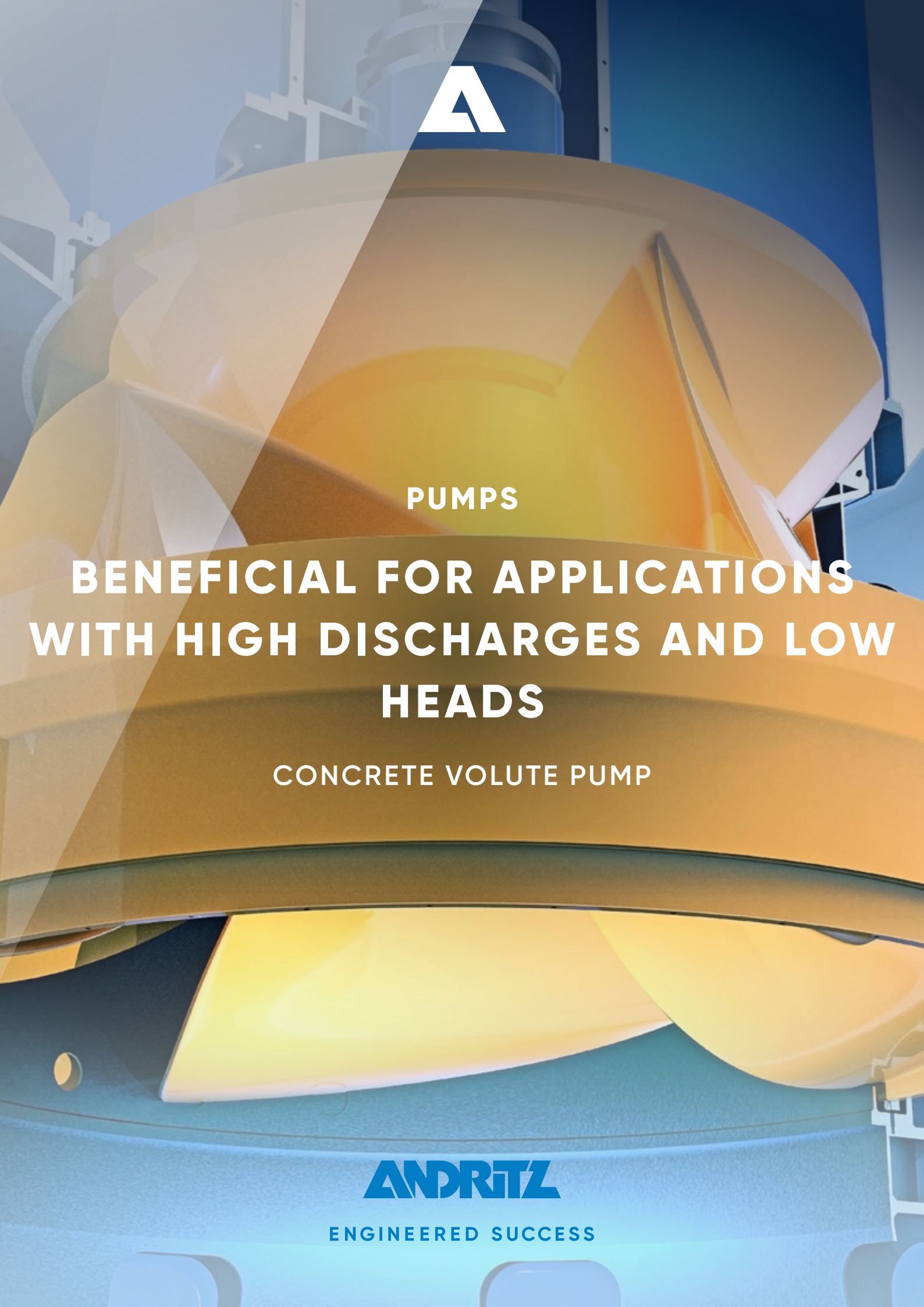


PUMPS

BENEFICIAL FOR APPLICATIONS WITH HIGH DISCHARGES AND LOW HEADS

CONCRETE VOLUTE PUMP

ANDRITZ

ENGINEERED SUCCESS

ANDRITZ Pumps for your industry

ANDRITZ specializes in the development and manufacturing of high-quality pumps, offering a comprehensive range from standardized products to tailor-made solutions across various industries. Our pumps have achieved global success in diverse applications, including municipal drinking water supply, wastewater disposal, industrial water distribution, and significant infrastructure projects such as irrigation, seawater desalination, and water transmission.

