

SPRINGER

# Sawing completely rethought

**15,000 m<sup>3</sup> of log wood per shift and year – but with just one tenth of the staff and on one tenth of the area**

Processes in sawmills have basically been the same for decades. Since 2021, though, change has been on the horizon. That year, the East Tyrolean timber construction entrepreneur and glued timber producer Leonhard Unterrainer started sawing at his headquarters because he was frustrated with the lumber supply. In August 2023, he presented his revolutionary sawmill concept for the first time to the Holzkurier. The article attracted keen interest, but also skepticism: Is it technically feasible? Can the promised performance really be achieved?

✍ Gerd Ebner 📷 Springer

The Sawbox concept was recently given acknowledgment when Springer of Friesach, one of Europe's most renowned sawmill suppliers, acquired the global marketing rights.

## Partnership promises feasibility

Springer stands for solutions for high-speed sawmills and, more recently, for robotics in the mechanization and sorting areas. Springer joined the Sawbox project as a partner, and the Carinthian machine manufacturer can answer the two questions in the introduction with "yes". The concept behind the Sawbox: Unsorted logs are debarked, scanned, clamped, chipped, cut by a band saw and rip-cut by circular saws in one step. A robot picks up the board and places it in various sorting areas. The laying, handling and stacking of stacking sticks complete the entire sawmill process. The one employee who works in the 500-m<sup>2</sup>-big sawmill hall only monitors the process.

## Optimierung vor Ort und in Software

"We have since optimized the system together at the reference Sawbox on site, but also in our digital environment," Manuel Seiß, CFO and manager for the Sawbox at Springer, explains. He tells us, for example, that the first robot was replaced. "The robot lifted the finished board from the pile that used to be a log. During that time, the machining center stood still. We optimized this process by using an outfeed device." Compared to the original version, they saved

themselves a robot and increased the plant availability. Another insight from more than a year of cutting log wood: A housing around the units increases availability because it prevents dust pollution.

## Higher availability thanks to optimization

According to the performance data which Springer collected in real operation and in the digital simulation, an average cutting volume of 15,000 m<sup>3</sup> of log wood per shift and year are possible. This performance is based on standard dimensions: logs with a length of 3 to 5 m and a top diameter of 25 to 75 cm, and up to twelve lumber grades. "With log wood and lumber of bigger dimensions and an optimized product mix, up to 20,000 m<sup>3</sup> a year can be cut in a single-shift operation – and all of this with just one employee," Seiß explains. According to Unterrainer, an average yield of over 70% was achieved in one year of real operation. With larger dimensions, the yield is significantly higher. "Yield is not the top priority, though. The goal is to produce value-optimized lumber," Seiß tells us.

## Three main target groups

Seiß defines three main target groups for the Springer Sawbox:

- SME sawmills looking for a less capital-intensive alternative to traditional sawmill technology
- processing companies which want to achieve price stability and security of sup-

- ply by producing their own lumber
- existing sawmills which also want to process large-diameter log wood

## Sawbox instead of a new sawmill

"If you really have to build a completely new sawmill, you would probably have to invest three times the sum needed for a Sawbox. And even if you have the necessary capital, there might not be enough staff to operate the sawmill. A lower noise level is another reason to invest in a Sawbox, since this system doesn't have a log yard," Seiß argues, who describes the Sawbox as an "affordable but highly automated solution".

Seiß knows that 2021 was probably an exceptional year when it comes to lumber prices and availability. Nevertheless, he is confident that other lumber processing companies will follow Unterrainer's example. "Constant availability without price fluctuations is a selling point," he says, adding that even at the current price level, DIY cutting has clear advantages over the market price.

## Logs with diameters of over 1 m

Over the past decade, Springer has provided equipment for hundreds of sawmills. This is why the company knows that many sawmills' limit is the maximum log diameter. "Our model for large-diameter logs can handle top diameters of up to 105 cm and when it comes to lumber dimensions, almost anything is possible. In many cases, it would make sense to put a Sawbox next to the exist-

ing sawing lines," Springer's experts are convinced. The Sawbox and the lumber produced in it could be directly connected to an existing sorting line, which would further reduce investment costs. Springer stands for the manufacture of heavy, robust machines. Accordingly, such heavy-duty models are feasible.

## The time to invest is now

Anyone interested is kindly asked to contact Springer. The company has created customizable business plans for each of the three above-mentioned scenarios or target groups. Also, the Sawbox in Ainet can be visited live at any time.

"The delivery time for the plant is currently around nine to twelve months, depending on the stage of expansion. Many people realize that now is the right time to invest. After all, the new plant should be up and running when the upswing comes. Given the great interest in this type of sawmill, though, the delivery time will probably be longer," Seiß says.

## Each Sawbox is unique

According to Seiß, there will not be one "standard" Sawbox. "Basically, the customer determines how the plant is designed based on the raw material used and the desired dimensions. Even cutting hardwood and other valuable wood is conceivable. At the moment, though, we are focusing on cutting spruce, pine, fir, Douglas fir etc. That alone keeps us busy enough." Seiß also talks about alternative solutions. For example, if a customer has an existing log yard, sorted cutting

could be done, too, but that is not necessary. If there is enough space, a secondary sorting module can be installed on an additional 250 m<sup>2</sup> and connected to the existing Sawbox infrastructure. This eliminates the need to invest in a separate post-sorting line.

