

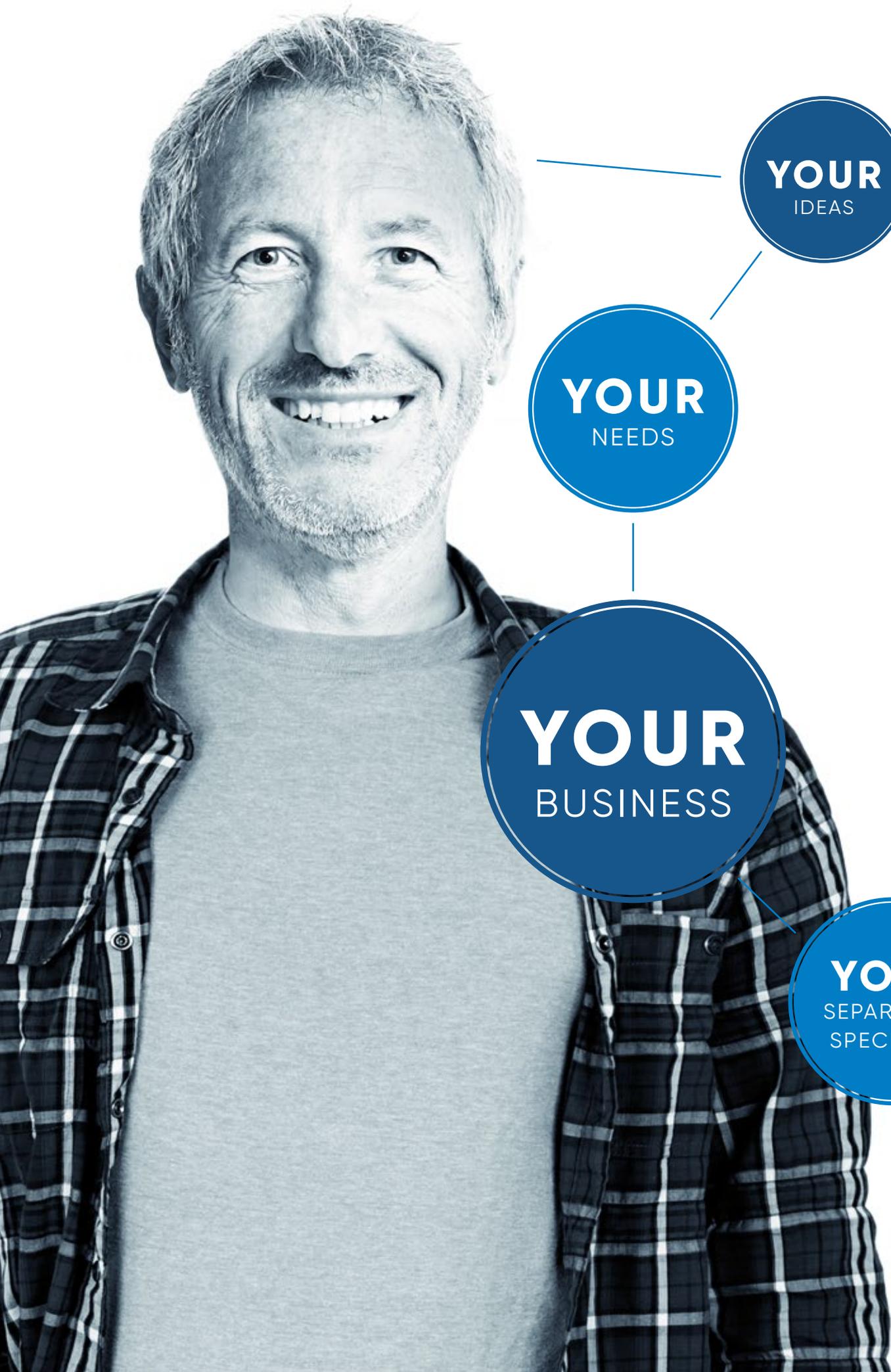


# SEPARATION EXPERTISE FOR YOUR SUCCESS IN POTASH

ASK YOUR SEPARATION SPECIALIST

**ANDRITZ**

ENGINEERED SUCCESS



**YOUR**  
IDEAS

**YOUR**  
NEEDS

**YOUR**  
BUSINESS

**YOUR**  
SEPARATION  
SPECIALIST

# How can we help improve your potash production?

As populations surge, so does the demand for high-quality potash for food and biofuel production. So how will your business capitalize on this growth? Higher throughput? Better product quality? Whatever your strategies, we offer the world's broadest range of dewatering, brine, and tailings treatment solutions to help you achieve them.