In flood control, irrigation, and water transport, ANDRITZ not only provides the largest and most powerful pumps, but also complete systems and pumping stations. As a prominent supplier to the pulp and paper industry, we leverage strong process expertise to deliver pump solutions that enhance process stability and energy efficiency. Our product portfolio encompasses a full range of robust process pumps and innovative medium-consistency pumps with an advanced system to avoid fiber losses. Notably, our double-suction headbox pumps boast efficiency levels of up to 93% and low-pulsation impellers, crafted with innovative methods. They thus provide the best performance in the paper manufacturing process.

In line with our commitment to sustainability, ANDRITZ offers reliable small hydroelectric power plants and pumps utilized as turbines for private, municipal, industrial, and commercial applications. Our diverse range ensures economically and ecologically sustainable energy production. Specializing in hydroelectric storage, our pumps cover a wide range from high heads to high flows, showcasing our engineering competence.

Our pump series, distinguished by modern and robust designs, high efficiency levels, and sustainability features, find applications in various demanding industries, including sugar and starch, lysine, bioethanol, hydrogen, fertilizer, mining, offshore, and general process industries.

Additionally, ANDRITZ provides IIOT-enabled premium pump technology for enhanced process monitoring, thus reflecting our commitment to cutting-edge solutions.

Customized premium pump technology

For over 165 years, ANDRITZ has been a byword for designing and manufacturing customized pump solutions at the highest level. Our engineered pumps are operating in various industrial applications successfully all over the world. They offer robustness and wear resistance, and fulfill highest customer expectations in terms of efficiency, life cycle, maintenance friendliness, and economic efficiency. The high standard of ANDRITZ centrifugal pumps is based on decades of experience in designing hydraulic machines and extensive know-how. In the interests of our customers, we set no limits on size and flow rate in the development and manufacture of customer-specific pumps. Experienced experts assist our customers with planning, development, installation, start-up and after-sales service. Engineering, design, material selection and manufacturing all run according to defined standards. The processes are transparent and can be adapted to individual needs. Our goals at ANDRITZ are to provide first-class products and service to secure sustained customer satisfaction.

ANDRITZ CONCRETE VOLUTE PUMPS

ANDRITZ has been installing Kaplan turbine units successfully all around the world since 1926. The design principle of Kaplan turbines with concrete casings is the same as that used for concrete volute pumps. Based on its many years of experience and on the exacting demands customary in the water turbine sector, ANDRITZ has adapted its technology to concrete volute pumps and designed sophisticated concreting systems ensuring smooth execution and accurate results. From the technological and economic points of view, concrete volute pumps are the best solution when large amounts of water are to be delivered. The concrete casing has a long service life and is resistant to erosion as well as to both seawater and brackish water. Furthermore, the material costs are low.

