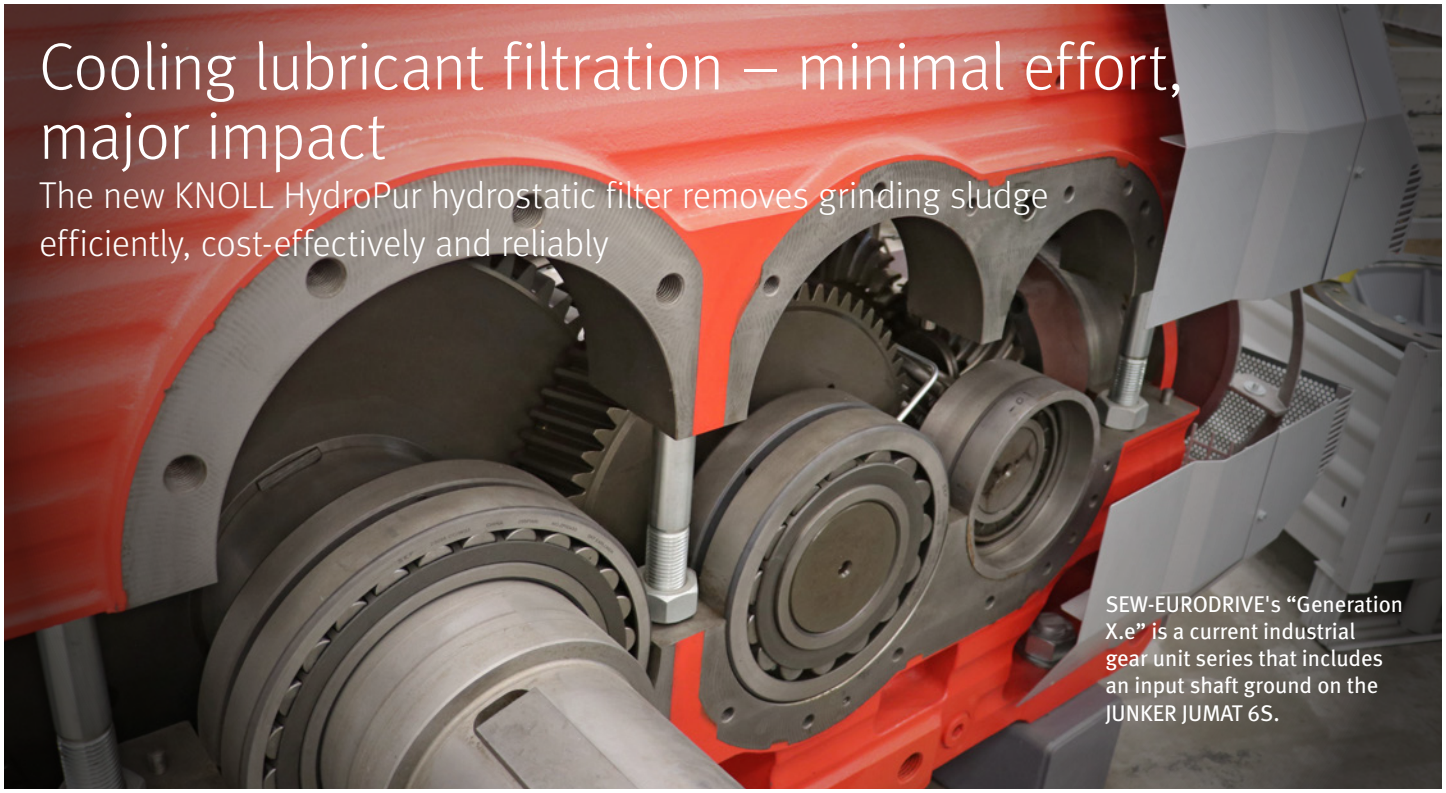
KNOLLREPORT

AT SEW-EURODRIVE IN BRUCHSAL

User report of
KNOLL Maschinenbau GmbH

Cooling lubricant filtration – minimal effort, major impact

The new KNOLL HydroPur hydrostatic filter removes grinding sludge efficiently, cost-effectively and reliably



SEW-EURODRIVE's "Generation X.e" is a current industrial gear unit series that includes an input shaft ground on the JUNKER JUMAT 6S.

When it comes to grinding, productivity and component quality depend on more than just the machine. The treatment of the cooling lubricant (KSS) also plays a significant part in achieving good results. The capabilities of KNOLL Maschinenbau's new generation of hydrostatic filters are demonstrated by the installation of a HydroPur H 1000 on a JUNKER JUMAT 6S at drive technology manufacturer SEW-EURODRIVE.

