



## Be ready for industry 4.0!

Our mission is to enable our customers to achieve their target figures: overall equipment efficiency, minimum production costs, transparency, and short training periods – all of which is required to give our customers peace of mind. That is what drives us in our continuous R&D efforts aimed at developing state-of-the-art filter press technologies. This is especially important in the highly competitive markets our customers are dealing with – be it the food, mining and minerals, environment, or chemicals industry. And the industries are facing a new challenge – the fourth industrial revolution, based on the use of cyber-physical systems.

#### SOLUTIONS FOR DIGITALIZATION AND INDUSTRIAL INTERNET OF THINGS (IIoT)

With ANDRITZ filter press technology, you are prepared for the challenges of digitalization and IIoT – all to the degree that fits your individual needs.

With a broad portfolio of automation solutions: From smart sensors to collect all the relevant operational data of your filter press, to sophisticated data analytics to turn data into relevant information, to augmented reality that visualizes the information for the operator.

For different degrees of automation: From manual operations to fully automated filter presses.

For a wide range of purposes: From predictive maintenance solutions, to process monitoring and troubleshooting, to long-term trending.

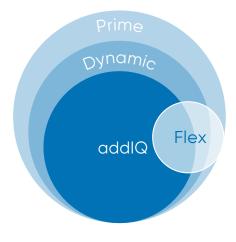
#### YOUR TRUSTED PARTNER FOR FILTER PRESS TECHNOLOGY IN THE PAST AND IN THE FUTURE

We can look back on more than 150 years of experience with over 20,000 filter press installations worldwide – a track record that not only underscores our status as a global separation specialist, but also as a strong partner for a wide range of customers in different industries. Our references underpin the vast experience we have and the trust our customers put in our knowhow. Extensive experience paired with innovation – ANDRITZ is your key to industry 4.0.

# Intelligent filter presses

Metris addIQ combines all our extensive operation, troubleshooting, and start-up experience in one tailored automation solution. The addIQ control system is a unique automation product. Its nucleus is a modular, PLC-based control system that supports you in making best use of your ANDRITZ filter press. In combination with addIQ add-ons and upgrades, the addIQ control system maximizes your machine performance regardless of whether you are using ANDRITZ filter presses or other makes.

The addIQ control system is available in different packages according to individual needs. The packages available include addIQ Dynamic, addIQ Prime, and addIQ Flex.



Each package can interact in different operating modes (including maintenance and manual operating mode), bringing undeniable advantages to your process by controlling a broad range of functions:

#### FILTER PRESS AUTOMATION SOLUTIONS

#### Hydraulic closure pressure control

More operating safety because the pressure is maintained at a safe, constant level. addIQ automatically measures and controls the hydraulic and feed pressure as well as the feed temperature and adjusts it as needed.

#### Plate shifter

For faster filter cake discharge, the speed of the plate shifter can be adjusted in both overhead and sidebar filter presses.

#### Drip plates

The drip plates are moved by means of hydraulic cylinders, which are controlled by addlQ. It ensures that the drip trays are in the open position for cake discharge and in the closed position during filtration so that the filtrate is kept separate from any containers or the conveyor system.

#### Monitoring systems for filter cake discharge

The next step towards achieving a fully autonomous filter press with optical monitoring for 24/7 operations without operator supervision.

#### Scraper and filter cloth washing device

More operating convenience because sticky filter cakes are discharged automatically and filter cloths are subsequently cleaned.

#### PERIPHERAL EQUIPMENT AUTOMATION SOLUTIONS

#### Filter press feeding system

The filter press feed is controlled continuously by pressure feeding and a flow meter in order to obtain the optimum filling level of the filter press.

#### Squeezing system

Best possible dewatering is achieved by means of an optimized membrane squeezing system.

#### Conveying systems

Controlled, fully automatic conveying systems for efficient filter cake discharge.

#### Filter cake washing devices

Sequences preconfigured in order to achieve optimum washing results.