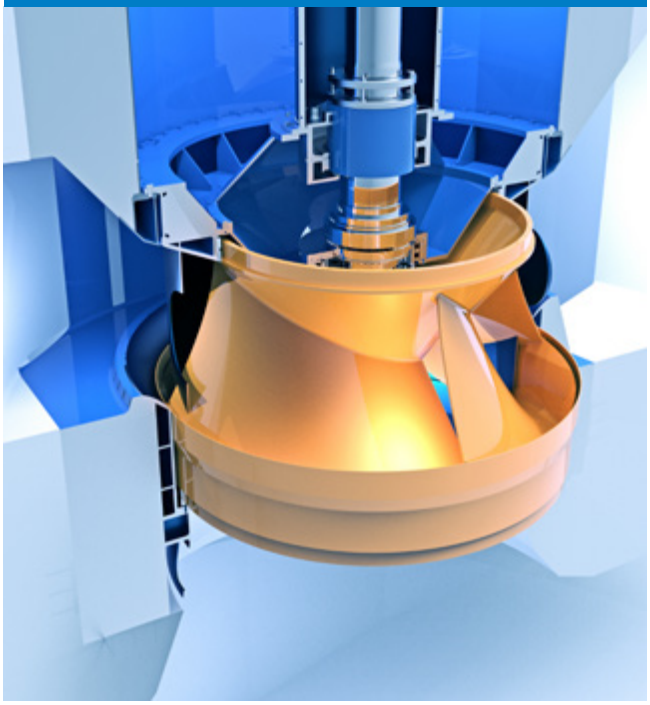
FIELDS OF APPLICATION

- Cooling water pumps for power stations
- Fresh water and seawater transport for irrigation and drainage
- Flood control
- Drinking and industrial water supplies
- Seawater intake pumps

PRODUCT FACTS*:

- Radial or semi-axial impeller
- Flow rate up to 50 m^3/sec
- Head up to 40 m
- Power up to 20 MW
- Highest efficiency