SEW-EURODRIVE is a global supplier of drive and automation technology. Its Bruchsal site is home to both the company's headquarters and its large gear unit plant. As the name suggests, the plant develops and manufactures gear units weighing up to 22 tonnes for demanding industrial applications. These are used in materials handling, the raw materials industry, port handling, the steel industry and many other sectors. Alongside more than 90 years of extensive gear unit expertise, one of SEW-EURODRIVE's key strengths is its ability to deliver quickly, with lead times ranging from one to fifteen days depending on requirements. SEW-EURODRIVE achieves these short lead times through a sophisticated modular system. Depending on the customer's requirements for torque, speed and maximum housing size, the drive specialists can often use this system to assemble a customised gear unit.

To respond flexibly and quickly to special requirements as well, the plant maintains a high level of in-house manufacturing. Markus Grimm, who is responsible for investment in machine tools and automation solutions at the Bruchsal large gear unit plant, explains: "Our machine park includes all types of metal-cutting machines for turning, milling, grinding, gear cutting and so on. We also have a straightening press and a hardening shop, so essentially the only things we need to buy in are screws, seals and bearings."

New grinding machine boosts productivity

His responsibilities include procuring new machinery and equipment and, in turn, optimising existing production processes. "We continuously invest in modernising our production facilities to further improve quality, productivity and sustainability," Grimm emphasises.

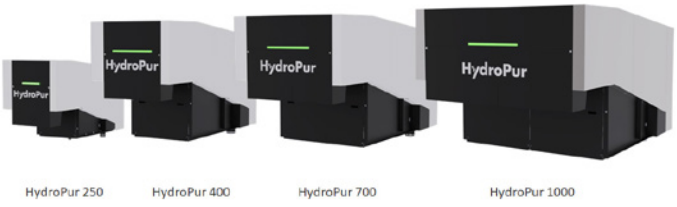
The starting point for the project described here was a replacement investment in 2021: an external cylindrical grinding machine needed replacing because of its age and increasing maintenance requirements. Markus Grimm and his colleagues chose to purchase a JUMAT 6S from Erwin Junker Maschinenfabrik GmbH, based in Nordrach. "Thanks to simultaneous grinding and modern grinding technology, this machine significantly reduces machining times compared with its predecessor," Grimm explains. "Automated operation also helps increase productivity."



An essential part of reliable cylindrical grinding: the KNOLL HydroPur H 1000 hydrostatic filter.

A hydrostatic filter tailored to your needs

The KNOLL HydroPur is a hydrostatic filter which, when integrated into a system with a tank, pumps, cooler and other components, supplies metal-cutting machine tools with purified cooling lubricant. The filter uses filter fleece or an endless belt which, in combination with hydrostatic pressure, separates liquid from chips very effectively, offering numerous advantages over simple filters. Their ability to filter out very fine particles makes hydrostatic filters particularly well suited to grinding processes. They also allow other types of chips, including those from light metals, to be discharged without difficulty. HydroPur systems are available in the 250 / 400 / 700 / 1000 variants, corresponding to their filtration capacity when used with emulsion. The modular concept allows users to configure a product to suit their needs from a range of standardised functional modules, without unnecessary features or costs.



KNOLL offers HydroPur filters in the 250, 400, 700 and 1000 variants. The model number indicates the maximum filtration capacity in litres per minute.

On the JUMAT 6S, SEW-EURODRIVE mainly machines shaft-type gear unit components, particularly output and input shafts. The primary operations involve grinding the outside diameters for bearing seats to the highest standards of precision and surface finish, as well as grinding some end faces. The shafts are generally made from C60 steel, a grade suitable for quenching and tempering, or comparable unhardened steel grades. Vitrified-bonded CBN grinding wheels are used for the grinding operations.

Demanding requirements for cooling lubricant treatment

The cooling lubricant emulsion and its treatment are an important part of the overall grinding process. The filtration system must be able to supply the grinding process continuously with clean cooling lubricant at a stable temperature so that machining can run automatically and reliably.

On the machine manufacturer's recommendation, the team decided to equip the JUMAT 6S with a KNOLL HL 650 hydrostatic filter. “We have known KNOLL for many years, during which the company has equipped numerous machines in our plant with filtration and conveying technology. We have therefore enjoyed a long-standing relationship built on trust. Ultimately, a key factor in our decision to choose KNOLL was the overall technical concept and the company's willingness to work with us to develop the solution further for our specific application.”

