

LEUCOline

H I G H L I G H T S 2 0 2 5

→ MIMICKING NATURE TO ACHIEVE A NEW LEVEL OF SUCCESS

NESTING CUTTER BASED ON
THE FIBONACCI PRINCIPLE

10 times longer edge life.
Bionics sets new standards.

More on p. 16

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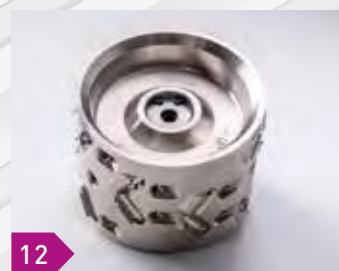
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Our tools and services
make production processes
more efficient and improve the
quality of the results.
Magentify Wood Processing.

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Editorial: LEUCO Ledermann GmbH & Co. KG,
Willi-Ledermann-Str. 1, D-72160 Horb am Neckar
T +49 (0) 7451/93-0
info@leuco.com
www.leuco.com
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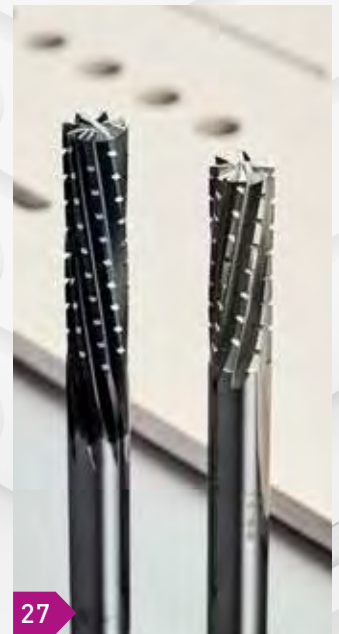
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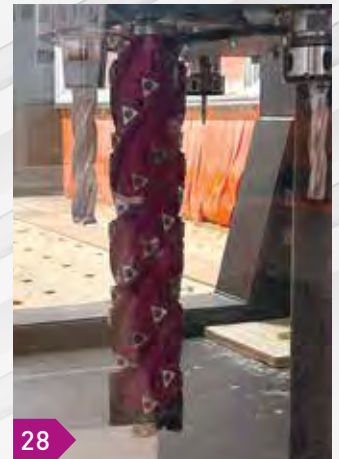
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Production at the highest level: Jürgen Hennig, Machinery Team Leader (right), and LEUCO Regional Manager, Heiko Späth (left) in the high-tech production facility of the internationally active REINHOLD KELLER Group, which relies on LEUCO tools when equipping its high-performance systems.

PANEL SIZING SAW BLADE

Q-CUT FROM LEUCO: PRECISION MEETS PERFECTION

With its "Q-Cut G6" saw blade, tool manufacturer LEUCO is setting new standards in the cutting of coated panels. The saw blade is the preferred tool of furniture manufacturers and interior furnishing specialists thanks to its outstanding quality and reliability for the finish cut. This includes the globally active REINHOLD KELLER Group. As an experienced roll-out partner in interior furnishings for the catering, hotel, fitness and healthcare sectors, the company relies on precise and efficient production processes. The excellent cutting quality of the LEUCO saw blade, which provides clean edges and maximum fitting accuracy, is therefore highly valued - essential for the series production of high-quality interior furnishings.

The Q-Cut G6 saw blade impresses with its innovative geometry and the high quality of the carbide-tipped teeth. The REINHOLD KELLER Group from Kleinheubach in Bavaria appreciates this. The company manufactures furnishings for hotels, catering businesses and fitness centers. Precision and efficiency are the key success factors for the family-owned business and at the same time set the standard for the tools used.

THE IDEAL CUT FOR WORLDWIDE PRODUCTION

"We are a global player, deliver to over 90 countries and have state-of-the-art production equipment for which we rely on precision tools from LEUCO," says Jürgen Hennig, Team Leader for Machinery at REINHOLD KELLER. "This," continues the master carpenter, "enables us to achieve results that are fully in line with our understanding of quality." The interior furnishings producer uses the Q-Cut G6 saw blade on his fully and semi-automatic cutting sys-

tems. "The saws," says Jürgen Hennig, "are in constant use. Regardless of whether we are cutting a larger quantity or a single panel. You can always rely on the Q-Cut G6 to do this precisely and efficiently."

ECONOMICAL AND POWERFUL FOR EVERY CHALLENGE

The price-performance ratio is also right, emphasizes Jürgen Hennig. New purchases and resharpening paid off. This is an important factor in view of the high load on the tools caused by the large processing quantities and the challenging sheet material, which contains an increased amount of foreign matter. "We always run two shifts and need around two to three saw blades per day on each machine. Because of the high processing volume and the increasingly demanding nature of the panels, we check the tools every quarter of an hour or so and change them sooner rather than later," emphasizes the master carpenter. In this way, the company ensures consistent quality of the finished cuts, even with an extremely demanding mix of materials. For example, solid core panels and wood core plywood (blockboard) with or without an HPL coating, 3-layer panels and particle board with all common surfaces can be sawn without changing the saw blade. According to Jürgen Hennig, with the G6 a user "can process an average of around two to two and a half thousand running meters before the saw blade needs resharpening."

MAGENTIFY
YOUR CUT



A place of superlatives: The REINHOLD KELLER Group warehouse sets standards in terms of size, automation level, number and variety of panels. Even with the most demanding materials, the Q-Cut G6 saw blade from LEUCO guarantees precise and chip-free cutting.



(Images: REINHOLD KELLER Group)

Made for top performance: The nesting cutter from LEUCO delivers a perfect edge, including on printed panels with an abrasive top layer. Despite the high mineral content, the cutter processes the panels precisely and without chipping. "It processes an amazing number of running meters", as Jürgen Hennig, Tool Manager from the REINHOLD KELLER Group, emphasizes.

PRECISION AND DURABILITY THANKS TO ADVANCED SAW BLADE TECHNOLOGY

The tool always produces excellent results. "The high cutting quality," explains Heiko Späth, LEUCO Regional Manager and master carpenter himself, "results from the low vibration of the tool body. In addition, the saw blade has a smooth-running tooth geometry that ensures long tool life thanks to two leading teeth with increased cutting performance and four trailing teeth for the finish cut." According to Späth, the Q-Cut G6 saw blade is perfect for processing both single panels and stacks with a cutting height of up to 80 millimeters. He adds: "The special LEUCO carbide also makes the tool resistant to breakage and impact."

GOOD COOPERATION FOR MAXIMUM RELIABILITY

In addition to the outstanding products from LEUCO, the master carpenter emphasizes the reliability of the tool supplier in Horb. Jürgen Hennig: "It just works really well. If I have a problem or am missing a tool, then Sales, Service or the office staff will help me immediately. Everything possible is done to provide me with a replacement tool quickly. As a customer, I feel very well looked after." The personal contact with LEUCO is highly valued at REINHOLD KELLER and also contributes to the success of the company, which is now being managed by the 6th generation, summarizes Hennig.

A COMPLETE RANGE OF TOOLS FROM LEUCO

Thanks to the high level of quality and service, the interior furnishings expert relies entirely on LEUCO products, including hoggers, jointing and flush-cutting tools, scraper blades as well as rounding and diamond-tipped tools, from

its CNC machining center to its through-feed machine. "For nesting, we rely on the high-speed cutter from LEUCO," explains Tool Manager Hennig. "It ensures an impressive number of running meters processed - even with demanding surfaces, such as those found on the printed panels from MB Digitalprint, a company of the REINHOLD KELLER Group. The top layer is extremely abrasive due to the applied clear coat, which has a high proportion of mineral corundum. Nevertheless, the cutter runs through it phenomenally - just like the G6 saw blade on every one of our panels."



A champion for single panels and packages up to a cutting height of 80 millimeters: The carbide-tipped Q-Cut G6 saw blade from LEUCO offers excellent cutting quality and long tool life thanks to its low vibration and special tooth geometry with two leading and four trailing teeth.



| These aluminum profiles are only sawn to length, rework is no longer necessary.

BURR? NO THANKS!

When sawing aluminum, a burr is easily formed on the underside or back. The travel trailer (caravan) and recreational vehicle manufacturer Fendt Caravan was not at all happy with this.

Clean chop cuts through straight and curved aluminum profiles are the strength of the WFM department at Fendt Caravan in Mertingen, Bavaria. There are two clipping saws in the department. The first one is a programmable automatic clipping saw from Weinig that is actually intended for cutting wood. It is programmed to slit up to 7-m-long profiles lengthwise. The output of the machine is so great that several employees at the rear of the machine have to pick the cut profiles, which are fed in by a transverse conveyor belt, for their destinations in the factory and also process some of them further. The other clipping saw from Gema is designed for cutting curved profiles into sections. It clamps the workpiece with two pressure cylinders and can be operated manually.

Until two years ago, the travel trailer and recreational vehicle manufacturer had problems with the chop cuts in the form of a visible and tangible burr on the underside of the profiles. This always meant rework.

LEUCO provided a remedy with its "HW TR-F-K" saw blade, which is specially designed for aluminum profiles. The product name describes the most important features of the saw blade: cutting edges made of carbide (HW), trapezoidal shape (TR), flat tooth (F) and convex (K). The geometry of the carbide cutting edges is decisive for the durability and precision of the saw blade.

*This saw cut the curved profile.
This saw cut also requires no further rework.*

*Bending the connection profile to the rear width of the vehicle
on a specially programmed machine.*





This bundle of chrome-plated plastic strips was cut in its entirety by the saw. Regardless of the random location of a profile, the quality is always right.

(Images: dds, G. Molinski)



(Image: Fendt)

Aluminum profiles are visible parts on a travel trailer.

SOON 10,000 VEHICLES PER YEAR

With almost 850 employees, Fendt Caravan manufactures almost 10,000 travel trailers and recreational vehicles a year.

»A TRUE PROBLEM SOLVER«

Arnold Arnoldi, WFM Team Leader, states: "LEUCO has solved a major problem with this saw blade. We reliably obtain clean, burr-free cuts that do not require any rework. Now we also use it to cut chrome-plated plastic profiles."

The report appeared in dds, 05/2024.

The cutting edges are made of carbide. Trapezoidal teeth and flat teeth with convex contours alternate.



IMPROVED PANEL SIZING SAW BLADES

WHY SAWING WITH DIAMOND PAYS OFF

Extreme edge life, but sensitive cutting edges: For a long time, diamond-tipped panel sizing saws were synonymous with both - until LEUCO changed the latter. The innovative tool manufacturer offers diamond saw blades that are both particularly durable and of high quality, as well as being extremely stable. The robust high-tech saw blades can even cope with foreign objects in the panel material.

"Diamonds are the woodworker's best friends" could be the motto when it comes to diamond saw blades from LEUCO. This is because the tools have been significantly optimized in order to fully exploit their strengths, such as the immensely long tool life and high cutting quality, right up to the end of the tool life.

BETTER BREAK RESISTANCE THAN EVER BEFORE, EVEN WITH CONTAMINATED PANELS

Thanks to thicker saw teeth and increased wedge angle, LEUCO reduces the risk of tooth breaking, smaller gullets allow the manufac-

turer to obtain a maximum tooth stability. The modified and robust diamond saws are suitable for all particle boards and MDF panels.

The robust saw blades can also cope with panel material containing recycling residues or other contamination which becomes ever more common in practice. If a tooth does break, the gap can be filled quickly and inexpensively by re-tipping.

LAST UP TO 20 TIMES LONGER, COST ADVANTAGE FROM 80,000 RUNNING METERS

Diamond-tipped saw blades achieve 20 times the tool life of carbide-tipped saw blades, i.e. a whopping 80,000 instead of just 4,000 running meters. The number of tool changes is correspondingly smaller. Both of these save time and money.

