PUMPS

EFFICIENT PUMPING TECHNOLOGY FOR DESALINATION

PUMPING THE FUTURE: IIOT-POWERED INNOVATION

ANDRITZ

ENGINEERED SUCCESS

Water

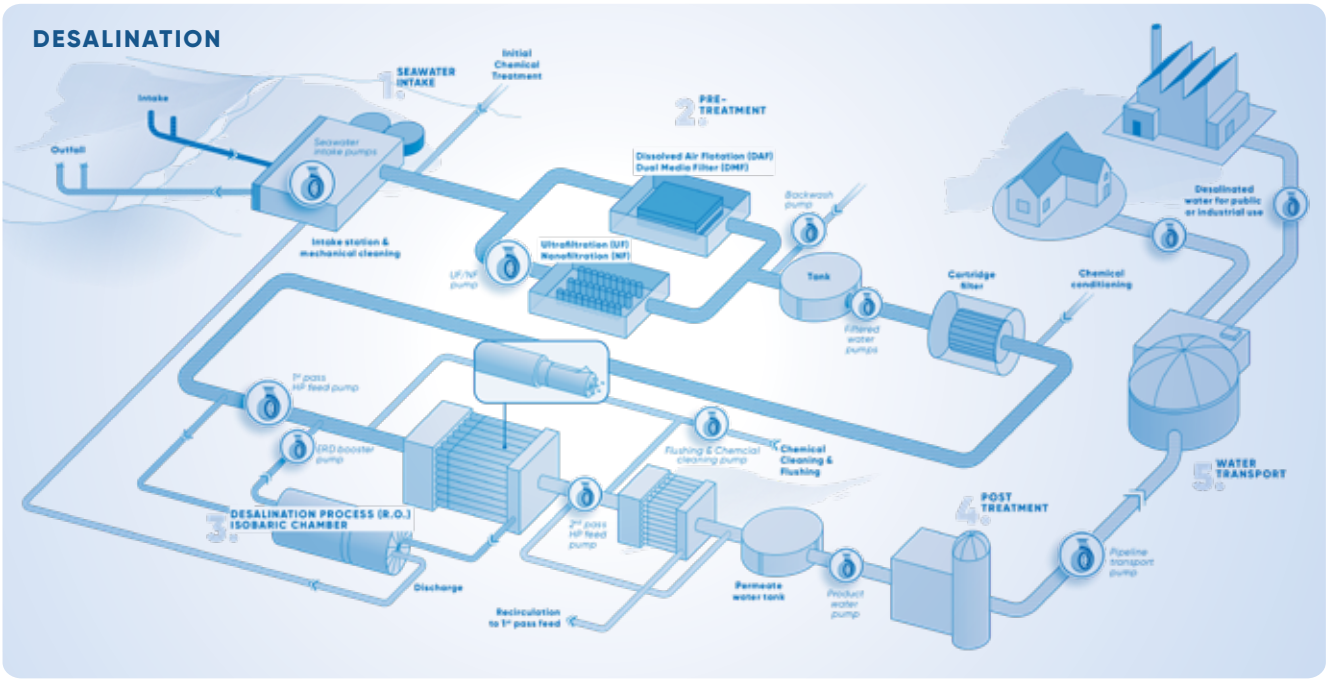
Pulp and paper

Energy

General industries

ANDRITZ in the desalination industry

ANDRITZ provides the complete pump portfolio and technical support for efficient and economic desalination as well as for all necessary production steps.



Apart from these pump solutions, ANDRITZ provides a comprehensive range of products designed specifically for desalination applications.

Discover our state-of-the-art ANDRITZ products tailored to meet the needs of the desalination industry.

For more information please visit our website:

https://www.andritz.com/group-en/industries/desalination-industry

Custom-tailored pump solutions

ANDRITZ is a world leading original equipment manufacturer for centrifugal pumps for seawater desalination applications, especially for Reverse Osmosis (RO) plants.

ANDRITZ Pumps offers highly engineered and reliable pump technology for seawater desalination process. The pump department combines the tremendous development capacities for highly efficient hydraulics with decades of experience with duplex material. Depending on level of salinity and on temperature, pumps are available in Duplex and Super Duplex steel. ANDRITZ centrifugal pumps fulfill highest customer expectations in terms of efficiency, life cycle, maintenance friendliness and economic efficiency.

