

## AT CERATIZIT IN KRECKELMOOS/AUSTRIA



Core of carbide machining

With its wooden façade and large windows, the new CERATIZIT plant in the Kreckelmoos district of Breitenwang, right next to the Fern Pass, is a highly visible sign of the company's success.

*At the new CERATIZIT production plant in Kreckelmoos, two KNOLL central cooling lubricant filtration systems reliably supply hundreds of grinding machines with oil and aqueous solution – perfectly cleaned and precisely tempered to  $\pm 0.2$  Kelvin. This enables the tool specialists to achieve the highest quality and efficiency when grinding and cutting carbide rods and indexable inserts.*

CERATIZIT has a clear goal in mind: "We want to become the world's number 3 in the carbide industry." The company, which is part of the Plansee Group, is not only continuing to drive growth in Asia and on the American continent. Progress is also being made at CERATIZIT Austria in Reutte - at the headquarters of the parent company. In the Kreckelmoos district of Breitenwang, just a few hundred metres up from the existing company headquarters, an additional production plant has been built that sets new standards in many respects.

The three-storey building has a total area of around 38,000 square metres and offers production halls of various sizes,

storage and logistics areas, offices and social spaces for around 500 employees. The production facility has just over 15,000 square metres at its disposal, around two thirds of which is currently being used. Tobias Raggl, Head of the Technology Department at CERATIZIT Austria and client representative for the new building, explains: "At our Reutte site, we produce carbide and machine it into indexable inserts, rods and moulded parts. The new building has enabled us to separate the carbide production - including pressing and sintering - and the machining of hardened blanks and create growth opportunities for both areas."

From January to December 2023, CERATIZIT Austria relocated around 220 large machines from the lower plant to Kreckelmoos, primarily machines for grinding and cutting indexable inserts and rods. A special tour de force, as ongoing production was maintained. "Our aim was to have every machine up and running again after two days," confirms Project Manager Raggl. "This required precise planning in terms of space and time."





Central cleaning system for aqueous solution: The strengths of the MicroPur® system start with the installation area. Compared to conventional filtration systems, only around 60 percent of the space is occupied with the same throughput volume.

## Indispensable: A central cooling lubricant supply

Those responsible paid particular attention to the supply of cooling lubricant to the machines, without which none of the machining systems can go into operation. "In our previous production, we had installed five central systems of different sizes from KNOLL Maschinenbau," reports Raggl. "After analysing the market with regard to the technical possibilities and taking into account the experience we had gained over the years, we were absolutely certain that KNOLL was also the perfect partner for the cooling lubricant systems we needed in Kreckelmoos. The KNOLL team, whether developers, planners or fitters, is a consistently competent and efficient partner who is aware that everything has to work perfectly for this new installation."

Once the systems and the entire pipework system had been dimensioned, the order was placed in March 2022 and the cooling lubricant supply was ready for operation by the end of the year.

## Two central systems – for oil and aqueous solution

As CERATIZIT Austria uses different cooling lubricants, oil and aqueous solution, the company decided in favour of two central systems, both of which are based on the KNOLL MicroPur® ultra-fine filter system. They are made up of several MicroPur® modules, each with a cleaning capacity of 400 l/min. Each module is fitted with four filter housings, each containing two filter cartridges. These can be backwashed individually with pure medium without interrupting the filtration process – a key feature of the MicroPur® filter.



Thanks to the modular design, central cooling lubricant cleaning systems with MicroPur® filters can be realised in almost any size. This system for aqueous solutions offers a cleaning capacity of up to 7,500 litres/min of cooling lubricant.



Michael Müller is responsible for the maintenance of the cooling lubricant systems at CERATIZIT: "Changing the MicroPur® filter elements is simple, drip-free and can be done in a matter of minutes without having to shut down the entire system."



Tobias Raggl (left) and Anton Pfanner look at the purified aqueous solution that comes out of the filter crystal clear. It does not contain any particles larger than 3 µm or air bubbles.

Over 70 systems are currently operated with oil at the CERATIZIT plant in Kreckelmoos. These are mainly machines for surface, peripheral and profile grinding of indexable inserts and for vibratory grinding in toolmaking. The central system installed for this purpose contains 15 MicroPur® modules, so that over 5,000 l/min can be cleaned continuously. To cope with the growth, the system can be expanded to 27 MicroPur® modules, doubling the total capacity to around 10,000 l/min.