The diamond tool really pays for itself from around 80,000 running meters: From this point, the costs for tool life extension (new tool costs, sharpening service, set-up costs) increase only slightly - to just under 3,250 euros at around 410,000 running meters. In comparison, the costs for tool life extension of the LEUCO carbide versions are around 7,200 euros for the same amount of running meters, depending on the version.



Tailored to long tool life: The two new panel dividing saws Q-Cut and U-Cut with diamond tips from LEUCO.

The new U-Cut DP and Q-Cut DP are therefore an economical alternative to the HW panel sizing circular saw blades, especially in companies that rely on cutting performance, see table diagram.

FAST DELIVERY OF STANDARD SAW BLADES

LEUCO has included the most popular sizes of diamond saws in its stock program. With the revision of the diamond-tipped panel dividing saws, the designations were also adapted to the carbide products in our company: "U-Cut DP" for classic or universal cuts and "Q-Cut DP", ideal for finish cuts.

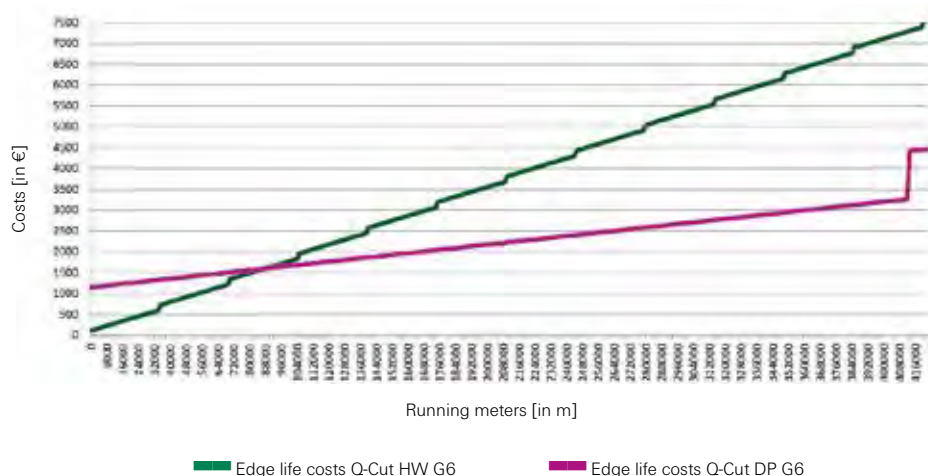


Very effective over short distances: The edge rounding of a carbide saw tooth after 4 km of cutting.



Endurance for long distances: The edge rounding of a diamond saw tooth after 80 km of cutting.

Illustration of economic efficiency: costs / running meter



The tool life costs per running meter of circular saw blades with diamond (line below) are significantly lower than those with carbide.

The cutting edge geometry of Generation 5 increases the edge life of LEUCO PowerTec hoggers, which have been tried and tested for many years. The PowerTec 5 variant on the left and the PowerTec 5S variant on the right. S stands for "strong". As can be clearly seen in the picture, each of its cutting edges is continuous. This makes it resistant to wear for longer edge life with less machine downtime.



PREMIUM TOOL

HOGGER OF THE FUTURE: POWERTEC 5 AIRFACE

It is a standout in highly productive manufacturing. Thanks to a constant diameter and cutting width, the PowerTec 5 airFace eliminates the need for time-consuming adjustments to the machine settings after sharpening. Its up to 25 % longer edge life also means fewer tool changes and minimal downtime. Feed rates of up to 80 m/min increase throughput, while the airFace design reduces noise emissions.

HIGH-PERFORMANCE HOGGERS: PRECISE AND PRACTICAL

With its consistent diameter and constant cutting width, the LEUCO PowerTec 5 airFace is extremely user-friendly. Thanks to this special characteristic,

the cutting circle diameter of the hogger remains unchanged even after sharpening. In practice, this means: "Plug & Play" without major adjustment. Simply place the freshly sharpened, now slightly narrower PowerTec 5 airFace on the power unit, adjust it axially - and continue working immediately. Height and overlap remain unchanged. This reduces setup times to a minimum and makes the PowerTec 5 airFace the ideal tool for automated machining.

POWER PACKAGE: FAST AND DURABLE

Long edge life is the be-all and end-all in hogging. Thanks to its cutting geometry, the LEUCO PowerTec 5 airFace achieves a completely new level of performance compared to the preceding version. Users of the 5th generation report increases in edge life of up to 25 %, in some cases even more. Starting with panels 8 mm thick, the PowerTec 5 airFace allows feed rates of up to 80 m/min. And ensures chip-free, low-noise sizing of numerous materials, e.g. raw, melamine-coated and paper-laminated, HPL, foil-covered and veneered wood-based materials. Even at high feed rates, the hogger delivers consistently first-class surface quality - regardless of whether with hard or sensitive, glossy coatings.

POWERTEC 5 & 5S: STRONG AND ROBUST

The high-tech hogger is available in two versions: the PowerTec 5 airFace model with enhanced cutting geometry for maximum efficiency is now joined by the PowerTec 5S airFace. This version has continuous cutting edges on each tooth. This provides additional robustness and results in even higher cutting rates with less wear. The polycrystalline diamond-tipped cutting edges ensure long tool life in any case. So if you are looking for greater efficiency, reduced setup time and optimum automation, the PowerTec 5 airFace generation and both of the versions available from LEUCO are a decisive step forward.



Machine operators will be able to make a note on the label provided of machine parameter settings when using a PowerTec for the first time. The constant diameter means that precisely this same value can then be used throughout the tool life of the hogger.

MAGENTIFY YOUR EFFICIENCY

INNOVATIVE TOOL TECHNOLOGY

FOR THROUGHFEED MACHINES: MILLING WITHOUT INTERRUPTION

No more height adjustment with varying panel thicknesses - with the Fibonacci jointing cutter from LEUCO. Its especially effective arrangement of the cutting edges prevents overcuts between the rows of teeth. This allows the cutter to continue working regardless of the material thickness. In addition, there is the long edge life, clean results and electricity savings of up to 15 percent.

The DIAREX jointing cutter is a safe bet for throughfeed sizing. The tool has proven itself to be an all-rounder. It masters a wide variety of materials, even challenging ones. In addition, the bionic geometry of the cutting edges patented by LEUCO ensures an exceptional level of cutter performance.

PERMANENT SETTING

Thanks to the unique arrangement of the cutting edges, modeled on nature itself, the Fibonacci DIAREX cutter does not produce any overcuts from one row of teeth to the next. This allows the user to continue production regardless of the material thickness - without having to re-adjust the height setting. This is an advantage over conventional jointing cutters, which have to be readjusted and always have an overcut area. Milling work carried with conventional cutters can result in reduced quality of the material's top layer.

PERFECT SURFACES

The overcut-free arrangement of cutting edges ensures better cutting quality, eliminates the need to adjust the height of the tool and increases tool life. The special arrangement of the cutting edges provides a better cutting pattern. The high, 48-degree shear angle of the DIAREX jointing cutter's cutting edges guarantees chip-free edges and surfaces. This all-rounder can handle a variety of materials, including sensitive and abrasive ones.

REDUCED VIBRATION OF THE MATERIAL

Thanks to their bionic arrangement, the cutting edges enter the workpiece with maximum uniformity, which significantly changes the amount of vibration



Standard DIAREX airFace Z3+3 cutter - engagement of the cutting edges in the panel. Adjustment of the cutter height to the 19-mm panel must be precise so that the overcut area does not reach the upper melamine layer.



Fibonacci DIAREX airFace Z3+3 cutter: The Fibonacci arrangement ensures that there is no overcut area. One cutting edge always mills the upper edge of the material exactly without chipping - this is called freedom from height adjustment.





LEUCO jointing cutters with the Fibonacci arrangement of cutting edges: from the left, SmartJointer airFace, DIAREX airFace and LEUCO p-System. The cutters have undergone trials and testing at LEUCO for many years and are excellent in their areas of application. What they all have in common is the further increase in handling options and performance thanks to the new arrangement of cutting edges.

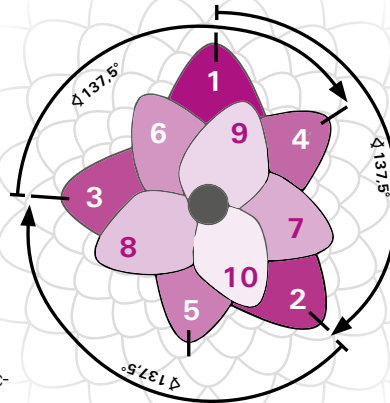
excitation. In turn, excitation of vibration during milling is minimized and unwanted vibrations are prevented. This also results in a smoother tool operation, which reduces the load on the motor, thus protecting the machine and reducing energy consumption - by up to 15 percent in the case of the DIAREX jointing cutter.

LOW-NOISE DESIGN

The unique design of the cutting edge also means that noise is generated at a lower frequency during use, which is perceived as more pleasant.

COMPLETE FAMILY OF FIBONACCI JOINTING CUTTERS

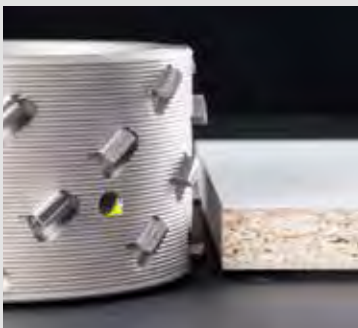
In addition to using the Fibonacci arrangement of cutting edges on the DIAREX jointing cutter, LEUCO now also employs it on the "SmartJointer airFace Fibonacci" and "LEUCO p-System" jointing cutters. The complete Fibonacci family stands for efficiency and reliable consistency in production - ideal for throughfeed machines.



TOOL DESIGN INSPIRED BY NATURE

The DIAREX airFace cutter with its Fibonacci arrangement of cutting edge is just one example of how evolutionary developments found in nature can be transformed into optimum tool geometries. The noise-reducing airFace design of the DIAREX cutter is based on the wings of owls, for example.. The striking technical surface, with its grooves and the different guiding edges of the chip gullets, directs the air flow in a specific manner: noisy turbulence is avoided. Cutters with the airFace surface are 2 dB quieter than comparable cutters with a standard surface.

In Fibonacci cutters, on the other hand, the arrangement of the cutting edges is modeled on the arrangement of leaves on plants, which have found the most efficient arrangement over millions of years of evolution. In the 13th century, Leonardo Fibonacci discovered the underlying mathematical relationship, which has since been known as the Fibonacci series.



Advantage of all LEUCO jointing cutters with the Fibonacci arrangement of the cutting edges: Different panel thicknesses can be milled with the same height setting. For production, this means that there is no machine down-time for adjusting the height of the cutter.



All LEUCO cutters with the Fibonacci arrangement of cutting edges bear this symbol. The application of this bionic principle to tools has been patented by LEUCO since 2025.

POTENTIAL FOR THROUGHFEED MACHINES

PRECISE TOOL CLAMPING: SO THAT EVERYTHING RUNS SMOOTHLY AND ACCURATELY

The type of clamping used to connect the tool and machine is a decisive factor for high-quality joining results. Rule of thumb: The greater the rotational accuracy, i.e. the lower the radial run-out, of the clamping, the more precisely the cutter works and the better the edge quality. This is why LEUCO encourages the use of particularly precise clamping systems such as Hydro 30/40, HSK 63F mod - and, for some years now, the HSK 32R for jointing cutters.

For edge finishing tools, the precise HSK 32R tool clamping system has been in use for a long time. The option of offering HSK 32R clamping for jointing cutters on compact, smaller machines, where the double keyway (DKN) is the standard everywhere is a more recent development.

