

Manufacturing Graz

Our know-how is your advantage



Top products for all ANDRITZ business areas

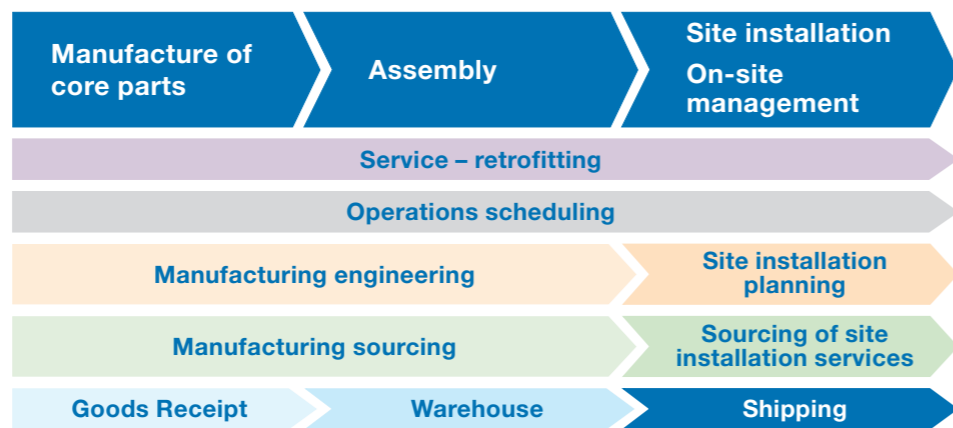


In our state-of-the-art facilities we offer fabrication, machining, assembly as well as service-repair and retrofitting for our customers. We are a respected partner providing innovative and efficient solutions in manufacturing, procurement and product development. We are a reputable service partner with innovative solutions in manufacturing, procurement, and product design.

The workshops in Graz have a total capacity of 400,000 to 650,000 manufacturing hours a year. To ensure accurate delivery performance and competitive lead times we actively manage capacity cycles.

Accurate planning, high commitment, and above all, the flexibility of our employees are the success factors that guarantee short lead times and high on-time performance.

Continuous improvement of the supply chain processes guarantees best product quality and has a substantial influence on our customers' satisfaction.



- Assistance in product transfer projects
- Supervision
- Manufacturing expert support
- Product engineering and development in cooperation with our customers

When there's a need for experts

Manufacturing Graz offers the whole process and supply chain by providing accurate project management, production planning, procurement, manufacturing and assembly services. We deliver a full scope Business-to-Business solution commencing

with the receipt of the customer's requirements followed by manufacturing, site installation and start-up.

Important success criteria:

- Manufacturing expertise and competence on a broad range of products
- Well educated and highly experienced experts supporting our customers world wide
- Highest quality standards based on individual customer requirements
- Accurate and competitive lead times over the whole supply chain
- Manufacturing experts supporting product engineering and development as well as support for the production of prototypes

Apprentice training Next generation

ANDRITZ realized at a very early stage how important it is for a company's success to train its own highly qualified specialists and has been running its own training and education workshop since 1922.



Our apprentices get practical, professional training in our workshops and attend a vocational school for one term a year throughout their apprenticeship. This guarantees sustainability for our business and offers various possibilities for young people and their future.

In addition, ANDRITZ offers its apprentices various technical and language courses, also organizing assignments abroad as part of an international apprentice exchange project.

The training offered, by far exceeds the statutory requirements. This is also reflected in the continuous excellent performance by ANDRITZ apprentices at the final apprenticeship examination.

We have approximately 100 permanent apprentices at ANDRITZ in Graz.

Apprenticeships at the Graz location

- Metals technology, fabrication and welding technology
- Materials engineering (focus on materials testing)
- Metals technology, mechanical engineering
- Metals technology, machining technology
- Electrical engineering (focus on plant and production engineering, automation, and process control engineering)
- Design engineering (focus on mechanical engineering)
- Industrial clerk

Manufacturing engineering Organization with common sense

Manufacturing engineering is the customer interface between manufacturing and the individual ANDRITZ business areas.

tracking and shop floor control to meet the customer requirements.