*These values are guidelines and may differ depending on project requirements

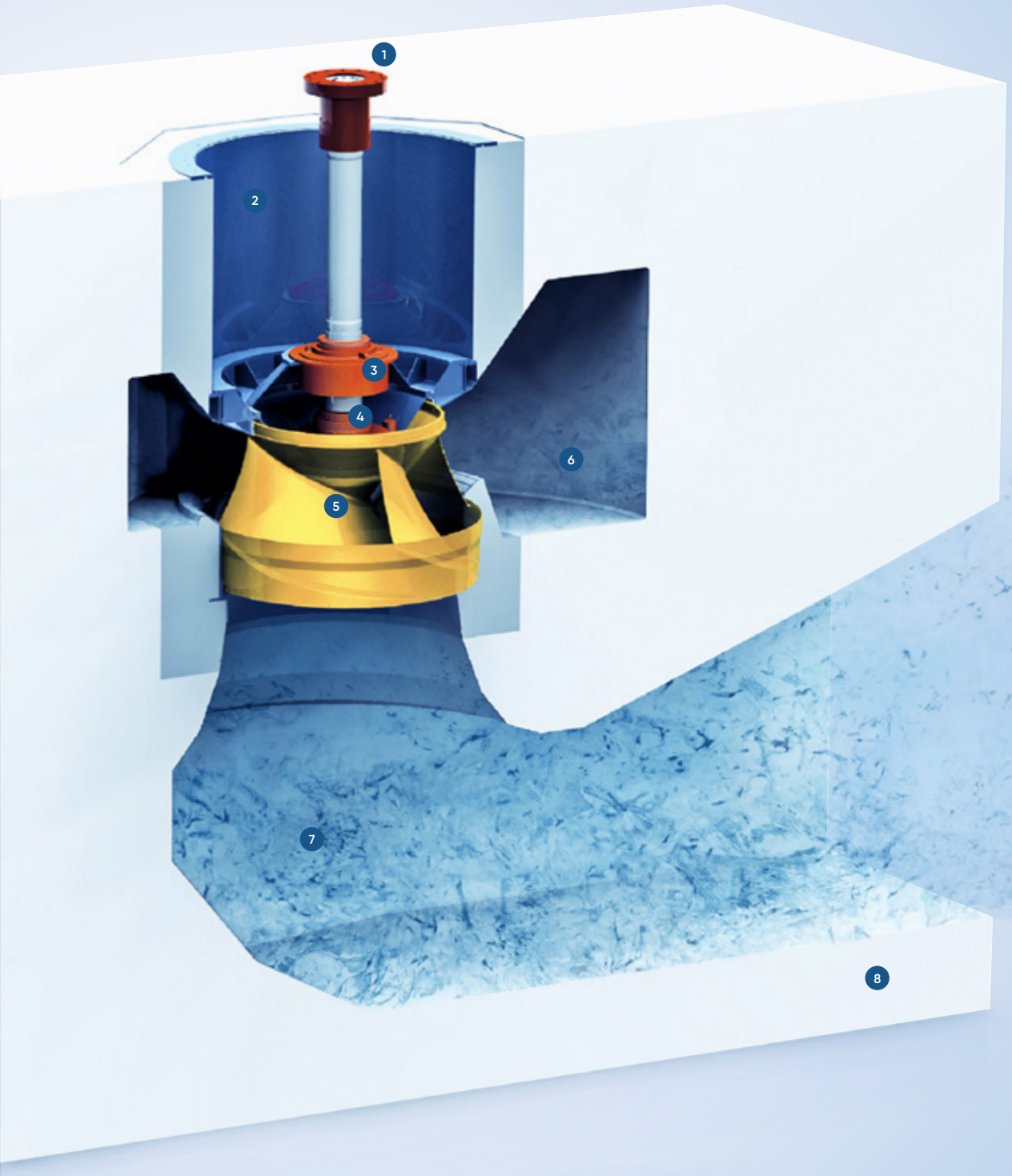


Concrete volute pump

PRODUCT BENEFITS

- Individual hydraulic dimensioning and design of the volute casing for specific output characteristics
- Optimum flow achieved in the volute thanks to individual shaping
- Three construction procedures for concrete volute pumps
- IIoT ready

1. **THRUST BEARING**
   - at pump, gearbox or motor
2. **PIT LINER**
3. **RADIAL BEARING**
4. **SHAFT SEAL**
5. **HYDRAULICS**
   - Radial or
   - Semi-axial impeller
6. **CONCRETE VOLUTE**
7. **INLET BEND**
8. **CONCRETE**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Benefits to convince you

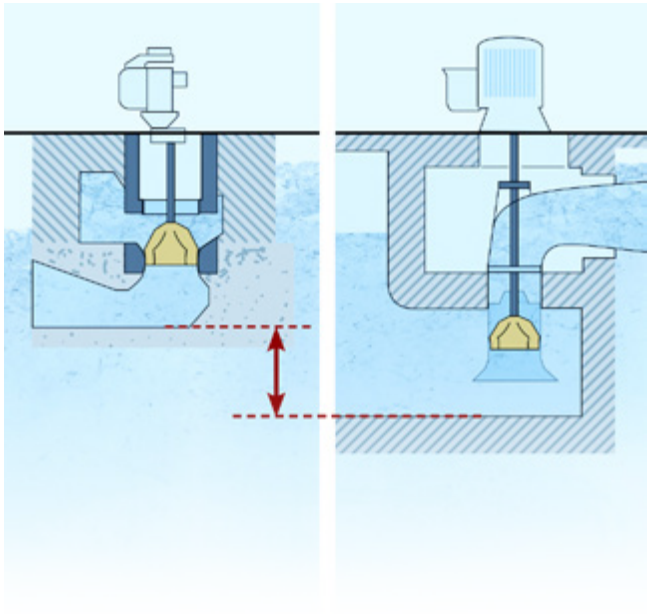
Every pump type has its justification and its advantages for applications with specific requirements. Due to the resulting installation conditions (small difference in head between inlet and outlet), concrete volute pumps are especially beneficial for applications with high discharges (5-50 m^3/s) and low heads. Normally, vertical line shaft pumps are used for this type of application.

REDUCED INVESTMENT COSTS

Compared to the conventional design of vertical line-shaft pumps, concrete volute pumps also have an inlet bend, which guides the water optimally to the impeller. Another essential difference is the much shorter distance between the center line of the impeller and the discharge pipe. This results in a very compact design, less construction depth being required, and reduced construction costs. In comparison, the vertical line shaft pump can be up to twice as heavy.

