


## AT KIRCHHOF GMBH IN REMSECK



Retrofitted high pressure  
Machining service provider improves  
productivity with the compact LubiCool®-L  
high-pressure system from KNOLL

For many milling operations,  
the powerful external flushing  
is sufficient.



For deep drilling, a high-  
pressure internal coolant  
supply is essential.

*An internal coolant supply at high pressure is essential for deep-hole drilling in stainless steel. But there are huge differences when it comes to retrofittable units, as Tobias Kirchhof, Managing Director of Kirchhof GmbH in Remseck, explains. Contract manufacturers have had excellent experiences with LubiCool®-L, the new compact high-pressure system from KNOLL. The result: shorter machining times, longer service lives for cooling lubricant and tools, as well as significantly lower noise levels.*

Kirchhof GmbH CNC-Präzisions-Dreh- & Frästechnik is a modern contract manufacturer specializing in high-precision, ready-to-install CNC-turned and milled parts. It is mainly stainless steel and similarly demanding materials that are machined for customers in armature and apparatus construction, device construction as well as machinery construction and the electrical industry.

Together with his father Peter Kirchhof, Tobias Kirchhof manages the business. Both emphasize: "The more complex, demanding or delicate the component to be produced, the more we see it as our duty to develop an optimal solution

concept". Highly motivated, well-trained employees are just as important to the Kirchhofs as the latest CNC technology: "This is the only way that we can ensure the high precision and quality of our components".

This also includes a good partnership with the suppliers, such as KNOLL Maschinenbau GmbH, Bad Saulgau. KNOLL conveyor and filtration systems for chips and cooling lubricants can be found on various lathes and milling machines. Unfortunately, not entirely universally," says Tobias Kirchhof. "Specifically, with our most recent investment in a turning center with a counter spindle and a 20-fold turret, we did not provide any specifications when ordering. When it was delivered, the machine was equipped with a chip conveyor and filter, which by no means could meet our requirements". In renegotiations with the machine manufacturer, the partners agreed to assign KNOLL with the individual retrofitting of the tried-and-tested chip conveyor and belt filter components. Tobias Kirchhof is happy to say: "Since then, we have been completely satisfied with the machine and its peripherals".

## Field test customer for compact high-pressure system

It was an intensive cooperation with consequences because KNOLL decided to ask Kirchhof, a precision machining company, to be a field test customer for the new compact LubiCool®-L high-pressure system. During one of his visits to Remseck, Product Manager Marco Lutz had discovered a machining center that lent itself to such a field test: "For the first applications of our new products, we are looking for partners with a broad manufacturing depth who machine different, quite demanding materials", explains Marco Lutz. "Since we offer our new LubiCool®-L high-pressure system for retrofitting to end customers, among others, we approached Kirchhof".

The target object was a Mori Seiki NV5000 machining center, which is a good ten years old and is used for demanding milling and, above all, drilling operations. Kirchhof had already retrofitted it eight years ago with a small high-pressure pump including a cartridge filter. "At the time, that was an urgently needed and therefore quick decision - and it also worked", Tobias Kirchhof confirms, qualifying his statement by saying: "But with quite little convenience and a wide variety of difficulties". The high-pressure pump, for example, was designed too weak and did not reach the necessary pressure. In addition, the filtration was poor and did not correspond to Kirchhof's quality standards. "The noise during the operation of the high-pressure unit was also decidedly unpleasant. Especially for me, since my office is located in the immediate vicinity of the machine", mentions Tobias Kirchhof. Asked about the long time that has passed since then, he says with a grin: "Emergency solutions often have that about them. They stay longer than originally planned".



The SmartConnect control panel allows the operator to select the pressure level easily and quickly.

Green light for machining – an LED bar signals the current state of the unit.



The compact LubiCool®-L high-pressure system is primarily designed for lathes and small and medium-sized machining centers.

## The strengths of the LubiCool®-L high-pressure system

- Compact design → space-saving installation
- Modular system → configuration to meet requirements
- Plug-and-Play → easy installation and retrofitting
- High pressure up to 90 bar → short breaking chips, reduced machining times, long tool service life
- Optional flushing and transfer pump → autonomous operation
- Frequency-controlled pumps → high energy efficiency
- Belt filter → high cooling lubricant purity and service life
- SmartConnect control unit → simple, intuitive operation
- Modular standard product → attractive price and short delivery time



KNOLL's new SmartConnect control concept makes LubiCool®-L easy and intuitive to operate. The 7" control panel is located protected under the (usually closed) cover.



Due to the little space required, it was no problem for Kirchhof to place the modular LubiCool®-L high-pressure system from KNOLL right by the machine.

## High pressure at a high level

In this respect, the time was long overdue for a new solution, so KNOLL was knocking down open doors with its field test offer for the LubiCool®-L. "The decision was made quickly", confirms Tobias Kirchhof. "The specifications for the new product and the possibility of configuring the high-pressure system according to our requirements left no other option at all. In addition, as mentioned before, we already had many positive experiences with KNOLL products".

