FROM WOOD TO HIGH QUALITY FIBER

SUCCESS STORY

The innovative design of the ANDRITZ Digester Discharger and C-Feeder increased Pfleiderer's overall efficiency.

ANDRITZ

From left to right: David Klement, ANDRITZ Project Manager; Florian Grünberger, ANDRITZ Key Account Manager; Karl Rausseck, Technical Services Manager, Pfleiderer; Alexander Held, Technical Services Director, Pfleiderer; Christoph Liese, Operations Manager, Pfleiderer.

“We got exactly what we wanted.”

In order to hit the production “sweet spot” more consistently, MDF panel maker, Pfleiderer, decided to do things differently at its plant in Baruth, Germany. ANDRITZ appreciated the challenge of coming up with a tailor-made solution, featuring a range of new designs that created possibly the most advanced refiner-feeding system in the industry.

Just over an hour south of Berlin, Pfleiderer’s plant in Baruth has been manufacturing wood-based panels for almost quarter of a century. In that time, it has been operating one of the largest refining systems in the industry, in the process of supplying, building, and decorating materials for homes, offices, healthcare facilities, hotels and restaurants, earning itself a reputation as one of the leading operators in the MDF business.

Due to continous growth and Pfleiderer’s determination always to produce state of the art, it was decided to improve their process. At this point, the latest ANDRITZ innovation helped to optimize the overall performance of their refining system. Essentially, the goal was to maximize the plant’s operating efficiency.

That meant changing things up, especially between the plant’s digester and refiner. Baruth wanted to have stable chip quality at the exit of the digester, processed and fed at a consistent rate, so they could run the refiner with steady load and speed. At the same time, they also came up with a plan to make the whole new digester discharger/screw feeder set-up easier to access, for quicker maintenance. ANDRITZ responded to Baruth’s wishes with a range of tailor-made innovations, featuring a radical change in layout, a built-in third chip-steaming stage and a new screw design.

“We wanted a new, state-of-the-art digester base unit, designed with diameter and pressure levels to fit our requirements.”

ALEXANDER HELD,
Technical Services Director,
Pfleiderer

New screw, new performance

Due to challenges in the fiber industry it was time to bring their feeding equipment to the next level. Also, after around 20 years of operation, areas of wear meant that the old system could no longer be operated at optimum pressure levels. To remedy these issues, Pfleiderer decided to replace the digester discharger with a new unit that better matched their mechanical, quality and profitability goals. They called on ANDRITZ to make them a tailor-made discharger with the exact proportions that would enable Pfleiderer Baruth to operate at the "sweet spot". As Alexander Held, Technical Services Director, Pfleiderer, explains: "We wanted a new, state-of-the-art digester base unit, designed with diameter and pressure levels to fit our requirements."

As it turned out, the upgrade would require quite a few innovations, and ANDRITZ was glad to contribute. Alexander Held remarks, "We've never had a partner before that was so open to non-standard requirements; ANDRITZ really listened and immediately understood our wishes." Karl Rausseck, Technical Services, Pfleiderer, adds, "The experience from planning phase till final design was very positive - unique. I've never seen such a good design." Florian Grünberger, ANDRITZ Key Account Manager, admits, "Our customers usually run their refining systems for many decades. Over that long period of time, production capacity, fiber quality and energy consumption requirements often change. It was great to be able to offer a tailor-made solution for a customer with specific requirements, to adapt to changing production conditions."

The newly-designed digester discharger works quite differently from the old one. Instead of being a classic drop feeder, the new unit compresses the cooked woodchips via a slightly conical screw set-up, to create chip plugs. These then enter the new ANDRITZ C-Feeder (constant feeder), which slices the chip plugs into small, equal-sized pieces, to ensure a highly-consistent feed volume entering the refiner.

Other design innovations include a central steam unit, which gives Pfleiderer the option of a third steaming stage, especially for any fiber clumps that may have been missed in the two steaming stages upstream in the digester itself. This helps to ensure less-variable temperatures, which can actually reduce overall steam consumption. "We have been using this option since Day 1, right from the startup", explains Alexander Held, while Christoph Liese, Operations Manager, Pfleiderer, confirms, "We have a good steam spread now."