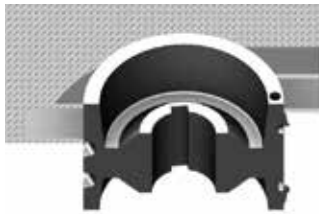
HOLZ-HER has recognized the quality potential and has been offering the FG 701 jointing unit to the woodworking industry since 2019. LEUCO's DIAMAX airStream range of jointing cutters with HSK 32R tool holder is the perfect match. LEUCO is ideally equipped for further

steps by system manufacturers to offer the HSK 32R bore for machines for jointing cutters with smaller diameters and provides the industry with optional LEUCO DIAREX airFace and LEUCO SmartJointer airFace jointing cutters with an HSK 32R interface. The era of zero-joint joining quality can now begin, even with small, compact machine sizes.

HIGHER CLAMPING FORCE, GREATER PRECISION, BETTER END PRODUCT

Although both the DKN and the HSK 32R employ mechanical clamping force, the HSK variant offers more secure positioning and higher precision compared to the DKN. The compact HSK 32 R tool clamping system

LEUCO offers the precise HSK 32R interface for jointing cutters.

Jointing cutter interface	DKN	HSK 32R
Rotational accuracy	max. 60 µ	max. 20 µ
Machine size/performance		
Clamping as the basis for zero joint quality		
max. tolerance range jointing work		
Tool cross cut / motor interface		

achieves a rotational accuracy (radial run-out) of two micrometers thanks to its combination of positive fit and force fit - comparable to the "Hydro 30", "Hydro 40" and "HSK 63F mod" interfaces used in the furniture industry on very large systems. The conventional clamping of the double keyway, on the other hand, has a deviation of up to six micrometers. The rotational accuracy of the jointing cutter always has a direct effect on the milling quality. The tighter the tolerance, the better the end product.

EASY HANDLING FOR THE MACHINE OPERATOR

Simple and quick insertion and removal of the tool is another advantage of an HSK 32R interface over a DKN. The machine operator only needs an Allen key and a few turns by hand to attach the tool to the unit or to loosen it.

CONCLUSION: A HIGH QUALITY AND COST-EFFECTIVE SOLUTION

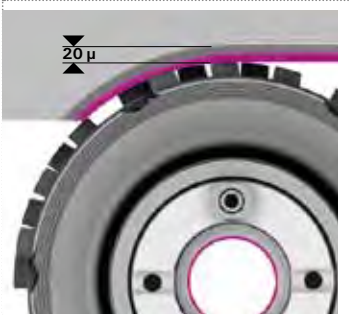
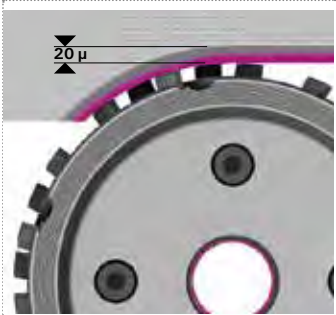
The HSK 32R is an efficient and high-quality tool clamping system with a good price-performance ratio. Use of HSK 32R clamping on jointing units opens up a new quality dimension in the compact machine sector and is therefore a new, interesting option for woodworking companies.



The LEUCO DIAREX airFace jointing cutter with HSK 32R is an option from LEUCO for the HSK 32R interface available on request from IMA Schelling on their Novimat series.



Maximum precision, easy handling: The LEUCO DIAMAX airStream with HSK 32R for the FG 701 unit from HOLZ-HER joins standard panel materials with zero-joint quality. The tool is changed with a simple Allen key.

Hydro 30/40	HSK 63F mod
max. 20 µ	max. 20 µ
	
	
	





One tool, several life cycles: The used tool in the picture on the left has until now been scrapped. Now it can be regenerated. The picture on the right shows a tool regenerated by LEUCO, ready for use with new diamond cutting edges.

EXTENDING THE USE OF DP TOOLS

EFFICIENT REGENERATION OF JOINTING CUTTERS

Regeneration of tools saves costs, is sustainable and sometimes faster than purchasing new tools. LEUCO now offers complete reconditioning to as-new condition for two of its diamond-tipped jointing cutters. This is made possible by a unique, patent-pending design of the cutting edges.

When the resharpener area of brazed LEUCO "DIAMAX airFace" and "DIAREX airFace" jointing cutters is completely used up, a second life cycle can now begin for them. The tools are reconditioned at LEUCO - with the full resharpener area like that on a new tool. Moreover, the jointing cutter remains the property of the customer.

PROFITABLE AND PRACTICAL FOR USERS

With the exclusive regeneration of these two jointing cutters, LEUCO is focusing on sustainability and returning the tools back to original sharpness. Depending on the number of cutting edges and their cutting width, this saves LEUCO customers time and money compared to purchasing a new tool. This is because regeneration of a used special tool is significantly less expensive and entails less time than production and delivery of a new jointing cutter. In addition, repeat use of the base body conserves valuable resources such as steel and energy.

SECOND LIFE, THIRD LIFE AND MORE

While the base body is retained, LEUCO replaces the used cutting edges with new ones as part of a service order. The reconditioned jointing cutter has the same performance potential as a new product. Furthermore, both tools can be regenerated several times. This considerably extends the useful life of the remaining base body - a sustainable and economically attractive feature, especially for trades with regular and intensive periods of use, such as furniture manufacturing or carpentry.

LEUCO'S SALES DEPARTMENT OFFERS ADVICE

The regeneration service is currently available exclusively for customers in Germany. LEUCO is focusing primarily on companies that already work with DIAMAX airFace and DIAREX airFace jointing cutters. You can obtain further details on the conditions for tool regeneration from your LEUCO sales partner.



Used becomes new: The picture from the LEUCO Service Center shows a red-hot new diamond tablet being brazed into the existing base body, with a newly brazed tooth on the right and a used tooth still to be brazed on the left. The brown mass protects the base body from damage during regeneration.

BACKGROUND This is why the base body of brazed jointing cutters can be regenerated

The diamond cutting edges of the two LEUCO DIAMAX airFace and LEUCO DIAREX airFace jointing cutters are attached directly to the tools using an innovative, patent-pending design from LEUCO - without the usual studs. In addition, the base body is no longer perforated during balancing thanks to the use of a new type of balancing screws. These two developments make regeneration possible for the first time in the history of brazed jointing cutters in the wood and furniture industry. LEUCO has also applied for a patent for the brazing and unbrazing process.



Designs of jointing cutters

Classic on the left: Cutting blade with studs and balancing bores

On the right, the DIAMAX and DIAREX airFace principle: Cutting blade directly in the base body, balanced using balancing screws



Quality contact: Dethleffs employee Patrick Bickel (right) appreciates the direct contact and service from LEUCO. Customer advisor Norbert König (left) also enjoys working for motorhome and travel trailer manufacturer Dethleffs: "It's an honest collaboration with qualified people. The human side is also just right."

FIBONACCI CUTTERS AT DETHLEFFS

HIGH QUALITY AND ALMOST 10 TIMES AS MANY RUNNING METERS

The tool from LEUCO with the arrangement of cutting edges inspired by nature is convincing in practice - just look at Dethleffs GmbH & Co. KG, one of the leading motorhome and campervan manufacturers in Europe. The company from Isny uses the nesting cutter to process sandwich panels with a styrofoam core. After being resharpened twice, it still achieves an extremely long service life of up to 13,000 running meters.

"We process around 2,000 composite panels every week. Extrapolated to 45 workweeks, this shows the enormous distance we process each year with LEUCO cutters. Our experience with it has been consistently positive, especially with the difficult composite material," says Andreas Biegert, Deputy Head of Parts Manufacturing at Dethleffs.

GREATER EFFICIENCY, FEWER TOOL CHANGES

Dethleffs Section Manager for routers Patrick Bickel summarizes the advantages of the tool: "In contrast to the old cutter, the polystyrene of the middle layer no longer sticks to the cutter. Added to this is the long service life, which means less machine downtime. We have to change the cutters less often. In addition we can resharpen the Z4+4 cutter twice, which makes it extremely economical. Finally, it processes many more running meters - with the previous tool, we achieved around 1,500 meters, now we can do around 13,000." Patrick Bickel adds: "And that with production at high speeds."

Bickel's conclusion: "The nesting cutter has proven to be the best tool for our material." He adds: "In terms of quality and service life, you can't beat it." In order to process the growing number of sandwich panels precisely and efficient-

ly, Dethleffs needed an appropriate high-performance tool. The decision was made to try the Z4+4 Fibonacci cutter developed by LEUCO, which was still a prototype at the time. Since then, the tool has become indispensable at Dethleffs.

LONG-LASTING PRODUCT, OUTSTANDING SUPPORT

With previous cutters, the 15-millimeter panels, which have a 9-millimeter styrofoam layer sandwiched between a 3-millimeter plywood layer at both the top and bottom, had to be smoothed afterwards. This took time and is now no longer required, which increased productivity considerably," summarizes Patrick Bickel. "Moreover, the cutter also lasts between 2 and 4 weeks," continues the Section Manager. The machines run in three shifts at Dethleffs. Seven machines, each running three shifts. The company produces around 500 parts per machine and shift, i.e. a total of 10,000 parts.

"In addition to robust tools, we also need good support. We get all of this from LEUCO. In short, we benefit greatly from the direct contact and professional exchange," emphasizes Bickel. The motorhome and campervan specialist has been a customer of the tool manufacturer in Horb for around 25 years. "The majority of our tools come from LEUCO," says Section Manager Bickel. Dethleffs equips its CNC systems with the Fibonacci tool.

MAGENTIFY
YOUR OPTIONS



Efficiency booster: Previous cutters required smoothing of the 15-mm-thick lightweight plywood/styrofoam panels. The additional time needed for this is now completely eliminated, which increases productivity, significantly," says Patrick Bickel, summarizing the benefits of the Fibonacci Z4+4 nesting cutter from LEUCO.



Long-distance runner: With its precise, pinpoint machining, the Fibonacci Z4+4 nesting cutter from LEUCO impresses at motorhome and travel trailer manufacturer Dethleffs. It also impresses with its outstanding service life, which is reflected in the large number of running meters processed. "The previous tool processed around 1,500 meters, now we can achieve around 13,000," explains Patrick Bickel, Section Manager for routers at Dethleffs.

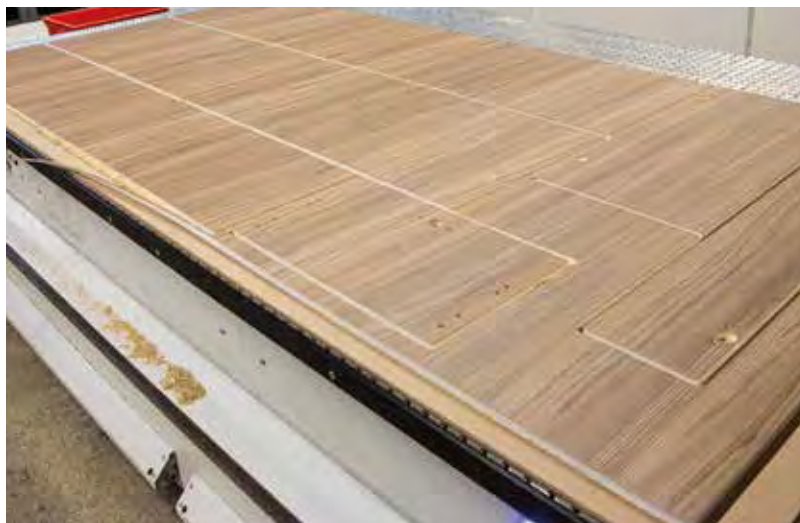
NOW PATENTED: INNOVATIVE CUTTER DESIGN BASED ON FIBONACCI ARRANGEMENT

The extraordinary Z4+4 nesting cutter from LEUCO combines four rows of diamond-tipped cutting edges, including corresponding chip gullets, in a diameter of just 12 millimeters. Inspired by the sophisticated spiral shapes found in nature, LEUCO uses the Fibonacci principle to optimize the arrangement of the cutting edges in this confined space. This means that four cutting edges are working at each point of the tool.

