates with high efficiencies and low NPSH requirements. General Purpose

05 ZPP Auxiliary Pumps

- Single stage, double suction pump especially designed for high flow rates with high efficiencies and low NPSH requirements. ISO 5199





Color code for applicable process type



Barrel Pumps

06 GSG Radially Split Diffuser Barrel Pumps

Design optimized for synchronous speed, direct drive applications without unnecessary and expensive construction features.
ISO 13709 (API 610) BB5

07 CP Radially Split Volute Barrel Pumps

For processes that require an axially split inner case for easy removal of the complete rotor to simplify maintenance.
ISO 13709 (API 610) BB5

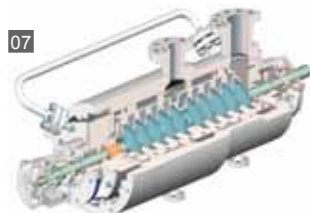
08 HPcp Diffuser Barrel Pumps

State-of-the-art, high energy pumps use the Sulzer TwistLock™ system of barrel closure to minimize weight. The world's largest onshore, offshore and vertical injection pumps are all Sulzer HPcp designs.
ISO 13709 (API 610) BB5

Axially Split Pumps

09 MSD Axially Split Multistage Volute Pumps

Multistage pumps widely used in pipelines, waterfloods, CO₂ injection and high-pressure CO₂ scrubbing applications.
ISO 13709 (API 610) BB3





Color code for applicable process type



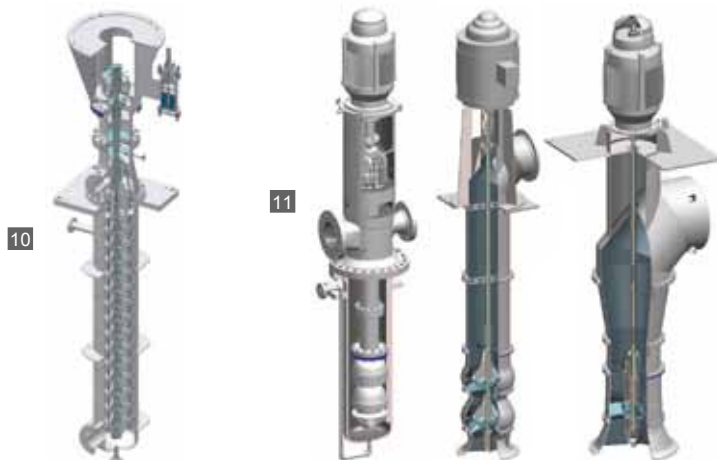
Vertical Pumps

10 JVCR Multistage Pumps

- VS6 design multistage canned pump for low temperature and LNG applications.
ISO 13709 (API 610)

11 SJD/SJM/SJP Vertically Suspended Pumps

- For a variety of applications including cooling water, condensate extraction and propane boosting.
ISO 13709 (API 610)



SALOMIX® Agitators

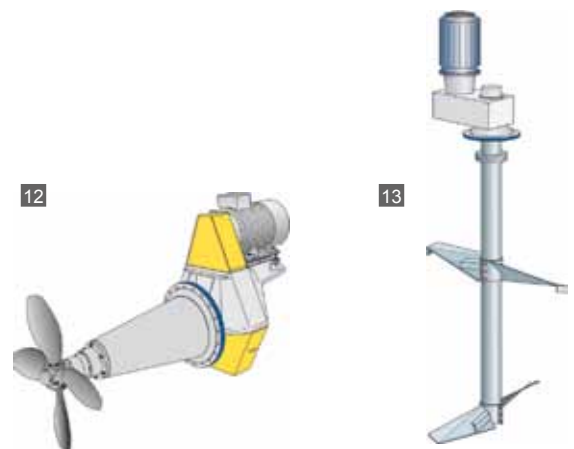
Widely used in challenging applications in the process industry. With a broad range of sizes and types, customers can select the best agitator to meet process demands. Strong mechanical and enhanced hydraulic design ensures minimum energy consumption for improved agitation intensity and reduced maintenance needs.

12 Horizontal SL/ST Agitators

- SL/ST agitators are side-mounted gear or belt driven propeller agitators specially designed for fibrous stocks in all process conditions.

13 Vertical L/LV Agitators

- The L-series covers gear or belt driven agitators mounted vertically on the tank top flange or through the tank bottom.



www.sulzerpumps.com



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