BENEFITS AT A GLANCE

- Highest efficiencies
- Wide hydraulic coverage
- Tailor made hydraulic development on demand
- Long service life
- Maintenance friendly
- Duplex and Super Duplex materials

PUMP APPLICATION

			HORIZONTAL						
	Vertically suspended		Multistage			Single stage			
			Axial split	Radial split		Double suction		End-suction	
	VLSP	VTP	ASPM	HP-RO	HP[1]	ASPP/ ASPC[1]	ASP-RO	ACP[1]/ ACP-RO	ASCP
Sea water intake	■	■				■		■	■
Filtered water / booster						■		■	
UF feed						■		■	
HP/LP Booster						■		■	
1st pass High-pressure pumps			■	■			■		
2nd pass HP feed					■	■		■	
ERD booster								■	
Backwash		■				■		■	
Flushing								■	
Chemical cleaning								■	
Product transport			■		■	■		■	
Secondary energy recovery[2]					■	■		■	

[1] Also available in vertical arrangement

Vertical turbine pumps (VTP)

ANDRITZ vertical turbine pumps from the VTP series are available in different standardized designs and materials, optimized for service conditions and tailored to customer needs upon request. For instance, the VTP is available in a total of 38 sizes in a range from DN300 to DN800. This pump is offered in multiple stages (1 to 3), and the choice of material for the wear ring ranges from polymers to stainless steel. If cooling is needed for the axial thrust casing, the customer can choose between water cooling and air cooling.

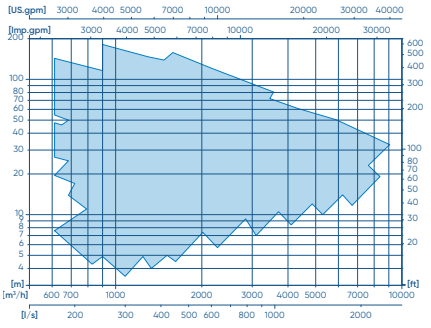
PRODUCT FACTS*

- Flow rate up to 8,640 m³/h
- Head up to 170 m
- Pressure up to 25 bar
- Power up to 1,000 kW
- Efficiency up to 91%
- Sealing: Stuffing box, cartridge and optional split sealing
- Stages: 1 to 3

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

MAIN PRODUCT BENEFITS

- Modular design with cost-effective standard parts
- Multi-stage options for high efficiency
- Various cooling options for thrust bearings
- Low maintenance requirements



Vertical line shaft pumps (VLSP)

ANDRITZ vertical shaft pumps are available in pull-out or non-pull-out design and feature optional hydraulic adjustment of the impeller angle to adapt to changing operating conditions. They are used in water pumping for irrigation and drainage, potable and industrial water supply, and serve as seawater intake pumps for desalination plants. Depending on the application, these pumps are designed as radial-flow, axial-flow or mixed-flow pumps. Materials available include cast iron, cast steel, carbon and low-alloy steel grades, CrNi stainless steel grades, and duplex and superduplex steel grades.

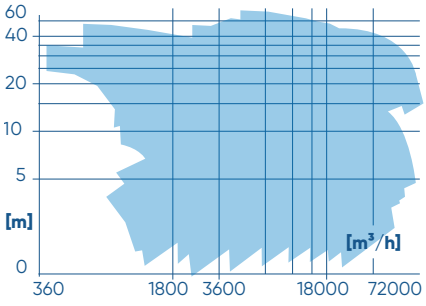
PRODUCT FACTS*

- Flow rate up to 80,000 m³/h
- Head up to 80 m (single stage) – 120 m (multi-stage)
- Pressure up to 30 bar
- Power up to 10,000 kW
- Efficiency up to 92%
- Impeller: radial, mixed flow or axial

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

MAIN PRODUCT BENEFITS

- High efficiency
- Customizable to project requirements
- 1 to 6 stages available
- Shaft lengths up to 25m
- Adjustable impeller for increased flow range
- Pull-out design for easy maintenance



Single-stage centrifugal pumps (ACP & ACP-RO)

ANDRITZ single-stage centrifugal pumps offer robustness, ease of maintenance, and cost-effectiveness. Available in compliance with EN 733, ISO2858, and 5199, they feature diverse material combinations for extended product life and superior efficiency. These end-suction pumps, with closed, semi-open, or open impellers, excel in wear resistance. They find applications in water supply, wastewater treatment, desalination, irrigation, and drainage. A modular design enhances availability, utilizes proven components, and minimizes spare parts inventory. Optimized for use as Energy Recovery Device (ERD) booster pumps in high-suction pressure desalination processes (ACP-RO).

