

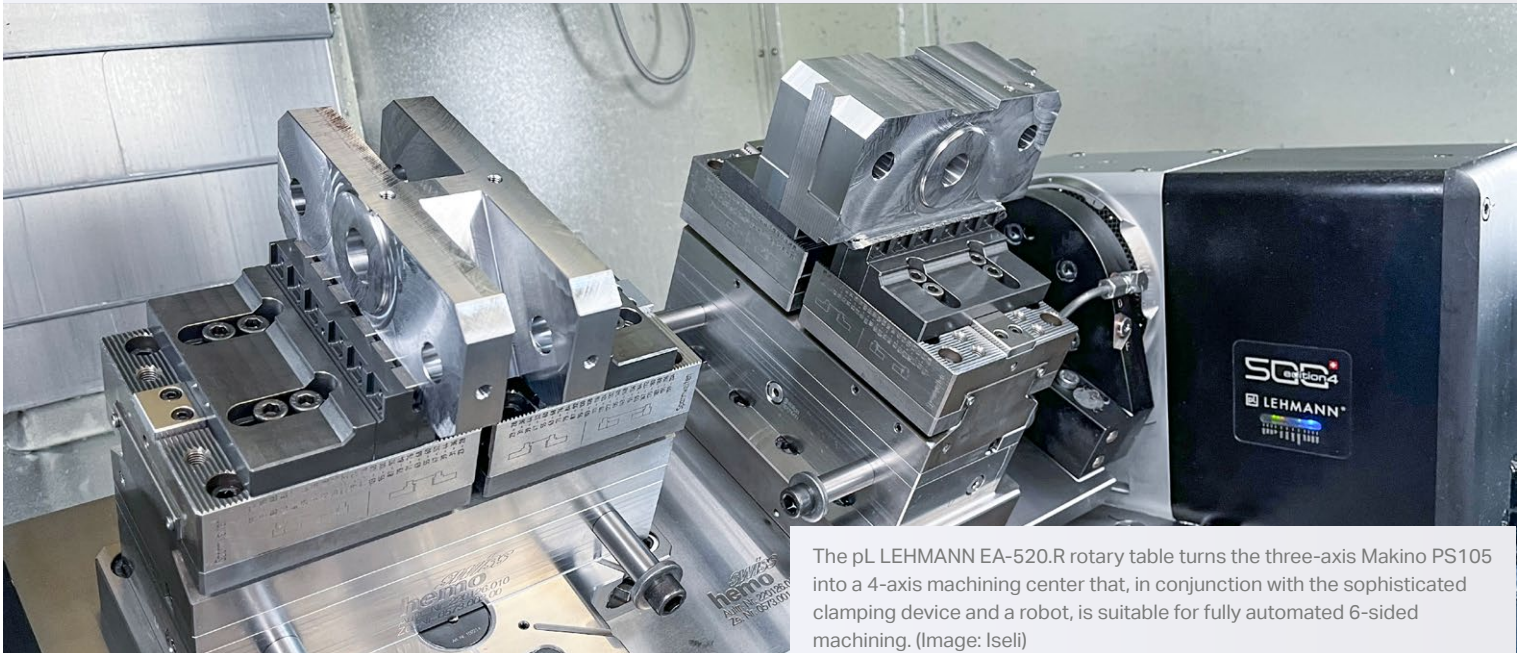
June 2023

Swiss Rotary Table Technology

NEWSLETTER

Highly productive on a small footprint – despite shortage of skilled workers

EA-520.R with rotoFIX



The pL LEHMANN EA-520.R rotary table turns the three-axis Makino PS105 into a 4-axis machining center that, in conjunction with the sophisticated clamping device and a robot, is suitable for fully automated 6-sided machining. (Image: Iseli)

pL rotary table turns 3-axis machine into a four-axis complete machining center

When production space is at a premium, compact, highly productive machining solutions are in demand. Sharpening machine manufacturer ISELI has made its vision of such a production system come true. The secret to its success: Equipping a three-axis milling machine with additional CNC rotary table from pL LEHMANN. Two center clamps on the bridge and robotic loading made even fully automated complete machining possible.

ISELI & Co. AG is a family-owned company that develops and produces machines for sharpening, straightening, tensioning and welding saw blades. Managing Director Philipp Iseli highlights the company's core competencies. "With innovative technologies, we lay the foundation for practical sharpening and



EA-520 rotary table with rotoFIX from pL LEHMANN. (Images: pL LEHMANN)



High productivity in a small space – the 3+1-axis production cell installed at Iseli is easy to set up and impresses with process-reliable automatic operation.

efficiency-boosting solutions – for sharpening services, tool manufacturers and, of course, sawmills." Our strength lies in high-quality mechanical engineering and in project planning and support for demanding individual projects." His brother Christian Iseli, responsible for the production of the extensive machine program, adds: "This means we have to use state-of-the-art manufacturing technology to implement customer requirements flexibly, quickly and economically."