#### **YOUR BENEFITS**

- Easy integration into existing or new dewatering lines/plants, ensuring a short start-up time
- High availability and good performance in operation for all filter press-related functionalities
- Avoids downtime by using preventive maintenance alarms and intuitive machine interface – peace of mind due to machine automation
- Easy to adapt for future plant expansion thanks to modular PLC system design
- Easy regional adaptation
- Shortened fault tracing by using alarm listing as well as historical alarm memory

### Better performance and maximum flexibility

You can expect higher life times from ANDRITZ filter presses: The average life time of an ANDRITZ filter press has proved to be more than 30 years. In order to maintain the high quality standards, finite element method (FEM) analyses are conducted as an integral part of our quality management during the engineering phase. Due to the low mechanical wear, ANDRITZ filter presses require less maintenance, and costs for spare and wear parts can also be kept low.

#### **MAXIMUM MECHANICAL DEWATERING**

With ANDRITZ filter presses, the highest dry substance (DS) content can be achieved without additional heat consumption, and even smaller particle sizes can be retained in the filter press. ANDRITZ will provide the right filter plates, cloths, or other components to achieve the exact degree of dewatering required.

#### **HIGHEST FILTRATE PURITY WITH UP TO 100% SEPARATION**

By using ANDRITZ filter press technology, potable water can be recovered and thus recycled in the process. This saves process water and reduces operating expenses while still achieving highest product purity. Even changes in legislative/environmental regulations or customer requirements can be met by applying posttreatment of the filtrate. With the broad portfolio of downstream equipment offered by ANDRITZ, such as dryers or evaporators, further processing is easy.

#### VIRTUALLY CONTINUOUS **DEWATERING PROCESS**

By using multiple filter presses in an intelligent process design engineered by ANDRITZ, it is possible to run a virtually continuous dewatering process, even with batch operated, dead-end filtration.

#### **MAXIMUM FLEXIBILITY - WHATEVER YOUR NEED IS**

ANDRITZ offers the complete filter press range from laboratory scale, to standard, to heavy duty, and from chamber, to membrane, to heated filter presses. Maximum flexibility can be achieved because different energy sources can be used, so there is a range of well-known power pack brands and different degrees of automation to choose from. Even such provisions as ATEX, GMP, and others can be met with ANDRITZ filter press technology. Low power consumption, easy operation, and thus low training requirements are additional benefits. ANDRITZ filter presses are flexible because they can be upgraded easily, which is especially important when process parameters change.











Our customers benefit from the broadest and unmatched filter press portfolio of both sidebar and overhead filter presses - whatever the need is.

#### MINING & **MINERALS**

- Coal and tailings
- FGD (Flue Gas

#### FOOD

- Baby food
- Beverages (beer,
- ingredients
- Industrial
- Nutraceuticals
- Starches and protein
- Vegetable oil

#### **ENVIRONMENT**

- Industrial wastewater and sludge (textile, food, other industries)
- treatment
- Sewage treatment
- Solid waste and biomass treatment
- Stone processing

#### CHEMICALS

- Mineral oil
- Natural rubber and
- Petrochemicals
- Pigments and dyes
- Soda ash
- Specialty

## Filter element technologies

#### **CHAMBER FILTER PRESSES**

Less peripheral equipment, resulting in lower investment and OPEX costs: Chamber filter presses are reliable and robust in many different applications. The plate pack consists of uniform chamber plates with a recess of 15-50 mm to receive the filter cake. The standard material for chamber plates is polypropylene. Possible operating pressures: 6 bar, 15 bar, and 30 bar.



#### **MEMBRANE FILTER PRESSES**

Higher DS content obtained with membrane filter presses: Membrane filter plates are designed in the same way as the chamber plates described above. A flexible membrane is secured to the support body. The membrane is impermeable and compresses the cake within the chamber after the filtration process has been completed. Liquid or gas can be used as the membrane inflation medium. Inflation pressures up to 30 bar are possible, and in special cases even higher.



#### PLATE AND FRAME FILTER PRESSES – SHEET FILTERS

Quick filter cloth change for process filtraton: The chambers in this type of filter press are formed by combining polypropylene filter plates and frames. This creates chambers of 5-40 mm, depending on frame thickness. Plate and frame type filter presses are suitable for pre-coating filtration, which is used in the beverage industry for clear filtration. ANDRITZ supplies plate and frame type filter presses for operating pressures up to 6 bar.