PRODUCT FACTS ACP*

- Flow rate up to 9,000 m³/h
- Head up to 190 m
- Pressure up to 40 bar
- Power up to 2,500 kW
- Efficiency up to 91%

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

MAIN PRODUCT BENEFITS

- High efficiency
- Modular design for easy maintenance
- Only seven bearing sizes for the entire range
- Custom sizes available on request

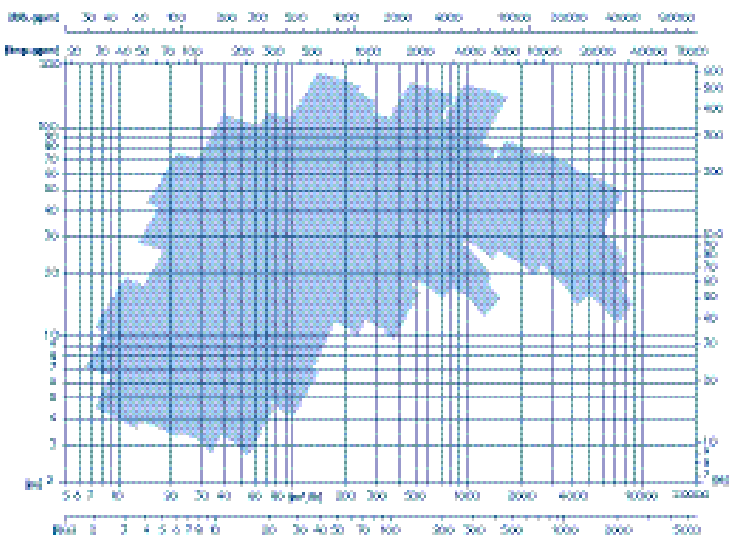
PRODUCT FACTS ACP-RO*

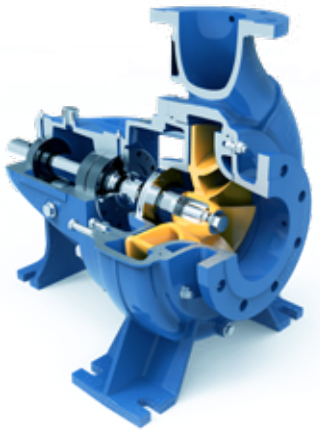
- Flow rate up to 3,000 m³/h
- Head up to 60 m
- Pressure up to 83 bar
- Power up to 500 kW
- Efficiency up to 91%

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

MAIN PRODUCT BENEFITS

- Optimised for RO energy recovery booster applications
- High efficiency with ACP Series hydraulics
- Pull-out design for quick rotor and bearing replacement





Multi-stage axial split case pumps (ASPM)

ANDRITZ multi-stage axial split case pumps have a multi-stage impeller arrangement in single or double flow design that can be combined in different ways to fulfill various application needs. This is a highly engineered pump designed to customers' specific requirements. The machine is optimized for transporting pure, slightly contaminated, or aggressive liquids in water supply projects, power station projects and desalination plants (high pressure pumps). Peak efficiencies, optimum suction performance and user-friendliness make this technology particularly effective, and in the axial split design maintenance-friendly at high heads.

