



**INSPIRED BY NATURE.
REFINED BY ENGINEERING.**

ANDRITZ PolyHex™ bagless sector

ANDRITZ

Inspired by nature

Nature has perfected the **hexagon** as an efficient combination of strength and material use. Found in honeycombs, turtle shells, and insect eyes, this geometry distributes forces evenly to create exceptional stability with minimal material. It inspired a new generation of bagless disc filter sectors.

Refined by engineering

The new ANDRITZ PolyHex™ bagless sector translates this natural principle into advanced filtration technology. Its perforated stainless steel plate features a honeycomb-like structure engineered for high rigidity, long service life, and optimized filtrate flow.

WHY BAGLESS?

Bagless sector designs have several advantages over sectors with synthetic bags – a key benefit being that no sector re-bagging is required.

Maintenance

- Extended maintenance interval compared to bag sectors
- Lower maintenance efforts and costs, because there are no filter bags to be replaced:
 - Manpower needed for regular dismounting of all sectors
 - Re-bagging costs
 - Machine downtime

Process and production

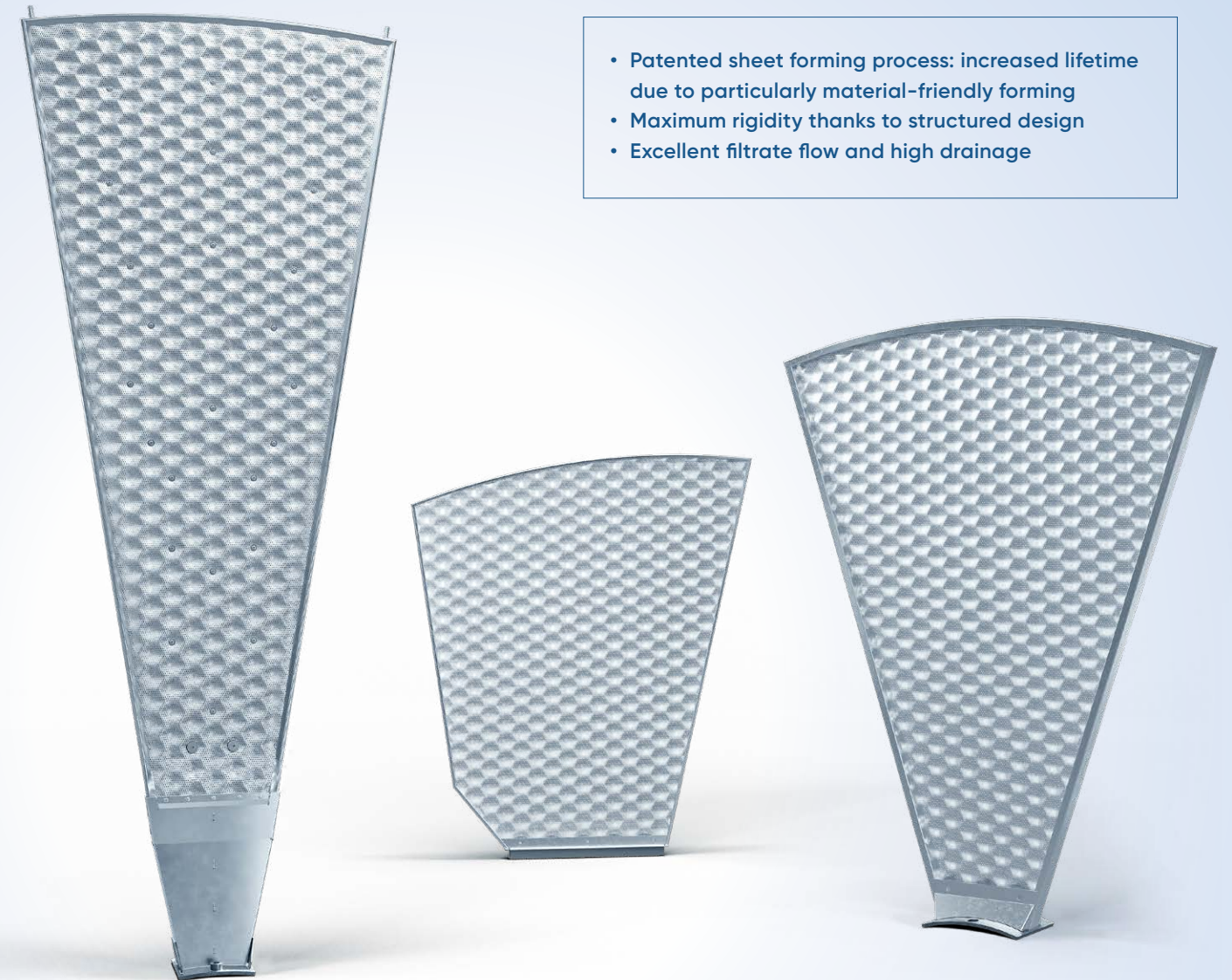
- Improved process stability
- Increased production thanks to extended dewatering surface
- Reduced fiber loss, thus better filtrate qualities
- Resistant to higher temperatures and chemicals