Our manufacturing engineering department ensures professional project management, project portfolio resource planning, production planning, sourcing- and subcontracting as well as efficient order

Our major goal is to offer a full scope Business-to-Business solution, which provides a tailor-made and customer specific package in respect of Services, Andritz core-component manufacturing scope and external procurement of components.

Process steps in manufacturing engineering

- Full scope project management and order execution to fulfill customer requirements in terms of lead time, costs and quality
- Project scheduling and follow-up
- Capacity planning
- External procurement, sourcing and subcontracting
- Support services for product development and prototype manufacturing
- Basic and detailed engineering of individual and customer specific production resources and tools
- Welding supervision



In addition, manufacturing engineering staff support our business partners during the sales phase by calculating production cost budgets and providing related price agreements. In order to stay within the agreed budget we frequently carry out cost follow-ups at project level.

Furthermore, manufacturing engineering provides professional support in product engineering and development as well as in prototype manufacturing projects.

- Assistance in costing for manufacturing and assembly services
- Consulting on manufacturing engineering matters and feasibility studies
- Support, supervision and inspections at sub-contractors' facilities



Logistics Center in Graz The bloodstream of the manufacturing plant

Worldwide logistics to customers' specs

In order to ensure smooth integration into the worldwide value added processes of our business areas, logistics requirements are closely linked to the high quality standards at ANDRITZ. We also take a holistic approach to the logistics process: from our suppliers, through our own logistics to custom-tailored delivery logistics for our customers. In the end, it is all about overcoming distances, being close to customers, and generating more added value. That's what we do day in, day out, all around the world.

Goods receipt, incoming goods

- CMR check (convention merchandise routine)
- Customs clearance
- Initial visual inspection
- Service spare part management
- Customer-specific support service

Incoming goods check and inspections

- Quality inspection
- Component check and documenting of result
- Inspections and progress checks at suppliers' facilities
- Supplier development

Complaints management

- Communication with suppliers
- Handling of return deliveries

Warehouse management

- Intermediate storage
- Inventory management
- Material replacement planning
- Pre-picking and materials issue

Commercial shipping process

- Worldwide transport planning, (air-freight, seafreight and/or rail or road transports) including abnormal heavy and wide loads
- Handling of import/export customs clearance
- INTRASTAT/dual use/compliance inspections
- Express deliveries

Packing

- The goods to be packed are classified in 10 goods categories according to the nature of the goods and based on customer requirements

Fabrication

High-quality and individual solutions



Fabrication is a specialized welding shop for production and repair of complex and high-grade components, largely made of stainless and acid-resistant materials.

The right welding process

is determined by our welding technologists together with our quality assurance department, placing special attention on precise welds. Fabrication has eight different welding processes, all of which reflect the latest state of the art (MIG, MAG, TIG, manual electric arc welding, SAW, CMT, PPA, PSL).
Process steps in fabrication:

Cutting

The components are cut out of the metal sheets using thermal cutting processes.

Forming

The parts are folded on presses and curled on bending machines.

Assembly

When the metal sheets are available in the shape required, all of the individual parts are combined and prepared for welding. In order to guarantee the correct dimensions, the parts are moved into position first of all, tack-welded, and straightened.

Welding

The components are welded using various high-quality processes.

Post-treatment

After welding, the components undergo thermal and/or mechanical post-treatment.

Process steps in fabrication

- Cutting
- Forming
- Welding
- Annealing

Fabrication

Catalog of manufacturing equipment



Cutting

NC autogenic flame cutting machine

Length	up to 12,600 mm
Width	up to 3,000 mm
Sheet thickness	up to 300 mm

NC plasma flame cutting machine

Length	up to 12,600 mm
Width	up to 3,000 mm
Sheet thickness	up to 40 mm (C-steel)
Sheet thickness	up to 120 mm (stainless steel)

NC underwater plasma flame cutting machine

Length	up to 12,000 mm
Width	up to 4,300 mm
Sheet thickness	up to 40 mm

Forming

Folding presses

Width	up to 8,000 mm
Sheet thickness	up to 60 mm

Bending machines

Width	up to 3,000 mm
Sheet thickness	up to 20 mm
Width	up to 3,000 mm
Sheet thickness	up to 50 mm