## One employee per shift

"Only one employee is needed to operate the Sawbox – from the log infeed to the finished, pre-sorted lumber package. How many more are needed for the remaining intralogistics varies from company to company," Seiß tells us. In a second half shift, the robot and the remaining infrastructure could also be used "for automated post-sorting".

"The Sawbox can also help solve the issues of staff shortages and high personnel costs. As a result, smaller companies can become more competitive again," Seiß says, summing up the main advantages of the innovative plant solution.

## One manufacturer, no interfaces

All system components – including the machining center – are manufactured by Springer. "The cutting unit is part of the entire machining center. Key components like that are always supplied by us, as is the control and optimization software," he explains. The robots are purchased from ABB or Kuka and are programmed by Springer. For lumber grading, industrial scanners from established suppliers are used. Leonhard Unterrainer is the worldwide patent-holder of the Sawbox, while the machine manufacturers from Friesach have the exclusive rights of

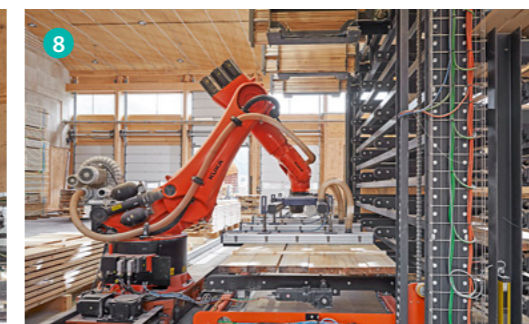
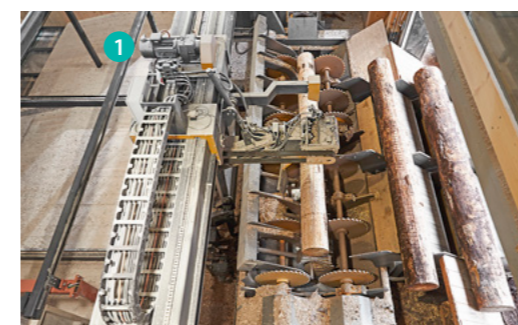
use. "Holzbau Unterrainer helps us as a sparing partner when we want to test details. After more than one year of operation and production, we were able to fully incorporate the technical findings into our optimized Sawbox."

## Self-sufficient sawing possible

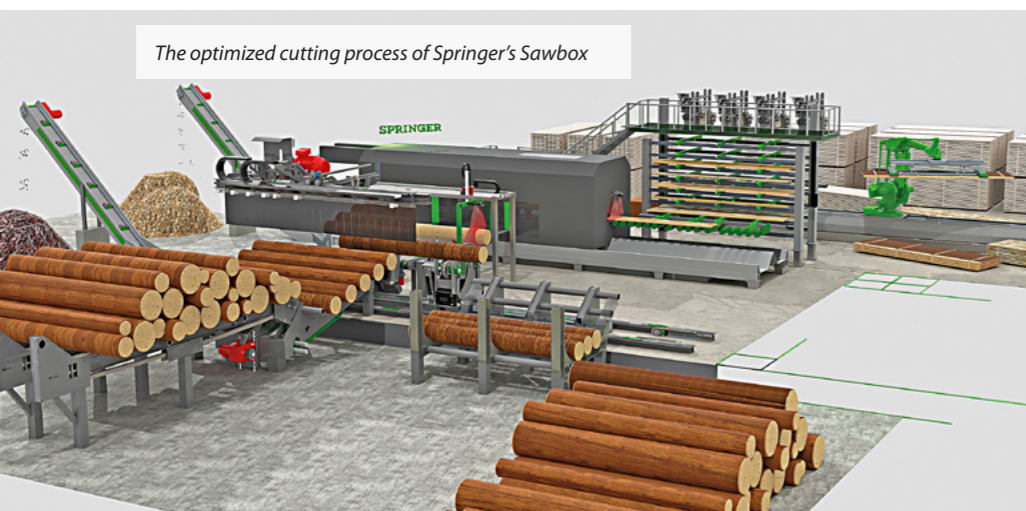
At the reference plant in Ainet, a 180-kW PV system is installed on the hall roofs. On sunny days, the Sawbox can be operated almost exclusively with solar energy since the entire sawmill only requires just under 200 kWh. //

### PROCESS STEPS IN THE SAWBOX:

- 1 *Debarking*
- 2 *Chipping*
- 3 *Profiling*
- 4 *Rip-cutting and cutting*
- 5 *Lifting of the finished board (In the future, a longitudinal outfeed solution will be used so that the band saw does not stand still.)*
- 6 *Sorting*
- 7 *Placing of stacking sticks*
- 8 *Handling*
- 9 *Stacking (This part of the plant could also be used for post-sorting.)*



The optimized cutting process of Springer's Sawbox



### CONVENTIONAL SAWMILL

Required space incl. outdoor space: 20,000 m<sup>2</sup>

Employees: 10 to 15

Cutting volume: 15,000 m<sup>3</sup>/shift/yr

### SAWBOX SAWMILL

Required space incl. outdoor space: 1,500 m<sup>2</sup>

Employees: 1 to 2

Cutting volume: 15,000 m<sup>3</sup>/shift/yr