The Fibonacci cutter produces no visible overcuts, has a stable base body and works with extremely low vibration. The tool is available with a diameter of 12 or 16 millimeters and cutting widths of 23 to 29 millimeters.



Quality guarantee: The Fibonacci Z4+4 nesting cutter from LEUCO prevents the polystyrene from sticking to the cutter, which means better edge quality.



High-performance machining: In addition to the Fibonacci cutter for nesting the panels, Dethleffs uses other tools from LEUCO, for example for drilling.



Precision tool: With the Fibonacci Z4+4 nesting cutter, Dethleffs produces sandwich panels with chip-free edges and a cleanly cut middle layer. This leads to significant savings in production - given that Dethleffs processes around 5,000 sandwich panels per week.

MODERN NESTING CUTTER

DIACURVE: ACHIEVES THE RESULT YOU WANT

Small workshops as well as larger manufacturing companies rely increasingly on automated systems to optimize their processes. This requires maximum precision and consistency from tools. The DIACURVE from LEUCO delivers: As an extremely robust, diamond-tipped disposable milling cutter with consistent dimensions, it ensures a low-friction, continuous workflow.

Because of its special properties, the DIACURVE nesting cutter is considered an exceptional tool. Tool inventor Oliver Galli provides insights into his patent-pending innovation.

NEW MILLING CUTTER TECHNOLOGY: AN EFFICIENT TOOL FOR EFFICIENT SYSTEMS

"One of the advantages of the diamond tool is its constant diameter," says Oliver Galli, Head of Development at LEUCO and father of the DIACURVE, emphasizing the specific benefits of this milling cutter. And explains: "Since it is a disposable tool, the user does not have to intervene in the machine values. The system can operate autonomously. Even when exchanging, because the next milling cutter has the same diameter as the previous one. The large chip gullets minimize the susceptibility of the tool's cutting edge to breaking, which reduces the chance of problems during operation." Ideal for fully and semi-automated production environments.

FROM IDEA TO INNOVATION: DEVELOPMENT OF THE MILLING CUTTER

It took intensive tinkering before the tool was ready for the market. The challenge presented by conventional milling cutters, especially those with a small cutting diameter, is to fit many cutting edges into a small space. "We wanted to develop a tool that solves this problem," explains Oliver Galli, Head of Development at LEUCO. He states: "Thanks to the curved cutting edge arrangement, several cutting edges can now be combined, which also increases the important chip gullet volume." Galli continues: "To achieve this, we had to find a way to produce these new types of cutting edges, i.e. to integrate two different shear angles, which are always moving to-



A creative mind and a successful design: Oliver Galli, Head of Development at LEUCO and inventor of the nesting cutter: "With the DIACURVE, we have developed a tool that accommodates many cutting edges in a small space."

wards the center of the workpiece, into one continuous diamond cutting edge. We developed an innovative system in which the ratio of the shear angle to the cutting diameter was also taken into account." As a result, the tool delivers precise, chip-free cutting results without overcuts, which protects the surfaces of the wood-based materials. "After numerous tests, we implemented a new technology in our production for the finish of the cutting edges," explains Head of Development Galli.



The milling cutters with D 12 and Z2 (for panel thicknesses 12-15 mm), Z3 (16-19 mm and 22-25 mm), Z4 (16-19 mm) and D 3/8 inch with Z3 (16-19 mm) are generally in stock. They are supplied in a sleeve made from recycled material.

DIACURVE: A SUCCESSFUL SOLUTION THROUGH A COMPREHENSIVE APPROACH

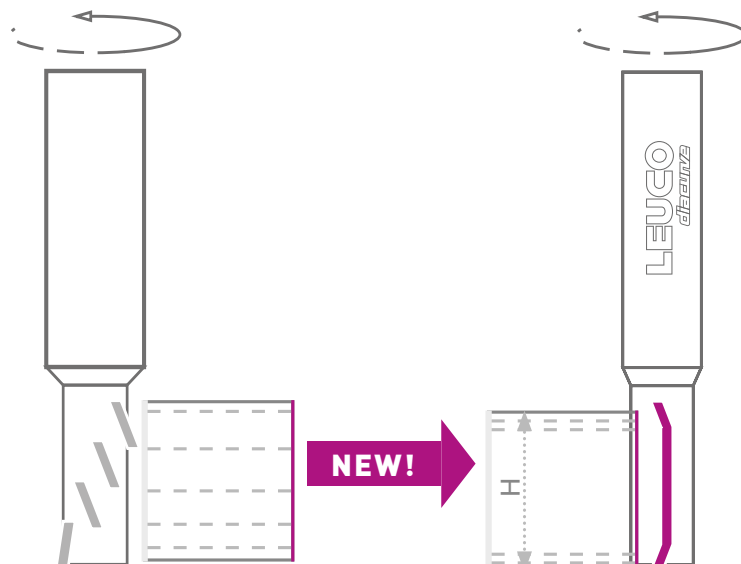
All technical hurdles in the development of the milling cutter were overcome. Oliver Galli, LEUCO's Head of Development, thinks back to how the tool came about in the first place: "In the field of carbide tools, the interesting approach of being able to change shear angles within a cutting edge was already known. I thought to myself, if it works there, then it must also be possible with diamond tools. That was the start of an idea that has now culminated in the DIACURVE nesting cutter."

DIACURVE: HIGH CUTTING QUALITY AND FEED SPEED

In addition to the generous chip gullets, the arc-shaped cutting edge geometry of the nesting cutter has fewer diamond tablets and two alternating shear angles per cutting edge, resulting in chip-free cuts, higher feed rates and a longer tool life - without overcuts. Available in five versions for panel thicknesses from 12 to 25 mm, the tool allows flexible configurations with up to four cutting edges and feed rates of up to 29 m/min. The distinctive gray coating also reduces friction, while the reinforced steel core gives the tool high stability.

The DIACURVE is suitable for all common wood-based materials.

A comparison between conventional milling cutter design and LEUCO's DIACURVE concept reveals the performance features of the innovative tool. The sketch clearly shows the two shear angles of the cutting edge and why they ensure very good cutting quality on the top and bottom.



PRODUCT RANGE EXPANSION

NESTING ON A NEW LEVEL

Following its success in the USA, LEUCO is now adding the "HP+" nesting cutter to its worldwide standard program. This opens up a new cutter option in solid tungsten carbide for nesting users - innovative and field-tested in practice. This optimized model is characterized by generation of less heat and can process higher chip loads. In addition, this advanced cutter achieves up to four times longer tool life than other VHW nesting tools.

The new HP+ cutter is suitable for nesting, cutting and joining wood-based panels - laminated or unfinished. This makes it the ideal tool for medium-sized companies with several CNC milling machines being used for nesting.

LESS FRICTIONAL HEAT, GREATER STABILITY

The high heat generated during nesting at fast feed rates is one of the main reasons that tools become blunt. "That's why our focus during development was on reducing frictional heat," states John Michel, Vice President of Technical Services at LEUCO USA. And explains: "The changes made affect the geometry of the tool body. First, the chip gullets were optimized for significantly greater chip removal. Then, we reinforced the back of the cutting edges." With more effective chip removal and more robust cutting edges, LEUCO achieved the desired reduction in temperature at the cutting edge. These measures lead to a longer tool life, supported additionally by a modification of the carbide.

LONGER TOOL LIFE, HIGHER CHIP LOADS

Depending on the application, tests with the newly designed cutter showed extended tool life of 30 to 200 percent compared to its predecessor. Tests were carried out on 1/2 inch (12.7 mm) and 3/4 inch (19 mm) thick particle board and MDF panels, laminated with melamine, LPL and HPL. High-quality, five-layer 3/4 inch furniture plywood was also included. "We saw that the HP+ can also process

Optimized VHW nesting cutter: The new LEUCO HP+ high-performance cutter impresses with its low heat generation, high chip loads and long tool life.



larger chip loads by operating at higher feed rates and a lower rpm" says John Michel. The tests also showed that feed rates of up to 46 meters per minute at 18,000 rpm can be achieved with high-volume workpieces. Because of its already high performance level, this cutter is not coated; nevertheless, LEUCO offers several coating options on request to further extend tool life.

SAME SERVICE CONVENIENCE, SUCCESSFUL VARIANTS

The resharpenability of the new HP+ tools is comparable to that of conventional HP models. The cutter can be resharpened between 5 and 6 times, depending on the diameter limit. The product has already been successfully launched in overseas markets such as the USA. LEUCO will initially offer the most commonly used sizes of 9 and 12 millimeters, including the corresponding tool interfaces. The HP+ is recommended as a robust and powerful VHW alternative for nesting.



"We have seen that the HP+ can also process larger chip loads by operating at higher feed rates and a lower rpm"

John Michel, application expert and Vice President of Technical Services at LEUCO in the USA



Proven VHW innovation: After a successful launch in the USA, the new HP+ nesting cutter from LEUCO is now coming to other markets.

EFFICIENT TOOL GEOMETRY

TRIO CUTTER: PRECISION AND POWER FOR MAGNETIC BOND BOARD



The new "LEUCO VHW-Trio finishing cutters" are available from stock in diameters of 12 and 18 mm.

The Trio cutter is a new solid carbide tool (VHW) developed by LEUCO for machining panels with magnetic or stainless steel surfaces. Thanks to its special coating and innovative cutting edge geometry, the cutting edges of the cutter remain sharp for a long time on these extremely abrasive materials.

Magnetic bond board is special particle board with a high magnetic force, generated by an iron foil or grid embedded in the laminate. Because their bonding capability and elegant appearance, these specially coated panels are used in many different areas. This includes children's and kitchen furniture as well as store and exhibition stand construction. They are also used in shop window design or for displays and information boards.

TOOL DESIGN INCREASES SERVICE LIFE

The Trio cutter has a special cutting edge geometry and a LEUCO "topcoat" coating to increase precision and edge life when machining extremely abrasive sheet materials. Test reports show just how long the edge life is thanks to the exceptional cutting edge structure: When machining V2A stainless steel-clad particle board, the tool still had a burr-free cutting edge even after 120 meters of use - an exception with this material. The cutter achieved the best results at a lower speed and higher feed rate. The last 20 meters were cut at 3,000 rpm and a feed rate of 5 m/min - with excellent results. The Trio cutter achieved the same with magnetic bond board. The successful concept: The cutter design combines a primary cutting edge with a normal shear angle and two closely spaced cutting edges with a higher shear angle.

TRIO CUTTER IMPRESSES IN LONG-TERM USE

Feedback from customers also underscores the exceptional performance of the Trio cutter: Users confirm that when used on magnetic bond board a speeds of 6000 rpm and a feed rate of 3-5 m/min, the cutter has not yet reached the end of its service life after more than 2500 running meters - at a removal rate of 3 millimeters per milling pass. In this case, the number of running meters might be even higher, as some of the material was removed twice during processing.

Optimum cutting strategy offers maximum efficiency when processing magnetic bond board or stainless steel-clad sheet material

In general, the recommended application parameters are speeds of 5000-6000 rpm and a feed rate of 4-8 m/min, depending on the diameter. Machining with feed is recommended for joint cuts. Otherwise, an oscillating milling process with an oscillation amplitude of 2-6 millimeters is preferable, depending on the cutter. If this is not possible, it is advisable to gradually offset the tool by 0.5 to 1 millimeter in the Z direction after each milling operation.

EXCLUSIVE CUTTING EDGE GEOMETRY ONLY FROM LEUCO

Because of the special arrangement of the three different shear angles in relation to one other, resharpening the cutter is not economical. The special cutting edge geometry is available exclusively from LEUCO and is protected by a utility patent. Thanks to its long tool life and clean cutting edges, this innovative tool is currently the state-of-the-art solution with the best price-performance ratio on the market.