ISELI manufactures almost all mechanical components of its machines itself. Even the software is programmed in-house. In this way, the Swiss machine builders translate their expertise, which has grown over many years, into innovations that promise customers an economic advantage. Examples were

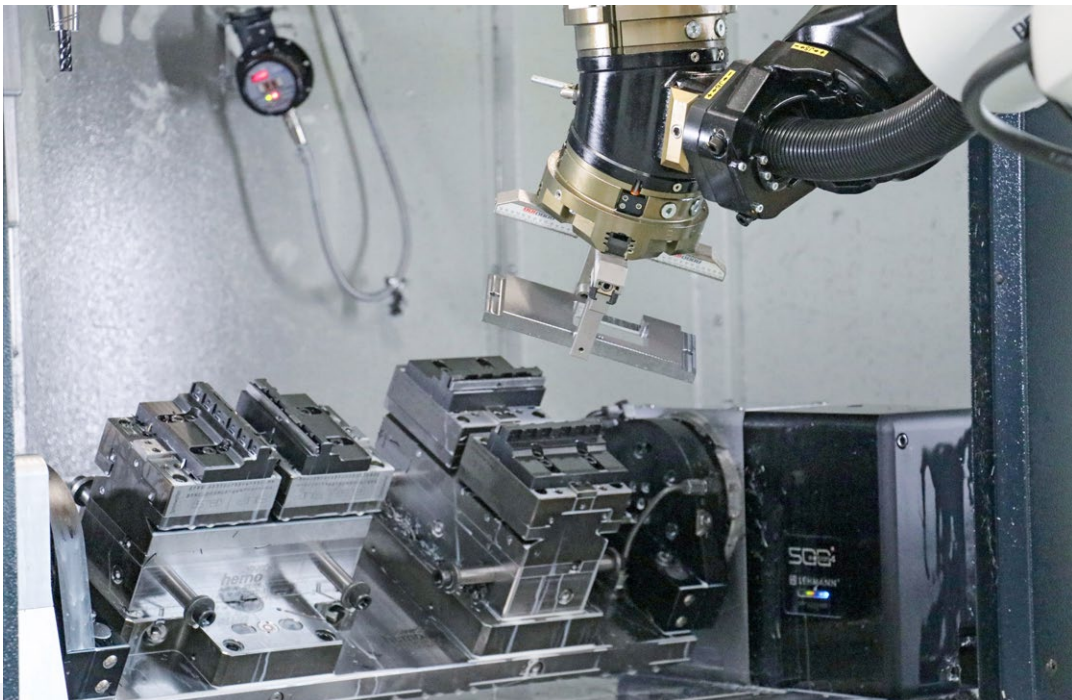
on display at the Ligna 2023 trade show, including a new machine for circular saw blades in which a robot provides fully automatic saw blade handling and enables efficient complete machining.

Innovative production systems

ISELI is innovative in its products, and the production in Schötz is equally progressive. "Automation of machine tools is playing an increasingly important role for us," Christian Iseli says. "It benefits employees because they do not have to do monotonous insertion work and can take on more interesting tasks instead. And it makes for higher productivity."

In recent years, ISELI's order volume has grown significantly. To cope with this and meet reasonable delivery times, the company is investing in modern manufacturing solutions. For example, the production manager relies on a 5-axis machining center with pallet handling. "This is a very versatile machine, but it does require some amount of expertise on the part of the operator. Unfortunately, we also have a certain shortage of skilled workers, so I felt compelled to think in terms of simpler solutions for further investment."

His first thought was for a three-axis milling machine that would be easy to operate, but fully automated. "We bought an automation system for a lathe a few years ago, called Turn-Assist from RoboJob, which performs shaft and flange handling," says Christian Iseli. "This robot is nice and easy to operate with-



The pL LEHMANN rotary table is equipped with clamping technology from project partner hemo. For 6-sided complete machining, the two vises on the bridge are crucial, one of which can be rotated 90 degrees. Likewise important: The rotary unions are completely internally guided, making the system highly process-reliable.



pL LEHMANN not only supplies high-end CNC rotary tables, but the necessary fittings and components are also clearly arranged in the supply cabinet.

out the need to go through lengthy training. I had a similar solution in mind for milling."

Are three axes or four axes better?