Annealing

Car bottom annealing furnaces

Temperature range:	300 °C-750 °C
Length	up to 9,000 mm
Width	up to 4,000 mm
Height	up to 3,500 mm
Weight	up to 50 t

Welding

Gantry welding robots

Length	up to 2,300 mm
Width	up to 2,300 mm
Height	up to 1,500 mm
Weight	up to 5 t

Welding robots

Diameter	up to 5,400 mm
Length	up to 14,000 mm
Weight	up to 30 t

PTA machines

Diameter	up to 1,750 mm
Length	up to 6,000 mm
Weight	up to 5 t

SAW automatic welding machine

Diameter	up to 6,000 mm
Length	up to 12,000 mm
Sheet thickness	up to 150 mm
Weight	up to 50 t

NC SAW welding plant

Diameter	up to 3,300 mm
Length	up to 30,000 mm
Weight	up to 15 t

Various manipulators for workpiece aligning

Type	rotating, tilting, swiveling, and lifting manipulators
Weight	from 500 kg to 50 t

CNC rotary welding device

Diameter	up to 900 mm
Length	up to 4,000 mm

Machine shop

High-quality products



High-quality and complex components with demanding quality and precision requirements are processed in the machining workshop.

The technologies used are machining processes where the material (mainly metal) is given the required shape by removing chips. Beginning with virtual 3D models, separate programs are prepared for individual machining of parts on CNC machining equipment.

Technologies

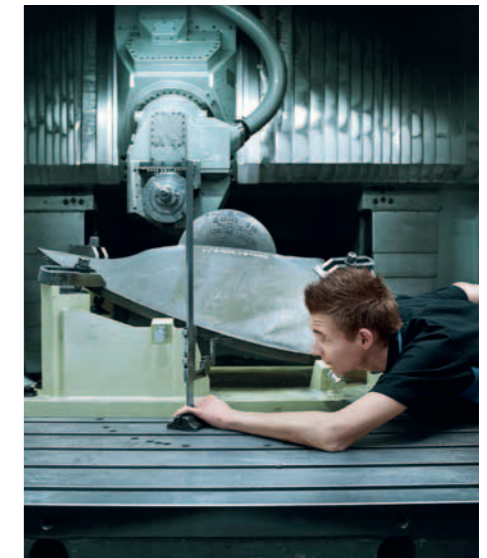
- CNC turning
- CNC milling and drilling
- CNC grinding
- CNC planing
- Lapping
- Dynamic balancing up to 30 t component weight
- NC programming
- 3D measurements

In addition, modern and extensive measuring equipment ensures that our products are of high quality. This equipment includes a laser tracker, several 3D measuring arms, and a 3D coordinate measuring machine.



Machine shop

Catalog of manufacturing equipment



CNC horizontal lathes

Diameter	up to 2,400 mm
Length	up to 15,000 mm
Weight	up to 50 t

CNC vertical boring and turning mill

Diameter	up to 4,380 mm
Length	up to 3,000 mm
Weight	up to 50 t

Drilling and milling

CNC machining centers (including rotary tables)

5-axis machining	
X =	23,000 mm (16,000 mm)
Y =	5,000 mm
Z+W =	2,200 mm

Planing

Gantry planers

Length	up to 10,500 mm
Width	up to 1,500 mm
Height	up to 2,000 mm
Weight	up to 31.5 t

Balancing

Balancing machines

Diameter	up to 2,800 mm
Length	up to 10,000 mm
Weight	up to 32 t

Grinding and lapping

CNC internal cylindrical grinding machine

Diameter	up to 850 mm
Weight	up to 0.5 t

External cylindrical grinding machine

Diameter	up to 600 mm
Distance between centers	up to 4,000 mm
Weight	up to 3 t

Surface grinding machine

Length	up to 1,000 mm
Width	up to 550 mm
Height	up to 400 mm

Lapping

Manufacture of mechanical seals

Measuring equipment

Air-conditioned measuring room with measuring machine

Weight	up to 4 t
Length	3,000 mm
Width	1,500 mm
Height	1,200 mm
Measuring accuracy	± 0.06 mm (at 500 mm)