Sectors with bags require regular re-bagging

Revolutionary bagless sector design

Discover what makes the PolyHex™ bagless sector design special:

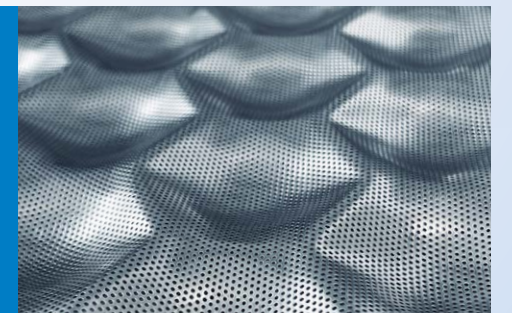


- Patented sheet forming process: increased lifetime due to particularly material-friendly forming
- Maximum rigidity thanks to structured design
- Excellent filtrate flow and high drainage

AVAILABLE FOR SECTORS OF VARIOUS DISC FILTER MODELS AND BRANDS

BENEFITS

- Increased stiffness, therefore less crash potential in operation
- Longer lifetime thanks to particularly material-friendly forming
- Filtrate flow-optimized design enhances production
- Perfect mat knock-off
- Up to 20% higher production capacity than bag sectors
- Suitable for all types of pulp and all paper grades



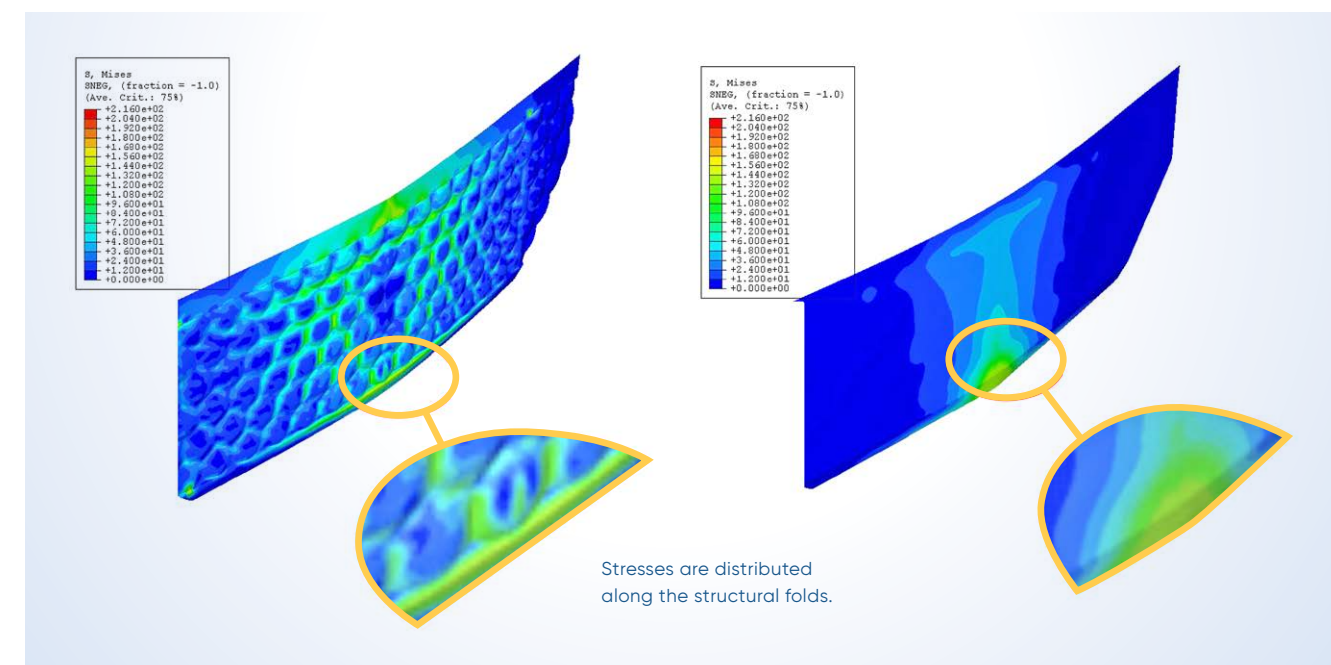
Patented smooth sheet forming process

The basis for the revolutionary design of the new ANDRITZ PolyHex™ sector is the patented sheet forming process, which is particularly gentle and material-friendly, and thus increases the lifetime of the filtration plate. The structured design guarantees maximum rigidity and is based on extensive research and material testing.

