

AT SCHNEBELT PRÄZISION IN SCHUTTERWALD



The ultimate in ultra-fine filtration

Central cooling lubricant filtration system for precision grinding ensures clean, precisely temperature-controlled oil and separation of material by type

Special tools like this end mill require precision in the μm range.

When tool grinder Schnebelt Präzision reorganized its production two years ago, those who were in charge decided to use a central system from KNOLL Maschinenbau for oil cleaning and chip disposal. With a KF-E 1000 prefilter, a MicroPur® 480 M ultra-fine filter plus an AK 25 automatic concentrator, as well as a cooling unit, the system is perfectly suited for mixed machining of HSS and carbide (HM). The precision grinders confirm, "This is the ultimate for the ultra-fine filtration we need."

Schnebelt – the name stands for precision, reliability and first-class service in the field of tool grinding, as Managing Director Pascal Schnebelt emphasizes: "Thanks to our many years of experience in grinding technology and the use of state-of-the-art CNC tool grinding machines, we are able to develop, to grind and also to recondition all cutting tools in high quality." In addition to high-quality regrinding, including a pick-up and delivery service, Schnebelt Präzision, in Schutterwald, Germany, primarily offers special tools – custom-developed milling, drilling and combination tools made of HSS and solid carbide (VHM). But standard tools are also part of the product range, including VHM end mills, universal and high-performance bandsaw blades, as well as high-performance precision circular saw blades. "The origin of our company lies in the latter

product group," explains Pascal Schnebelt. His father, company founder Rolf Schnebelt, started in 1985 with the offer to regrind HSS circular saw blades.

With precision, quality and reliability to success

Pascal Schnebelt joined the management of the family business in 2020 and took it over one year later. Previously, the trained industrial mechanic and mechanical engineer had worked for over 20 years at Offenburg-based machine manufacturer Witzig & Frank, known for customized production systems based on rotary transfer machines. As production and sales manager, he gained a great deal of experience and built up relationships that also benefit him now in his own company.

From this period, he is very familiar with KNOLL Maschinenbau, one of the leading suppliers of conveying and filtering systems for chips and cooling lubricants in metal machining. Together with KNOLL Area Sales Manager Ralph Knobelspies, he successfully implemented several projects even back then. It is therefore not surprising that he brought the Bad Saulgau-based company into play at Schnebelt Präzision when it



Works perfectly: The KNOLL central system at Schnebelt Präzision consists of a KF-E compact filter (at the back), a MicroPur® ultra-fine filter (in the foreground), automatic concentrator (with green drum) and a cooling unit (not in the figure). The compact filter (in the background) ensures dry chip discharge. From the automatic concentrator, the carbide sludge falls into the green drum, largely sorted by type.

came to reorganizing the production area in 2020 and in finding the optimum central system for cooling lubricant cleaning and sludge processing.

Time for new oil and chip management

Jörg Scheidecker, industrial foreman and technical manager at Schnebelt, describes the situation as follows: "For almost 20 years, we had already been operating two small central systems for oil cleaning and chip disposal when grinding our HSS and HM tools – one based on centrifuges and one with backflushable filter cartridges. However, they were located in the same production hall as our five five-axis tool grinding machines, which resulted in a few disadvantages." For example, despite separation by partition walls, a certain thermal and acoustic influence could not be avoided.

When, due to the growing number of orders, the capacity of the five machines reached its limits despite three-shift operation, the solution was that the two central systems had to go;



Thanks to perfect oil quality, Schnebelt Präzision achieves improved grinding results. The service life of the grinding wheels has also increased with the new central system.



Currently, six 5-axis tool grinding machines are connected to the KNOLL central system.

we could then provide additional machines and at the same time bring the oil and chip management up to the latest standards.

Mixed machining presents special requirements

The two filter systems had clear weaknesses. The separation capacity of the centrifuge was too low for the fine carbide abrasion, so that the oil, and thus the connected machines, quickly became contaminated. The other system cleaned the oil sufficiently well from the carbide erosion, but the upstream magnetic separator did not succeed in retaining the HSS fibres, so that – in the end – the discharge was not properly sorted and the oil content was too high.

In addition, both systems could not keep the oil temperature constant. "Tolerances in the μm range are specified for our products," says Jörg Scheidecker. "For this, we need consistent production conditions and accordingly rely on precisely temperature-controlled oil."

Tailor-made concept, proven components

The inquiry at KNOLL Maschinenbau was promptly followed by a proposal: in view of the grinding by HSS and carbide, Ralph Knobelspies recommended a central system consisting of a compact filter with a KF-E 1000 continuous roll for prefiltration, the MicroPur® 480 M ultra-fine filter and the associated AK 25 automatic concentrator, as well as a cooling unit. "Before deciding on this offer, we compared various filter processes and suppliers. In the end, this two-stage filter combination seemed very promising to us," reasons Jörg Scheidecker.