# ANDRITZ filter presses with sidebar technology

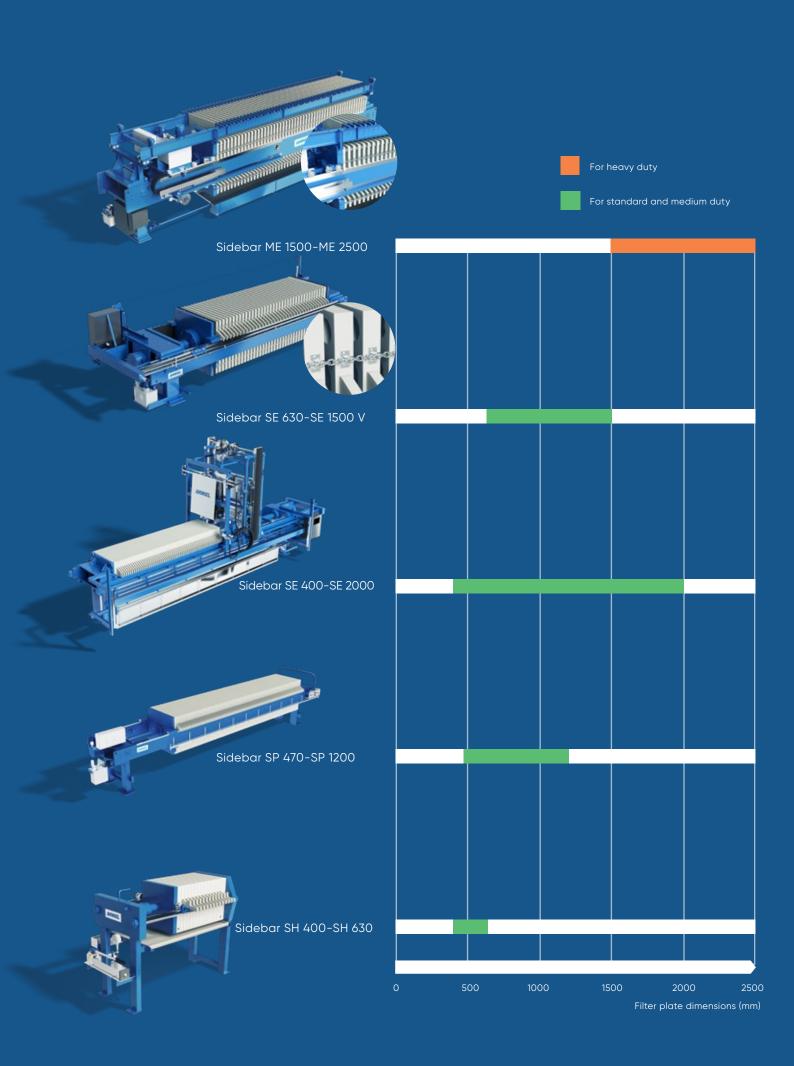
ANDRITZ offers a wider range of filter presses with sidebar technology suitable for both standard and medium duty, and for heavy-duty performance levels. Maximum flexibility is provided by choosing between simple manual to fully automated ANDRITZ sidebar filter press designs. ANDRITZ sidebar filter presses are upgradable in terms of modules and features and can be customized to your specific needs.

In sidebar filter presses, the plate is shifted on the side bar. Thus, additional devices such as scrapers or cloth washers have access to the press from above. Fast opening technology is available for selected fast filtration applications.

As the sidebar technology has a low structural weight for lower foundation loads in comparison to overhead filter presses, customers benefit from lower investment costs for the building structure.

The product range comprises frame, sheet, chamber, and membrane filter presses up to a size of  $2,000 \times 2,000$  mm and an area of approx.  $1,300 \text{ m}^2$ . The filtration pressures range from 7 to 30 bar.