The patented forming process of the new PolyHex™ sector results in **much lower material solidification** compared to a standard embossed hexagonal structure.



Significantly **more even stress distribution** with reduced stress peaks.



Nearly no thinning of material with the PolyHex™ forming process:

- Height of structure: ~9 mm
- Local material thinning
 - Structural fold: 0%
 - Structural mould: ~4%



Material thickness not reduced during the forming process.

BENEFITS

- Higher durability
- Higher fatigue resistance
- Increased bending stiffness
- Higher sector stability
- Higher sector lifetime

Validation of performance

A key factor behind the outstanding performance of the PolyHex™ sectors lies in the comprehensive in-house and external testing we conduct during the development and validation phases.

TESTING OF MATERIAL PROPERTIES

The properties of the 3D-shaped hexagonal metal sheet have been explored in a **four-point bending test** at a Technical University in Austria. The material property data obtained during the tests provided valuable input for optimizing the sector design.

TEST FOR STRUCTURAL STABILITY

To validate long-term reliability, ANDRITZ performed dedicated fatigue and lifetime testing using **bending and deflection test** equipment developed specifically for this purpose. Repeated bending cycles are applied to complete sector assemblies simulating years of continuous operation within a compressed timeframe. These tests allow engineers to identify potential weak points, optimize the design, and verify the sector's resistance to long-term mechanical fatigue. Accelerated lifetime testing demonstrates that the PolyHex™ sector design maintains its structural integrity even under operating conditions.

SIMULATING REAL-LIFE OPERATION

Disc filter sectors are exposed to continuously alternating vacuum and atmospheric pressure conditions during operation. To replicate these dynamic loads, ANDRITZ developed a dedicated **"breathing" test**. This unique test reproduces the cyclic loading conditions experienced by the sector during every filtration cycle. By that, engineers can evaluate dynamic fatigue behavior and validate long-term performance under realistic operating conditions. The results provide a reliable prediction of sector lifetime and confirm the robustness of the PolyHex™ concept in actual mill operation. All sector sizes and models of various brands undergo this test to prove each specific design.

BENEFITS

- Proven durability through comprehensive testing
- Verified structural stability and fatigue resistance
- Reliable performance under real operating conditions
- Reduced operational risk
- Longer service life
- Confidence backed by laboratory and field validation



Lifetime validation with bending and deflection test

"Breathing test" to simulate real-life operation



DESIGN PROVEN IN LAB AND IN THE FIELD

Backed by extensive engineering, testing, simulation, and field experience, the PolyHex™ sector is validated for material behavior, structural stability, fatigue resistance, and long-term performance. This thorough process confirms proven reliability, durability, and consistent operation in demanding disc filter applications, helping customers maximize production while reducing maintenance needs and operational risk.