The name "Trio" describes the new technology with three different shear angles on the same cutting circle. The precision and power of the Trio is impressive: a cutter providing 3 mm stock removal from 19 mm magnetic bond board had not yet reached the end of its service life after more than 2,500 running meters of use.

WHEN A TOOL IS NOT HELD SECURELY

FATAL: TOOLS NOT INSERTED FULLY

LEUCO recommends that shank-type tools be inserted as deeply as possible to increase their performance and service life. This is because inserting a tool deeper results in less vibration and optimum power transmission. Moreover, the improved stability protects against excessive wear and potential damage, such as tool breakage.

The insertion marking on the tool shank is merely a minimum insertion length defined in Standard EN 847-2. In order to ensure optimal performance of tools such as milling cutters, however, LEUCO recommends inserting the entire clamping surface into the clamping system.

IDEAL CLAMPING – THE DEEPER, THE TIGHTER

A sufficient clamping length ensures that the tool is held securely and safely. The firm grip

minimizes vibrations and enables precise machining. Stable clamping produces a better surface quality of the machined workpiece, as vibrations and deviations in concentricity are reduced. On the other hand, an insufficient clamping depth results in greater vibration, which can cause the tool to break more quickly.

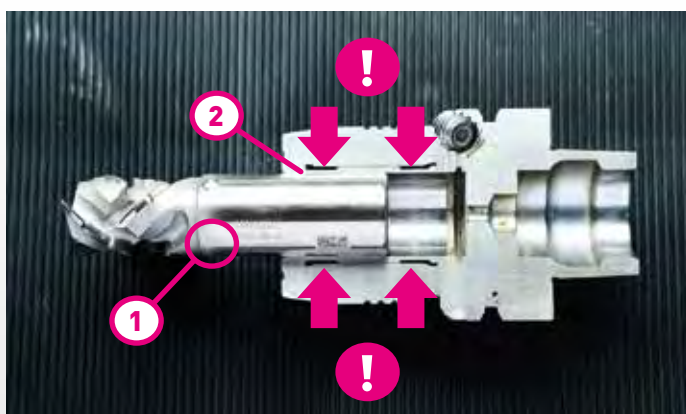
In addition, the higher clamping force achieved through a deep clamping length prevents the tool from loosening, falling out or slipping during operation, thus increasing safety for the operator and machine. Furthermore, optimum clamping distributes the load on the tool evenly, which extends its service life.

CLAMPING SYSTEMS AND CLEANING - OBSERVE SPECIFICATIONS AND CLEANLINESS

Standard EN 847-2 specifies the marking of the minimum insertion length of shank-type tools for woodworking. It establishes the minimum surface area that must be clamped on the shaft to ensure safe operation. Optimization of quality and service life are not ensured by the marking.

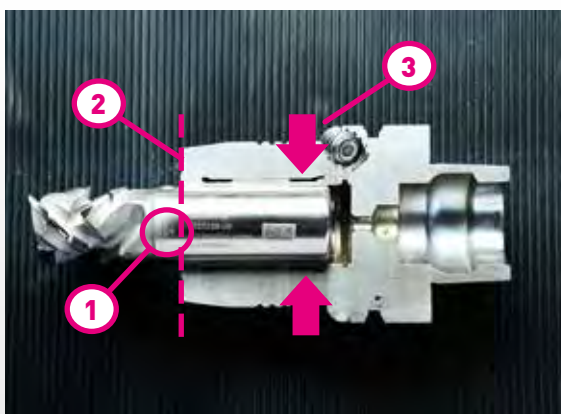
The tool shank and clamping device belong together like a key and a lock. The specifications of the clamping devices must therefore always be taken into account when considering the minimum insertion depth. For example, the minimum insertion depth of most clamping

A look inside a hydro expansion chuck



1 shows the minimum insertion depth marking on the cutter stipulated by Standard EN 847-2.

2 The section through the hydro expansion chuck clearly shows the two chambers where the pressure in the hydro expansion chuck exerts its greatest clamping forces. Regardless of the fact that the insertion depth marking on the cutter in the picture (which was created for demonstration purposes) does not actually correspond to the minimum insertion depth stipulated in the Standard, the right-hand pressure point does not exert any clamping force with such positioning. Vibrations or even tool breakage would likely be the result.



1 shows the minimum insertion depth marking on the cutter stipulated by Standard EN 847-2

2 The cutter is correctly positioned according to the minimum insertion depth marked on the cutter. When working on a CNC machine, every user must know that the minimum insertion depth does not ensure any optimization of quality or tool life.

3 The shank of the cutter is clamped by the right-hand chamber, but just at the end of the shank. This means that the full clamping force that can be provided for the cutter by the clamping device is still not utilized fully. Vibrations are still possible, which can lead to less than the expected cutting quality, premature wear of the cutter, etc.

devices is greater than what is marked on the shank. The reason: The clamping force is not always applied in the front part of the tool holder. As a result, tools that are only clamped according to the specifications on the tool do not reach the minimum insertion depth in the clamping device.

For optimum results without errors, the shank should be inserted as far as possible into the tool holder. Overly deep insertion of the tool occurs only when the clamping surface of the holder is exposed and can become dirty.

THE COLLET CHUCK IS AN EXCEPTION TO THIS

With this type of clamping, a special characteristic must be taken into account, since the collet is pulled backwards into a cone when the clamping nut is tightened. In order to leave enough space for this, the tool shank should not be inserted all the way to the stop, as LEUCO recommends, but with a small gap of around 2 millimeters - this ensures optimum clamping.

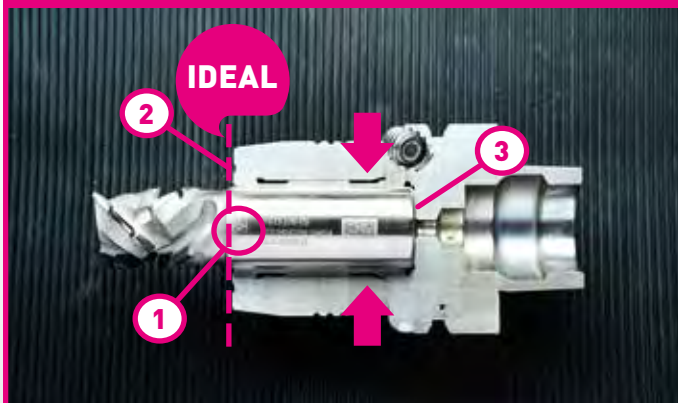
LEUCO points out that, although the collet chuck is a simple and cost-effective clamping solution, it has the worst radial run-out (at around 0.02 millimeters) and less clamping force compared to other systems. More precise collets also lose accuracy over their useful life and should be replaced regularly. Higher-quality variants such as hy-

dro expansion, heat shrink or Tribos chucks, on the other hand, offer more precise holding of the shank and therefore ensure more precise work and a longer tool life. Even after many hours of operation, they retain their radial run-out of only around 0.002 - 0.003 millimeters.

THE CLEANLINESS OF THE TOOL AND CLAMPING SURFACES IS ALSO CRUCIAL FOR CORRECT CLAMPING.

Dust and dirt can impair the grip. The tool and clamping device should therefore be cleaned regularly. Conclusion: The minimum insertion depth is only the minimum requirement, while the optimum insertion depth is as deep as possible - and ensures the quality of the work and the result.

IDEAL TOOL CLAMPING for hydro expansion, heat shrink and Tribos chucks:



IDEAL: The upper edge of the clamping device and the edge of the shank are flush.

1 The marking for the minimum insertion depth is located below the upper edge of the clamping device.

2 Both clamping chambers can exert full pressure on the maximum possible shank surface. The maximum clamping force of the clamping device is ideally utilized. Vibrations due to improper clamping are impossible.

3 The cutter sits at the maximum depth in the clamping device, the upper edge of the cutter shank is flush with the upper edge of the clamping device. For cutters or drills without a shoulder, the ideal practice is to always insert the shank all the way to the bottom of the clamping device.

TIP!

IF YOU HAVE ANY QUESTIONS, THE LEUCO TOOL EXPERTS WILL BE HAPPY TO HELP YOU.



HIGH PERFORMANCE IN A SMALL PACKAGE

DIAMOND TOOLS FOR MOBILE CNC MACHINES

For the first time, LEUCO is offering diamond cutters for portable CNC equipment. The benefit: Long service life and first-class cutting results with numerous materials, even abrasive ones. The patented diamond-tipped p-System cutters also ensure chip-free edges, eliminating the need for rework.

With this offering, LEUCO is taking mobile CNC milling to an industrial high-performance level. The diamond-tipped tool program enables carpentry shops, manufacturing companies and furniture manufacturers to implement special details or assembly work efficiently and to a high standard.

Such easy to handle equipment provides flexibility and is also suitable for entry-level CNC use - now with the precision and efficiency of diamond tools thanks to LEUCO.

DIAMOND CUTTERS: HIGH STABILITY, LONG SERVICE LIFE

The new LEUCO product range for the mobile CNC sector includes DIAMAX shank-type cutters, dovetail cutters, relief cutters and high-performance grooving shank-type cutters. Compared to conventional carbide tools, diamond cutters have an exceptionally long service life, lasting between 30 and 50 times longer, and can also be resharpened. Thanks to their diamond tips, these cutters are extremely robust, which makes them ideal for machining highly abrasive materials and complex composite materials.

p-SYSTEM: EXCELLENT EDGES, NO REWORK AT ALL

Of the diamond tools, the dovetail cutters and high-performance grooving shank-type cutters are available in p-System versions. LEUCO's patented concept with cutting edges at a 70 degree shear angle achieves chip-free surfaces and simplifies machining, even for delicate designs. Regardless of whether the job involves straight milling work, milling of radii and chamfers or freehand milling, these

tools reliably deliver a high-quality finish cut without the need for rework.

By including diamond cutters in the product range for mobile CNC machines, LEUCO combines the flexibility of portable CNC equipment with the high precision and durability of special tools, a step forward for machining technology and its users. Moreover, they are easy to handle: All tool versions are equipped with an 8 millimeter shank and fit on all machines with a corresponding tool holder.

USE OF RESHARPENABLE DIAMOND-TIPPED CUTTERS, FROM THE LEFT:

The diamond-tipped V-groove cutter is suitable for engraving and chamfering, for example. It provides an alternative to HW cutters when edge life is important.

The DIA jointing cutter is a problem solver, e.g. for milling cutouts in abrasive materials and is generally suitable for all milling operations in which HW cutters are used.

With the LEUCO p-System dovetail cutter, the visually appealing but technically demanding dovetail joint can be cut tear-free in almost any material and can be easily repeated as often as required with dimensional accuracy.

LEUCO p-System grooving cutter for chip-free grooving, even with the shallowest of groove depths, in all materials, e.g. veneer across the grain.

OPTIMIZING TOOLS

WHAT MAKES USE EVEN BETTER

Coatings enhance products, not only visually, but above all in terms of quality and performance: They increase tool life, lengthen edge life, reduce friction, heat and adhesion. To make the best possible use of these effects, tool manufacturer LEUCO customizes its coatings for the specific tool and application.

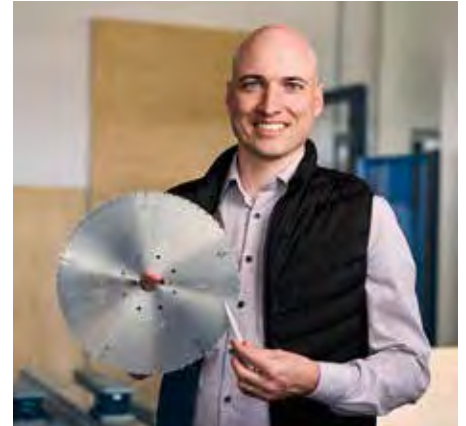
"Coating is a good way to further increase the efficiency and cost-effectiveness of applications," says Alexander Steinhart, Product Manager at LEUCO. As a tool manufacturer, LEUCO focuses on precision, i.e. tailoring the coating to the tool, material and application - which significantly maximizes the benefits.