## MEETING THE DEMANDS OF A GROWING INDUSTRY

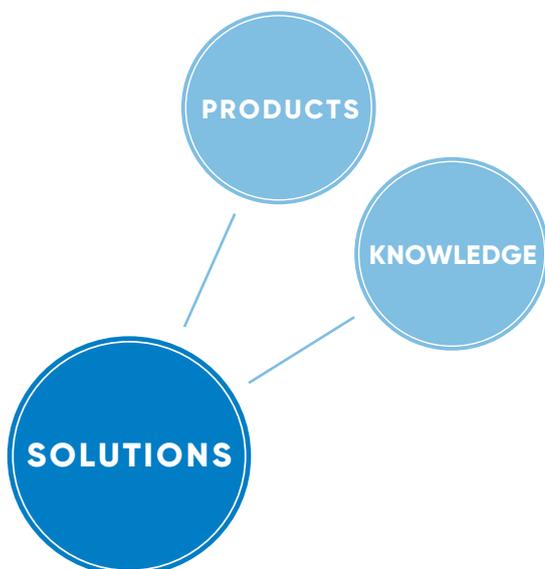
Having served major potash producers across the globe for over 80 years, we understand that every processing step has its own unique challenges. For some, it's about implementing innovative ways to save space, water, and energy. For others, it's a matter of achieving the lowest possible moisture content in the final product, whether through substitution, upgrades, or entirely new installations.

## CUSTOMIZED SOLUTIONS WITH REMARKABLE RESULTS

Whatever their specific needs, each of our customers faces constant demands for more reliable, efficient, and profitable output. In Belarus, this meant overcoming the limitations of traditional solutions with a fractional dewatering system that boosted capacity, lowered energy costs, and achieved a 30% reduction in residual moisture. In a solar evaporation plant in South America, we helped to remove a tailings bottleneck with the continent's highest capacity disc filters, thus ensuring 300,000 t/y of additional liquid capacity while reducing downtime by nearly one-third.

## A PARTNER WITH DEEPER RESOURCES

For every such challenge, ANDRITZ Separation provides a complete range of mechanical separation and thermal drying systems to solve it – from centrifuges, thickeners, and specific filters to filter presses and fluidized bed dryers. And as a preferred supplier, we are the go-to source for preferred separation technologies and consulting to potash contractors worldwide. It's all part of the experience, financial strength, and technical resources of the ANDRITZ GROUP, a global organization with 250 production and service sites in 40 countries. So where is your next opportunity? And how can we help you make the most of it?



# Meeting your potash challenges with the right separation solutions

Shifting raw material prices. Scarce resources. A fast-changing global market. As the world leader in potash separation and drying, our aim is to surround every challenge you face with a more comprehensive solution. One that places your needs at the center of everything we do.

## **BROADER SOLUTIONS FOR ANY PROCESS STEP**

Ever since installing our first potash centrifuge in 1928, our ambition has been to tailor the right solution and services for any requirements – whatever the capacity, process conditions, or type of end product. Over the years we've stayed true to this vision, and today process more tonnage than all other brands combined. This means that as soon as your raw materials are above ground, we've got you covered with a total production solution – every single process step along the way. It's all part of our effort to promise lower life cycle costs, higher availability and capacity, better end product quality, and longer equipment lifetime than any supplier on the market.

## **GLOBAL TECHNOLOGY LEADERS**

Our decades of know-how have resulted in some of the industry's most innovative, efficient, and reliable solutions. Many high-capacity producers, for instance, turn to us for our uniquely efficient conical screen bowl decanters or large-diameter disc filters. Others rely on our patented fluidized bed systems with prism jet gas distribution, maximized air temperatures, and easy maintenance. Whether it's an individual machine, a smaller module, or a modular project, we're applying this vast expertise to meet the needs of global players and smaller companies every day throughout the world.

## **THE INDUSTRY'S MOST RELIABLE NAMES**

This experience is no surprise to those who know us as the brand behind some of the best-known suppliers in the industry – from Bird and KHD Humboldt Wedag to Krauss-Maffei centrifuges and filters. In the past our fluidized beds were also sold under the trade name Escher Wyss fluidized bed systems, and many customers still remember and value this brand name. Together these all amount to nearly 600 installations, including more than 425 centrifuges, 100 fluidized bed systems, and dozens of filters, plate dryers, and thickeners worldwide. This includes installed bases on five continents, in every major potash producing market. All backed by 25,000 ANDRITZ GROUP employees and two potash service centers in Russia and North America, ready to respond to your demands.

## **A HEAVY FOCUS ON R&D**

Interested in developing your next big idea together? At ANDRITZ Separation we're constantly investing in R&D to improve your next potash separation or drying solution. With R&D labs located throughout the globe, we're always on hand to investigate new products or adapt to your unique process needs. Recent examples include a series of eight large-diameter disc filters installed in Belarus, Russia, and South America, as well as our innovative conical screen bowl decanters now in operation in North America. These are just a few examples of the industry-leading R&D we've been specializing in at the ANDRITZ GROUP for more than 150 years.