Increasing material removal rates pose a challenge

The capabilities of the JUNKER JUMAT 6S and ongoing optimisation of the grinding process led to a noticeable increase in the material removal rate, accompanied by a rise in the amount of fine grinding sludge entering the emulsion. This presented a growing challenge for the KNOLL HL 650 hydrostatic filter. Although it continued to meet the required filtration capacity and cooling lubricant quality, filter fleece consumption increased significantly. The fleece roll sometimes had to be changed as often as once a day, resulting in high consumable costs and a corresponding increase in operator attention.



The JUNKER JUMAT 6S cylindrical grinding machine is designed for short cycle times and high availability. The cooling lubricant treatment system must therefore also operate reliably at all times.

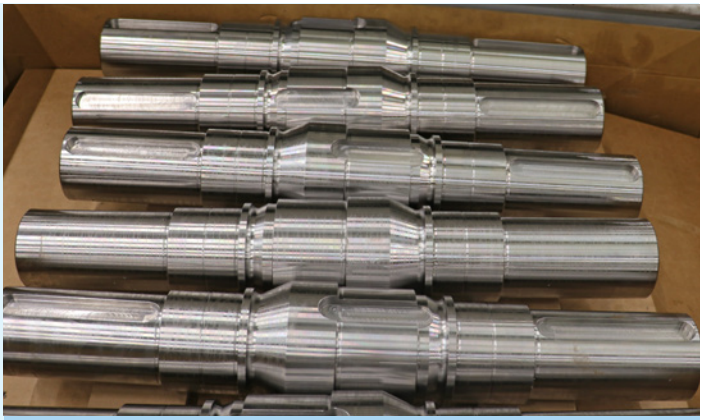


The high material removal rate of the JUNKER JUMAT 6S generates large quantities of fine grinding sludge, which the KNOLL HydroPur H 1000 reliably filters out of the emulsion.

To improve the situation, SEW-EURODRIVE and KNOLL analysed the process conditions together. The outcome was a proposal from KNOLL to convert the filtration system to the new HydroPur H 1000 hydrostatic filter as part of a field trial, with the aim of improving filtration performance, stability and cost-effectiveness. “That is exactly what we expect from a partnership,” says Markus Grimm. “Identify the problem together and offer a solution. Of course we agreed.”

New development provides greater operating reserves and lower energy consumption

SEW-EURODRIVE has been using the HydroPur H 1000 on the JUMAT 6S since the beginning of 2025. KNOLL product manager Jannik Nörz explains: “Unlike the HL hydrostatic filter, our HydroPur filtration systems have a completely modular design. This starts with the filter head, which is available in four different sizes, each with a different maximum filtration capacity.” To adapt the existing filtration system to the grinding machine's increased performance and provide greater operating reserves, the team selected the HydroPur H 1000, which has a filtration capacity of 1,000 l/min when filtering emulsion, with a filter fleece width of 1,520 mm. The filtration area increased to 0.608 m², more than four times that of



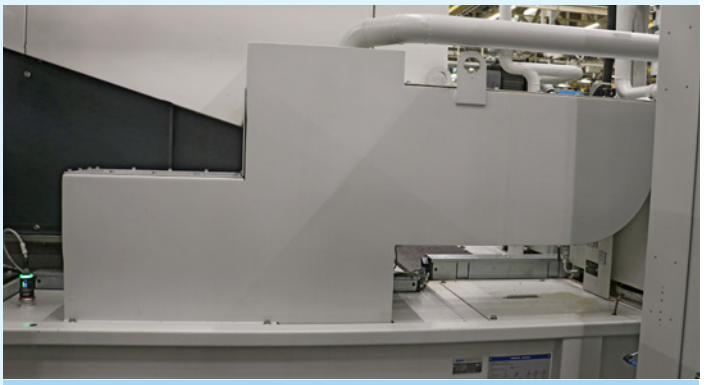
Typical input shafts machined by SEW-EURODRIVE on the JUNKER JUMAT 6S cylindrical grinding machine, ready for installation.

the previous solution. The system thus has considerably more capacity in reserve to cope with the high contaminant load generated by the grinding process.