Concrete volute pump

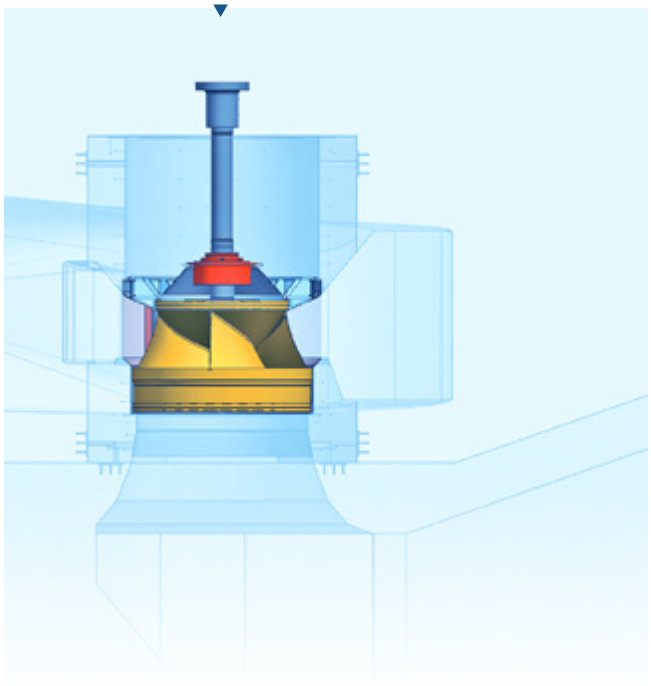
Vertical line shaft pump



EASY MAINTENANCE

The concrete volute pump basically consists of the concrete casing and the pull-out pump unit (rotating parts of the pump). The pull-out unit can be lifted out easily for maintenance purposes. The concrete surface is resistant to any kind of water and requires no maintenance. The fewer parts there are, the less maintenance is required.

Pull-out pump unit



Three construction procedures for concrete volute pumps

IN-SITU CASTING

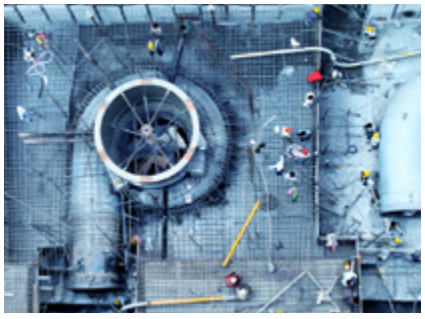
Wooden formwork is positioned at site and the surrounding concrete is cast in two stages. The formwork can be reused several times and is easy to lift as well as position. For large sizes, the investment costs are relatively low in comparison to other solutions. The concrete surface is resistant to brackish water or seawater.

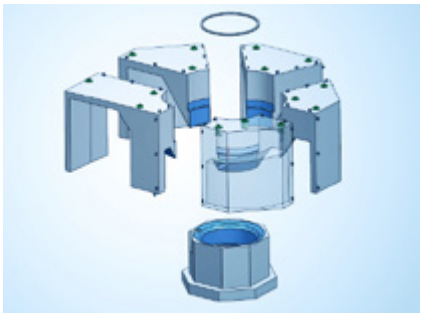
STEEL LINER

The steel liner of the volute is used as permanent formwork. Depending on the size of the volute, the liner parts can be welded at site. This option is an advantage with small pumps in small numbers. For seawater applications, this type of volute liner is expensive because it must be made of stainless steel or have expensive coating.

PREFABRICATED ELEMENTS

The pump volute is split into a certain number of concrete blocks, which are cast in a concrete factory. The parts are then shipped to site and assembled. The advantage is that the civil work at site need not be particularly accurate. The volute surface is resistant to brackish water or seawater.