The compact LubiCool®-L high-pressure system is primarily designed for lathes as well as small and medium-sized machining centers - both for OEMs for initial machine equipment and also for retrofitting end customers. The core components are the KTS 25-50 high-pressure pump and the KF compact belt filter, both of which come from the proven KNOLL standard portfolio. As an option, customers can opt for various add-ons, such as a centrifugal pump (TG 30) for flushing and a lifting pump (BS 40), which ensures autonomous transport of the medium from the machine to the filter. Other options include several switchable outputs for high-pressure and flushing pumps. Furthermore, all the pumps can be equipped with frequency converters, ensuring maximum energy efficiency, on-demand control and consumption. In addition, the installation of a continuous flow cooler or plate heat exchanger is available, along with a temperature sensor. In this way, the modular kit allows configuring the system entirely according to the customer's requirements. Kirchhof adds: "The LubiCool®-L high-pressure system has a very space-saving design, so we can place it next to our NV5000 without any problem". It was also easy to connect via plug-and-play using a customized interface cable provided by KNOLL.

For operation, KNOLL developed the new "SmartConnect" control concept. Product Manager Lutz explains: "We installed a small touchscreen display under the LubiCool®-L cover that allows the user to set the desired pressure level and other parameters. The user can also call up information from the sensors and all the actuators". Tobias Kirchhof, a trained industrial mechanic and master craftsman, confirms: "Using SmartConnect is as easy as using a smartphone app. But we are most pleased when we don't have to intervene at all. Faultless operation is signaled to us by the green glow of an LED light strip positioned on the outside of the cover, which indicates the various states of the unit".

## Convincing performance and quality

Kirchhof spent a year gaining experience with the LubiCool®-L high-pressure system as a field test partner and then decided to buy the unit because "the system ran great right from the start". He is enthusiastic about the high-pressure supply that is provided. This is because deep-hole drilling, which Kirchhof carries out on stainless steel materials, for example, with an 8-mm solid carbide drill at a depth of 16xD, requires a pressurized internal coolant supply to flush out the chips to the top: "Unfortunately, due to the machine, we can only use up to 65 bar of the theoretically possible 90 bar, but at a volume flow of 40 l/min, this is sufficient for all of our requirements", says Kirchhof.

The eight different pressure levels, which allow settings to be made as required, ensure exceptional efficiency. "The high pressure that is provided ensures short chips and reduced machining times. And in milling, the flushing power is often sufficient to make the machining process optimal and productive. Thus, with the help of LubiCool®-L, we have succeeded in improving our processes. Cycle times are now up to ten percent shorter and tool service life is up to seven times longer. This is of key importance, especially for a contract manufacturer like us".

As a second cost-saving factor, the Managing Director mentions the effective filtration provided by the belt filter: "There



On the Mori Seiki NV5000, Kirchhof handles all the demanding drilling and milling operations that cannot be carried out on a lathe with driven tools.

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Tobias Kirchof: "In order to machine stainless steel materials in the desired quality and at the desired productivity level, we absolutely need high pressure. The compact KNOLL LubiCool®-L high-pressure system leaves nothing to be desired in terms of our requirements".

is no comparison with the previous cartridge filter. With the LubiCool®-L unit, the concentration of ultra-fine particles in the cooling lubricant has been significantly reduced". The associated increase in service life is further aided by the additional 360-liter cooling lubricant volume available.

Kirchof also has words of praise for the feed pump: "At this machine, the chip conveyor is not from KNOLL and unfortunately has weaknesses. This is because chips often get stuck in the cooling lubricant trough, but now they no longer accumulate. Because, with the LubiCool®-L, the powerful transfer pump extracts a large portion of these chips along to the filter, from where they are disposed of with the fleece".

Nevertheless, as befits a field test customer, he had a few minor suggestions for improvement. These included, for example, optimized handling of the sludge tank and the integration of a level sensor to prevent overflowing and overflowing on machines with only a small cooling lubricant tank. Both suggestions were promptly implemented by KNOLL and included in the standard offer. "That was a super thing, the field test for KNOLL", says Tobias Kirchof. "The new LubiCool®-L high-pressure system has significantly increased the productivity of machining with our machining center, so that the investment will pay for itself in a short period of time".



### KNOLL Maschinenbau GmbH

KNOLL Maschinenbau is one of the leading suppliers of conveyor and filter systems for chips and cooling lubricants in metal processing. Ultra-flexible transport systems round off KNOLL's product range. With its comprehensive range of products, KNOLL develops complete systems and system solutions with centralised or decentralised functions. KNOLL has been a byword for innovation, progress and growth since 1970.

KNOLL Maschinenbau GmbH  
Schwarzachstraße 20  
DE-88348 Bad Saulgau  
Tel.: +49 7581 2008-0  
info.itworks@knoll-mb.de  
www.knoll-mb.com

### Kirchof GmbH CNC-Präzisions-Dreh- & Frästechnik

Kirchof GmbH CNC-Präzisions-Dreh- & Frästechnik was founded in 1986 by Peter Kirchof. The company's focus is on the machining of technically demanding and ready-to-install turned and milled parts, as well as their finishing and further processing - in batch sizes from 50 units, mainly from stainless steel and other demanding materials. Today, the founder manages the business together with his son Tobias. Kirchof employs eleven people and generates annual sales of just under 2 million euros.

Kirchof GmbH  
CNC-Präzisions-Dreh- & Frästechnik  
Industriegebiet Schießtal  
Rainwiesen 35  
DE-71686 Remseck  
Tel.: +49 7141 648969-0  
info@kirchof-gmbh.de  
www.kirchof-gmbh.de