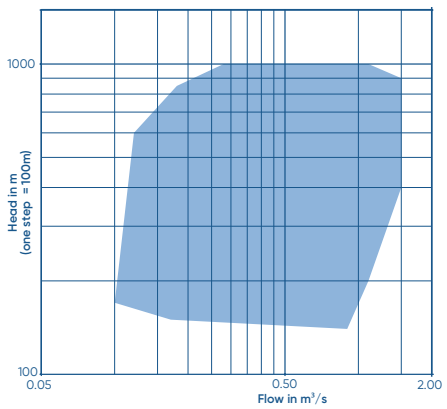
PRODUCT FACTS*

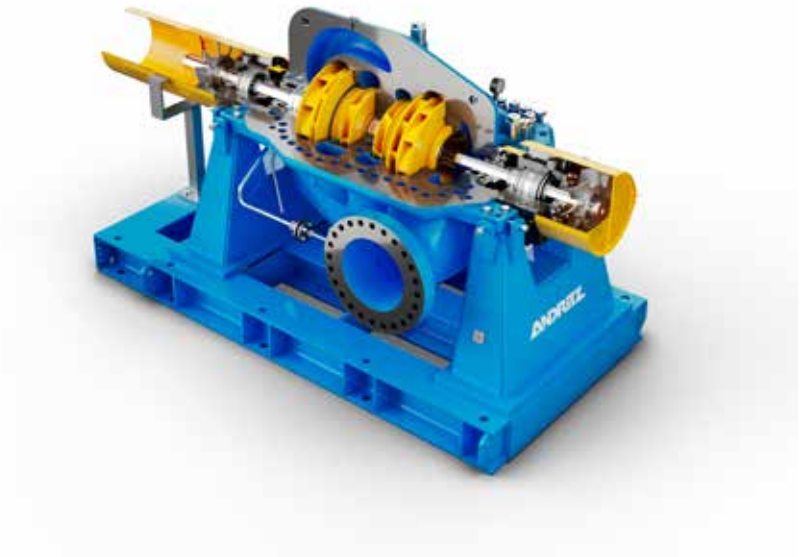
- Flow rate up to 4,500 m³/h
- Head up to 750 m
- Pressure up to 100 bar
- Power up to 8,000 kW
- Efficiency up to 91%

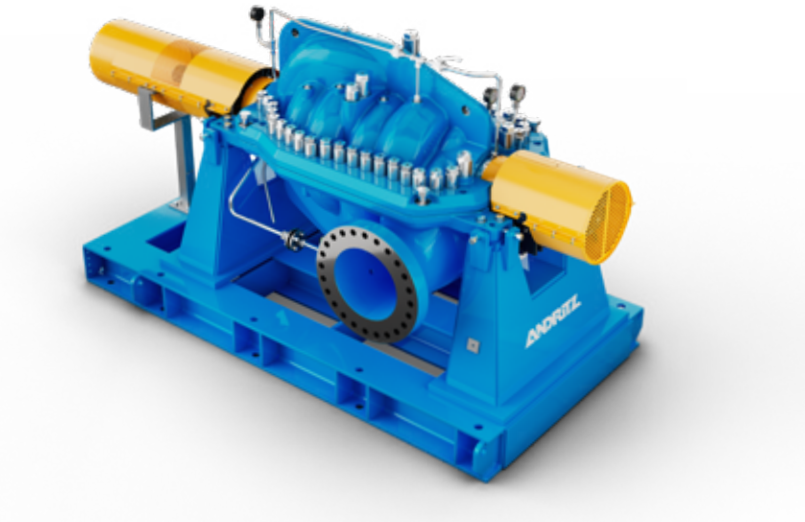
*These values are guidelines and may differ depending on project requirements

MAIN PRODUCT BENEFITS

- Excellent efficiencies above industry average
- Compact and reliable design due to axial force compensation by back-to-back impeller configuration







Double-flow axial split case pumps (ASP-RO)

The ASP-RO single-stage, double suction axial split case high-pressure pump offers significant advantages in both cost and performance. Its compact single-stage design minimizes investment costs, while the double suction configuration ensures lower NPSHr values, enhancing cavitation resistance. Compared to multi-stage pumps, the ASP-RO is easier to maintain, reducing downtime and service costs. This versatile pump is engineered for high-pressure applications, including desalination plants (pressure center design), water transport and industrial processes, delivering superior efficiency and reliability. The ASP-RO's design prioritizes user-friendliness and longevity, making it an excellent choice for demanding environments.

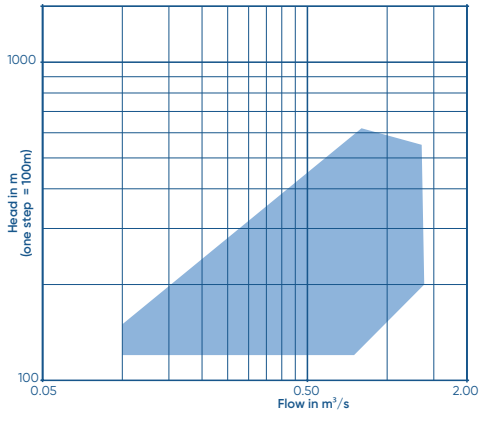
PRODUCT FACTS*

- Flow rate up to 5,500 m³/h
- Head up to 650 m
- Pressure up to 90 bar
- Power up to 8,000 kW
- Efficiency up to 91%

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

MAIN PRODUCT BENEFITS

- Lower investment costs with compact, single-stage, high-pressure design
- Easy maintenance
- Low NPSH with double suction design