### Reliable and powerful

Anton Pfanner, Maintenance Group Manager, is responsible for the operation of the two KNOLL cooling lubricant systems. He knows that he doesn't need to worry about their functionality: "All pumps and other important components are redundant. Only a power failure can actually cause an unplanned stop."

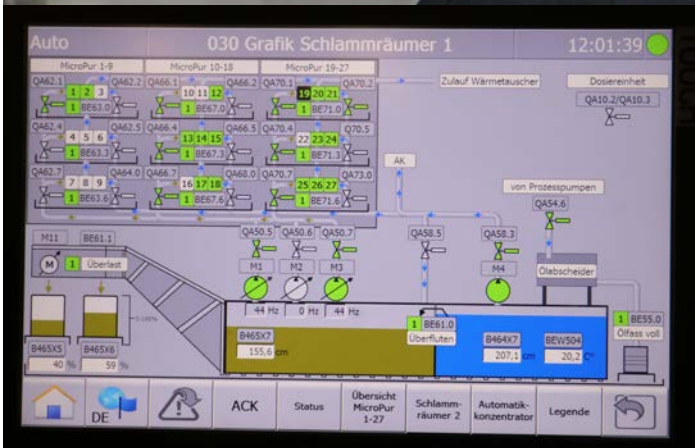
He is also very familiar with the performance of the KNOLL systems at the previous plant. Although the oil system there was slightly smaller with a maximum flow rate of 2,400 l/min, the achievable values are identical. "The filter fineness range is between 1 and 3 µm, and the cleaned oil has a gravimetric residual dirt content of just 1 mg/l," says the Maintenance Group Manager happily. This purity not only results in optimum machining results, it also prevents wear on machine bed guides and high-pressure pumps.

### Problem areas of the aqueous solution under control

CERATIZIT Austria uses an aqueous cooling lubricant solution for centreless grinding and cutting carbide rods. "This is the only way to achieve the desired mirror finish," argues Technical Manager Tobias Raggl: "Water dissipates heat much better than oil, which breaks down under the high pressure during centreless grinding. That's why we have to stick with water, even if we would like to use oil as the only medium."

The aqueous cooling lubricant solution is a concentrate that usually consists of polymers or salts dissolved in water and, unlike emulsions, is free of mineral oil. A major problem is that the medium becomes charged with micro-air during the machining process, which hinders filtration. In addition, the aqueous solution requires a very constant temperature for perfect machining results and must be constantly flowing to prevent contamination by microorganisms and fungi.

KNOLL designed its MicroPur® filter to be "water-compatible" for cleaning such cooling lubricant solutions. This means that the developers customised the filter fabric and module housing to the special requirements. The backwash was modified and process sequences reprogrammed. Two of the first water-compatible MicroPur® modules were installed at



The control display provides a clear overview of the current data and filter curves of the central cleaning system.



CERATIZIT Austria in 2017. They were part of a KNOLL central system in which hydrocyclones removed the coarse impurities and the MicroPur® filters in the bypass removed the fine impurities.

### All areas of concern under control

#### All areas of concern under control

Inspired by the success of this microfiltration, those responsible decided to switch to full filtration of the aqueous solution with MicroPur® modules at the Kreckelmoos plant. This central system can hold a maximum cooling lubricant volume of 150,000 litres and can clean up to 7,500 l/min with its 27 MicroPur® modules.

As of December 2023, 85 machines are connected for centreless grinding and cutting the carbide rods, with sufficient filter capacity for a further 85 machines. "We therefore did not fill the system completely," says Maintenance Group Manager Anton Pfanner. "However, the MicroPur® units are usually all in operation, as the system automatically controls their use depending on the machines switched on and the flow rate."

Anton Pfanner is aware of the problem areas of the aqueous solution mentioned above. "But the experience gained from the partnership with KNOLL and the close cooperation with regard to further developments in solution filtration have justified the decision in favour of MicroPur® cleaning at full flow," says Pfanner.

In order to minimise the risk of germ contamination, KNOLL developed a sophisticated flow control system for the cooling lubricant so that there are no dead spaces in the MicroPur® modules or in the tanks where the medium could accumulate.