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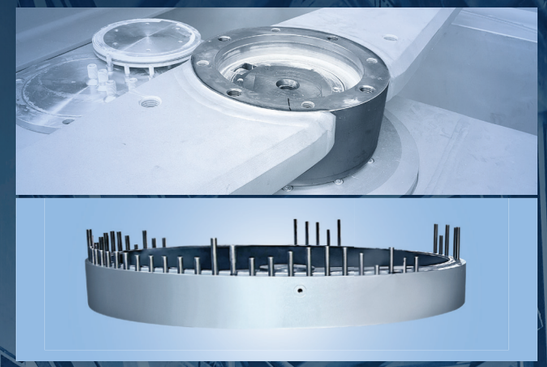
ANDRITZ Key Account Manager

A further innovation was the implementation of a new wear ring inside the digester bottom, next to the agitator tips. Additionally ANDRITZ provided a cartridge solution for the bushing of the agitator shaft. It now can be swapped out at planned service intervals, which is much more maintenance friendly. This saves both time and money on changeovers, which are now seven times faster. Karl Rausseck adds, "We made many practical changes, to simplify the system. For example, we turned the agitator drive by 90°, to make it more easily accessible. It was a really good decision, it makes it much easier to install spare parts, reducing costs and downtime."



Wear parts: Cartridge solution and wear ring

Drop-in unit C-Feeder

Need for feed

The new, two-part design is where this digester discharger gets its ' 84-22" ' name. The 84" refers to the size of the vertical part, while 22" is the measurement of the horizontal part. The horizontal part, in turn, is designed to fit the new, state-of-the-art 22" C-Feeder, which has replaced the old twin-screw design with a single screw.

Like other parts of the upgraded system, the new compact and maintenance-friendly C-Feeder has also been manufactured to Pfleiderer's specific design. Karl Rausseck explains: "I was skeptical, at first. I've been working on this digester for more than 20 years, and I was afraid the C-Feeder wouldn't be able to handle the operating conditions: there can be some big fiber chunks to deal with. But we tested it and, with the help of a larger, reinforced foundation, it has turned out to be really solid." Florian Grünberger understands his caution: "It's a more complex piece of equipment, so Karl was afraid that it would be more sensitive, but in fact, it is very robust."

The new C-Feeder works together with the new digester discharger to ensure continuous feeding of wood from the base of the digester into the ribbon-feeder. The capacity of the new setup was adjusted according to the new throughput capacity needs. This means it now operates with far more consistent energy consumption, which reduced operating expenses and increasing refiner plate lifetimes (assuming like-for-like fiber characteristics). Another major advantage is homogenous defibration, which means the plant uses a lot less adhesive during production, while delivering reliable board properties in all capacity ranges. To sum up all of these innovations, we believe Pfleiderer Baruth may now have the most advanced refiner-feeding system in the industry.

CUSTOMER BENEFITS

Homogeneous feeding of wood chips leads to
- reduced refiner load deviation of almost 50%
- reduced steaming pressure deviation over 70%
- reduced overall refiner energy consumption
- reduced adhesive consumption

The innovative design helped to increase efficiency by reducing maintenance time and costs.

All targets hit

The new equipment arrived at Pfleiderer Baruth in September 2023, and the upgraded system was started up in October, on time, with no delays. David Klement, ANDRITZ Project Manager, notes, "The project installation took place during three weeks of downtime, exactly as planned. There was hardly any variation from the plan, at all. There were some obstacles – there always are – but we trusted our design, combining the old and the new equipment, and it worked." Pfleiderer noticed an improvement right from the startup - they can 'hear' that it is running quieter now." Christoph Liese confirms, "There were no installation problems, no major issues with the startup. And there have been no stoppages since, no trouble with worn parts – it's working well and running smoothly. We hit all of our targets for this project. There has been a clear improvement in all variables - we achieved all of our expectations. The project was a success and we would absolutely recommend this system." Alexander Held concludes, "It was almost a 'plug-and-play' solution. We were already achieving our savings targets as early as January 2024" (just three months after startup). "From our side, this is a real success story. We got exactly what we wanted."

According to Christoph Schwarz, ANDRITZ Product Manager, "Pfleiderer is usually a very careful customer, keeping a keen eye out for any difficulties. So from such a high-precision customer, this is very high praise, indeed."

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Operations Manager, Pfleiderer

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DAVID KLEMENT,
ANDRITZ Project Manager

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