Radial split multi-stage pumps (HP & HP-RO)

ANDRITZ radial split multi-stage pumps feature a robust multi-stage ring section design with extra-large shaft sections for vibration-free operation. These pumps offer additional axial thrust balancing through a pump shaft-mounted balancing piston for high output pressures. Shaft sealing options include mechanical seals or gland packing. Shaft wear sleeves protect the shaft against wear and corrosion throughout its length, particularly around the shaft seals. Lip seals safeguard bearing housings from spray water intrusion. For challenging suction conditions with low NPSH-available, the pump can be equipped with an axial inlet to reduce cavitation. Plus, all wearing parts are replaceable without requiring additional work on the casing parts.

PRODUCT FACTS HP*

- Flow rate up to 950 m³/h
- Head up to 400 m
- Pressure up to 40 bar
- Power up to 1,300 kW
- Highest efficiency

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

MAIN PRODUCT BENEFITS

- Excellent hydraulic design with industry-leading efficiency
- Medium-lubricated slide bearings, reliable and easy to maintain
- Easy on-site maintenance

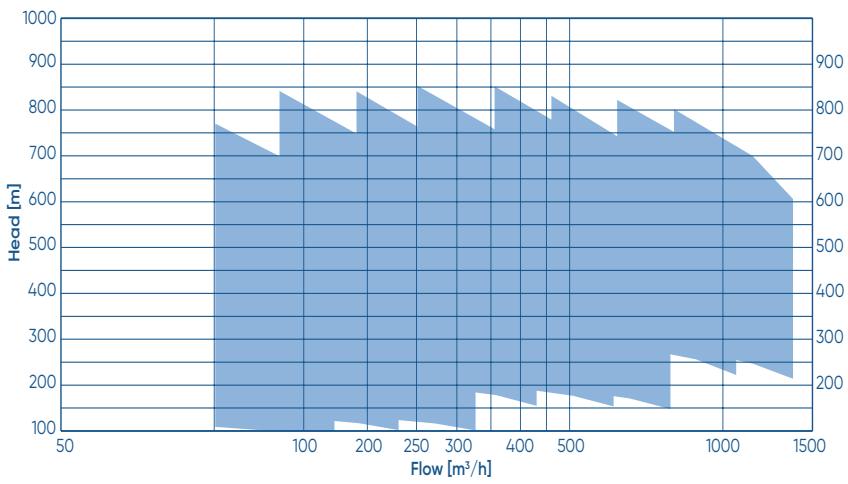
PRODUCT FACTS HP-RO*

- Flow rate up to 1,400 m³/h
- Head up to 850 m
- Pressure up to 100 bar
- Power up to 3,000 kW
- Efficiency up to 88.5%

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

MAIN PRODUCT BENEFITS

- Industry-leading hydraulic efficiency
- Reliable medium-lubricated bearings for easy maintenance
- Flexible flange orientations available



Double-flow axial split case pumps (ASPC & ASPP)

ANDRITZ split case pumps have been further developed into two versions, the ASPC and ASPP split case pumps. The pumps are versatile and are used in water management, wastewater disposal, and large infrastructure projects such as irrigation, desalination, and drinking and process water supply. Their robust construction and sophisticated design not only ensure easy and fast maintenance, but also provide excellent NPSH values and energy savings. Drinking water certifications are available for these pump types.

PRODUCT FACTS ASPP*

- Flow rate up to 40.000 m³/h
- Head up to 250 m
- Pressure up to 25 bar
- Power up to 7,000 kW
- Efficiency up to 93%
- Low pulsation

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

MAIN PRODUCT BENEFITS

- Horizontal split casing
- Easy and fast maintenance
- Excellent NPSH values
- Compact, economic design
- Ideal for small and medium split case pumps