	IN-SITU CASTING	STEEL LINER	PREFABRICATED ELEMENTS
Large size of pump (D1* > 2 m)	+++	++	+
	Wooden formwork costs are low	A lot of steel required which is relative expensive	Many heavy concrete blocks difficult to transport and position
Medium size of pump (1.6 m < D1 < 2 m)	++	++	+
	Wooden formwork costs are low	Steel costs get less expensive in relation	Difficult positioning of heavy concrete blocks
Small size of pump (D1 < 1.6 m)	+	+++	++
	Pulling out of formwork after concreting starts to get difficult	Steel volute can be easily manufactured	Small concrete blocks are easy to position and adjust at site
Small number of equal pumps (n ≤ 3)	++	+++	+
	Formwork costs are low, reusal of formwork makes no sense	Price difference between steel and wood is not relevant	High effort for small number of pumps (high capacity of mobile crane)
Large number of equal pumps (n > 3)	+++	+	++
	Formwork can be reused several times	Big price difference between steel and wood	Required efforts are feasible
Sea or brakish Water	+++	+	+++
	Concrete surface is resistant and not corroding	Expensive coatings or stainless steel liners are required	Concrete surface is resistant and not corroding
Delivery time and trans-port of formworks/ liners/blocks to site	+++	++	+
	Production time of formworks is fast; Easy positioning of formworks at site	Production time of liners is fast, welding of liner parts at site	Production of elements takes plus ≈1 month, high efforts for concrete blocks positioning
Concreting at site	+	++	+++
	Careful pouring of concrete	Careful pouring of concrete	No very accurate civil work necessary at site

* D1 = impeller inlet Ø

The evaluation matrix above is simplified. The decision on which construction procedure to choose shall be done case by case and include various individual requirements. ANDRITZ HYDRO is looking forward to supporting you in finding the best solution for your project.

Greater efficiency for a competitive edge – Pumps service

Optimization / Modernization / Operating reliability

The conditions of your plant have changed, but your pumps are still operating as previously and therefore, wasting energy? Would you like to optimize your system to reduce costs? With ANDRITZ, you will have a competent partner for these and numerous other services at your side.

Service and maintenance have a long tradition at ANDRITZ and complement the product portfolio. The century-long expertise is reflected not only in a service portfolio with innovative solutions and advanced products that can be optimally adapted to the respective customer needs, but also in a specially trained staff. ANDRITZ has specialized in the servicing of pumps to achieve improved efficiencies and adaptations to changed operating points of the installed pumps. A large potential for savings can already be achieved by improving the efficiency of 20 percent of the installed pumps. Our service team provides prompt, professional, and reliable assistance – also for other manufacturers' products. Book our service package and you can be sure of the best operating reliability for your systems in the long term. We conduct an expert assessment together with you, thus creating transparency and making an optimum solution possible that is tailored to your needs. After examining your plant, we determine its savings potential and realize it by improving the efficiency of the pumps installed. Additionally, this individual solution lowers your maintenance costs. You do not have to think about personnel, nor about maintenance schedules or utilities. Assembly is conducted according to defined schedules and with assistance from our trained personnel.

AN OVERVIEW OF OUR SERVICES

- Supply of original spare parts
- Deployment of trained personnel
- Installation and start-up
- Inspection
- Repairs, overhauls, maintenance
- Machine assessment by an expert for early fault detection
- Consulting and modernization
- Performance and vibration measurement
- Fault and damage analyses
- Feasibility studies
- Energy consulting for pumps and systems
- Preparation of maintenance schedules
- Service and maintenance agreements
- Automation and Electrical Power Systems
- Electronic equipment
- Training