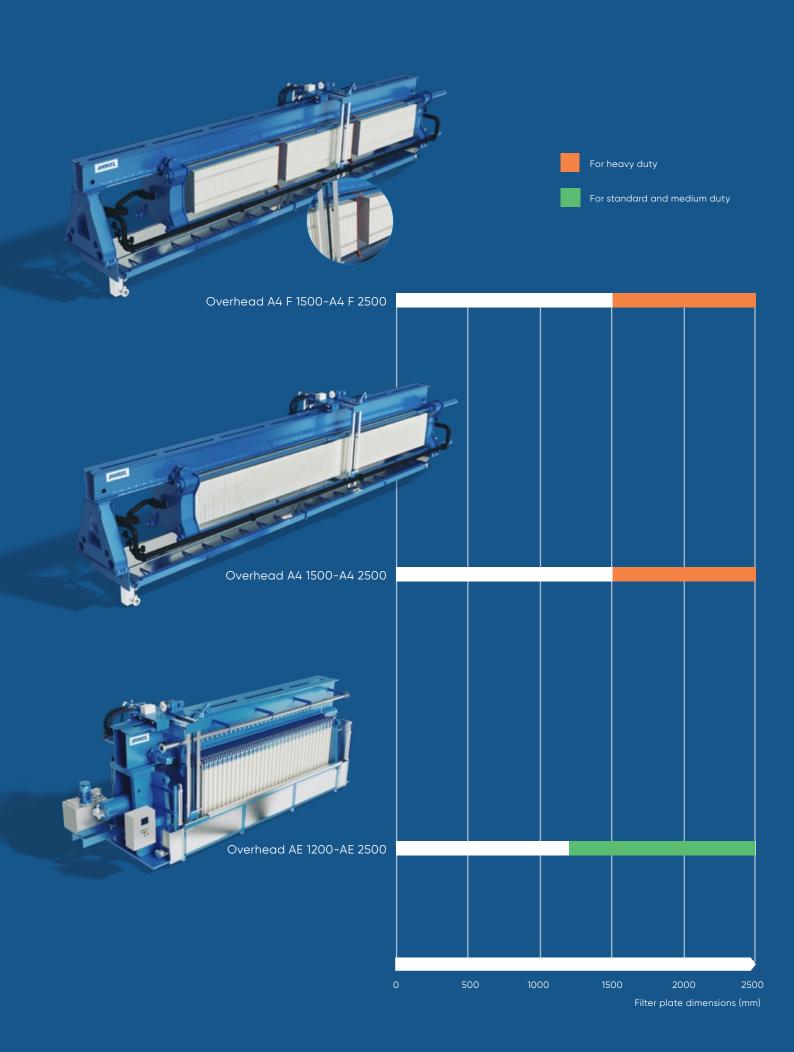
# ANDRITZ filter presses with overhead technology

ANDRITZ overhead filter presses are used for processing aggressive media where high throughputs are required per machine and free access to the plate pack is also necessary. ANDRITZ overhead filter presses are upgradable in terms of modules and features and can be customized to your specific needs. In overhead filter presses, the plates are shifted via the overhead beam. Thus, free access to the plate package is ensured from the side.

ANDRITZ offers a wider range of filter presses with overhead technology suitable for medium and for heavy-duty performance levels. The outstanding features of the ANDRITZ overhead filter presses are highest throughputs through maximum package length and a solid structure for maximum lifespan of the filter press. For highest performance in tailings treatment and mining applications, an additional plate package divider guarantees the highest possible throughput and maximum discharge speed.

The product range of ANDRITZ overhead filter presses comprises chamber and membrane filter presses up to a size of 2,500 x 2,500 mm and an area of 2,000  $\text{m}^2$ . The filtration pressures range from 7 to 30 bar.





### Flexible solutions

From a basic set-up that can be upgraded with a broad range of pre-configured modules to a fully customized filter press, ANDRITZ provides the optimum filter press solution.

## Long-term proven modules

By integrating preconfigured modules, customers benefit from shorter delivery times and lower investment costs without compromising on quality, safety, and performance.