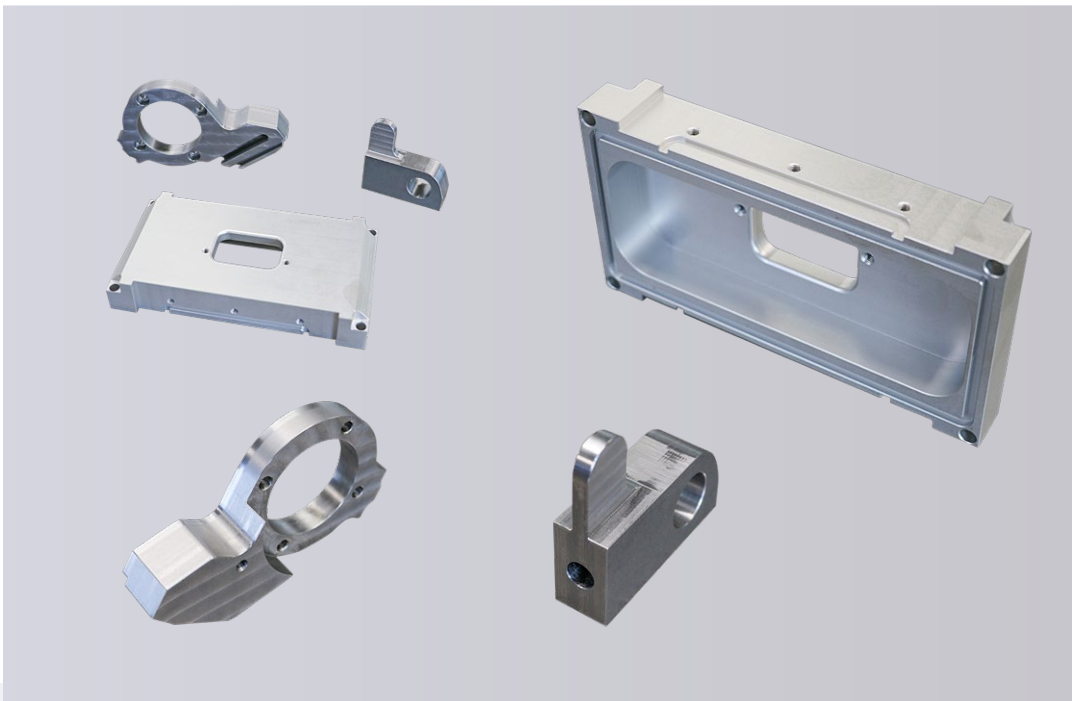
In his search for such a high-quality 3-axis machining center, a small Makino was recommended to him by a partner company. Now this Japanese machine tool manufacturer – exclusively represented in Switzerland for 30 years by neutec Werkzeugmaschinen AG in Immensee – is not exactly known for its three-axis vertical milling machines, but rather for its four-axis horizontal centers. This made the production manager recon-

sider and wonder whether a 4-axis Makino might be the better solution. Ultimately, the significantly larger space requirement made him decide against it. The quality of the three-axis Makino won him over. It is evident in features such as rigid design features and sophisticated temperature management.

Attaining four-axis operation using a pL LEHMANN auxiliary rotating table

But why not upgrade this machine to a 4-axis center with an additional CNC rotary table? "This way, we could also implement multi-page machining," Christian Iseli thought. "pL LEHMAN immediately came to mind as a supplier. I'd seen the high-end rotary tables from this supplier, which is just under an hour away from us, several times at trade shows and heard only good things from users."

The production manager was enthralled by the idea. The rotary table would have to move a bridge equipped with zero point clamping systems as well as hydraulic vises. hemo AG was his first choice as partner for the clamping equipment. After all, the workholding specialist from neighboring Kriens had already equipped other machines on its premises with high-quality, customized fixtures.



On the Makino PS105 with pL rotary table, mainly cubic components made of aluminum and steel in a size range between 20 mm and 200 mm are machined. The batch sizes are between 20 and 150 pieces.

Teaming up to create the ideal manufacturing solution

Before the contract was awarded, the parties concerned – neutec, pL LEHMANN and hemo – met to discuss the details. He transferred the overall responsibility to machine dealer neutec, which had already successfully handled another project with pL LEHMANN and hemo in the past.

The first machine agreed upon was the Makino PS105 machining center, whose machine table, with its size of 1300 x 510 mm, offers space for a large additional axis. pL LEHMANN proposed the EA-520.R design with counter bearing and a rotoFIX base plate as the rotary table. The development of the clamping bridge with the installed zero point clamping systems and vises was carried out by hemo in close coordination with pL LEHMANN. This team has proven itself many times over since 2007 and is currently working together on projects in the valve industry, aircraft construction and medical technology.

