In SPECTRUM, we often focus on major developments: World-first technologies. Environmental breakthroughs. New plants that create state-of-the-art products, economic value, and jobs. But ANDRITZ also spends a lot of time doing the ordinary things, too. The less-spectacular, but still essential, fixes that help a paper mill keep on doing do what it does best. World-changing? Perhaps not every time. Important? Always.

SQUEEZING MORE PROFIT OUT OF SLUDGE

"The renovation was well done and the problem has been fixed successfully. We are satisfied with the work ANDRITZ did."

Maurizio Giordano
Technical Director, Lucart Diecimo

Lucart is capable of producing 350,000 tonnes per year of tissue across Europe, including more than a quarter of a million tonnes in the firm's home country, Italy. Packaging papers take the total to around 400,000 tonnes. The group's tissue converting plants stretch from Spain and the UK in the west, via France and Italy, to Hungary in the east, and it is also one of the few operators in Italy that make air-laid (non-woven) tissue.

The company is also an environmental innovator. For example, Lucart's mill in Diecimo, near Lucca in northwestern Italy, recycles Tetra Pak® type beverage cartons into fresh paper, plastic pearls, hygiene product dispensers, and plastic pallets. The firm's Technical Director, Maurizio Giordano, points out, "Only three tissue mills in Europe can do this, and Lucart operates two of them." The mill is also investing in solar power, which is soon expected to supply around 7% of its energy needs, as it runs three paper machines, producing 100,000 tonnes per year of tissue. The group then converts this into toilet paper, kitchen towels, napkins, handkerchiefs, and hand towels.

Lucart obviously spends time, thought, money, and effort on high-profile technology. Of course, all paper mills – even headline-makers – have to do the basics, too. As Franco Pichler, Global Product Manager Screw Press Service ANDRITZ, notes, almost all paper mills have one thing in common, "When part of the mill doesn't cause a problem, no one pays it much attention." This is particularly true in one of the least glamorous areas of the paper mill – the sludge handling equipment in the effluent system. It is not unusual for a mill to let these units run and run for years, with very little maintenance. This is what happened at Diecimo, after it installed its sludge screw press in 1995. By the time ANDRITZ renovated it in October 2023, it was almost 30 years old, and in all that time, "We only carried out maintenance twice, just to make sure it kept running safely," explains Maurizio Giordano.

THE ROAD TO NO WEAR

Eventually though, more comprehensive maintenance was required. As Riccardo Chiesa, Effluent Plant Manager at Diecimo, explains, "We noticed that one basket had a large leak in the high-pressure area of the screw press, and after dismantling it, we discovered that the screw was extremely worn and one side of the chest had a large crack in it, which was leaking badly. So, we decided to fix it."

Diecimo invested in a full renovation of its ANDRITZ SCS1408 sludge screw press to restore it to the state-of-the-art. This included high-quality shaft wear protection, exchanging worn-out screw flights, wear segments, high-pressure screen plates, shaft screen and end plates, as well as a new body plates. This removed any risk of near-term breakdown or any potential need to replace the unit completely in the foreseeable future.

The engineers from ANDRITZ Graz carried out the pre-work inspection and supervised the local installers, passing on-site knowledge and ideas seamlessly back and forth, to ensure the project continued smoothly. "We worked very well with the staff at Diecimo, who were always on hand to verify the quality of our work," explains Tobias Prügger, ANDRITZ Project Supervisor. "It was an unusual installation and a very good one. Diecimo has confirmed that it's now running better, and we can see that from the improved operating performance values." Riccardo Chiesa confirms, "The renovation was well done and the problem has been fixed successfully." Maurizio Giordano agrees, "We are satisfied with the work ANDRITZ did."

SAVING COSTS AND THE ENVIRONMENT

Zooming out from Diecimo briefly, ANDRITZ has serviced hundreds of paper mill screw presses in just the past three years, and thousands in the last 15 years. This has even included many hundreds of services on non-ANDRITZ screw presses, too.