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**>600** / references  
in potash

**4x** / more tonnage  
processed than  
any other brand

**>425** / centrifuges installed in  
potash production

# Your separation specialist

As the world's leading separation specialist, we are committed to delivering the right knowledge, services, and solutions for any separation challenge.

## **UPGRADES AND PROCESS OPTIMIZATION**

Improvements in performance and safety of existing equipment to extend productive life.

## **TECHNICAL SUPPORT**

Extending lifetime of machines/equipment with more experience in different materials.

## **CONSULTING**

Customer-oriented equipment solutions and knowledge sharing with contractors.

## **R&D**

Process simulations, ROI calculations, and joint product development for tailor-made customer solutions.

## **LOCAL SUPPORT WORLDWIDE**

Strategically positioned warehouses with OEM replacement parts and engineered wear parts/consumables and field service.

## **TEST FACILITIES**

From lab scale to pilot and industrial scale.

## **SUSTAINABILITY**

Full raw material utilization, waste elimination processes, and environmental controls for minimal impact.

## **MECHANICAL AUDITS/INSPECTIONS**

Service to check mechanical integrity, wear parts, alignment, vibration, etc. and recommend improvements.

## **SERVICE LEVEL AGREEMENTS**

Full-service contracts for operational safety, maintenance, and provision of parts.

## **BROADEST PRODUCT PORTFOLIO**

Full range of solid/liquid separation products.