#### **PLATE SHIFTER**

A plate shifter module can be installed for greater automation (no need to move the filter plates manually). The module is available for both sidebar and overhead filter presses and ensures a maximum specific throughput without operator assistance. ANDRITZ plate shifters are engineered to be maintenance-friendly, and the speed of cake discharge can be adjusted very easily.



Plate shifter for sidebar filter presses, ensuring reliable automatic operation



Continuously moving plate shifter for overhead filter presses to reduce idle time

#### **CLOTH WASHER**

An optional cloth washing device with up to 100 bar pressure can be installed to ensure throughput, performance, and longer filter plate and cloth life time.



Cloth washing device for sidebar filter presses



Cloth washing device for overhead filter presses

#### **DISCHARGE FLAPS**

Discharge flaps can be installed to collect process water from the washing device. Liquids are prevented reliably from reaching the peripheral equipment, such as conveyors, and rehydration of discharged cake is avoided.



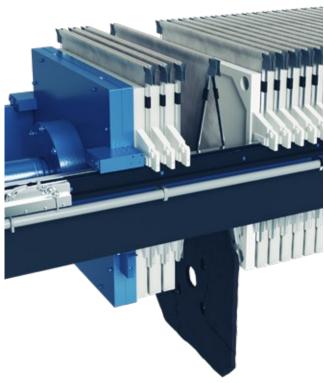
Discharge flaps for overhead filter presses

#### INTEGRATED CORE BLOW CONNECTION

Residues in the core funnel are removed reliably and transported back to the storage tank in order to prevent blockages and rehydration of the discharged cake when the filter press is opened.

#### LONG DISCHARGE FRAMES

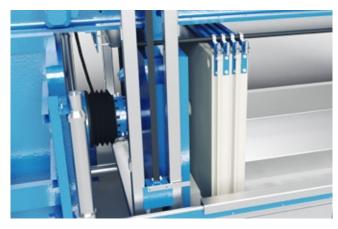
With long discharge frames, sticky filter cakes can be discharged quickly and reliably. Also available as short discharge frames for certain models.



Long discharge frames for reliable discharge of sticky filter cakes

#### **CYLINDER BELLOW**

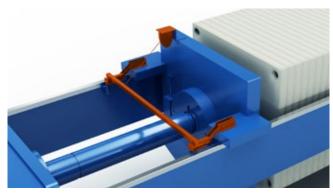
In roughest operating conditions, such as corrosive atmospheres in the chemical industry, cylinder bellows ensure that corrosion is prevented at the cylinder.



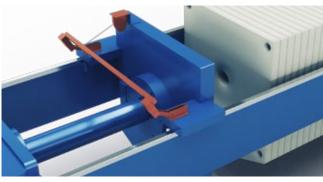
Cylinder bellow of an overhead filter press AE

#### **PISTON STROKE SHORTENING SYSTEM**

A cycle time reduction of up to 40% can be realized with the piston stroke shortening device. The piston stroke shortening system is available for sidebar and overhead filter presses. Overhead filter presses use an electronic system, while sidebar filter presses have a mechanical piston stroke shortening device.



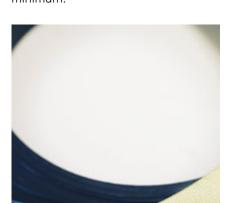
Mechanical piston stroke shortening device for sidebar filter presses down position to reduce cycle time and keep shifting plate aligend



Mechanical piston stroke shortening device for sidebar filter presses – up position for full opening of the filter press for sticky filter cakes and filter cloth cleaning

#### **SMARTFEED**

SmartFEED is the new feed shoe from ANDRITZ, which reduces the downtime of the filter press by up to 40%. The combination of two single filter cloths (no need for a double cloth connected with a barrel neck) with the SmartFEED shoe revolutionizes the process of cloth changing and keeps the downtime of the filter press to a minimum.



SmartFEED shoe for shorter filter cloth exchange times

#### **SMARTLIFT**

Exchanging filter cloths is a time-consuming and a risky task, especially for larger machines. For easier, safe, and faster exchange of filter cloths, we have developed SmartLIFT, a new hydraulic lifting system for overhead filter presses. It is installed over the tie bars for maximum flexibility. SmartLIFT is a lifting device for filter press maintenance and reduces downtime by up to 40%.