"This is a typical example of ANDRITZ working flexibly. We can move quickly, when the mill needs us to, sending experts from dozens of different locations around Europe and the world."

Erika Sboarina
Sales Manager, ANDRITZ

Franco Pichler argues, "Paper mills typically don't notice much change in a sludge screw press, because the performance doesn't deteriorate much each year. But these little changes add up, and many mills are missing a great opportunity. Just because sludge isn't a product, doesn't mean it has no effect on profits. A new screw shaft geometry or different screen patterns can help to reduce water content in the waste sludge, and that leads to lower transport and disposal costs or more efficient sludge utilization. That can cut costs and benefit the environment."

In fact, a sludge screw press can gradually end up performing 20% to 30% below its original design parameters, pushing up costs correspondingly. At that point, "a mill could start having difficulty keeping up with key performance targets," says ANDRITZ Sales Manager, Erika Sboarina. And if you factor in the advances in technology over time, restoring an older unit to the state-of-the-art could typically see a jump in performance that increases outlet consistency. The savings calculation example on the next page shows that every percentage point more in dry content after mechanical dewatering is worth hard cash.

Franco Pichler explains, "Whether a mill wants to increase capacity or raise the outlet dryness of the sludge, our services are tailor-made to the customer's needs. Even if they are only looking to maintain the unit to keep meeting key performance targets, we specialize in that, too." ANDRITZ's capabilities include on-site inspections and mobile testing equipment to analyse fresh sludge, providing a complete overview of the process, including recommended tasks for improvements or solutions for problems.

TIMING IS EVERYTHING

At Diecimo, one of the major project requirements was flexibility. Erika Sboarina explains, "In this case, we carried out the service on site, meaning there was no need for the mill to send the equipment to Austria, so that gave us the flexibility to adapt to the mill's timing. We knew the rebuild would take place over five days, but for quite a while, we didn't know the exact dates, because they depended on market and production conditions. In the end, the project was agreed and defined in August and delivered in October." This meant that Diecimo could have the work done during planned annual downtime, so as Riccardo Chiesa notes, "In this way, we were able to avoid any loss of production".

Erika Sboarina says "This is a typical example of ANDRITZ working flexibly. We can move quickly, when the mill needs us to, sending just one or two experts or a whole team from dozens of different locations around Europe and the world. Alternatively, our service teams can work with our customers day to day, to help with whatever comes up." Lucart's Maurizio Giordano confirms, "I have known Erika for many years. She is an engineer, always available to consult on any part of our operation. She is someone we can count on." Riccardo Chiesa adds, "We work well with ANDRITZ – in addition to their undoubted professionalism, they are always available when we need them."

Globally, ANDRITZ operates out of more than a hundred locations, covering every continent. The Diecimo project highlights the advantage of this geographical spread, because ANDRITZ has one of its manufacturing plants very close to Italy. As Lucart's Riccardo Chiesa points out, "It is an advantage to have the supplier just an 8-hour drive away." Inside Italy itself, ANDRITZ has more than a dozen experts for pulp and paper alone. And Italy is also the home of the companies ANDRITZ Novimpianti, ANDRITZ Bonetti, ANDRITZ Fabrics and Rolls, and ANDRITZ Diatec.

ONE THING LEADS TO ANOTHER

Back at Diecimo, it seems that this relatively small project could spark some fresh collaborations. Riccardo Chiesa points out, "We've already been working together on some other optimization projects." These involve gravity table water nozzles and doctor blade holders initially, with future possibilities potentially including a METRIS addIQ RheoScan system to measure sludge viscosity and perhaps optimizing flocculant consumption.

