



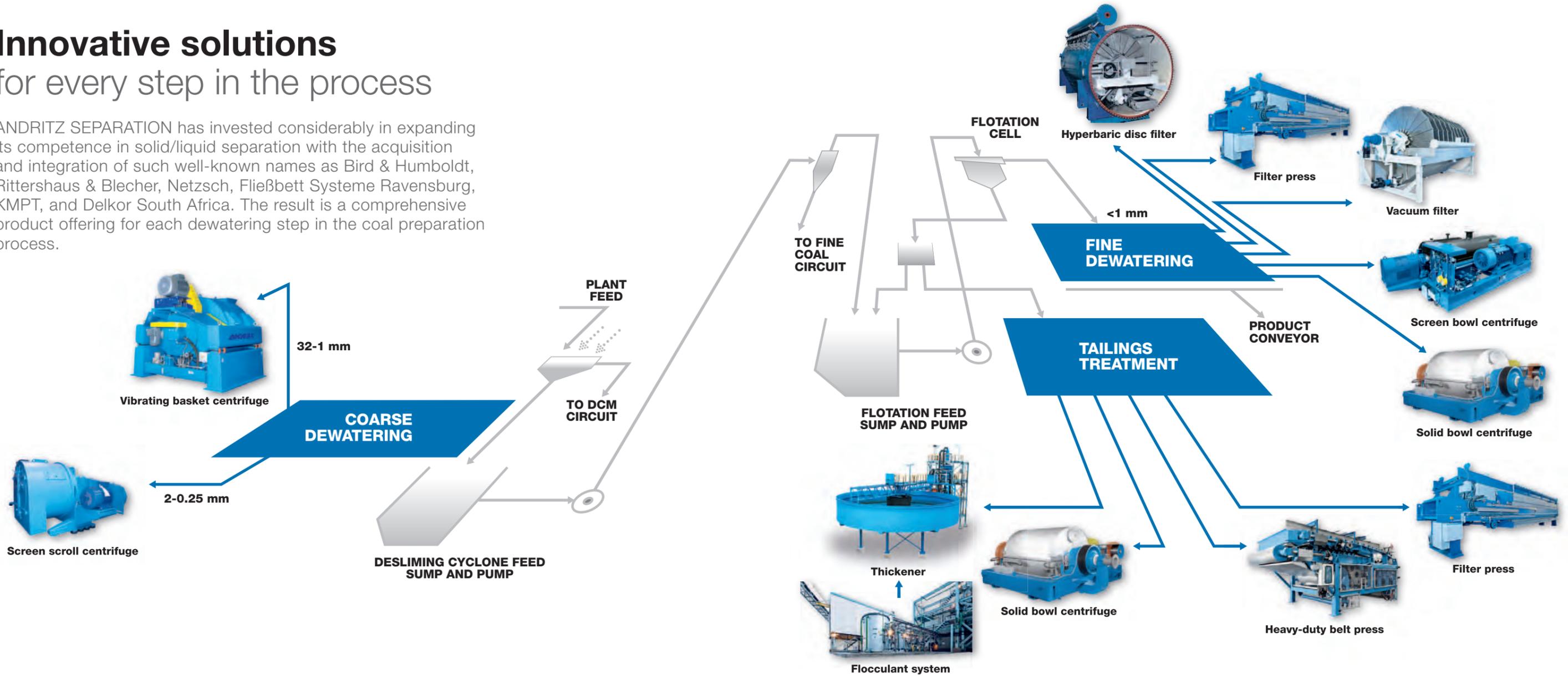
**ANDRITZ**  
Separation

**COAL**  
Separation to the finest



# Innovative solutions for every step in the process

ANDRITZ SEPARATION has invested considerably in expanding its competence in solid/liquid separation with the acquisition and integration of such well-known names as Bird & Humboldt, Rittershaus & Blecher, Netzsch, Fließbett Systeme Ravensburg, KMPT, and Delkor South Africa. The result is a comprehensive product offering for each dewatering step in the coal preparation process.