Measuring machine for large components

Length	12,000 mm
Width	3,500 mm
Height	2,500 mm
Measuring accuracy	±0.06 mm (at 1,000 mm)

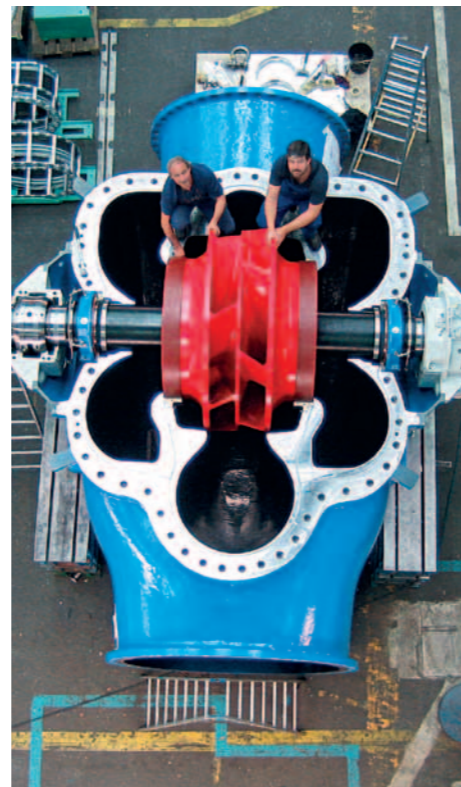
Mobile 3D measuring equipment

Laser tracker for large components and on-site measuring

Measuring range up to 35 m

3D measuring arms, including component scanner

Width	4,000 mm
Measuring range	up to 35 m



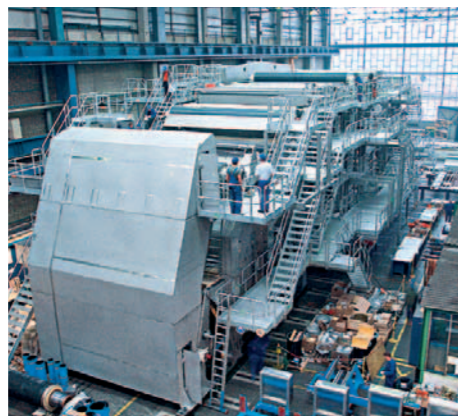
Assembly: a soccer pitch for assembling key components

The assembly shop's services cover the following:

- **PULP & PAPER:**
Tissue machines, sheet drying plants, refiners, twin wire presses, screw presses, board machines
- **HYDRO:**
Hydro-electric turbines, pumps, space technology components
- **METALS:**
Pickling lines, galvanizing lines, regeneration plants, DeNO_x plants
- **SEPARATION:**
Disc filters, pressure filters, vacuum filters, belt presses

Our assembly shops extend over a total area of approximately 9,000 m², which is roughly the size of 14 soccer pitches. Machines up to a height of 16.2 m are assembled here.

Another important service offered is our deployment of highly qualified personnel to assignments on sites around the world. High flexibility is an established practice in the assembly shop.



Assembly service portfolio:

- Assembly of key machinery (A-Parts) and equipment
- Site supervision
- Mechanical function tests and test runs without media
- Assistance with assembly work at other manufacturing locations
- Quality checks on all components
- Checks for completion and conformity
- Assistance with know-how transfer to low-wage locations
- On site installation services and support for commissioning and start-up
- Planning and execution of pipe systems (hydraulic and pneumatic)

Repair center in Graz

The professional service center

The repair center in Graz develops performance-oriented service and rehab concepts offering maximum customer benefit and short return on investment at the same time.

All customer requests are fulfilled by means of individually custom-tailored solutions in line with the technical, economic, and legal requirements. The range of products and services comprises supply of components and spare parts, assistance with start-up and commissioning, brief repairs and modifications, inspections and remedial maintenance, analysis of remaining useful life, risk assessment, feasibility studies, training, and refurbishment, as well as modernization and rebuild of existing plants.

Our employees are deployed worldwide for supervision and for complete execution of service orders. A high level of customer orientation, lean processes, flexibility with respect to time, place, and product know-how are the mainstays of the repair center.