Each waste drum contains 400 kg of carbide sludge, which is processed at another CERATIZIT Group company and then reused in Kreckelmoos.

There are therefore no deposits that promote the growth of germs. In order to banish the micro-air almost completely from the aqueous solution, KNOLL designed a relatively long, flat degassing section through which the cooling lubricant must pass. And to keep the temperature of the cooling lubricant stable, it passes through a cooling system immediately after filtering, which ensures values of  $\pm 0.2$  K.

Last but not least, the aqueous solution itself is of great importance. "In recent years, we have carried out extensive tests with our additive supplier and KNOLL in order to achieve the best results in cleaning and machining," reports Pfanner. "We



An important component of KNOLL filtration systems is the integrated automatic concentrator, which ensures that the carbide sludge ends up in the waste drum in a compact state.



Growth prospects: The KNOLL MicroPur® system for oil filtration can be expanded to a capacity of 10,000 l/min.



MicroPur® modules are equipped with four filter housings, each containing two filter cartridges. The cleaning capacity per module is 400 l/min.



The five KNOLL process pumps for the aqueous solution system can be seen in the foreground. They pump the cleaned medium back to the machines as required. In the background are the three somewhat smaller filter pumps, all of which are frequency-controlled.

Carbide indexable inserts require ever greater precision and surface quality, which places high demands on the grinding process and the cooling lubricant.

have actually succeeded in reducing the additives to a single additive that realises all the desired properties of the solution. It contributes to rapid degassing, improves the friction conditions, provides rust protection and counteracts the release of heavy metals such as cobalt."

### Central cooling lubricant supply systems – a complete success

"The processes and transparency during installation, the rapid support when questions arise and, finally, the cooling lubricant qualities that our new central systems deliver, fully confirm our trust in KNOLL," summarises Raggl. "The system runs great - down to the last detail."

This also includes the extremely effective desludging system, which, in addition to sedimentation in the dirt tank, includes an automatic concentrator that also separates the carbide backwashed out of the filter cartridges. Anton Pfanner explains: "We recover around one drum containing 400 kg of carbide per month from the oil plant. In the case of the aqueous solution, there are currently around four such drums, which is due to the larger dimensions. We send the grinding sludge to our sister company Stadler Metalle in Türkheim. After processing, the recycled carbide is reused by us."

When asked about the overall maintenance effort, Michael Müller, the responsible maintenance employee, replies: "The systems are relatively low-maintenance. Filters need to be changed every six to twelve months, depending on the load. It only takes a few minutes to replace the filters. Other tasks include changing the grinding sludge drums and regularly checking the cooling lubricant values." If system faults occur, they can be recognised very quickly on the control display so that Michael Müller can initiate countermeasures immediately.





## AT CERATIZIT IN KRECKELMOOS/AUSTRIA



### KNOLL Maschinenbau GmbH

KNOLL is the leading provider of conveyor systems, filtration units and pumps for metalworking. These transport and separate chips and cooling lubricants. The comprehensive product range offers systems for decentralised or centralised applications. Its Automation Division deals with solutions for challenging assembly and logistics tasks. These include stationary transport systems with chain and roller conveyors. The integration of handling units (robots, cobots) and transport robots (AGVs) enables flexible systems to be created from a single source.

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



### CERATIZIT – Global player in the carbide industry

Over 100 years ago, both CERAMETAL and Plansee Tizit started out as pioneers of sophisticated carbide products. Their merger in 2002 created CERATIZIT, a global player in the carbide industry, which today employs 7,000 people worldwide and operates more than 30 production sites. CERATIZIT offers sophisticated carbide solutions for machining and wear protection, highly specialised cutting tools, indexable inserts and carbide rods. These products are used in areas such as mechanical engineering and toolmaking, the automotive industry, the aerospace industry, the oil and gas industry and the medical industry. CERATIZIT Austria is located in Reutte/Tyrol, at the headquarters of the parent company Plansee Group. This is where carbides are mixed, pressed and sintered and carbide indexable inserts, rods and moulded parts are produced.

User contact:  
CERATIZIT Austria GmbH  
Metallwerk-Plansee-Str. 71  
A-6600 Reutte, Austria  
Tel: +43 5672 200-0  
www.ceratizit.com