Application	Coarse coal	Coal fines	Ultra fine coal	Tailings slurries
Particle size (mm)	32-1	2-0.25	1-0.150	
Vibrating basket centrifuge	X			
Screen bowl centrifuge			X	
Screen scroll centrifuge		X	X	
Solid bowl centrifuge		X	X	X
Hyperbaric disc filter, vacuum disc filter			X	
Heavy-duty belt press				X
Filter press		X	X	X
Vacuum belt filter	X	X		(X)*
Thickener		(X)*	X	X

\* depends on performance data

## Automation solutions

ANDRITZ SEPARATION also delivers automation solutions for its equipment, allowing in many cases for the equipment to operate around the clock without operator attention. This includes specialized instrumentation when required, advanced process control, and even dynamic simulation of mining operations.

## Comprehensive and responsive service

Technology without attention to maintenance and service requirements is of little use. ANDRITZ SEPARATION has service and technical specialists stationed around the world, available on customers' demand. These specialists respond to your needs for technical assistance, spare and

wear parts, on-site repairs, retrofits and upgrades, and best-practices maintenance advice – on a case-by-case or contract basis.

# COARSE DEWATERING

## High throughput with low residual moisture

For the processing of coarse coal particles, ANDRITZ SEPARATION supplies rugged and reliable centrifuge systems that achieve high throughput with low residual moisture.

### Vibrating basket centrifuge

The vibrating basket centrifuge has a circular basket constructed of stainless steel wedge wire with apertures. The size of the aperture is determined by the application. The centrifuge uses centrifugal force to separate and remove the liquids from the solids. Coal particles enter the centrifuge in the center rear of the basket and the solids progress to the front of the basket lip and are discharged by a chute. As the solids move to the lip of the basket, water is removed through the basket apertures, collected, and discharged to the plant water circuit.

Design features and benefits:

- Rotating circular basket of stainless steel wedge wire with different aperture sizes
- Interchangeable eccentric shaft for basket
- High capacities of more than 400 t/h
- Lowest residual moisture

### Screen scroll centrifuge

Screen scroll centrifuges have become the preferred machine for dewatering spiral concentrates. This type of centrifuge is a higher-speed alternative to vibrating basket centrifuges. The higher speed increases the centrifugal force to separate moisture from finer coal particles. The screen scroll centrifuge consists of a horizontally mounted wedge wire basket, enclosing a drum on which curved scraper/conveyor blades are mounted in a helical pattern. The basket and conveyor rotate in the same direction, but at slightly different speeds so that the conveyor blades move the coal particles through the basket – controlling the distribution and retention time. Since the basket apertures are smaller than those used with a vibrating basket, the scroll conveyor helps keep the apertures clear.

Design features and benefits:

- Powerful planetary or cyclical gearbox maintains the differential speed of basket and scroll
- Highest capacity centrifuge (per area of screen)
- High capacity and recovery
- Lowest moisture content down to 5%

▼ Vibrating basket centrifuge





## Maximum dewatering of even the finest coal particles

The smaller the coal particle, the larger the surface area – increasing the volume of surface moisture that must be removed. ANDRITZ SEPARATION offers both conventional and innovative systems to achieve throughput and moisture targets for any coal preparation operation.

### Hyperbaric disc filter

ANDRITZ SEPARATION's innovation of hyperbaric filter technology sets a new standard for performance – especially in coal preparation applications where particle sizes are becoming finer, higher throughput and clear filtrate is required. The increased pressure differential (up to 6 bar) across the filter medium dramatically enhances the filter's ability to lower residual moisture. The ability of the hyperbaric disc filter (HBF) to operate in continuous mode allows it to be integrated easily into highly automated coal beneficiation plants.