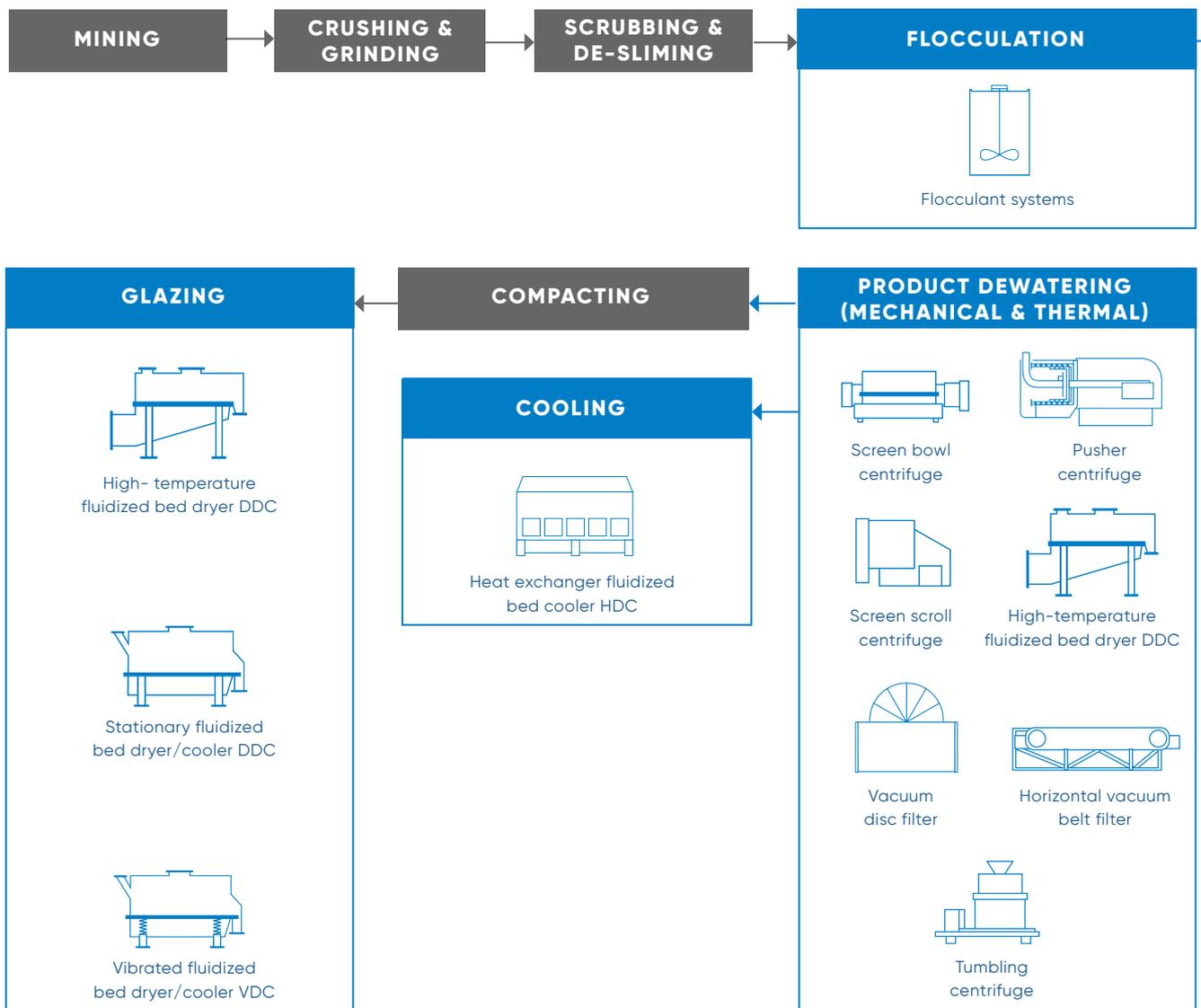


# Where we fit into your production line

As the separation specialists in brine refining, we supply complete systems and multiple technologies for all above-ground process phases. Whether it's dewatering, thickening, compacting, or after-treatment, we can recommend the optimal solution to improve your productivity in any type of potash separation.

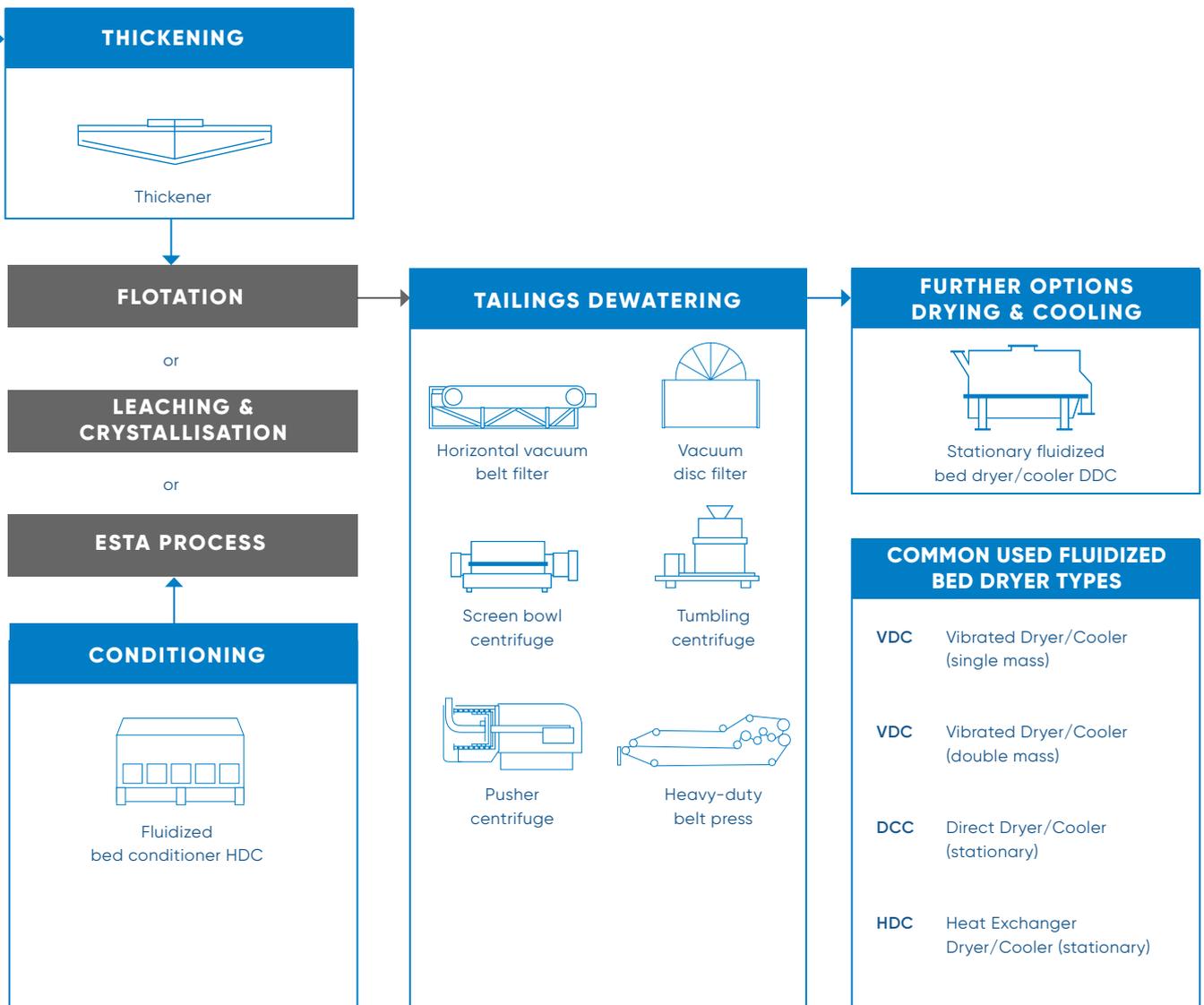
To many leading customers, we're best known as the suppliers of high-capacity, energy-efficient equipment. Our highly efficient pusher centrifuge, for instance, is capable of achieving 25% better throughput and less moisture than equivalent machines of the same size. Others know us for our unique fluidized bed systems, which use patented prism jet gas distribution plates to ensure uniform product fluidization and conveying. To create

maximal thermal energy with minimal air, they combine an easy-to-maintain full metal construction with hot air of up to 650°C. Fewer new customers are aware of our fractional dewatering expertise, which separates the slurry to achieve significantly lower moisture content and energy costs. And these are just a few of the hundreds of ways we're helping potash customers push the limits of productivity throughout the world.