HOW COATINGS LEAD TO GREATER PRODUCTIVITY

Coating of tools is a relatively new topic in the wood processing industry. One that is becoming increasingly important. As traditional cutting materials such as carbide and diamond have undergone continuous further development, coatings in particular have made considerable progress in recent years.

There is a reason for this. Coatings provide many benefits for tools. These include less contamination, reduced wear and protection against heat build-up and deformation. For instance, the non-stick effect prevents dirt from accumulating on the cutting edge of finger jointing tools, turnover knives and cutters during milling or profiling of solid wood - even when processing abrasive materials. At the same time, the increased surface hardness delays wear on the cutting edges of HW and DP circular saw blades, milling cutters, planing knives as well as turnover knives and scrapers.

"A coating provides the greatest possible benefit when the tool type, its properties and the material have been considered", says Product Manager Alexander Steinhart. He shows an nn-System saw blade with a "topcoat" coating that prevents chips from sticking to the saw blade.



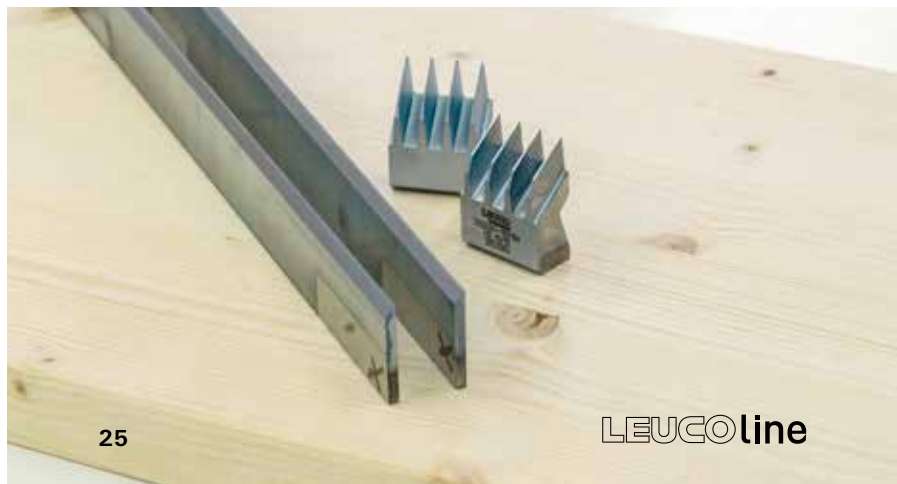
WHY CUSTOMIZED COATINGS ARE SUPERIOR

LEUCO started developing coatings quite early and under the name "topcoat" offers a range of coatings with different performance characteristics to improve the tools for the respective application in the wood processing and furniture industries. Alexander Steinhart from LEUCO explains the effect: "Selected coatings, for example for turnover knives in the joinery area, achieve an edge life that is two to three times longer than that of uncoated ones."

And gives further examples: "The TC109 coating reduces the tendency of chips to stick to the saw blade on circular saws. The elimination of coatings in LEUCO's product range, even for finger joint cutters would be unthinkable. They make it possible to double the edge life."

Three parameters need to be considered in order to achieve the maximum possible benefit from the coating: First of all, the type of tool, then its composition and thirdly, the composition of the material being processed. LEUCO uses this data and its in-depth expertise to determine the right coating when advising customers - for example, for carbide or diamond-tipped circular saw blades, shank-type cutters or planing knives used to machine solid wood or panel materials. LEUCO Product Manager Alexander Steinhart emphasizes: "We don't use a standardized coating, but provide the ideal solution for the respective application."

The right coating generally doubles the tool life of finger joint cutters and planing knives. The effect remains after sharpening. Since a coated tool does not cost twice as much as an uncoated one and also reduces set-up and machine downtimes, coating almost always gives a good return. How much, however, also depends on the user's calculation.



HIGH-PERFORMANCE COATINGS

MAXIMIZING THE PERFORMANCE OF COMPOSITE PROCESSING TOOLS

Polycrystalline diamond (PCD) is an established cutting material in composite machining and impresses with its outstanding hardness and wear resistance. However, PCD tools are limited in their geometry and are not always ideal for highly complex applications. This is where CVD diamond coatings come into play: they combine the advantages of diamond with the design flexibility of carbide tools.

CVD DIAMOND COATINGS

With LEUCO DIACOAT (USA: LEUCO RX), LEUCO offers the latest generation of a CVD (Chemical Vapor Deposition) diamond coating. It is characterized by extreme hardness, high abrasion resistance and optimized adhesion, which considerably extends the service life of carbide-tipped tools. This coating offers an ideal solution for drill bits, reamers, countersinks and milling cutters used to machine composites particular. The variable coating thickness of 3-17 μm enables precise adaptation to the respective application in order to minimize wear and ensure dimensional accuracy.

DLC COATINGS

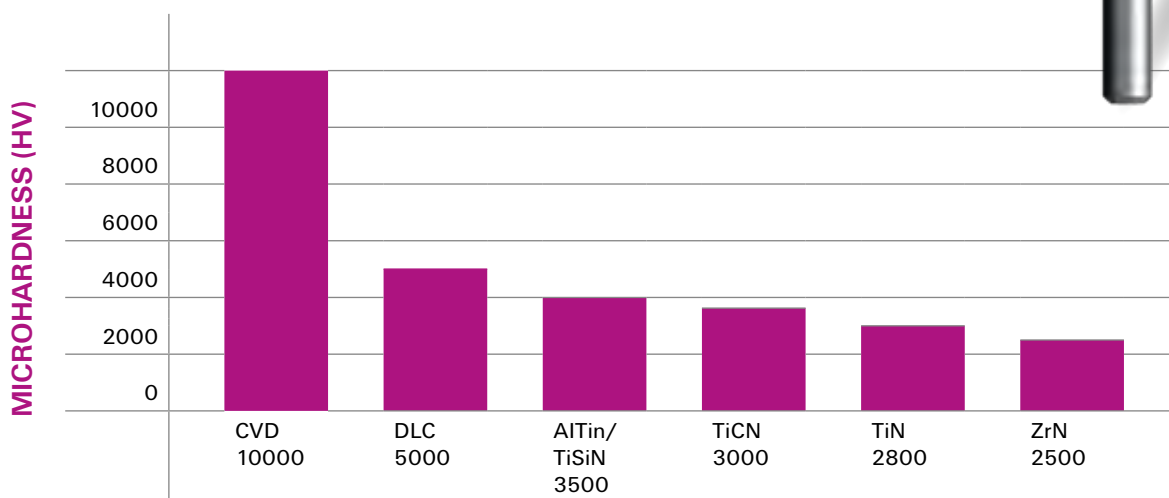
For applications that require tools made of HSS or metal matrix alloys, LEUCO relies on the TOPCOAT 111 coating (USA: LEUCO BX Coating) - a diamond-like carbon coating (DLC). It impresses with its high hardness, low coefficients of friction and excellent sliding properties, which makes it particularly suitable for machining composite materials in combination with non-ferrous metals.

LEUCO's expertise in research and development results in tools that are perfectly tailored to industrial requirements. Moreover, LEUCO offers several product families that are already available from stock, with coating, as a standard product.

IN ADDITION TO THE COATING, TOOL GEOMETRY IS ALSO CRUCIAL

It influences the cutting behavior, but also how well a coating adheres to the tool. The tool geometry and coating must be precisely matched. LEUCO therefore develops tools that are specially optimized for use on modern CNC machines. Drill reamers with progressive reaming surfaces reduce delamination effects, while faceted drill bits with special point angles minimize cutting pressure. By combining drilling and countersinking steps, boring countersinks ensure a highly efficient machining process.

Tools with a "CVD" coating are easily recognizable by their dark color. When machining composites, the coatings maximize the service life of tools whose geometry can ideally only be produced from wear-prone carbide.



Coatings increase wear resistance by increasing surface hardness and thus the tool life of metal-carbide tools. A TiCN (titanium carbonitride) coating has a hardness of approx. 3,000 HV, a DLC coating one of 5,000 HV. At 10,000 HV, the CVD coating achieves the greatest effect and is therefore comparable to polycrystalline diamond.





When milling control cabinet elements made of GRP with the CM010 multi-tooth cutter VHW from LEUCO, the user increased tool life by 400%. These cutters are available from stock at LEUCO with a pushing cut (left) and a pulling cut. A CVD coating (cutter on the left) can extend the tool life further under certain production conditions.

LEUCO MULTI-TOOTH CUTTER VHW

MAXIMUM TOOL LIFE, PERFECT PERFORMANCE

With the new LEUCO multi-tooth cutter VHW, LEUCO is setting a new record for tool life in machining of GRP. In a market test, a customer increased the tool life by a significant 400% compared to their previous milling cutter when milling an control cabinet. The customer benefits in many ways. In addition to the increase in tool life, machine downtimes for cutter changes and the cost of procuring new cutters are reduced.

In a fully automated milling process, robots process 5 mm thick GRP components with the utmost precision. Thanks to optimally matched machining parameters - 8,000 rpm and a feed rate of 2.5 m/min - the 6 mm all-rounder made of rugged solid tungsten carbide (ID 187812) unleashes its full potential.

Its unique design with 8 unevenly distributed cutting edges and innovative chip breakers minimizes vibrations and oscillations. The result: extremely smooth running, perfect cutting quality and maximum efficiency. The CM 010 multi-tooth cutter VHW is in stock at LEUCO in diameters of 6 or 8 mm, each with a pushing or pulling cut. Under the production conditions

for the aforementioned GRP control cabinet elements, an uncoated milling cutter was ideal for achieving maximum tool life. For other ambient conditions, the optional diamond coating available from LEUCO can help to increase the tool life even further. LEUCO's tool experts will be happy to check your conditions and recommend the right multi-tooth cutter.

Example of control cabinet made of GRP elements



**NEW
2025**

NEW PRODUCT CATALOG

COMPOSITE MACHINING CP 06

Recent product developments have added to the LEUCO CP 06 range of precision tools for milling, drilling and sawing fiber-reinforced plastics. These new products satisfy the very latest requirements on the market.



Catalog online at
<https://bit.ly/LEUCO-CP-06> or
speak to your technical consultant.

TOOL PREMIERE

**READY FOR USE QUICKLY:
VARIABLE-LENGTH CUTTER
FOR JOINERY WORK**

The delivery speed for a joinery tool has reached a new level - with the t3-System multi-block cutter from LEUCO. Thanks to its modular design, the tool can be flexibly produced in the desired length. This saves time in production and ensures rapid availability for the user. In addition, the specially positioned triangular turn-over knives result in excellent surface and edge quality as well as a high chip volume. Introduction will take place this year.

Readily available tools are a prerequisite for a continuous workflow on joinery equipment. This is becoming reality: LEUCO immediately supplies the right tool length with the new t3-System multi-block cutter, which is constructed in individual segments.

**CUTTER TECHNOLOGY: THE
VERSATILITY OF DIMENSIONS
AND MODULES**

Eliminate processes and tools - this is what the multi-block cutter offers with its variable dimensions. Moreover, the special cutting edge geometry of the t3-System gives this tool both the quality of a finishing cutter and the chip volume of a roughing cutter. Whether wall processing on portal processing machines, window cut-outs or doors, the upcoming tool is designed for structural and standard timber (glued laminated timber), quality laminated timber and cross-laminated timber.

The multi-block cutter can be supplied with a working length of 230 to 430 millimeters and diameters of 40, 64, 85 and 100 millimeters, depending on customer requirements. LEUCO achieves these flexible lengths thanks to the modular design of the cutter: LEUCO mounts its weight-saving individual segments made of anodized aluminum on a specially manufactured and hardened HSK mandrel. For the highest balancing quality, the cutter is balanced exclusively by means of balancing screws. Together, this ensures easy handling of the cutter as well as precise and stable application.