**The steam-hood filtration option can enhance the filter's performance by treating the filter cake with steam, which reduces viscosity, among other things. The uniform heating of the filter cake achieved by the steam-hood can ultimately reduce the residual moisture.**

Design features and benefits:

- Proven double-gate valve for filter cake discharge
- Easily automated to operate with minimal human intervention



- Optional steam-hood filtration
- Lowest residual moisture which is significantly better than filtration with a vacuum system and outstanding capacities of more than 1,000 kg/m<sup>2</sup>/h
- Low investment for peripheral equipment due to continuous operation
- High level of automation with minimal human intervention

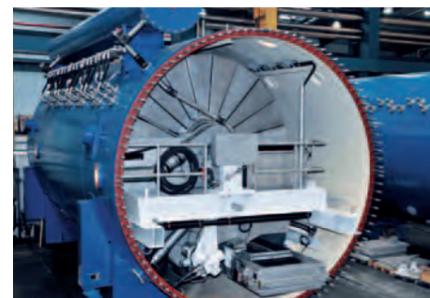
### Screen bowl centrifuge

This is a high-speed centrifuge, originally developed by Bird & Humboldt and further developed by ANDRITZ SEPARATION, which reduces the moisture content of solids on the screen deck. It provides economic dewatering of even the finest coal particles as a result of enhancements to the proven design.

**The newest design is a conical screen which allows highest capacity with the lowest energy consumption.**

Design features and benefits:

- Optimized wear protection with ceramic or tungsten tiles
- High capacities of more than 120 t/h
- Low operating costs due to advanced wear protection
- Low solids moisture content due to advanced design
- Conical screen design provides highest capacity with lowest energy consumption



◀ Hyperbaric disc filter ▶

### Filter press

The ANDRITZ SEPARATION filter presses are of a proven robust design that is highly efficient in dewatering all grades from raw to superfine coal. The base technology was developed by Rittershaus & Blecher and Netzsch and has been enhanced by ANDRITZ SEPARATION.

Design features and benefits:

- Fast opening mechanism leads to reduced cycle times
- Automated operation, even with sticky filter cakes
- Automated cake discharge without operator intervention
- Low residual moistures due to flexible operation

### Vacuum disc filter

This filter utilizes the pressure differential across the filter medium to enhance solid/liquid separation, lower the residual moisture of the product, and produce a clear filtrate. It is best suited for suspensions with medium-to fine-size particles based on the specific permeability of a coal suspension which depends on the fine grain and ash content of the material.

Design features and benefits:

- Filtrate collection pipes located externally to the shaft for easy replacement
- Optional steam-hood filtration (see hyperbaric disc filter)
- High throughput at low residual moisture due to modern design
- Easy to maintain – easily accessible

### Vacuum belt filter

This unit is ruggedly designed to operate in the most demanding applications. It operates under continuous vacuum to enhance solid/liquid separation. Designed for ease of operation, the filter also has all wear parts easily accessible for maintenance.

Design features and benefits:

- Wear strips of low-friction, wear-resistant material
- Pneumatic system for raising and lowering vacuum box (ease of maintenance)
- Reliable filtration under the most challenging conditions
- Ease of maintenance

### Solid bowl centrifuge

These centrifuges were originally developed by Bird & Humboldt and have been further advanced by ANDRITZ SEPARATION. They are well-proven in industrial applications all over the world.

Design features and benefits:

- High rotational speed and long service life due to ceramic and tungsten carbide wear protection
- Variable speed adjustment for drum and scroll possible
- Produces effluent with less than 1% solids
- Optimized centrifugation for all process requirements



▶ Screen bowl centrifuge ▶

# TAILINGS TREATMENT

## Efficient technologies to save water and protect the environment

With the goal of reducing handling and disposal costs while recovering the maximum volume of water for reuse, ANDRITZ SEPARATION has the best solutions for solid/liquid separation of coal tailings.

### Thickeners

ANDRITZ SEPARATION has a depth of experience spanning 30 years in designing and delivering gravity thickeners for coal applications.

Design features and benefits:

- Most efficient integrated feed system and feed well
- High-rate, conventional, and paste designs
- Reduced flocculant consumption due to enhanced feed design
- Reliable operation due to rugged design and three-level protection against overloading
- Very low maintenance requirements due to robust construction

