

## SUCCESS STORY

Continuous ANDRITZ Plug  
Screw Feeder progress  
at Sonae Arauco



PANELBOARD

# THE PROGRESS TO THE ADJUSTABLE PLUG SCREW FEEDER

BIG ENERGY SAVINGS,  
RIGHT ON TIME

**ANDRITZ**

ENGINEERED SUCCESS



# Big energy savings, right on time

Sonae Arauco is one of the world's leading wood-based panel producers, with almost one billion EUR in sales. Headquartered in Portugal, the firm makes around four million m<sup>3</sup> of board products, with 20 operations in nine countries.

One of those plants is in Meppen, Germany, where Sonae Arauco "makes an astonishing range of products," according to Dietmar Ulm, Product Manager, ANDRITZ. These include "thin wall boards, flooring, special niche products in colours like blue and yellow, insulation boards and more." This ambitious, progressive plant began working with ANDRITZ when it installed a plug screw feeder (PSF) in 1997. It has since carried out

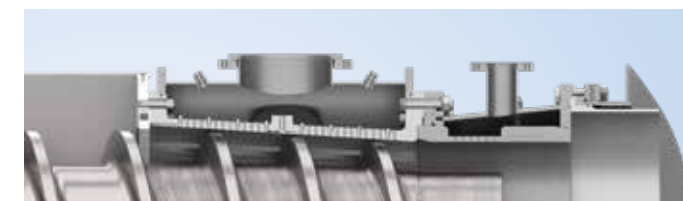
a full program of upgrades, known as the "ANDRITZ Plug Screw Feeder Progress" which progressively increased dewatering from the original 25% to more than 60%, as well as converting the plant's 20-inch PSF from a conical to a cylindrical screw set-up. Until last year, these upgrades were saving the firm around half a million Euros per year.

## PSF PROGRESS IN MEPPEN



### 1. STANDARD PSF (1997)

No post dewatering



### 2. DEWATERING UNIT (2007)

Post dewatering in spool



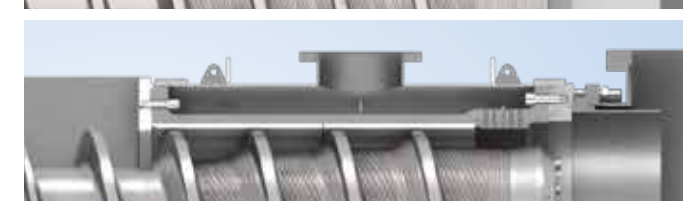
### 3. APS MULTIPLE - DEWATERING CONICAL (2017)

Extended dewatering zone before spool



### 4. APS MULTIPLE - DEWATERING CYLINDRICAL (2018)

Maximized extension of dewatering surface



### 5. ADJUSTABLE PLUG SCREW FEEDER (2021)

Adjustable to maximized dewatering





## Cutting back on gas

Last year, Meppen upgraded the PSF again, becoming the second company in the world to install ANDRITZ's revolutionary Adjustable Plug Screw Feeder. The new unit has now increased the plant's annual savings even further additionally, and the investment paid for itself in just 9 months.

Those savings come in two main forms: On the one hand, the new set-up results in more dewatering and therefore less gas consumption in the dryer. This is especially important with fresh, moist wood and it was already the plan even before natural gas prices skyrocketed over the past year. The observed results show that the average dryer temperature has fallen by around 15%.

Such aggressive dewatering means running the PSF's motor and compression rate at the maximum sustainable level, even though that had previously caused some blockages and stoppages. This is where the second area of savings can be found. Obviously, wood is

a natural raw material, so moisture and other physical characteristics vary constantly. However, with the ANDRITZ Adjustable Plug Screw Feeder, the operator can easily adjust the system to prevent over-compression, as the new, adjustable bearing unit can move the screw back and forth axially by up to 100mm, accurately reducing or increasing the pressure, all while operation continues. The unit actually has a new conical screw nose design, which together with the axial movement allows a wide compression range adjustment. All of this prevents even the most ambitious operating program from overloading the motor or creating a sustained blockage, no matter how the raw materials vary from moment to moment.

Speaking of variable raw materials, the Adjustable Plug Screw Feeder also makes it possible to lower costs even further by adding recycled wood to the fiber mix. Meppen hasn't tried this yet, but that is another potential option for the future.

## Tight for time

Although ANDRITZ had already successfully upgraded several Plug screw feeder systems, it still had no track record of the ANDRITZ Adjustable Plug Screw Feeder at the time when Meppen placed its order— there were no units operating commercially anywhere in the world yet. That doesn't mean it was a do-or-die risk, though: Just in case the new design had issues, the project included a fail-safe fallback plan to switch back to the old system and be producing again within just 24 hours. That meant all of the parts that were common to both systems had to be compatible with both the new and old equipment. As Hermann Kassens, Head of Maintenance at Meppen, explains, "That was a big requirement for me: I had to know – What will you do if it doesn't work? It absolutely had to be operational on time."

And time really was a major factor in this case. Despite the use of world-first technology, delivery was due in December 2021 for an order that was placed in April. As Florian Grünberger, ANDRITZ Key Account Manager, points out, "Implementing a prototype installation as complex as this in just seven months, with all the engineering, raw material sourcing, finishing, testing and delivery that involved, was remarkable."

Furthermore, ANDRITZ and the team at Meppen only had from 16–21 December 2021 to remove the old ANDRITZ PSF and install the new ANDRITZ Adjustable Plug Screw Feeder, with its new hydraulic bearing unit and drive transmission, etc. And there really was no room for error, because the upgrade had to work right from the beginning. With a completion date of 21 December, any delays would have meant very "special" Christmas holidays for the Austrian installation team!