The tool is easy to install thanks to the integrated HSK interface. The clamping system



High chip volume quickly disposed of and a clean edge: spiral plunge into the material with the t3-System multi-block cutter at a feed rate of 10 meters and 8,500 rpm.



Precise and chip-free milling: 30 cm deep pocket in cross laminated timber (CLT) with the variable t3-System multi-block cutter from LEUCO. Milled with 6 cm advance at a 10 meter feed rate and 8,500 rpm.

Available in a variety of usable lengths from 230 to 430 mm and diameters of 40, 64, 85 and 100 mm. Weight-saving individual segments made of anodized aluminum are balanced by LEUCO through use of balancing screws.



has a standard dimension of HSK 80F, but can also vary from HSK 63 to HSK 100, depending on the size of the system. The planned cutter versions are also designed for portal processing systems from TechnoWood. With the appropriate machine, the cutter also enables spiral plunge-cutting into the material. Alternatively, the cutter can be retracted using a ramp to cut a groove.

The tool delivers impressive cutting results and is versatile. The operating mode varies, depending on the requirements. In tests, the multi-block cutter achieved excellent results with a cutting width of 430 millimeters, an 80-millimeter diameter and a feed rate of 10 meters per minute at 8500 rpm.

t3-SYSTEM: THE POWER OF TRIANGLES AND ANGLES

The multi-block cutter owes its high performance to the innovative mix of variable length

and the advantages of the patent-pending t3-System. With t3-System tools, the triangular turnover knives are mounted at an shear angle that pulls the cutting forces of the cutter inwards at the workpiece edges. The t3-System ensures that the wood fibers are cut cleanly. This means that the edges remain chip-free and do not need to be reworked. In contrast to square turnover knives, which can only be attached in such a way that their cutting pressure acts outwards. Here, the wood fibers are plucked more than cut, which leaves unclean edges that require reworking.

With precise positioning of the inserts, the shear angle always pulls in the right direction, which also reduces the cutting pressure.

In addition to excellent cutting quality with fine edges, the triangular turnover knives with their combination of optimized shear angle and aggressive hook angle provide further benefits: Joining and rabbeting in a single operation with chip-free surface quality. No visible overcuts and feed rates of 10 to 12 meters per minute, all without double cutting thanks to the large chip volume. For fast delivery, LEUCO brings the highest cutting quality to the joinery market with its t3-System multi-block cutter. Ideal for grooving, sizing and plunge-cutting into the material - with the best results both with feed and against feed. Whether along or across the grain, in wet or dry wood. These special properties make the multi-block cutter an all-rounder.



Fast and well equipped: The new t3-System multi-block cutter from LEUCO on a Technowood PBA.

FOR NEW AS WELL AS EXISTING TOOLS

DIGITAL TOOL MANAGEMENT PROVIDES AN OVERVIEW

Digitally recorded through serialization, LEUCO tools can be managed easily and efficiently via an app. The digital twin enables networking with machines and provides information on the status, availability and location of tools. Existing tools can also be serialized with LEUCO and integrated into the system.

LEUCO actively supports digitization in companies. New tools are already supplied by LEUCO with an engraved data matrix code for digital recording as a standard feature. LEUCO offers a special service for the subsequent serialization of existing tools without a marking.

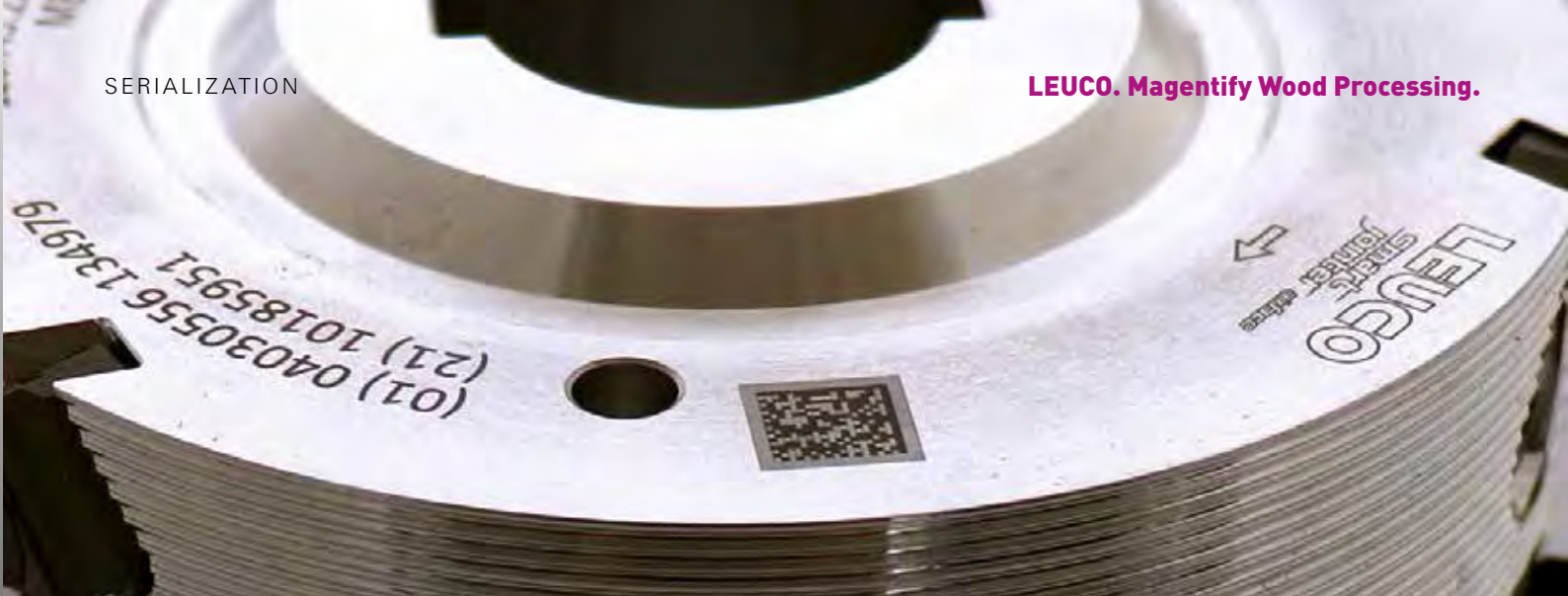
EFFECTIVE TOOL MANAGEMENT VIA DIGITAL TWINS

Each tool is identified and digitally registered through serialization. Management software maps the tools at every stage of their life cycle - from purchase, use and storage through to their repair by LEUCO Service. The digital twin provides the user with valuable data, such as where the tool is currently located, what its current diameter is and how often it has been resharpened.

DIGITALLY NETWORKED PRODUCTION THROUGH COMPLETE RECORDING

Each tool is marked with its own globally valid identification number, applied in the form of a laser code. LEUCO can also integrate an RFID chip for reliable identification when processing abrasive materials where the marking on the tool could become detached. However, digitally networked production only works optimally if every tool is recorded. LEUCO therefore offers a unique post-serialization service for existing tools that have not yet been registered but are ready for use. This allows all tools to be recorded digitally and conveniently controlled and monitored using the "twinio" app from Tapio, for example.





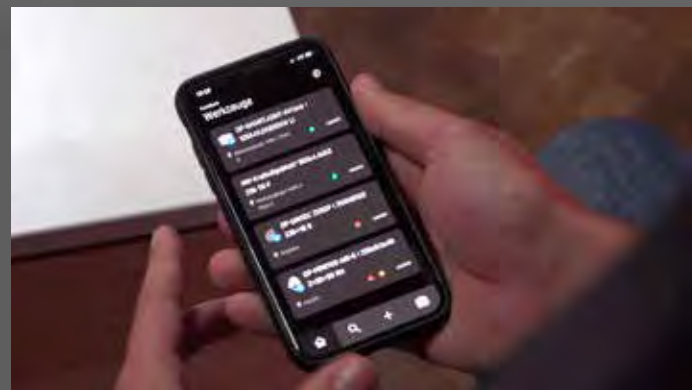
Securely registered: The engraved data matrix code links the tool to its digital twin in the tool management system during post-serialization.

EASY TRACKING THANKS TO CLEAR IDENTIFICATION

The user can even easily schedule the tool on the machine using the app. In return, the digital tool management system records the running meters performed and stores them for evaluation. The app also provides information on other tool measurement data, such as collision dimensions or safety-relevant data such as maximum diameter and speed. In addition to the digital data, the customer still receives a paper tool card. In addition, the tool data can be retrieved anywhere and at any time by scanning. After sharpening a tool, LEUCO provides the new dimensions of the reduced diameter. The data can be retrieved via the app and transferred directly to the machine.

EFFECTIVE AUTOMATION WITH TRANSPARENT TOOL MANAGEMENT

With serialization and the post-serialization service, LEUCO offers efficient digital management, from locating tools and retrieving measurement data to networked communication. In the next step, the data can be used to automate inventory management in real time and further optimize the life cycle of the tools.



Easy to handle: The entire tool cycle can be tracked clearly as well as conveniently controlled and monitored using the "twinio" app.

What can the digital twin do & how are existing tools re-serialized - watch the video now:





Executive Board of LEUCO AG since 1.9.2024 from left: Frank Seifert, Daniel Schrenk (spokesman) and Roland Günther.

LEUCO IN HORB AM NECKAR

FURTHER DEVELOPMENT THROUGH SUCCESS - CONTINUATION THROUGH CHANGE

NEW COMPOSITION OF THE LEUCO AG EXECUTIVE BOARD AS OF SEPTEMBER 1, 2024

The Executive Board of LEUCO AG has had a new composition since September 1, 2024. With Daniel Schrenk, Roland Günther and Frank Seifert, LEUCO is relying on the many years of expertise within the company and in the woodworking industry.

In the newly formed Executive Board, graduate engineer **Daniel Schrenk** is responsible for Sales, Marketing and Human Resources departments, building on his many years of experience as LEUCO's Managing Director.

Frank Seifert, who holds a degree in business administration, is responsible for the

Finance and Controlling, Materials Management and IT departments as a member of the Executive Board and contributes his decades of experience and excellent networking as CFO of the LEUCO Group.

Roland Günther, a mechanical engineer and plant manager, who has been responsible for the Production and Service departments of the LEUCO Group's German parent company for many years, is responsible for production, service and technology as a member of the Executive Board and drives technology development at the Group level.

The LEUCO Group is a global market leader in the field of cutting tool systems for the woodworking industry, mineral and plas-

tic-based materials, non-ferrous metals and composite materials.

Operating worldwide with more than 20 subsidiaries and over 100 partner companies, LEUCO provides its products, resharpening service and other services as a reliable driver of innovation.

The expertise and wealth of experience of over 1200 employees worldwide provides the basis for the success of the group of companies, which is still family-owned.

1.200 employees
worldwide.
20 subsidiaries

1954
LEUCO has been
established

Leading position in the tool
technology with about **230**
patents and protective briefs





FRANK DIEZ

After more than 18 years on the Supervisory Board of LEUCO AG, including many years as Chairman of the Supervisory Board and after more than 12 years as Chairman of the Executive Board, Frank Diez retired on August 31, 2024.

"Apart from the two company founders Willi Ledermann and Josef Störzer and later Dr. Dieter Wolfram, there is no other person in our history who has shaped the LEUCO Group as successfully and sustainably as Frank Diez.

He has been personally associated with the company for almost his entire life. Frank Diez has been directly involved with LEUCO as a member of the Supervisory Board since 1994 and as Deputy Chairman since 1996.