# How can we optimize your process?

Looking for new ways to boost capacity while reducing energy costs? Look no further than our innovative conical screen bowl decenter. Now installed on the North American market, this unique solution enables 15% higher throughput with 20% less power consumption than traditional units. All to better meet our customers' fast-changing needs. What are yours?



# Tailored solutions for every product deliquoring need

Our deliquoring solutions serve nearly half the world's potash production. For some it's all about achieving the highest availability and throughput. For others it all comes down to a longer lifetime for each individual part or the lowest possible residual moisture. Whatever the case, we not only offer more deliquoring choices – we back them up with a customized solution and service package for any need.

## UNMATCHED EXPERTISE IN DELIQUORING

For more than 85 years, we've helped our customers lead the way with innovative approaches to all types of potash products, brines, and applications. With more than 570 installations for product deliquoring alone, we've proven ourselves capable of managing everything from complete system design and customization to intake and exhaust air installation, intermediate product handling, electrotechnical installation, and control systems.

## TAILORED STATIC THICKENING SOLUTIONS

Among our more innovative solutions is a specially equipped static thickener that allows you to reduce flocculant consumption, ensure faster settlement, and minimize your thickening area. Like all our thickeners,

its key strength lies in combining a superior volumetric capacity with faster thickening rates.

## THE MARKET'S WIDEST RANGE OF CHOICES

More than just offering the broadest range of equipment, we take pride in rethinking the typical continuous process approach of thickening and vacuum filtration. Often, this means a total process redesign where fine and coarse fractions are handled separately – each with the right equipment for the job. The result is the best of all worlds: higher capacity with lower residual moisture, and therefore lower energy costs along with a significantly smaller footprint. It's this comprehensive approach to potash deliquoring that keeps our customers ahead of tomorrow's challenges.

Potash →

## MECHANICAL PRODUCT DELIQUORING

<b>CONICAL SCREEN BOWL DECANTER</b>	<b>SCREEN BOWL CENTRIFUGE</b>	<b>TUMBLING CENTRIFUGE</b>	<b>PUSHER CENTRIFUGE</b>	<b>SCREEN SCROLL CENTRIFUGE</b>
<ul style="list-style-type: none"> <li>• Ability to process feed rates at least 20% greater than standard configuration</li> <li>• Better torque response over a wide range of throughputs</li> <li>• Tungsten carbide dog bone screens and wear saddles are resistant to process wear</li> </ul>	<ul style="list-style-type: none"> <li>• Compulsory solid conveying</li> <li>• Better handling of massive temporary or long term process upsets</li> <li>• Operation possible with a higher volume of insolubles</li> <li>• Lower and changing feeding conditions possible</li> </ul>	<ul style="list-style-type: none"> <li>• High throughput capacity for very coarse particles</li> <li>• Very low sound level</li> <li>• Particle integrity and minimum particle breakage</li> <li>• Easy maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Lower moistures due to longer retention time</li> <li>• Higher throughput due to longer strokes</li> <li>• Special feeding (impeller) device for gentle product acceleration</li> <li>• Easy maintenance (cartridge concept)</li> <li>• Better wash efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Lowest specific energy consumption</li> <li>• Compulsory solid conveying</li> <li>• Operation possible with a higher volume of insolubles</li> <li>• Lower capital costs</li> </ul>
				



**>85** / years of industry experience

**>570** / installed base for potash deliquoring

**nearly 50%** / of global potash production served by ANDRITZ products

As populations rise and agricultural land becomes increasingly scarce, global demand continues to rise for potash – one of the main compounds in agricultural fertilizers.

### THERMAL PRODUCT DEWATERING

#### HORIZONTAL VACUUM BELT FILTER

- Good possible recovery
- Highest wash rates possible
- Low maintenance
- Higher availability
- Lower wear
- Low machine costs

#### VACUUM DISC FILTER

- Low machine cost
- Highest possible specific filtration rate
- Highest possible recovery
- Higher availability
- Small footprint area (space requirement)
- Low maintenance
- Lower wear



# High-capacity tailings dewatering - a success by any measure

In South America, a major global minerals processor had reached an insurmountable bottleneck. Despite sitting atop one of the world's richest brine sources, the company was limited by its tailings dewatering capacity. Too little saturated brine meant no new thickening resources, and no more growth for a highly profitable business in potassium chloride.



