SUCCESS STORY

Extending the service life of PSFs at Guararapes in Caçador, Brazil

PANELBOARD

ANDRITZ REFURBISHMENTS – THE MOST COST-EFFECTIVE OPTION FOR THE CUSTOMER

ADVAPROTECT 70 HARDFACING INCREASES THE SERVICE LIFE OF PLUG SCREW FEEDERS BY UP TO 80%

ANDRITZ

ENGINEERED SUCCESS

Andreas Hoffmann, Industrial Manager, and Atílio Formagio, Application and Sales Engineer, at the Guararapes MDF plant in Caçador, SC, Brazil.

Searching for an efficient alternative

The solution for an extended service life and best performance at the Caçador Guararapes plant

In search of an efficient alternative to extend the service life of Plug Screw Feeders (PSF), Guararapes found the perfect solution in the AdvaProtect 70 hardfacing supplied by ANDRITZ. "We saw an increase of up to 80% in the service life of the screws by using the ANDRITZ hardfacing. In practice, plug screws that would be changed after every seven months in use have their durability extended to one year," says Andreas Hoffmann, manager of the Caçador (Santa Catarina, Brazil) plant operated by Guararapes, a manufacturer of plywood and MDF panels.

The material with a high hardness level that characterizes the surface protection guarantees an extended service life for equipment that usually has a high wear rate. "The PSF has direct contact with abrasive components in the wood, including silica (sand) and other particles incorporated into the raw material. Over time, the abrasive wood chips wear down the surface of the equipment, reducing its sizing and, consequently, its performance," explains Hoffmann.

Continuing to describe PSF operation, Hoffmann mentions that the equipment is responsible for reducing the natural moisture content of the wood before it goes to the drying stage. When carried over to the pre-steaming bin, the wood chips undergo steam tracing with an average of 50 to 100 kg steam per ton of dry wood. The steam penetrates the raw material and helps transform it into a more compressible material, as if it were a damp sponge. "Below this pre-steaming bin is a plug screw feeder system where the plug screw is located. The main function of the screw is to bring the mass of wood from atmospheric pressure to digester pressure (stage in which the wood chips will be further heated with hot steam)."

20" plug screw feeder in operation at Guararapes - line 2

> **"A plug screw that would be changed after every seven months in use has its durability extended to one year by applying AdvaProtect 70 hardfacing."**
>
> **ANDREAS HOFFMANN,**
> Manager of the Caçador (SC) plant operated by the plywood and MDF panel manufacturer Guararapes.

Working in partnership

As the plug screw rotates and squeezes the wood into an increasingly narrower cross-section as well as acting as the transition between a vessel pressurized to 9 bar and a bin at atmospheric pressure, it also drains the moisture present in the wood at the beginning of the process and homogenizes the wood chips before they move on to the next stage of the manufacturing process. "We are located in a region of Brazil where wood has one of the highest natural moisture content levels, reaching 160 kg of water per 100 kg of wood, a figure that represents one of the highest limits in the MDF industry. Thus, this natural moisture has to be reduced before the drying stage in order for the wood to be energetically viable," Hoffmann adds, highlighting the relevance of the equipment.

Wear in the plug screw leads to loss of its compression ratio, indicating a need for replacement. "As the compression rate is lost, the plug screw has reduced drainage potential, impairing the refining process either by limiting production or by changing the quality of the fiber," explains Hoffmann regarding the factors that justify the change.

IN VIEW OF SUCH DEMAND, THERE ARE THREE OPTIONS AVAILABLE:

- replacing the plug screw,
- refurbishing the screw without applying AdvaProtect 70 hardfacing and
- refurbishing the screw and applying the ANDRITZ wear lining with high hardness level.

Also according to Hoffmann, by diluting the cost of the AdvaProtect 70 hardfacing over the months by which the life of the equipment is extended, adopting the ANDRITZ technology turns out to be the most cost-effective alternative. "Moreover, by reducing the frequency of interventions to replace the plug screw, we have now seen only three changes over the past two years instead of the four changes we usually had when using the normal hardfacing. Considering that replacement itself incurs costs, including labor costs and machine downtime, the reduced replacement frequency also provided an economic advantage."

Andreas Hoffmann and Atílio Formagio in the control room at Guararapes. >

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SAYS THE MANAGER OF GUARARAPES' CAÇADOR PLANT

ANDRITZ has been supplying equipment and technology for the Guararapes' Caçador plant for over a decade. The most recent technology, the AdvaProtect 70 hardfacing, will be supplied for a period of two years, according to Hoffmann. "The main driver of the search for improvements in this specific case was the drainage stage, which was in perfect condition in the first months after installing the plug screw, but its performance was deteriorating over time. Our technical staff submitted this demand to ANDRITZ, and the company's technical team suggested using this more wear-resistant coating. We have relied on ANDRITZ's expertise, invested in this improvement, and proven its effectiveness in our operational routine over the past two years."

The fact that ANDRITZ is present in numerous plants across various industrial segments was cited by Hoffmann as a differential of the equipment supplier.

"ANDRITZ pays attention on two indispensable fronts to ensure the competitiveness of any company in the industrial segment: productivity and plant availability."

EVALUATION BY THE MANAGER OF GUARARAPES' CAÇADOR PLANT.

Inside the ANDRITZ technology

Plug screw feeder with Advaprotect 70.

In order to overcome the bottleneck caused by plug screw feeders (PSF), which have a high wear rate, especially in the higher compression area, ANDRITZ has developed and patented a technology for refurbishment of PSFs by applying AdvaProtect 70, a new generation of wear protection coatings with a high hardness level that provides refurbished screws with a service life equal to that of new plug screws.

The entire process, comprising refurbishment and the application of AdvaProtect 70 hardfacing, is carried out at the ANDRITZ workshop by specialized technicians using technically approved components, thus ensuring high quality at competitive prices.

Here are some of the benefits of the new generation of ANDRITZ hardfacings:

BENEFITS

- **longer service life of refurbished screws;**
- **reduced energy consumption thanks to high efficiency in the drainage stage;**
- **high wear resistance with excellent cost-benefit ratio;**
- **option of applying hardfacing only in areas that need to withstand high wear, keeping the focus on low cost and high profitability.**

Guararapes celebrates...

... over four decades of competitive performance in the wood panel market.

Guararapes Plant at Caçador, SC, Brazil.

Guararapes has been operating in the plywood industry for more than 40 years, going from strength to strength over this period as one of the largest manufacturers of this type of panel in Brazil. The past 15 years of this history were marked by an important strategic decision: The company started to direct 100% of its production towards exports, serving the construction industry.

Also in this most recent period, shareholders saw an opportunity arising about 12 years ago from the manufacturing process: The wood surplus from the central part of the logs, which was not used in the manufacture of plywood panels and until then was marketed in the pulp and paper industry, could be used in its own manufacture of MDF panels. Acquisition of the Caçador (SC) plant in 2009 fulfilled the company's plan to have a plant producing this type of panel and focusing on serving the domestic market.

In 2016, Guararapes invested in a second production line at the Caçador plant in order to meet the growing demand from the domestic market. The plant currently has an annual production capacity of 600,000 m^3/year of MDF panels, while the other plants, in Palmas (PR) and Santa Cecilia (SC), have an annual production capacity of 400,000 m^3 of plywood panels.

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