An entirely correct decision

The production cell has been in operation since June 2022, to the complete satisfaction of Production Manager Christian Iseli. "The machine with automation is easy to set up and highly precise. The performance data and accuracy of the pL rotary table are an ideal fit. And as far as the clamping device is concerned, our special wishes were fulfilled regarding the zero point clamping systems and the two hydraulic vises. Experience makes me 100 percent certain that I bought the right product."

A word about the pL rotary table with 3+3 strategy and the clamping technique. Christian Iseli wanted to have two vises on the pivoting bridge. One of them was to be designed so that it can be turned 90 degrees. "If the two vises are at right angles to each other, I have the ability to machine three sides in the first clamping and – thanks to the swivel axis – at any angle." After changing to the second clamping, the other three sides are free-



ISELI manufactures the components needed for its machines in-house. This sample component was completely machined on the automated Makino PS105 with pL rotary table.

ly accessible for machining. Complete machining like this saves us time and money."

If the two vises are set axially parallel, ISELI can also use them to clamp long components. And if the components are too heavy for the robot or have contours that are difficult to grip, the fixture is designed so that it can also be loaded manually.



ISELI supplies sharpening room equipment for machining band saws, gang saws, circular saws and knives – in Swiss precision and quality.

The vises are controlled by a 6-position rotary union from pL LEHMANN, which is completely internally guided, making the system very process-reliable.

In addition, the fourth axis, counter bearing and bridge are mounted on a base plate that can be removed from the machine as a unit. Then the Makino PS105 with its entire working area is available as a three-axis machine.

Pays for itself in three years or less

"This is the kind of solution I had in mind," Christian Iseli says in conclusion. "This manufacturing cell is highly flexible in use and yet easy to operate." The employee at the machine was able to master it in no time and enjoys working with it."

ISELI's 3+1 solution now produces parts that the machining specialists did not initially have in mind, for example workpieces that used to run on the 5-axis machining center. Other components that used to be produced in up to six clamping operations on a three-axis machine are produced here in one or two setups. "This pays off. Because the system works for us in 1-shift operation for an average of 13 hours, the investment will certainly have paid for itself in three years," says Christian Iseli confidently. "That's a good argument to purchase a second identical unit in the next two years."

Sharpening solutions for saw blades

ISELI, founded in 1945 as a trading company for horticultural products, is now a leading global manufacturer of machines for sharpening and machining band, gang and circular saw blades. In constant dialog with customers, the family-owned company also develops innovative, practice-oriented solutions for efficient stelling, upsetting, straightening, and measuring on band and circular saws as well as for sharpening industrial knives, chain saws and hand tools. ISELI employs around 50 people at its home base in Schötz, Switzerland, and four more at an assembly facility in Hungary. The annual production volume is about 150 machines, of which 95 percent are exported.

ISELI & Co. AG, Maschinenfabrik, Luzernerstrasse 31,
CH - 6247 Schoetz, Phone: +41 41 9840060,
office@iseli-swiss.com, www.iseli-swiss.com

CNC rotary tables with Swiss quality

Founded in 1960 strictly as a contract manufacturer, pL LEHMANN has been developing and producing CNC rotary tables for over 40 years. With innovations and Swiss quality, the family-owned company in the Swiss town of Bärau (Emmental) succeeded in opening up new opportunities for its customers and developing lean machining solutions characterized by high productivity through use of additional NC axes. One of the highlights of the company's history is the powerful and flexible Series 500 developed in 2009, which is ideal for the most demanding tasks thanks to its modular design. With the backlash-free, preloaded PGD gear unit developed in 2014, pL LEHMANN reached another milestone. In 2017, the company introduced innovations such as the new pL-iBox, which makes its rotary tables ready for Industry 4.0 and digitalized production. This was followed in 2019 by the introduction of the Series 900 DD (Direct Drive) comprised of rotary tables with speeds of up to 5,450 rpm. An additional new product, the AM-LOCK system, a special zero-point clamping system for 3-D printing, including pre-machining and post-machining, was presented for the first time in 2019. Additional innovations have followed since 2020: With rotary tables for measurement technology, pL LEHMANN is entering a new market segment. There is also a smart solution in the field of automation in the form of ROTOMATION, the slim, space-saving indoor automation product.

Contacts: **Peter Lehmann AG**
Bäraustrasse 43
CH-3552 Bärau
Switzerland
Phone +41 34 409 66 66
Fax +41 34 409 66 00
sales@plehmann.com
www.lehmann-rotary-tables.com

ISELI & Co. AG
Maschinenfabrik
Luzernerstrasse 31
CH - 6247 Schoetz
Phone +41 41 984 00 60
office@iseli-swiss.com
www.iseli-swiss.com