But the entire project, which was managed internally by Evgeni Savov, Sales Manager ANDRITZ, was completed on time, without any major problems. Martin Giesen, Deputy Head of Mechanical Operations at Meppen, explains that "many of the components were pre-installed, which meant it all went without a hitch," while Hermann Kassens adds that "There were the usual challenges with the installation, but they were all resolved." In fact, despite the challenges, the installation actually turned out to be relatively comfortable, according to Florian Grünberger, who says, "we prepared the upgrade very well in regular project meetings, so that even with a shutdown of just one week, we were able to carry out the modernization with no problems at all." And as Hermann Kassens points out, "The startup went as we wanted. It was very positive. Nothing went wrong."



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**FLORIAN GRÜNBERGER,**  
ANDRITZ Senior Sales Manager



**"Many of the components were pre-installed, which meant it all went without a hitch."**

**MARTIN GIESEN,**  
Deputy Head of Mechanical  
Operations at Meppen



"Together with ANDRITZ, we've achieved a lot. I've spent a lot of time on this plant, a lot of nights. It's my baby. I'm very proud of it."

**HERMANN KASSENS,**  
Head of Maintenance at Meppen



## Exceeding expectations

"It's all gone without a hitch and we've achieved our goals. In fact, we could have been even more ambitious!" continues Hermann Kassens. With the new Adjustable PSF, Meppen simply sets the target for motor power, and the compression is adjusted while the line continues to operate, to keep all variables as close as possible to the maximum sustainable level, all of the time. So they achieve maximal dewatering, with more efficient use of the motor (which saves electrical energy), therefore saving the maximum possible amount of money, thermal energy, and CO<sub>2</sub>.

In the year since Meppen installed the ANDRITZ Adjustable PSF, "it has really been running stably," says Hermann Kassens. "There have been no sustained blockages; the only two incidents were quickly resolved by moving the screw" – which is the whole point of the design. "That option didn't exist before. Previously, it would have meant an 8-10-hour stoppage. It's a big step up in machine availability." (Incidentally, the other commercially-operating ANDRITZ Adjustable PSF – in Germany – has the same record of zero sustained PSF-related stoppages.)

Besides operational stability and energy savings, the Adjustable PSF provides other new options, too. Meppen's Hermann Kassens explains, "The new compression ring at the end of the screw works great, and gives us more flexibility, so we can run special products. We can even use other wood species now, and develop new recipes." Enrico Fuser, Key Account Manager, SW Europe, ANDRITZ, notes, "Previously, operating conditions were set and you couldn't change anything," but now, Martin Giesen adds, "we can vary energy, drives, moisture – all the parameters."

### EYES ON THE PRIZE

Summing up, Hermann Kassens says, "Together with ANDRITZ, we've achieved a lot. I've spent a lot of time on this plant, a lot of nights. It's my baby. I'm very proud of it." So proud, in fact, that the team at Meppen has entered this upgrade project into a competition to win a Sonae Arauco company award for 2022. The Board of Directors came to Meppen in September 2022 to learn more, and "there was a positive reaction." We're pleased about that – in fact, our solution with the Adjustable PS won the Sonae Arauco Improvement award in the Cost savings category.



"For all the upgrades for the Plug Screw Feeder Progress we have been working right from the start in close cooperation with both the Meppen plant and Sonae Arauco headquarters in Portugal. We have managed to follow the plant's requirements and also to understand the most suitable ways to develop the projects to minimize the customer's investments and risks. In a real partnership, ANDRITZ has had the chance to develop new solutions together with Sonae Arauco and the results have been very beneficial for both parties."

**ENRICO FUSER,**  
ANDRITZ Senior Sales Manager, SW Europe



### Q&A with Pedro Marujo from Sonae Arauco Headquarters in Portugal

(specifically the GTECH Group Technology team, which has now been re-named "Industrial Strategy, Technology & Projects").

#### What were the main reasons that you approved the upgrades?

There were several reasons, some technical, some historical. On the technical side, ANDRITZ proposed prototypes that involved real innovations, but they seemed feasible to us. Also, very importantly, they were good technical solutions for the plant's needs. On the historical side, we also approved the project because we trust ANDRITZ: We know from previous projects that they are committed and they treat their challenges honestly and seriously.

#### How do the results look from the "Headquarters" viewpoint?

By constantly improving operational flexibility in the plug screw feeder area, we have increased our Meppen plant's competitiveness considerably, over time. We began by upgrading the dewatering unit, followed by a new, longer housing and cylindrical design, and now we have the Adjustable Plug Screw Feeder. All of

the investments have delivered benefits that made them worthwhile, in terms of the money, time and energy we spent on them. We can see that from the clear project follow-up and results, both from ANDRITZ and from the plant in Meppen.

#### After the successful upgrades of the Plug Screw Feeder at Meppen, what will be the next steps in the wider Sonae Arauco group?

The Sonae Arauco Group is strongly focused on operating more sustainably, and Meppen has succeeded in doing that, by reducing the thermal energy required in the dryer and lowering the plant's overall production costs. Improved process flexibility is an additional benefit. We will evaluate this carefully, but it would be interesting to see how we could learn from Meppen's progress with its Plug Screw Feeder and replicate that success at some of our other plants. A partner like ANDRITZ could help us with that.



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### EUROPE

ANDRITZ AG  
Vienna, Austria  
p: +43 50805-0

### SOUTH AMERICA

ANDRITZ Brasil Ltda.  
Curitiba, Brazil  
p: +55 41 2103-7601

### NORTH AMERICA

ANDRITZ Ltd.  
Brantford, Canada  
p: +1 519 754-4590

### CHINA

ANDRITZ (China) Ltd.  
Foshan, China  
p: +86 757 8296 9222

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