In 2002, Mr. Diez assumed responsibility as Chairman of the LEUCO Supervisory Board and, as the representative of the owners, has been extremely successful in shaping the development of the group of companies.

Starting in 2012, Frank Diez then took over operational and strategic responsibility as Chairman of the LEUCO AG Executive Board. During his tenure, LEUCO was reorganized, massively improving all key performance indicators, and became a technological pacesetter in product and production technology.

We would like to thank Frank Diez for the outstanding success of his life's work in the history of the company."

*Daniel Schrenk, Frank Seifert,
Roland Günther*



The logistics and canteen were put into operation in less than 15 months after the groundbreaking ceremony. The building is equipped with modern technology, is CO₂ neutral and has a positive energy balance.



With the robot-assisted, highly flexible AutoStore small parts storage system and a pallet high-bay warehouse, the logistics in the new building have been completely re-equipped and made more efficient.

NEW BUILDING FOR LOGISTICS AND THE CANTEEN

After decades of using various external storage areas in the city of Horb, LEUCO has built a new, modern logistics hall and a contemporary canteen at its headquarters in Horb.

Logistics has been centrally integrated at the site since August 2024. As a result, LEUCO customers benefit from faster, more reliable deliveries and even more efficient processing. The new, state-of-the-art warehouse technology enables flexible, automated storage and ensures shorter lead times. The di-

rect structural link between logistics and production further optimizes internal processes, which increases the quality and availability of products for customers. The new, bright canteen also improves working conditions for employees, which has a positive impact on the quality of service.

The entire construction project was completed on time and within budget and is a clear commitment by LEUCO to the Horb am Neckar site and to sustainable further development of the company.



Wood, as a basic material for LEUCO tools, is an important element of the canteen's furnishings.

Innovative, highly modern logistics center



Image: LEUCO Headquarters in Horb am Neckar (Baden-Württemberg/Germany)

LEUCO GREAT BRITAIN

NEW MANAGING DIRECTOR CARLTON HEATHCOTE

After more than 24 years as Managing Director of LEUCO GB in Bishops Stortford, Steve Limbrick has retired. Carlton Heathcote, known as Carl, has been appointed as Managing Director since the beginning of January 2025.

The 58-year-old has previously worked in the areas of engineering, sales and project management in the wood, machine and tool industry. He would like to use his many years of experience and expertise to continue to offer the high-quality tool standard together with the competent LEUCO staff and to further expand the advantages for the customers. LEUCO GB historically have been market leaders and

innovators in panel production within GB it is my goal to drive us to the top. We are expanding our tooling range to include composite tools together with our colleagues from Horb and also partner TWT for solid wood solutions including window tooling.

LEUCO GB was founded in 1982. Today, LEUCO GB is a leading provider of new tools, sharpening services and advice on machine tools for the woodworking and furniture industry in Great Britain and has a payroll staff of 37 people over 3 sites (Bishops Stortford, Cleckheaton/West Yorkshire and Bristol) within GB.



Carlton Heathcote, new Managing Director LEUCO GB

LEUCO JAPAN

30 YEARS OF PRECISION TOOLS



Technology transfer to maintain the latest state-of-the-art sharpening service between LEUCO Japan, the parent company in Horb am Neckar and LEUCO Asia -Technik has been in place since the beginning. Yasumi Arigaya (4th from left) together with his team in Tochigi as well as Head of Engineering Roland Albert (2nd from left) and Managing Director LEUCO Asia Udo Leiber (right).

In 2025, LEUCO Japan celebrates its 30th anniversary - a remarkable milestone made possible by commitment, innovation and trusted partnerships with our customers.

Since its founding in 1995, we have grown together with the Japanese woodworking industry, adapting to the changing times while remaining true to our mission: **To deliver precision tooling solutions that increase quality, productivity and performance.** I remember the early days well - from the purchase of the land to the construction of our factory - and I feel deeply honored to be the only one who has experienced this journey from the beginning.

Over the past 30 years, our environment has changed constantly. Recently, we have had to face common global

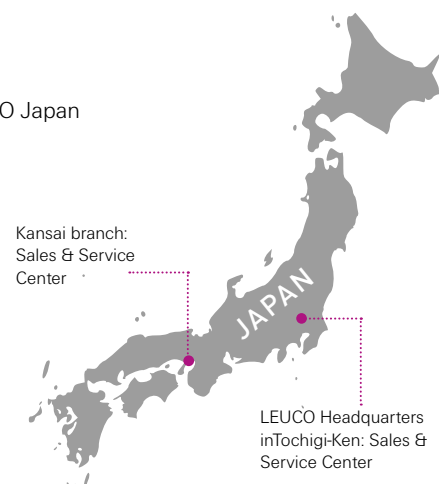
challenges: rising material costs, a shortage of skilled labor, a weakening yen and natural disasters. Nevertheless, we overcame every challenge with resilience, a willingness to learn and cooperation.

MORE THAN JUST A TOOL SUPPLIER

Our goal is to build lasting relationships with our customers through reliable service, technical expertise and customized solutions. We know that the tools we provide play a decisive role in production processes - they influence quality, operating costs and production efficiency. This awareness drives us to pursue continuous improvement and innovation.

We would like to thank our valued customers for their support over the past three decades. We look forward to celebrating this special anniversary together and continuing on our successful path into the future.

With thanks,
Yasumi Arigaya
Managing Director LEUCO Japan



Around 20 employees work at two locations every day on the mission to provide precision tools and more.

CARAVANING INDUSTRY DAYS

FOCUS ON MATERIALS, MACHINES, TOOLS & DIGITAL SOLUTIONS

In November 2024, LEUCO successfully held its Caravaning Industry Days in Horb am Neckar. These served as a platform for innovation and exchange in the caravaning / recreational vehicle sector and this sector's suppliers. The focus was on future-oriented materials, digitization and efficient production solutions for recreational vehicle construction.

The two-day event brought partners and customers together to jointly develop innovative solutions for recreational vehicles - from the outer skin to the interior fittings. Attention focused on lighter, technically improved materials and their optimal processing to further increase functionality and comfort.

Tim Rüttgers from the Caravaning Industrieverband e.V. highlighted the growing demand for recreational vehicles and analyzed the impact of individual, flexible forms of vacations for manufacturers.

Sustainability was the focal point of Hannes Bäuerle's presentation (Material Bank®). He encouraged the reuse of materials based on the "cradle to cradle" principle. The presentation on the "Airply" panel by Yannick Vöhringer (Vöhringer

er GmbH & Co. KG), an innovative lightweight construction material that could be experienced first-hand in the specially developed caravan / motorhome was particularly impressive.

The two speakers from HOMAG, Friedhelm Rempp and Reinhard Maier, demonstrated advanced nesting technologies that optimize production efficiency and chip volume handling. Albrecht Maier (LEUCO Sales) and Oliver Galli (LEUCO Development) presented innovative tool solutions on the same topic, this time from the tool side. On the second day, a joint presentation by Jan Essig (tapio) and Paul Götz (LEUCO Product Management) focused on the digitization of tool management: The "twinio" platform demonstrated how digital organization can sustainably improve tool use.

Practical demonstrations in the LEUCO Trials area as well as guided tours of production, service and new warehouse logistics illustrated how precision and efficiency are interlinked along the entire process chain. The Industry Days impressively underlined how cooperation and expertise can produce innovative solutions that meet demanding customer requirements.



The speakers at the Caravaning Industry Days: in front, from left to right: Tim Rüttgers (Caravaning Industry Association), Wolfgang Maier, Paul Götz (both LEUCO) and Hannes Bäuerle (Material Bank®), second row: Yannick Vöhringer (Vöhringer), Reinhard Maier (Homag), Oliver Galli (LEUCO), in back, from left to right: Jan Essig (tapio), Albrecht Maier (LEUCO) and Friedhelm Rempp (HOMAG)



Enthusiastic participants at the Caravaning Industry Days

A real caravan / motor home was on the LEUCO site in Horb for the first time. During the Industry Days, the Vöhringer showmobile demonstrated the lightweight construction material "Airply" in practice.



A LOOK AT LEUCO

LEUCO ranks among the leading international suppliers of complex tools solutions and intelligent services for the wood-working industry.

Our goal is to improve the opportunities for our customers and partners through forward-looking innovations and to open up the potential of wood and related materials as a recyclable raw material to benefit people.

In close contact with our industry, we design and develop tungsten carbide and diamond-tipped circular saw blades, hoggers, boring and shank-type tools, drill bits, turnover knives and clamping devices. Our goal is to streamline the processes of our customers in the construction, furniture and panel industry, in lumber mills and interior design companies while also opening up new opportunities in working with the growing variety of materials.

Comprehensive consulting services, our sharpening service at manufacturer quality and future digital tool management solutions have made LEUCO a one-stop tool shop for our customers.

Today, around 1,200 employees work for LEUCO worldwide. With sales subsidiaries in Australia, Belarus, Belgium, England, Japan, Poland, Thailand, Ukraine, Vietnam, as well as sales and production locations in China, France, Malaysia, Russia, Switzerland, South Africa, the USA our company is represented on all five continents.

LEUCO
Magentify Wood Processing

WE ARE HERE FOR YOU:

64
1.200

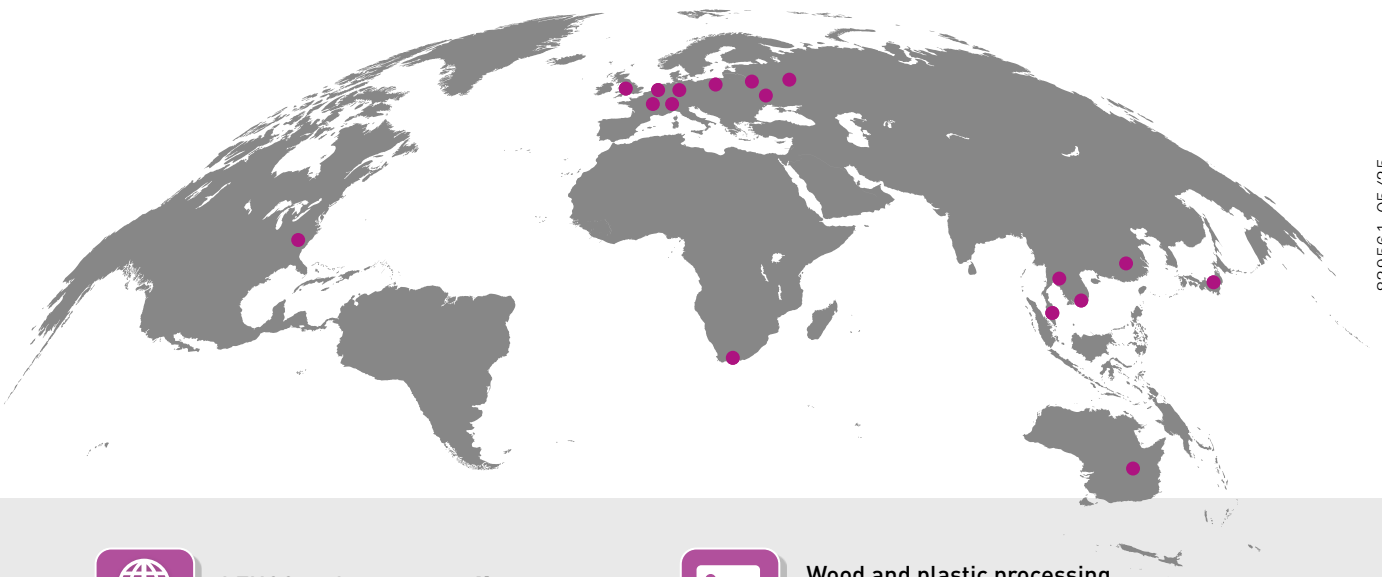
Countries

Employees worldwide

20
93

Subsidiaries

Sales partners



LEUCO tool program **online:**
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Wood and plastic processing.
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