Diecimo had previously been limiting the consistency/dryness of the sludge to prevent blocking the dewatering holes, but ANDRITZ's Franco Pichler pointed out that this could be made unnecessary, with a change to the screw shaft. Money could be saved by raising the consistency and therefore reducing the volume of sludge to be disposed of. Lucart and ANDRITZ are now discussing this option. Maurizio Giordano says, "It could be a possibility, depending on how quickly the costs (of flocculants and a screw shaft optimization) will be paid back in the form of lower sludge volumes. It could be a good improvement."

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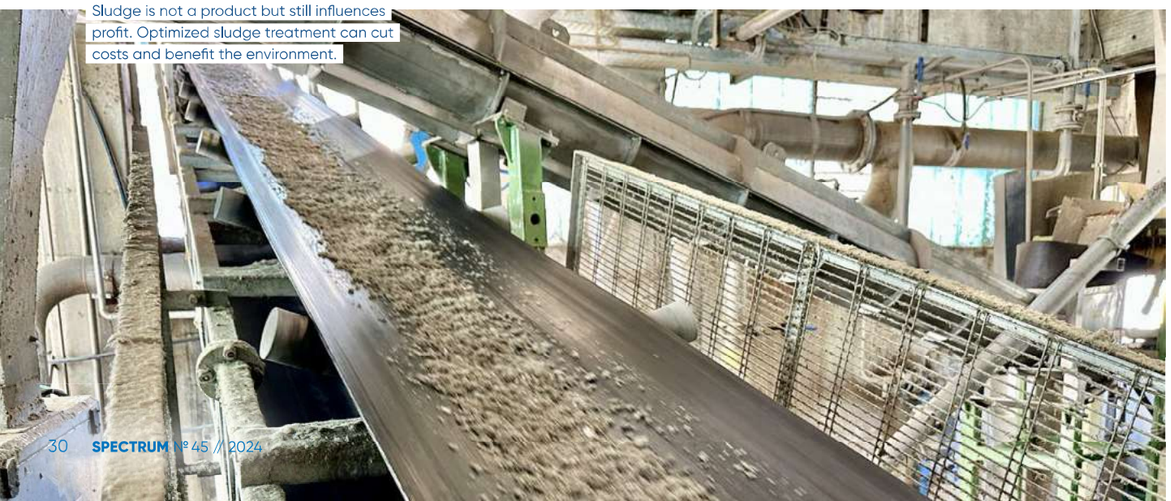
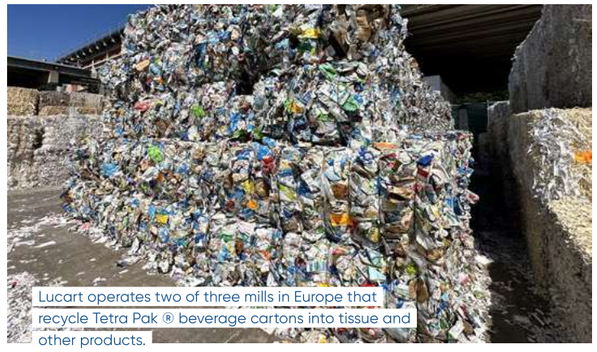


Sludge is not a product but still influences profit. Optimized sludge treatment can cut costs and benefit the environment.



Lucart operates two of three mills in Europe that recycle Tetra Pak ® beverage cartons into tissue and other products.

In the past almost 30 years, only minor maintenance was carried out on the ANDRITZ sludge screw press to ensure safe operation. The recent refurbishment restored it to state-of-the art.

	Current situation	Improved dryness	Savings
Production	150 bdmt/d	150 bdmt/d	
Consistency	50%	53%	3% weight
Total sludge weight	300.0 t/d	283 t/d	
Costs of further sludge use			
Costs per ton	15 EUR/t	15 EUR/t	
Costs per day	4,500 EUR/d	4,245 EUR/d	255 EUR/d
Costs per year*	1.575 MEUR/a	1.486 MEUR/a	**= 90,000 EUR/year**

*350 days

Example: Saving costs of further sludge use thanks to higher sludge dryness