SmartLIFT for easier, safe, and faster exchange of filter cloths for overhead filter presses

#### **SMARTSIM**

SmartSIM is a simulation-based operator training system to help you get more out of your machine with a minimum of training time when there is a need to train a new operator or implement a new machine control system. ANDRITZ SmartSIM is a computer-assisted classroom training course that can be used at any time without affecting actual plant operation.



SmartSIM for ANDRITZ filter presses

Modules and features	Sidebar SP 470–1200	Sidebar SE 400-2000	Sidebar SE 630 V-1500 V
Lock valve		X	Х
Light curtains		X for size 630 and larger	Х
Plate shifter	X for size 630 and larger	X for size 630 and larger	Fast filter cake discharge
Cloth washer		X for size 800 and larger	
Discharge flaps	Χ	X	X
Long discharge frames		X for size 800 and larger	
Short discharge frames		X for size 800 and larger	
Cylinder bellow	X	X	X
Integrated core blow connection	X	Х	Х
Piston stroke shortening system		X for size 800 and larger	

**SmartLIFT** 

## Long-term proven features

Special features such as the unique lock valve increase the operating safety tremendously.

#### LIGHT CURTAINS

Light curtains for operating side and non-operating side ensure highest operating safety.

#### **LOCK VALVE**

The lock valve prevents a sudden pressure drop inside the hydraulic cylinder, thus improving operating safety.



Lock valve of an overhead filter press AE

#### **ANDRITZ FILTER CLOTHS**

The right filter cloth is selected for each application. This can achieve a longer service life (up to 20%) and a higher solids content in the cake. The extra smooth surface finish on the cloth ensures easy filter cake release.



Broad range of filter cloths available

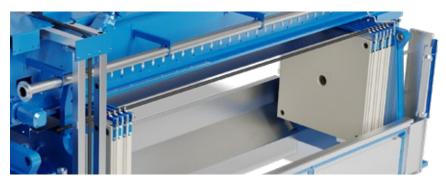
Sidebar ME 1500-2500	Overhead AE 1200-2500	Overhead A4 1500-2500	Overhead A4 F 1500-2500
X	X	X	X
X	X	Х	X
Fast filter cake discharge	X	Х	X
Cloth rinsing device available	X	Χ	X
X	X	X	Х
	X	X	X
X	X	X	Х
X	X	X	X
	X	X	X
	X	Χ	X

# Fully customizable filter press for every possible application

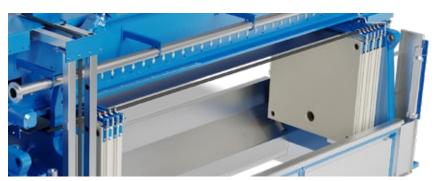
For the most sophisticated separation tasks, a fully engineered design might be the best solution. These technical solutions are especially suitable for food and pharmaceutical applications, rough environments, and hazardous suspensions.

#### **VARIOUS FEED PORT POSITIONS**

Filter presses with an outside or corner feed port are flexible solutions for processing of slurries within a broad range of physical properties in order to maximize throughputs. ANDRITZ offers the right feed port solution for filter presses to meet your process requirements in all applications in the minerals and mining, environment, food, and chemical industries.



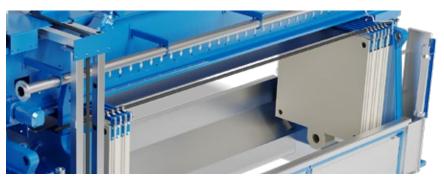
ANDRITZ filter press with standard central feed port



ANDRITZ filter press with bottom feed port



ANDRITZ filter press with corner feed port



ANDRITZ filter press with external feed port

#### **SCRAPER**

For extremely sticky filter cakes, a scraping device ensures reliable removal of filter cake in a fully automatic mode.