Material testing of the PolyHex™ metal sheet

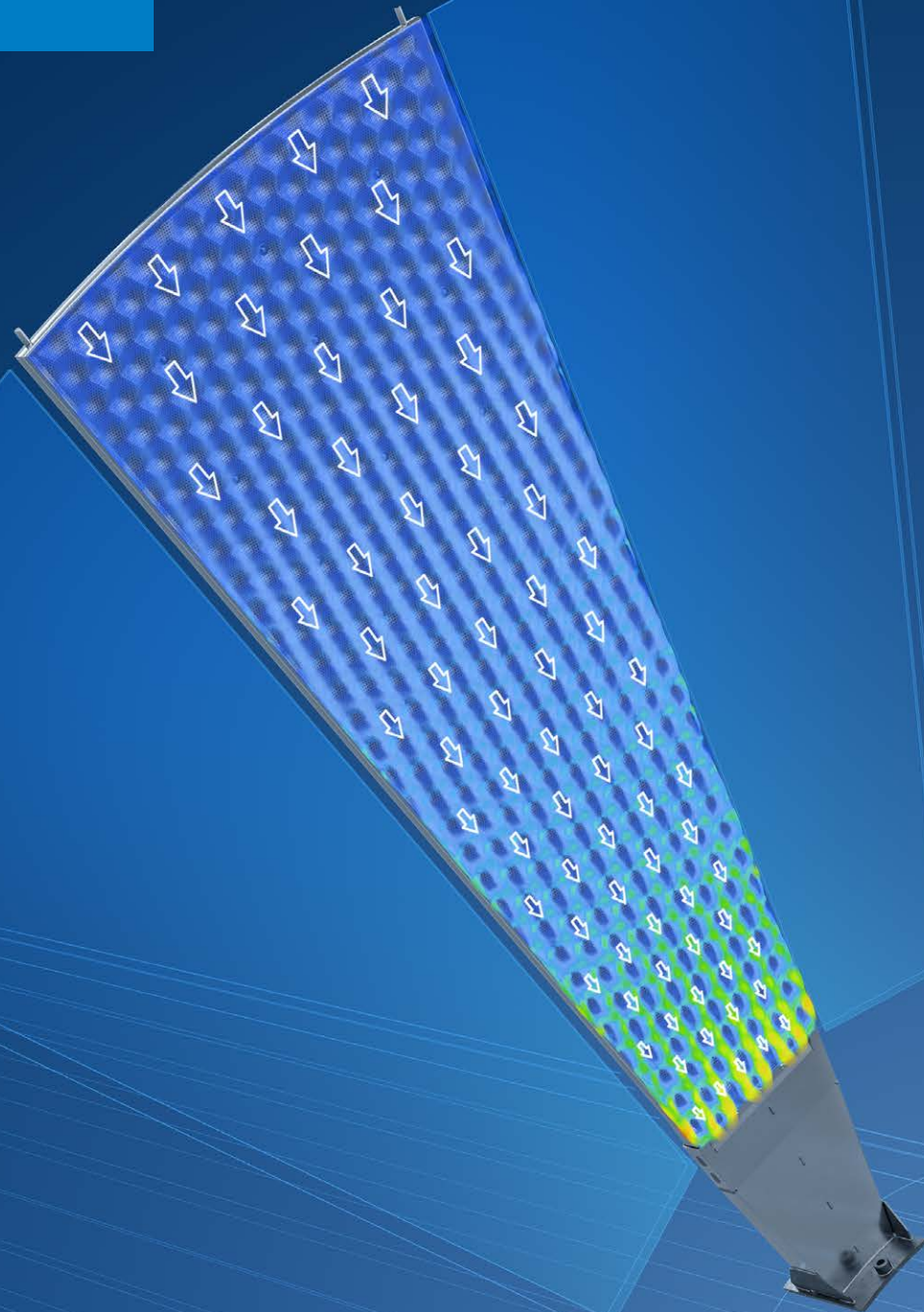


Optimum filtrate flow

The PolyHex™ sector features a **fully open cross section from top to bottom**. CFD (Computational Fluid Dynamics) simulations confirm optimized filtrate flow throughout the sector. This allows filtrate to move freely and without obstruction inside the sector.

BENEFITS

- No structural bottlenecks that might increase fiber build-up
- Optimum filtrate flow
- Higher flow speed and volume flow
- Improved vacuum



Highly reliable operation

Perfect mat knock-off thanks to specially treated sheet metal surface.

BENEFITS

- Only one knock-off nozzle needed
- Reduced shower water consumption and pumping energy



The ANDRITZ HighFlex knock-off system is 3D-adjustable and ensures a perfect knock-off point.





CASE STUDY

Capacity target over-achieved

THE CHALLENGE

- Capacity upgrade for a long fiber disc filter in OCC application
- Original disc filter production capacity: 340 bdmt/d
- Target capacity after upgrade: 410 bdmt/d | +20% increase

THE SOLUTION

- Existing bag sectors replaced with new ANDRITZ PolyHex™ sectors
- Significantly more dewatering surface
- Higher drainage capacity without increasing the machine footprint
- Modification of the discharge screw to handle the higher throughput and ensure reliable operation

THE RESULT

- Performance run exceeded all expectations
- Slightly improved outlet dry content

ANDRITZ DF5206	Before upgrade	Customer target	After upgrade
Furnish	OCC		OCC
Freeness	475 CSF		475 CSF
Production	340 bdmt/d	410 bdmt/d	438 bdmt/d
Production increase		+20%	+29%
Feed consistency	1.1 %		1.14 %
Temperature	40 °C		40 °C

This result not only confirmed the design capabilities of the PolyHex™ sectors but also allowed the customer to operate the disc filter – and the entire system – within a broader and more stable process window. After the upgrade the disc filter is no longer a bottleneck in the production line.





CENTER OF EXCELLENCE FOR DISC FILTER SECTORS

ANDRITZ Slovakia in Levice, serves as the ANDRITZ Center of Excellence for disc filter sectors. Our comprehensive portfolio includes the design and production of various disc filter sectors and the manufacturing of filter bags. These sectors and bags are available for ANDRITZ disc filters as well as machines from various other suppliers. Our Levice facility upholds the high manufacturing and quality standards ANDRITZ is known for while continuously implementing new improvements and innovations.

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