



**PULP & PAPER**

**SLUDGE  
DEWATERING  
SERVICES**

**SPOTLIGHT ON A NEGLECTED AREA**

**ANDRITZ**

**ENGINEERED SUCCESS**

# Sludge dewatering system audit

In the paper industry, no special attention is often paid to sludge treatment. However, efficient processing of wastewater and sludge is a must for environmental and economic reasons. Fibers and process water can be recovered or cleaned and recirculated. Residual sludge can be recycled thermally or used as an additive in other industries.

## CHALLENGES FOR SLUDGE DEWATERING

There are multiple factors that can affect the sludge dewatering process and its design, potentially prompting a mill to closely examine it:

- Stricter environmental regulations
- Grade changes in paper production, entailing different sludge composition
- Production increases that challenge sludge dewatering capacities
- Increasing maintenance and service costs of existing equipment
- Need to reduce operating costs

## EXPLOITING THE FULL SAVINGS POTENTIAL

Whatever the machine type and design, sludge dewatering should be as efficient as possible. Every percentage point more in dry content after mechanical dewatering is worth hard cash:

- Reduced transport costs (i.e. lower volume or weight to be shipped), if further sludge treatment is done outside the mill
- More efficient sludge treatment in sub-process steps, such as drying or incineration
- Lower disposal costs



Higher dry content after dewatering leads to reduced transport and disposal costs as well as more efficient sludge utilization.



## AUDIT: CONDITION SURVEY AS BASIS

The easiest way to determine the condition of a facility and its potential for improvement, upgrades, and optimization is to perform an audit. We will conduct a performance evaluation and mechanical inspection during operation for you.

A comprehensive sludge dewatering audit might comprise process analysis, checking the condition of installed equipment, and analyzing sludge samples taken in the mill.

ANDRITZ can help you find the best technical solution and provide you with a qualified offer based on verified data. All in all, we can be your main contact for all further sludge dewatering tasks.

## BENEFITS

- Holistic view of the sludge dewatering process
- ANDRITZ specialist on site to answer questions right away
- Analysis and tests with fresh sludge samples possible
- Detailed report including process description as well as recommended tasks and improvement solutions

# Sludge testing

In our labs or directly at your mill site

## ANDRITZ LAB TESTS

Practical laboratory tests are essential when it comes to evaluating the dewatering characteristics of pulp and paper sludges. ANDRITZ has installed a wet lab at its headquarters in Graz, Austria, which is fully equipped to simulate sludge dewatering applications, such as gravity table, sludge screw press, and continuous pressure filter. It also has thickener, filter press and decanter simulation devices. Additional lab tests can be done in this facility or in your mill's own laboratory.

### ANALYSES AND SIMULATIONS

- **Sludge analysis:** ash, fiber, and sand content, etc.
- **Flocculant tests:** to determine the flocculant or combination of flocculants best suited for a specific dewatering method
- **Dewatering trials:** simulation of dewatering equipment to find out the dryness level or the capacity that can be achieved on your installed equipment.



## MOBILE TEST UNIT

For testing sludges directly at the mill site, ANDRITZ provides a mobile sludge dewatering unit. The unit is fully assembled in a standard industrial container, which can be easily shipped to any mill in the world. The sludge trials are carried out using a gravity table with a sludge screw press. Testing can be done independently from regular mill operations, since the unit is fully equipped with a sludge tank and a flocculant dosing station. It also includes all required drive units and auxiliaries and a fully automated control system.

### BENEFITS

- Convenient standard container
- Fully equipped and automated
- Ready-to-use with simple connection on site
- Any sludge composition can be tested
- Results enable appropriate up-scaling to industrial sizes



# Services and upgrades

From single parts to comprehensive solutions

In addition to our broad range of OEM spare parts and engineered wear components, ANDRITZ offers customized rebuilds and upgrades for your sludge dewatering equipment and process.