Scraping unit for sidebar filter press

#### **VIBRATING DEVICE**

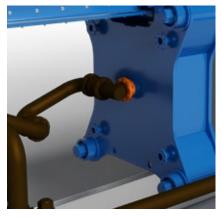
The vibrating device features a compact design that is especially suitable for very sticky filter cakes. It reduces filtration cycle times and enables fully automatic operations.



Optional vibrating device for faster filter cake discharge and thus shorter cycle times

#### SECOND FEED INLET

A second inlet can be installed for faster slurry feed in order to achieve shorter filtration cycle times and ensure homogeneous cake formation. Especially suitable for such filtration challenges as occur in the minerals and mining industry.



Second feed inlet (orange part) in an ANDRITZ overhead filter press A4

#### **SAFETY GUARDS**

Safety guards ensure highest operating safety.



Safety guards for overhead filter press

#### **SPLASH GUARDS**

Splash guards prevent splashes for greater safety and reduced maintenance and care effort.

#### **RAISED PRESS FRAME**

Raised press frames ensure that even special conveyor or container systems for filter cake discharge can be placed beneath the filter press.

#### SECOND FILTRATE OUTLET

In addition to accelerating the dewatering process, less flocculent is also needed in the preceding process. Suitable for filtration challenges in the minerals and mining industry, for example, such as sand and gravel.



Second filtrate outlet (orange part) for faster dewatering of sludge in an ANDRITZ overhead filter press A4

# Fully customizable filter press for every possible application

For some filtration challenges, especially sophisticated applications in the food and chemical industries, a fully engineered design might be the best solution.

ANDRITZ also offers mobile filter press units for temporary use.

#### STAINLESS STEEL CLADDING

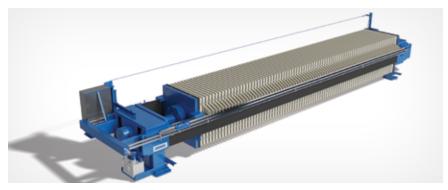
The hygienic design ensures that all machine parts in contact with the product have stainless steel cladding for easy cleaning. Especially suitable for filtration challenges in the food industry.



ANDRITZ overhead filter press AE 1500 with stainless steel cladding

#### RUBBER LINING OR PP COATING

When processing aggressive media, the rubber lining prevents corrosion on machine parts coming into contact with the product. Especially suitable for filtration challenges in the chemical industry.



ANDRITZ sidebar filter press SE 1500 with rubber lining or PP spray coating

#### **MOBILE FILTER PRESS UNITS**

ANDRITZ mobile units are fully customized filter press solutions for short-term operation. Mobile filter presses ensure maximum flexibility as they can be operated at any site independently of the specific process. They are engineered to fit all connections at the customers' premises.



ANDRITZ mobile filter press unit



We are all about finding the optimum solutions for your processes! Our experienced separation specialists will advise you in order to determine suitable technologies from our wide portfolio that are most appropriate for your product. We consult the customer, even at an early stage, in order to find the optimum separation solution for a specific task – with a technological assessment and recommendation that is as objective as possible. Our goal is to validate and define technologies and sizing and to provide technical and process support to our customers.

We do this by means of both feasibility and performance checks of solid-liquid separation. For industry-specific analyses, we co-operate with university-level institutions.



One of the global ANDRITZ testing facilities in Pomerode, Brazil

### The ANDRITZ test centers offer:

#### **PROCESS SUPPORT**

- Evaluation of inquiries (related to process and separation technology)
- Definition and evaluation of performance data
- Local sales and service team
- Optimization of operating installations

#### LAB TESTS

- Definition and characterization of feed material (slurry characterization)
- Technical feasibility
- Estimation of performance

#### PILOT TESTS (ON-SITE)

- Performance evaluation at process conditions on site
- Data collection for scale-up