### Filter press

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- Automated operation, even with sticky filter cakes
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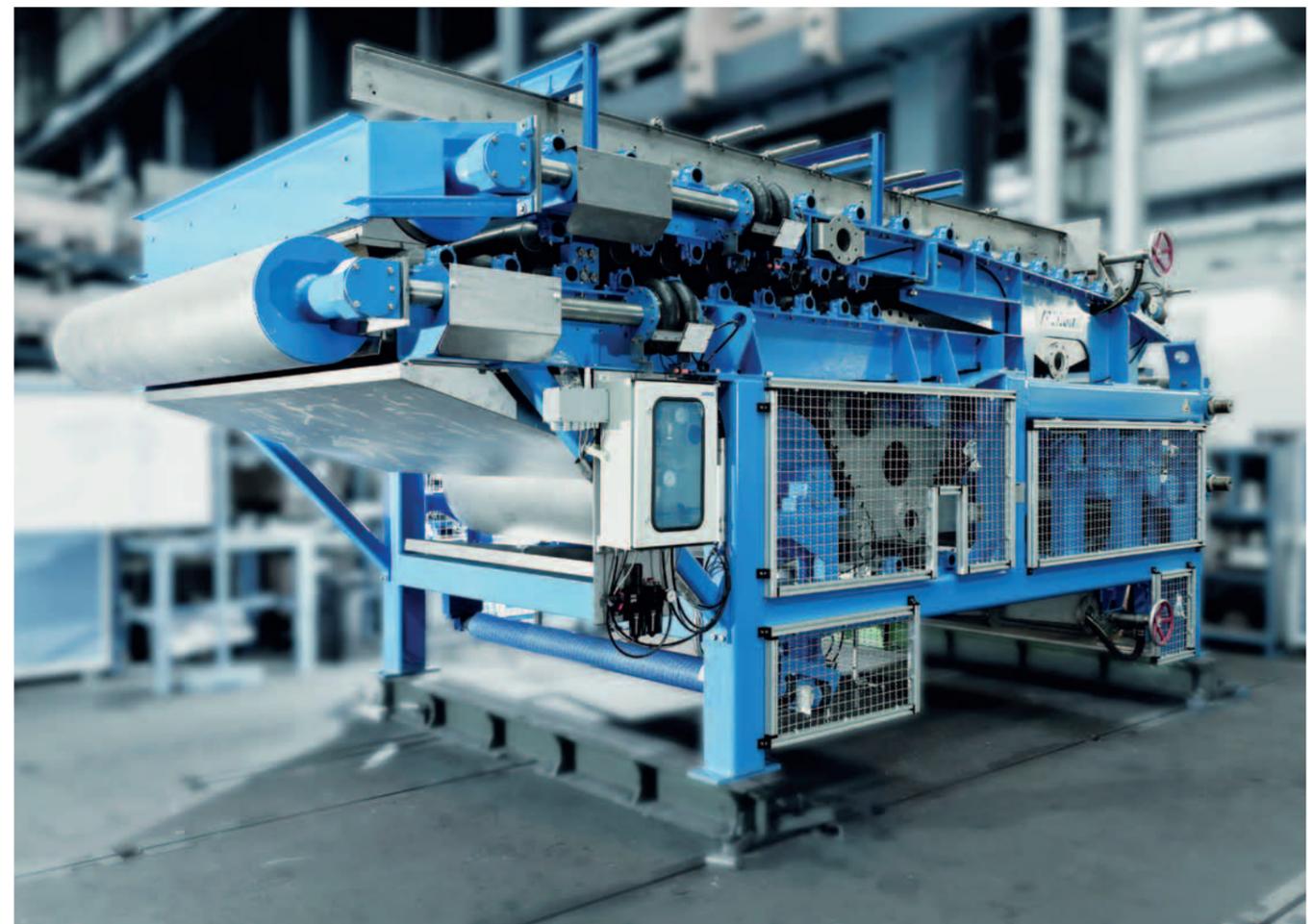
### Heavy-duty belt press

The choice of filtration technology for coal tailings treatment, based upon the ash content and particle size, is critical. The Continuous Pressure Filter (CPF) uses two belts and pressures up to 2 bar to achieve excellent dewatering. The drainage and dewatering zones of the press are optimized for each application. Known for providing long-term, reliable operation, the press can be operated in fully automated mode.

Design features and benefits:

- Robust design to accommodate high dewatering pressures
- Distribution device ensures uniform distribution of solids over the entire working width
- High throughput of up to 15 t/h per meter working width
- High dry content of over 65%
- Maximum water recovery in combination with thickeners

▼ Heavy-duty belt press



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