300,000 t/y / in increased capacity

30% / less downtime

135 t/h / in increased brine yield

„No solution on the market can match our latest disc filters in terms of sheer scale, or with such high filtration rates. This gives our customers a major boost to their tailings capacity and brine yield, with nearly one-third less downtime.“

**ANDRITZ SEPARATION**

Application Manager Potash

**REMOVING THE BOTTLENECK, ONCE AND FOR ALL**

To free up more tailings liquids for recirculation, the facility needed a completely new solution. One that would deliquor significantly more tailings to unleash a new, steady supply of liquids. Having recently installed an innovative new technology in tailings treatment, we knew we had just the right solution: a pair of newly developed disc filters with large disc diameters for the highest possible filtration rates. This would be the first such installation in South America, and only the second of its kind in the world.

**UNLEASHING NEW PROFIT STREAMS**

Thanks to this innovative approach, the plant has achieved not just 135 t/h in additional brine yield, but also a full 300,000 t/y of new production capacity as a result. This allows for a more flexible operation with substantially lower production costs. More remarkably, the entire tailings treatment process has now reduced downtime by as much as 30%. With figures like these, it's clear that a complete return on investment won't be far behind.



Triple disc filter station



Ponds for brine saturation



# Integrated thermal process solutions for separation, drying, and cooling

Whatever the chemical composition of your deposits, and whatever final purity you aim to achieve, we provide just the right dry or wet processing solution to meet your needs. All based on more than 40 years' experience in fluidized bed technologies for potash, including installations for every major potash producer worldwide.

## EFFICIENT, LOW-COST DRY PROCESSING

Our dry processing solutions are recognized around the world for their reliably low cost of operation. Compared with additional screening, our fluidized bed classifier not only removes more fine particles than with additional screening – it does so more efficiently and with a significantly smaller footprint. Its full metal, primarily carbon steel construction ensures robust performance. For further conditioning, a high-capacity fluidized bed conditioner with throughput up to 1,000 t/h can be installed to ensure significant improvements in electrostatic separation efficiency within the ESTA process.

## HIGH-PURITY WET PROCESSING

To help you boost product purity, we supply fluidized bed dryer and cooler technologies that give you a wide range of process flexibility. Hot drying gas, for instance, can be generated by natural gas or diesel, and exhaust air can be dedusted either by bag house filter or wet scrubber. In any configuration, our fluidized bed dryer allows you to handle capacities in excess of 300 t/h, all within a minimal footprint enabled by drying air up to temperatures of 650°C. The full metal construction in specially developed heat- and corrosion-resistant metal makes it possible to handle these extreme temperatures while ensuring non-stop performance for years to come.