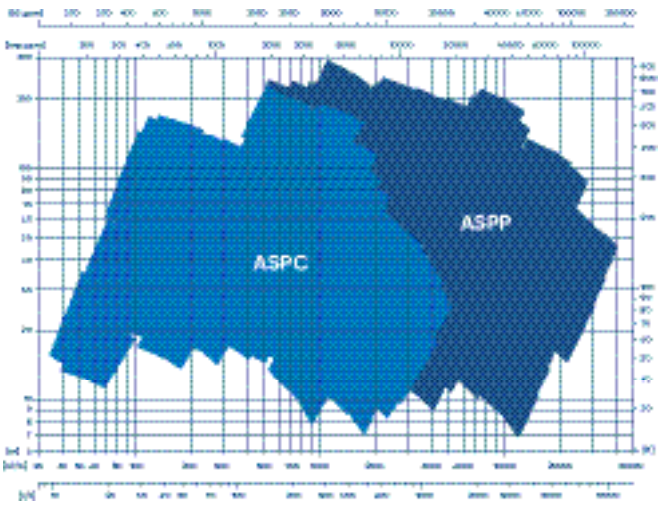
PRODUCT FACTS ASPC*

- Flow rate up to 5,000 m³/h
- Head up to 200 m
- Pressure up to 20 bar
- Power up to 700 kW
- Efficiency up to 91%
- Low pulsation

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

MAIN PRODUCT BENEFITS

- Horizontal split casing
- Easy and fast maintenance
- Excellent NPSH values
- Rigid design with heavy-duty bearings for long product life



Greater efficiency for a competitive edge – Pumps service

Optimization / Modernization / Operating reliability

Are conditions changing your plant while your pumps continue to operate inefficiently and waste energy? Optimize your system and reduce your costs with ANDRITZ pumpen. We have centuries of experience in maintaining pumps, improving efficiency, and adapting to changing operating conditions. Our experienced team ensures the best long-term operational reliability for your systems. Together with you, we evaluate your system, identify potential savings and implement efficiency improvements, reduce maintenance costs, and ensure trouble-free, scheduled installation by our trained personnel.

COST OPTIMIZATION
We enhance your plant's efficiency and cut your costs.

MODERNIZATION AND REHAB
We bring your plant up to the latest standards.

OPERATING RELIABILITY
We are here for you around the clock, 365 days a year, with our service partners.

AUTOMATION
Customized solutions and services for small and large pumping stations.

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

Always a flow ahead – Research and development

Our affiliate 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.

In response to evolving customer demands, we prioritize R&D to optimize our products and services. Efficiency, flexibility, and reliability over an extended lifespan are now paramount in the market.

Our commitment to research and development is foundational for hydraulic machine manufacturing. Through ASTROE, a leading hydraulic engineering institute, we have the resources for development and testing in Austria, Germany, Switzerland, and China, with some of the world's most precise test facilities. These centers are interconnected to facilitate knowledge exchange within the ANDRITZ GROUP, enhancing our offerings for customers. R&D relies on numerical simulations, lab experiments, and cutting-edge equipment, ensuring the high technical quality of ANDRITZ pumps and turbines.

RANGE OF SERVICES

- Model testing in the hydraulic laboratory
- Hydraulic design and numerical flow simulations
- Prototype tests and plant measurements

Highest casting quality by in house foundry

ANDRITZ – Special Alloy Foundry Co. Ltd. is renowned for producing high-quality stainless steel castings for ANDRITZ pumps and hydro solutions, as well as external customers. Since commencing production in 2007, the foundry has established itself as an industry leader, noted for its impressive production capabilities and cutting-edge processes.

PRODUCTION CAPACITY AND QUALITY

The foundry achieves an annual production volume of 1200 tons and employs 82 skilled workers. The maximum casting weight is up to 8 tons, allowing for significant flexibility in production.

PATTERN SHOPS AND MATERIAL DIVERSITY

The foundry is equipped with modern pattern shops that ensure efficient and precise manufacturing of casting molds. Over 30 different steel grades are processed, with a focus on duplex and super duplex steels known for their high corrosion resistance and strength.

PRODUCTION PROCESSES

The production process comprises several meticulously coordinated steps, including:

Pattern Creation and Molding: Supported by simulations using MagmaSoft and GS 100 software to optimize feeder and gating systems.

Melting Process: Utilizing medium-frequency furnaces with a nominal capacity of 1.5 to 6 tons, supported by argon purging and an AOD converter.

Fettling and Heat Treatment: Programmable electric heat treatment furnaces up to 1200°C, water and air quenching, and stainless steel shot blasting for surface finishing.

TESTING PROCEDURES AND QUALITY CONTROL

Comprehensive testing procedures are employed to ensure the highest quality standards:

Mechanical Testing: Universal tensile testing machine, impact test machine (down to -60°C), hardness testing (HBW, HRC, HV).

Metallographic Examinations: Spectrometer with a nitrogen channel, metallographic inspection, and CMM machine for dimensional checks.