Find out more about
ANDRITZ pumps service

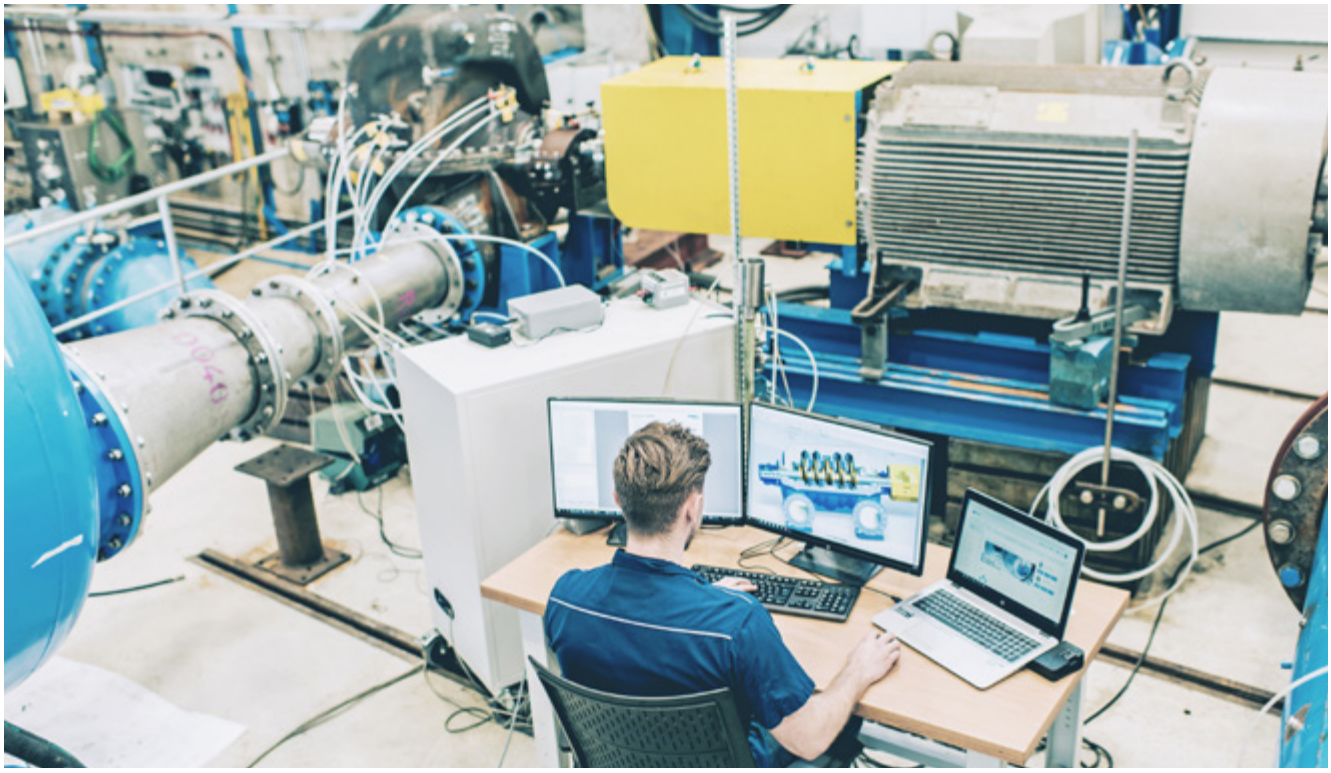
Always a flow ahead – Research and development