Service portfolio of the repair center in Graz

- **Project execution:** Projects executed by the repair center under its own responsibility, planning and order processing in the service sector in collaboration with the business areas
- **Diagnosis:** Logging, evaluating and weighing up project-related parameters
- **Analysis:** Development and evaluation of suitable modernization scenarios and/or repair measures
- **Therapy:** Implementation of optimum modernization solutions
- **Installation:** Disassembly/assembly and test runs for equipment and plants (in-house and on site)
- **Manufacturing:** Unrestricted access to high-quality manufacturing operations
- **Packing and shipping**

Electric panel shop

Switchgear to meet the highest demands

Detailed planning, installation, and wiring of switch cabinets, MCC cabinets, local operating panels, and VVVF drive cabinets are the main focus of our range of services. Here, we connect the strengths of the individual members of the ANDRITZ GROUP to provide a custom-tailored system solution with optimum cost efficiency for our customers. For individual solutions, the electric panel shop is the ideal partner for all ANDRITZ business areas. The panel shop is generally deeply involved in the planning, application, and offer phases so it can implement ideas and changes directly and flexibly during manufacture of the cabinets. The electric panel shop also provides assistance wherever needed, also on site installation planning for the respective orders.



Electric panel shop service portfolio

- Detailed planning, procurement, and assembly of certified and type-approved switchgear complying with the applicable standards
- Providing staff for installation supervision and start-up of hardware and software components for plant automation
- Comprehensive overall project supervision (from beginning of order until completion of repair)
- Cost estimates, planning, and procurement of materials for switchgear
- Manufacture and testing of low-voltage switchgear
- Machine wiring
- Delivery processing for all electrical components
- Installation
- Start-up

The cabinets are manufactured in accordance with ISO 9001, EN 60439 (new version EN 61439), and EN 60204. The electric panel shop can provide the following certification for switchgear of own manufacture:

- CE (product safety marking in Europe)
- CULUS (testing according to Canadian and United States safety directives)
- SA (product certification for the Canadian market)

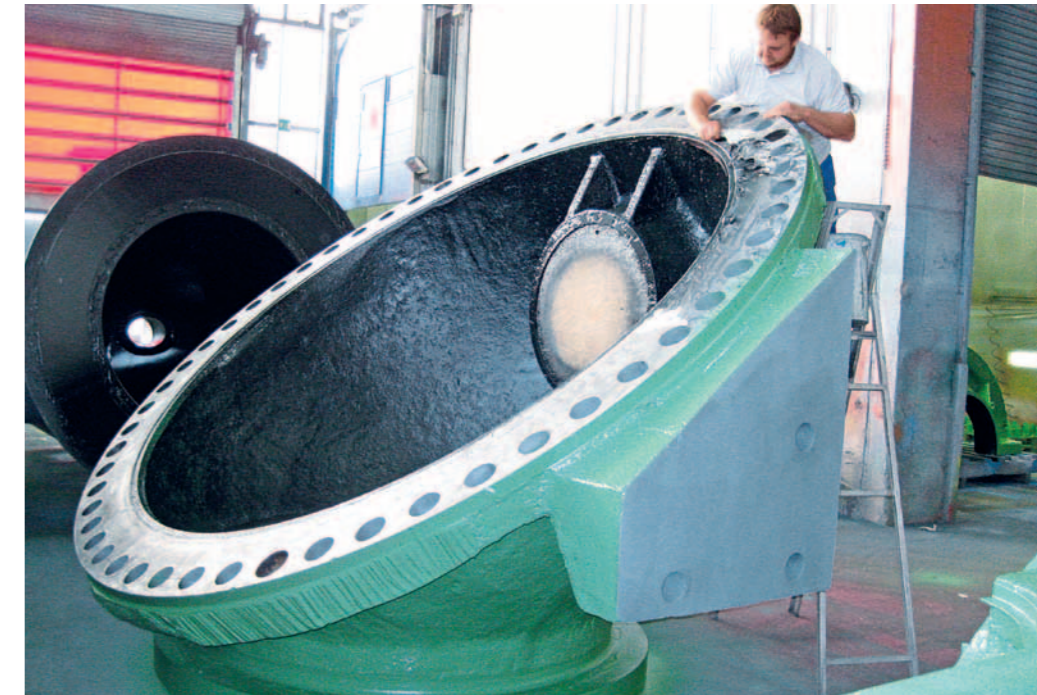


Plastics shop

and surface treatment technology

Plastics shop

Due to its many years of project experience, the plastics shop has broad technical knowledge and accompanies the business areas over the entire value added chain (support in planning, procurement under own responsibility, production, as well as assembly, shipping, and service).