Non-Destructive Testing (NDE): Penetrant liquid test (PT), magnetic particle test (MT), and ultrasonic test (UT). Radiographic tests (RT) are in-house.

The foundry also conducts regular third-party analyses through the Guangzhou Research Institute and employs qualified staff with Level II certifications in relevant testing procedures. This ensures that all products meet the highest standards of quality and safety.

With this comprehensive and well-thought-out approach, ANDRITZ – WOLFENSBERGER Special Alloy Foundry Co. Ltd. not only delivers stable and high-quality casting products but also continuously innovates and adapts to meet the needs of its customers.

XIANDA TIANJIN – LEADING THE WAY IN DESALINATION

Desalination management around the world

In the rapidly developing industrial hub of Tianjin, China, the Xianda Tianjin Nangang Industrial Area Seawater Desalination and Integrated Utilization (300MLD piloting) Project stands out as a monumental achievement in sustainable water management. With a planned capacity of 300,000 m^3 per day, this project is set to become the largest seawater desalination facility under construction in China. By the end of 2023, a significant milestone was achieved with the successful commercial operation of four high-pressure pumps and four seawater intake pumps.

ANDRITZ played a crucial role in the initial phase (first 150,000 m^3 per day) of this groundbreaking project. Tasked with supplying high-pressure pump units and seawater intake pumps, ANDRITZ brought its extensive expertise and innovative solutions to the forefront. The pumps are designed to handle the demanding requirements of large-scale desalination, ensuring reliable and efficient operation.

The contract for this significant undertaking was awarded in 2022. By Q4 2023, the first phase of the project including ANDRITZ pumps has successfully been delivered and commissioned. This included the installation of four high-pressure pumps, four ERD booster SWRO pumps and four seawater intake pumps, all of which are now in commercial operation. Intake pumps, High pressure pumps and ERD booster pumps are the main and most important pumping equipment in a desalination plant. These components are vital for the plant's ability to process large volumes of seawater and produce fresh, potable water.

The Xianda Tianjin project is a testament to ANDRITZ's commitment to environmental sustainability and operational efficiency. The high-performance pumps not only ensure the optimal conversion of seawater into fresh water but also contribute to significant energy savings and reduced operational costs. The project's adherence to stringent environmental standards underscores its role in promoting sustainable water management practices.

The successful implementation of the first phase of the Xianda Tianjin project highlights ANDRITZ's capability to deliver high-impact solutions on a massive scale. As the largest seawater desalination project under construction in China, Xianda Tianjin is poised to set new benchmarks in the industry. The project's future phases will build on this foundation, ultimately providing a reliable and sustainable water supply for Tianjin and its surrounding regions. Through its innovative technology and unwavering commitment to quality, ANDRITZ is helping to pave the way for a more sustainable future in water management.

300,000 M³/DAY

ANDRITZ PUMPS POWER CHINA'S LARGEST SEAWATER DESALINATION PROJECT, PROVIDING 300,000 M³/DAY WITH HIGH EFFICIENCY AND ENERGY SAVINGS.

QUEBRADA BLANCA II

Sustainable desalination for Chile's mining industry

In northern Chile, the Quebrada Blanca II project emerged as a crucial solution to the region's pressing water scarcity issues. The Reverse Osmosis (RO) desalination plant, with a remarkable capacity of 103,680 m^3/day, stands as a beacon of sustainable water management and technological innovation.