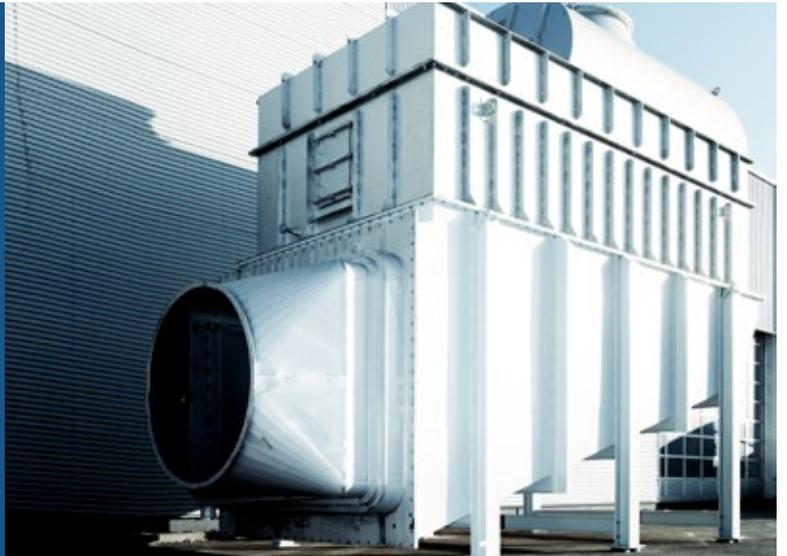
>100 / installed fluidized bed systems

up to 650° C / drying air temperature

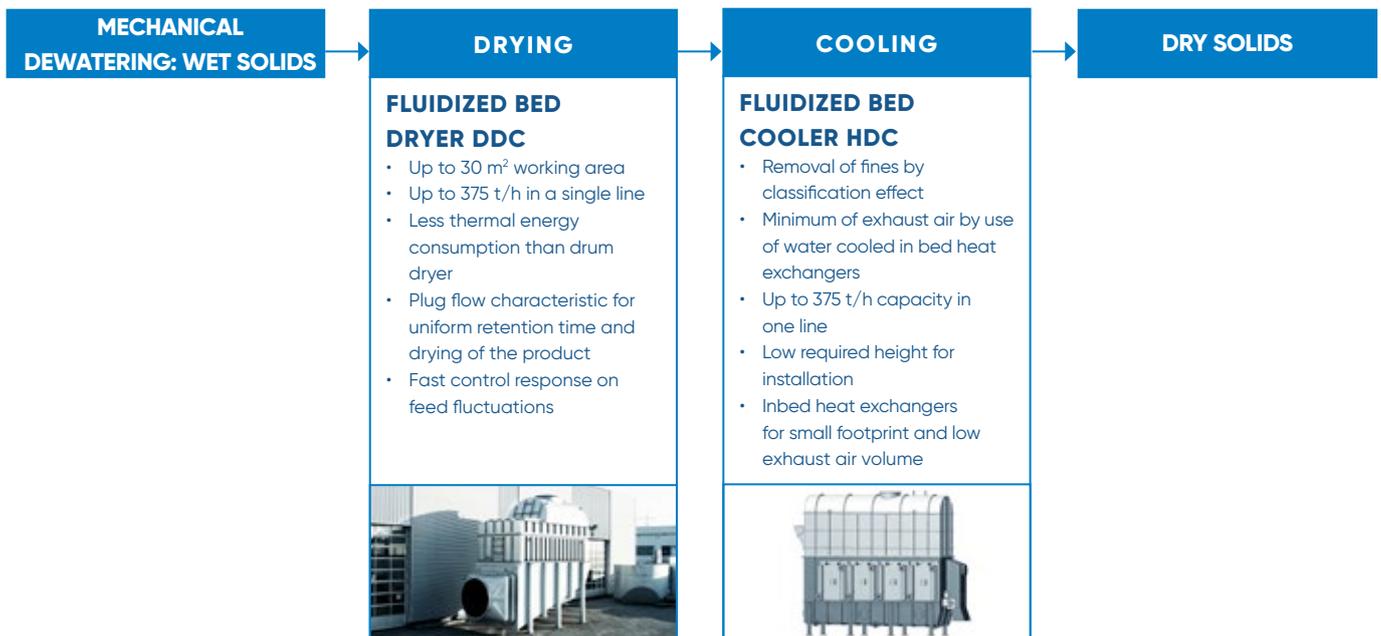
free-flowing / end product

## Integrated process solutions

To optimize your potash production, we offer complete integrated solutions for drying and cooling. This means that, in addition to stand-alone fluidized bed dryers, for example, we provide complete fluidized bed systems equipped with intake and exhaust air installation, intermediate product handling and conveying as well as electro-technical installation and related control systems. The aim is to ensure a consistent, sustainable supply of potash – with maximum availability and productivity.



### WET PROCESSING: DRYING AND COOLING



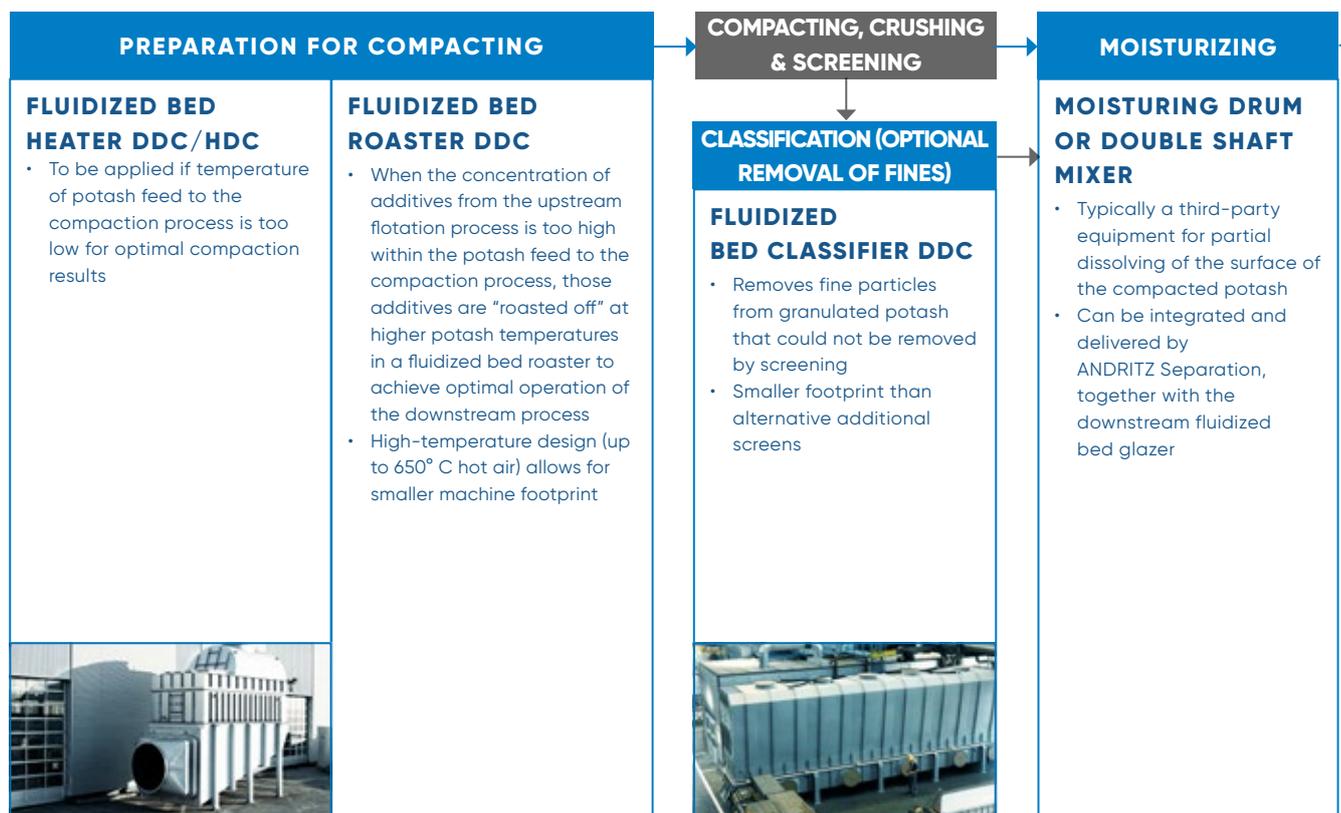
# Optimized glazing technologies for added product value