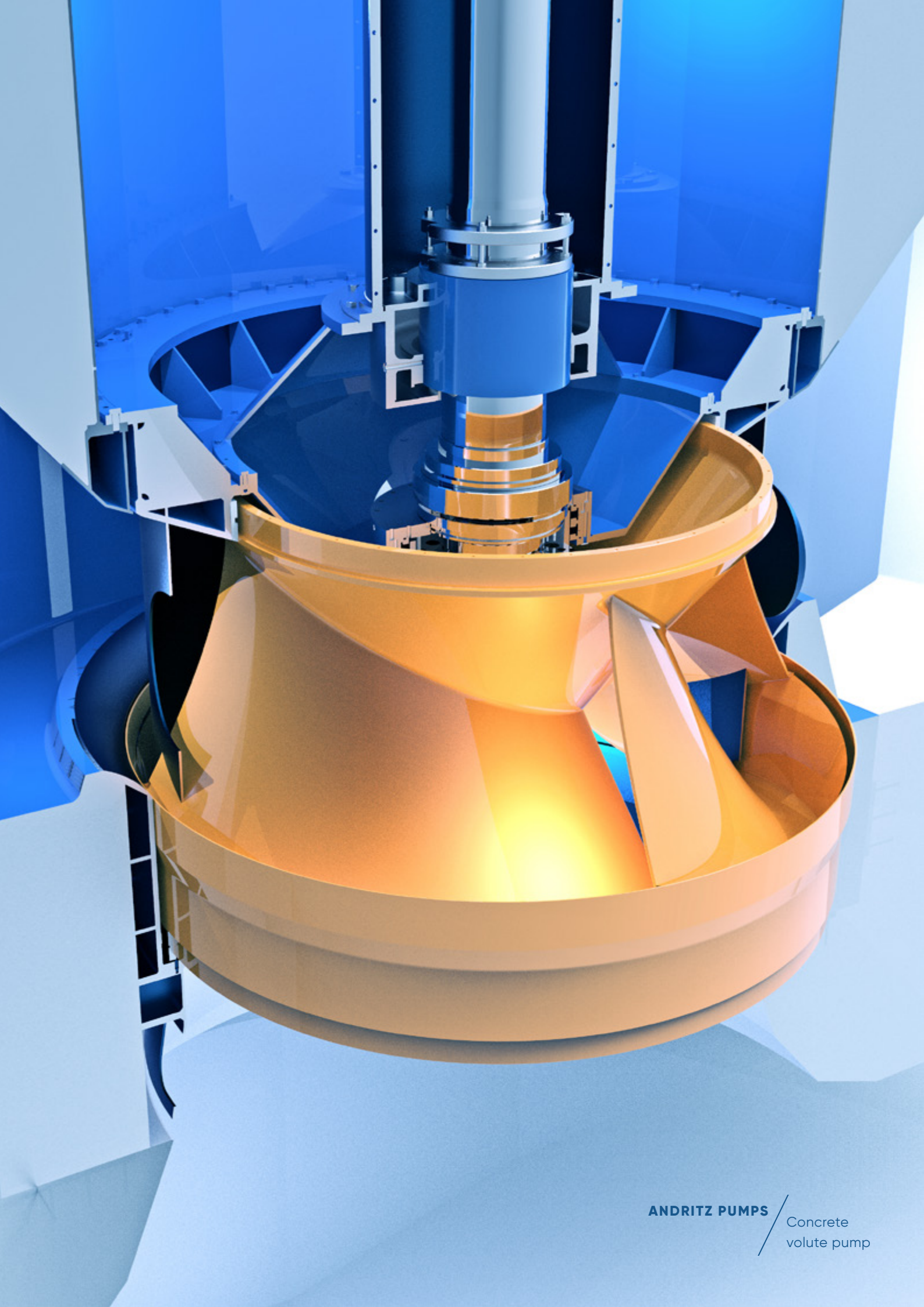
Our Pump Technology Center (PTC) ASTROE enjoys an internationally renowned reputation for its hydraulic developments and investigations. The high efficiency of the ANDRITZ pump series is ensured by Computational Fluid Dynamic (CFD) calculations and extensive testing carried out in our company owned laboratory.

Continuously increasing demands by customers in our operating industries emphasize the significance of R&D in the constant optimization of products and services. Today, efficiency, flexibility, and reliability over an extended lifetime are the major challenges of the market.

Our commitment to research and development forms the basis for our advances in hydraulic machine manufacturing. With PTC ASTROE, center for hydraulic engineering and laboratory, we have an internationally renowned institute for hydraulic development work at our disposal.

We are developing and testing our pumps at different locations worldwide. Our test stands are among the most accurate in the world. By networking these research and development centers, we provide a continuous transfer of know-how within the ANDRITZ GROUP for the benefit of our customers. The main tools for R&D are numerical simulation methods as well as experimental measurements in the laboratory and on site. State-of-the-art equipment, highly precise measuring instruments as well as the latest simulation technologies, and powerful software form the basis of the high technical quality of the pumps and turbines from ANDRITZ.





ANDRITZ PUMPS

Concrete
volute pump

INNOVATION SINCE 1852

The internationally renowned ANDRITZ GROUP has been building pumps for more than 170 years. We offer innovative and targeted solutions with pumps and complete pumping stations. Our longstanding experience in hydraulic machine manufacturing and complete process know-how form the basis of the high standard of ANDRITZ pump engineering. Our quality and high-efficiency products as well as our understanding of customer requirements have made us a preferred partner for pumping solutions worldwide. ANDRITZ offers everything from a single source – from development work, model tests, engineering design, manufacture and project management, to after-sales service and training. We also perform complete start-up on site and guarantee our customers the best support. Our declared goal is your complete satisfaction. See for yourself!

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