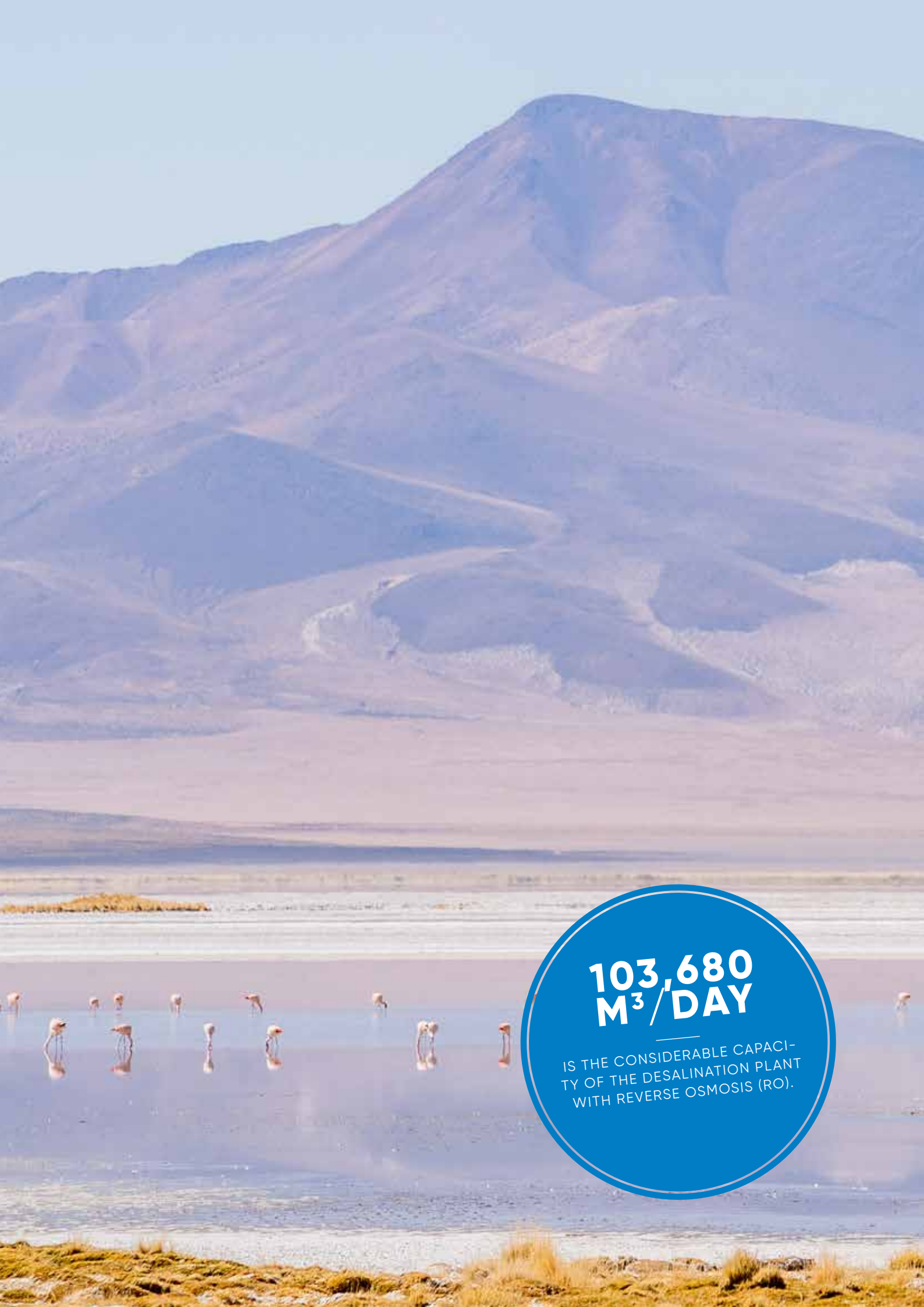
ANDRITZ was chosen to play a pivotal role in this ambitious project, entrusted with the task of enhancing the desalination process. Their expertise brought twenty process pumps, tailored to ensure the plant's economic viability, and two high-throughput decanters, designed for efficient brine dewatering. This equipment was instrumental in achieving the desired sludge dryness, making waste disposal both safe and cost-effective.

ADVANTAGES FOR ENVIRONMENTAL AND OPERATIONAL EXCELLENCE

One of the significant achievements of the Quebrada Blanca II project is its adherence to stringent environmental protection measures. This compliance not only mitigates ecological impact but also sets a new standard for future projects. The plant's fully automated operations, powered by Metris addIQ, streamline efficiency, reducing the need for manual intervention and enhancing overall productivity. Furthermore, the strategic management of capital expenditure and operational costs has ensured the economic success of the project.

PROJECT SUCCESS AND FUTURE IMPLICATIONS

The successful implementation of ANDRITZ's solutions at Quebrada Blanca II underscores their commitment to innovation and sustainability. By reducing operating expenses and maintenance costs through highly efficient pumps and optimizing the overall desalination process, ANDRITZ has played a pivotal role in making Quebrada Blanca II a model for future desalination projects. This initiative not only secures a vital water supply for northern Chile but also showcases the seamless integration of advanced technology with environmental responsibility. With local support and cutting-edge solutions, ANDRITZ has proven its ability to deliver impactful, sustainable results in water management.



103,680 M³/DAY

IS THE CONSIDERABLE CAPACITY OF THE DESALINATION PLANT WITH REVERSE OSMOSIS (RO).

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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