## MAJOR UPGRADE SOLUTIONS

### Gravity table:

- Table elongation and new floating roll
- New take-off doctors for drive roll and tensioning roll
- Metris AddIQ RheoScan – optical measurement for automatic polymer dosage

### Continuous pressure filter:

- Installation of a gravity table on top of the press and additional S-nip
- New perforated roll with spray pipe

### Sludge screw press:

- New screw shaft with customized compression curve
- Highly durable wear protection
- High-quality screen baskets
- Modern screw press control system and counter-pressure unit

### BENEFITS

- Higher constant outlet dryness for optimized thermal treatment
- Reduced sludge transport and disposal costs
- Easy operation and maintenance



# How to save hard cash

## It pays off to focus on sludge dewatering

Besides a higher dry content after mechanical dewatering, there are other process improvements that help you save money:

- Optimized fiber recovery by minimizing the fiber content in the sludge needed for efficient dewatering.
- Reduced operating costs: By optimizing the rotational speed of a sludge screw press, for instance, you can reduce energy consumption considerably while maintaining the same level of outlet dryness.
- Higher operating reliability and reduced chemical consumption despite frequent variations in sludge quality and volumes thanks to a higher degree of equipment automation.

### SAVINGS CALCULATIONS

#### EXAMPLE 1

Saving costs of further sludge use thanks to higher sludge dryness

	Current situation	Improved dryness	Savings
Production	150 bdmt/d	150 bdmt/d	
Consistency	50%	53%	<b>3% weight</b>
Total sludge weight	300.0 t/d	288.5 t/d	<b>11.5 t/d</b>
<b>Costs of further sludge use</b>			
Costs per ton	15 EUR/t	15 EUR/t	
Costs per day	4,500 EUR/d	4,328 EUR/d	<b>173 EUR/d</b>
Costs per year*	1.575 kEUR/a	1.515 kEUR/a	<b>≈ 60,000 EUR/year</b>

\* 350 days

#### HOW TO ACHIEVE THIS?

Performing an **audit on your sludge screw press** and making operational adjustments.

#### HOW TO ACHIEVE MUCH MORE?

Depending on your improvement goal, a consistency increase to reach up to 65% of outlet dryness is possible.

**Recommended measures for a sludge screw press can be:**

- Adaption of the screw shaft compression curve
- Improved screw flight wear protection
- New screen baskets with improved design
- Modification of the counter-pressure unit



Higher sludge dryness can save sludge treatment costs.



Installing Metris addIQ RheoScan saves flocculants.

#### EXAMPLE 2

Saving flocculant thanks to smart and automated polymer dosage

	Current situation	Improved flocculant dosage	Savings
Production	150 bdmt/d	150 bdmt/d	
Addition of flocculants	0.5 - 1.5 kg/t	0.45 - 1.35 kg/t	<b>10%</b>
Total amount of flocculants	75 - 225 kg/d	67.5 - 202.5 kg/d	<b>7.5 - 22.5 kg/d</b>
Flocculant costs	3 EUR/kg	3 EUR/kg	
Flocculant costs per day	225 - 675 EUR/d	202.5 - 607.5 EUR/d	<b>22.5 - 67.5 EUR/d</b>
Flocculant costs per year*	78,750 - 236,250 EUR/a	70,875 - 212,625 EUR/a	<b>≈ 7,900 - 23,500 EUR/year up to ≈ 2,000 EUR/month</b>

\* 350 days

#### HOW TO ACHIEVE THIS?

Installation of **Metris addIQ RheoScan at a gravity table**, an optical measuring system for automatic adjustment of polymer dosage in real time.

**Results:** installation in a DIP line with difficult paper sludge conditions

- Constant sludge outlet consistency
- Flocculant savings of more than 10%
- Improved process stability
- Autonomous machine operation 24/7
- ROI of less than two years



## ANDRITZ DEWATERING SERVICES

### SPARE AND WEAR PARTS

ANDRITZ spare and wear parts are always state-of-the-art due to our uncompromising production quality standards and OEM product expertise.

### REBUILDS AND UPGRADES

By providing continuous service, ANDRITZ guarantees that the performance of your equipment remains at its original level and that safety standards are always observed. Additionally, we offer a wide variety of upgrade products that not only improve performance but also provide energy and cost savings.

### AUDITS AND OPTIMIZATION

Our ANDRITZ specialists have extensive global experience in machine operation, start-up, and troubleshooting. They can identify opportunities for improvement, upgrades, and optimization of your dewatering equipment.

### SERVICE AND MAINTENANCE CONTRACTS

ANDRITZ works closely together with customers to maximize machine and process reliability.

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