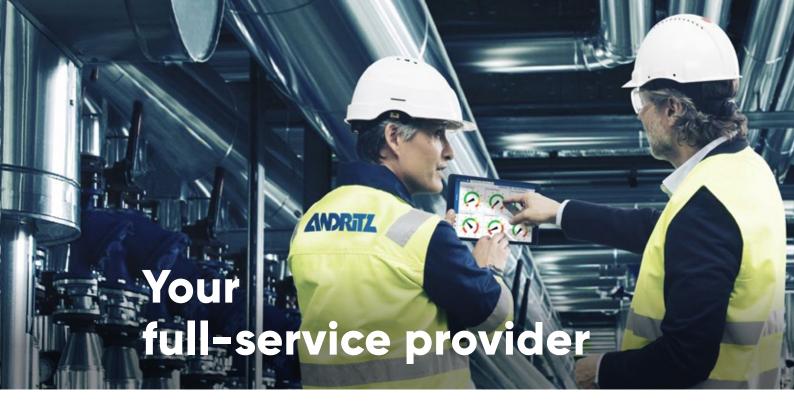
# Intelligence for machine and process control

## Metris addlQ control systems

With Metris addIQ, you get a well-proven, intelligent control solution for industrial processes and machines. Our solid/liquid separation specialists use their in-depth expertise to provide scalable solutions that are individually tailored to regional and application requirements. Whether you're automating new equipment or upgrading to extend the lifecycle of existing systems, we find the ideal solution for you.

Our tailored turnkey systems from a single supplier can improve entire plants or individual machines. By providing state-of-the-art automation technologies and digitalization, we ensure best-in-class performance. Automating machine and plant equipment measurably reduces gaps in many different production process steps. By using automation from ANDRITZ, you can reduce downtime thanks to features such as predictive analysis that allow you to optimize productivity.

Metris addIQ covers all levels of automation, starting at basic automation (machine, process, and plant control), to upgrades, and add-ons for process optimization. Together, you get a full range of optimized solutions that help reduce maintenance efforts and ensure preventive service for your machines and plants. These are all delivered from a single source and always individually tailored to your business demands. Metris addIQ control systems are part of the ANDRITZ brand for Digital IIoT (Industrial Internet of Things) Solutions.



With ANDRITZ Separation, you gain access to one of the world's largest OEM manufacturers for solid/liquid separation systems, including such well-known brands as 3Sys Technologies, Bird, Delkor Capital Equipment (Pty) Ltd., Escher Wyss dryers, Frautech, Guinard Centrifugation, KHD Humboldt Wedag, Krauss-Maffei centrifuges, dryers, and filters, Lenser, Netzsch Filtration, Rittershaus & Blecher, Royal GMF Gouda, Sprout Bauer, and Vandenbroek.

Whether you need spare parts, rentals, local service, repairs, upgrades, or modernization of your equipment, ANDRITZ Separation is your true full-service provider. From initial consulting through to service agreements, process optimization, and training programs, we are always looking for ways to minimize downtime and increase predictability in operations while raising your overall production efficiency. Wherever you operate, our network of 550 service specialists and global service centers ensures we'll always be there to support you for many life cycles to come. Let's sit down and see how we could take your operations to the next level.



Responsive local service centers and field service technicians



Optimization of machine and process performance, repair work,

retrofitting, and modernization



SECOND-HAND & RENTALS
Certified second-hand and
rental machines



Operator training and tailored seminars for operating and maintenance personnel



#### **OEM SPARE PARTS**

Filter cloths, spare and wear parts from OEMs or with OEM level quality, all readily available



#### SERVICE AGREEMENTS

Preventive maintenance, contracts for spare parts, maintenance, inspections, repairs, upgrades, operation, and equipment monitoring



#### PROCESS OPTIMIZATION

Automation tools and process expertise to boost your profit



#### LAB AND ON-SITE TESTS

Lab and testing capabilities for process optimization and machine upgrades



#### WHAT'S YOUR SEPARATION CHALLENGE?

ANDRITZ Separation is the world's leading separation specialist with the broadest technology portfolio and more than 2,000 specialists in 40 countries. For more than 150 years, we have been a driving force in the evolution of separation solutions and services for industries ranging from environment to food, chemicals, and mining & minerals. As the OEM for many of the world's leading brands, we have the solutions and services to transform your business to meet tomorrow's changing demands – wherever you are and whatever your separation challenge. **Ask your separation specialist!** 

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