Joachim Gruß, KNOLL project manager for central systems, explains: "Since we have long HSS fibres in the oil here in addition to the ultra-fine carbide particles, these have to be separated out even before the ultra-fine filtration takes place. This is ensured by forced filtration with our KF-E compact filter

with continuous filter roll. This consists of a fine-mesh fabric with which – supported by the filter cake – we achieve a filter fineness of about 50 µm." The KF-E is also capable of filtering out grinding wheel abrasion. As a pure gravity filter, it is also very energy-efficient and does not pollute the environment with filter consumables.

Core element: The MicroPur® ultra-fine filter

The MicroPur® ultra-fine filter then ensures maximum oil purity. The installed module handles a volume flow of 480 l/min. "For Schnebelt, this is sufficient output to connect the six grinding machines currently available," explains Joachim Groß. "With a benchmark value of 60 l/min required per machine, there is still the desired buffer for two additional machines."

The backflushable filter cartridges used for mixed machining are specially designed for this machining process, so that – again supported by the filter cake that builds up – the filter quality is less than 5 µm at the end. "With pure carbide machining, a filter fineness of up to 1 µm is achieved with specially designed filter cartridges," mentions Joachim Groß. He points out other positive features of the MicroPur®: "Thanks to its special design, it does not require any filter consumables, which contributes to its high cost-effectiveness. The filters are gradually backwashed while the entire system is in



A special request: Unlike the classic central systems, Schnebelt Präzision assigns a clean oil pump with a separate supply line to each grinding machine.



Managing Director Pascal Schnebelt: "We attach great importance to quality and reliability. Because that's why the customers come back and not the goods."



Jörg Scheidecker, technical manager at Schnebelt Präzision: "The oil always stays clean, even when all the tool grinding machines are working at full load."

operation. This ensures a very constant filter performance, which ensures high process reliability during grinding."

The success of the MicroPur® is closely linked to the so-called automatic concentrator (AK), which absorbs the backwash and prevents the oil from being re-contaminated by these particles. Ralph Knobelspies explains, "The backwash material sediments in the AK and is removed from the system by the integrated scraper conveyor. The contained oil is returned to the system by a separate cleaning process."

Special requests – no problem

This concept convinced Jörg Scheidecker and the other people in charge. In addition, KNOLL was able to respond to special requests. For example, Schnebelt Präzision wanted a separate clean oil pump and feed line for each machine. "Since the central system is now located outside the production hall, we had to redo the pipework anyway," mentions Jörg Scheidecker. "That's where separate return and supply lines for each machine seemed to make sense to us."

The second special request concerned the cooling unit, which is usually installed on the system. "We wanted to get the waste heat completely out of the relatively low space," explains the technical manager. "Therefore, together with the specialists from KNOLL, we worked out a solution in which the cooler sits one level higher under the roof." The temperature control now works perfectly. According to Scheidecker, the system is run at an operating temperature of 22 degrees Celsius. The cooler keeps the temperature constant, even when all the machines are in operation and it is really hot outside.

Perfect oil quality with many benefits

The central system has been in operation at Schnebelt since

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Managing Director Pascal Schnebelt (right) is pleased with the technical manager Jörg Scheidecker (left) and the two KNOLL representatives Ralph Knobelspies (2nd from left) and Joachim Gruß about the successful, trouble-free operation of the KNOLL central system.

November, 2020 – to the complete satisfaction of management and staff. "The oil always stays clean, even when all the tool grinding machines are working at full load," confirms Jörg Scheidecker. "Our production employees are also happy with this, because they come into contact with the oil again and again, especially during regrinding work. Now they can be sure that all foreign substances have been filtered out and they don't rub chips etc. into their hands."

As a result of the improved oil quality, the technical manager has noticed a longer service life for the grinding wheels: "They no longer clog up as quickly, and we don't have to sharpen them as often. We also achieve even better qualities in the tool surfaces that are produced."

Economical right down to the chip and sludge discharge

After an initial start-up phase in which fine adjustments were still being made, the system has now been running in the optimum range for more than 18 months. Maintenance requirements are minimal. "Of course, we always keep an eye on the system to see if any error messages appear on the display or if there is a leak," says Jörg Scheidecker. The sludge discharge also works flawlessly, and the chips come out of the system drier – both from the compact filter as well as the automatic concentrator. "It is particularly pleasing that the carbide is separated so purely by type that we receive money for it from the disposal company," adds Managing Director Pascal Schnebelt. The reduced drag-out of the oil, which means that less replenishment is required, also contributes to economic efficiency.



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 demanding assembly and logistics tasks. These include stationary transport systems with chain and roller conveyors. With the integration of handling units (robots, cobots) and transport robots (AGV), flexible systems are created from a single source.

Schnebelt Präzision KG

Schnebelt Präzision, founded in 1985, undertakes the development, manufacture and preparation of precision tools of the highest quality. The company from Schutterwald in the Ortenau district is one of the leading manufacturers of special tools and the largest regrinding service for shank tools and circular saw blades in the region. With their many years of experience, the 36 employees support customers from the metal, wood and plastics processing industries. Schnebelt Präzision is certified according to DIN ISO 9001. The annual turnover is around 3 million euros.

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