Plastics shop service portfolio

- Order execution as well as technical and practical assistance for the business areas
- Welding, assembly
- Manufacture of components made of Duroplast, Thermoplast, elastomers, and polymer concrete, as well as all types of coatings
- Cutting of semi-finished goods
- Laminating with different reinforcing materials
- Elastomer treatment of polymer concrete
- Wear-resistant coatings
- Non-stick coatings

Surface treatment technology

Corrosion protection covers a wide range of different fields of application. It includes technologies to prevent damage caused by atmospheric, chemical, and mechanical stress acting on metal components. Standards like EN ISO 12944 and bodies of rules and regulations standardize the quality and workmanship by means of specific stress classifications.

The plastics shop offers different coating systems conforming to standards. The surface preparation is also chosen according to the corrosion protection system and applied either mechanically or by blasting with appropriate blasting means in each case. We guarantee excellent quality from the first step to the last – in the workshops or directly on site.

Surface treatment service portfolio

Surface preparation and application of different industrial coating systems (paint, coating, metal spraying) using environmentally friendly, high-quality technological processes.

- Degreasing
- Component cleaning (e.g. soda blasting)
- Blasting technology (stainless with ceramic pearls, C-steel with iron grit, surface finishing by shotpeening)
- Wear-resistant coatings
- Application process, (airless, gravity spray gun, hand painting)
- Metal spraying (wire flame spraying, arc spraying, powder flame spraying (metal/plastic))

Materials testing

Safety, inspection, trust



Materials testing service portfolio

Different material tests are used here in order to supply our customers with the highest possible quality.

Non-destructive testing

- Dye penetrant testing (PT)
- Magnetic particle testing (MT)
- Material analysis
- X-ray testing (RT)
- Ultrasonic testing (UT)
- Visual inspection (VT)

Destructive testing

- Hardness test
- Notch impact testing
- Tensile testing

The quality of products depends in many ways on the quality of the materials used. The demands that industry makes on the chemical and physical properties are similarly high. Thus, tensile strength, corrosion resistance, and hardness (brittleness) are tested in steel, other metals, and in composite materials in different uses.

Materials testing is a sector of materials technology, and its processes make a substantial contribution towards quality and innovation.



Site installation

In action on your site



Thanks to its many years of experience and work being performed by the company's own specialists, the site installation department is a competent and reliable partner for all of the ANDRITZ GROUP's business areas.

Working together with you, we can find the optimum solution and accompany you from installation work planning up to hand-over to the business area.

Nothing is too big, nothing is too heavy. As a competent partner on site, we perform our work with flexibility, strength of purpose, and cost awareness. Due to our extensive stock of special equipment and our engineering competence, we can also solve difficult challenges to the full satisfaction of our customers.

Site installation service portfolio

Global management, planning, directing, supervision, and performance of site installation and service activities on machines/plants are a guarantee for first-class quality. The site installation team ensures on-schedule professional installation and start-up/commissioning of ANDRITZ equipment on customer sites all over the world.

- Installation and site coordination
- Assistance during start-up and commissioning
- Service
- Planning and implementation (cost estimate and sales support, project execution)

Manufacturing Graz

Global and local



Our certifications:

- OHSAS 18001
- ISO 9001
- AD2000-HP0
- ISO 3834/2
- ASME – N, NPT, NS
- KTA 1401, AVSD 100/50
- KTA 3201.3
- KTA 1408.3
- KTA 3903
- QSF-C
- AQSIQ-China
- UL 508 A
- Pressure Equipment Directive 97/23/EC

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