Drying? Polishing? Or classification? When it comes to achieving just the right product for the market, sometimes compacting just won't suffice. This is where our seamless lineup of glazing technologies comes in – to ensure your end product is dust-free, easily handled, and perfectly refined with the lowest possible energy consumption.

When compaction alone isn't enough, we provide a full range of after-treatment solutions to ensure your end product is precisely what the market demands. Depending on the grade of potash, this could include fluidized bed heaters, roasters, classifiers, high- and low-temperature dryers and coolers, and more.

The sharp breaking edges generated by crushing within the compaction process are smoothed off by rewetting the particles in a rotating drum or double-shaft mixer. After this, they are dried and polished in a fluidized bed glazer to obtain a dust-free granulate which can be easily handled.

In most cases, this means applying minimal thermal energy to your granulate with our stationary fluidized bed dryer. For customized applications, we can also configure vibrated solutions, combined dryer/coolers, or – for the hardest surface – high-heat dryers with separate cooling beds. It's all up to you – and your customers – to decide where the true value lies.



**360 t/h** / in a single glazing line

**Dust-free** / granulate with hardened surface

**Wide portfolio** / range for tailored solutions

#### FLUID BED GLAZING

##### HIGH-TEMPERATURE FLUIDIZED BED DRYER DDC AND FLUIDIZED BED COOLER DDC

- For fluidized glazing/drying at higher product temperatures (>150° C), after which the product is cooled in a separate fluid bed cooler
- Separate dryer and cooler can be individually optimized without compromises in machine geometry

##### STATIONARY FLUIDIZED BED DRYER/COOLER DDC

- For low-temperature (<100° C) glazing with limited feed parameters and final moisture content <0.2% wt
- Lower investment costs compared with two separate units
- Less maintenance due to stationary equipment
- Low thermal energy consumption at acceptable final moisture

##### VIBRATING DRYER/COOLER VDC

- Vibrating design allows for shallow bed with uniform particle retention time
- Partial heat recovery is optional by recirculation of cooling exhaust air





# Intelligence for machine and process control

## Metris addIQ 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.



# Your full-service provider

With ANDRITZ, 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 Vandebroek.

Whether you need spare parts, rentals, local service, repairs, upgrades, or modernization of your equipment, ANDRITZ 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.



#### LOCAL SUPPORT

Responsive local service centers and field service technicians



#### REPAIRS & UPGRADES

Optimization of machine and process performance, repair work, retrofitting, and modernization



#### SECOND-HAND & RENTALS

Certified second-hand and rental machines



#### TRAINING

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 biggest separation challenge?**





## Ask your separation specialist.

Now you've seen how ANDRITZ Separation can improve your separation processes: more than 2,000 separation specialists and a range of reliable, innovative systems, all backed by a 150-year track record.

In addition, we can provide solutions for other organic and inorganic fertilizers, like potassium sulfate, phosphates, potassium nitrate, ammonium sulfate, urea, and more.

Let's sit down and see how our separation expertise can contribute to your success. To find out more, please contact us today.

[ANDRITZ.COM/SEPARATION](https://www.andritz.com/separation)



## 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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**ANDRITZ.COM/SEPARATION**



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