The HydroPur H 1000 also offers a better energy balance than the previous HL 650: while the HL 650 filter head consumed 1.75 kWh per operating hour, the new HydroPur H 1000 filter head uses just 0.85 kWh per operating hour, slightly less than half as much. The HydroPur H 1000 also saves energy in recirculation mode, consuming 3.36 kWh per operating hour. That is around one-third less energy than the 5.125 kWh consumed by the HL 650. This is due partly to the new, simpler design of the filter chamber and partly to less frequent operation of the fleece drive, as the fleece roll advances at longer intervals.

Successful conversion of the filtration system

The HydroPur H 1000 filter module was fitted to the existing tank using an adapter. The new system design also made further improvements possible, including the addition of a degassing channel and a frequency-controlled lifting pump. Both help counteract foam formation, which had repeatedly caused problems during grinding operations with the previous system. During the field trial, KNOLL also integrated an



Unobtrusive but effective: the degassing section adapted for SEW-EURODRIVE's HydroPur filtration system.



Jannik Nörz takes a sample from the clean-coolant tank of the HydroPur filtration system to check the condition of the emulsion.



The grinding sludge is discharged in a very dry state, helping to minimise disposal costs and cooling lubricant losses.

optional take-up unit for the used filter fleece. Among other things, this separates the discharged sludge from the used fleece, helping to reduce disposal costs.

KNOLL product manager Jannik Nörz adds: “The modular approach extends to numerous options that allow us to configure the filter precisely to users' requirements. Options include a magnetic roller for pre-separation, vacuum support and an endless filter belt. All the standardised functional modules can also be retrofitted.”

Vacuum support offers numerous benefits

Jannik Nörz also highlights a particular technical advantage: “Vacuum support produces a higher pressure differential across the filter surface, increasing cooling lubricant throughput and allowing a homogeneous filter cake to form more quickly, which removes even the finest particles. Users benefit from cleaner cooling lubricant, which has a positive effect on workpiece quality and tool life, among other things.”



Markus Grimm (left) and Jannik Nörz are pleased with the successful collaboration between SEW-EURODRIVE and KNOLL: “With the HydroPur filtration system, we have achieved high process reliability and consistent component quality on the JUMAT 6S, with little operator attention or maintenance required during ongoing operation.”

Vacuum support also reduces filter fleece consumption. “With the new HydroPur, we only need to change the fleece every two weeks in two-shift operation,” says Markus Grimm. “Nevertheless, we are currently looking into replacing the filter fleece with the optional endless belt with fabric cleaning. This would reduce consumable use as well as operating and disposal costs to almost zero. It would also be another contribution towards sustainable production.”

A partnership on equal terms

For Markus Grimm and his colleagues in production, the switch to the KNOLL HydroPur H 1000 hydrostatic filter has been a complete success: the filtration system handles the JUMAT 6S's high material removal rate and ensures maximum production reliability. “By introducing the HydroPur filter head, the larger effective filtration area, the degassing channel and the frequency-controlled lifting pump, we have made targeted improvements to the existing system,” Grimm says enthusiastically. “We have been able to continue using the existing infrastructure while significantly increasing filtration performance.”

Markus Grimm and the SEW-EURODRIVE team are entirely positive about their collaboration with KNOLL: “During both installation and subsequent optimisation, open communication, a structured approach and reliable technical support ensured that everything ran smoothly.” Even during day-to-day operation, communication is straightforward and the contacts are knowledgeable, which is an important factor for SEW-EURODRIVE. Grimm concludes: “KNOLL supports us not only as a supplier but also as a technical partner, enabling us to continue working together on the development of economical and sustainable manufacturing solutions.”

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SEW-EURODRIVE...

... is a family-owned company with global operations that develops and manufactures drive and automation technology for almost every industrial sector. SEW-EURODRIVE employs more than 22,000 people worldwide and generated revenue of over €4.5 billion in 2024. Its product range includes gearmotors, industrial gear units, motors, inverters and complete automation solutions. Its customers operate in materials handling, intralogistics, the steel and raw materials industries, energy technology and numerous other industrial sectors.

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KNOLL Maschinenbau GmbH

KNOLL Maschinenbau is one of the leading suppliers of conveying systems, filtration systems and pumps for the metalworking industry. The systems transport and separate chips and cooling lubricants. The Automation division develops solutions for demanding assembly and logistics tasks. The comprehensive product range includes systems for both decentralised and centralised applications. Since 1970, KNOLL has stood for innovation, progress, and sustainable growth. KNOLL has a worldwide presence, with its own subsidiaries in the USA, China, Poland, Switzerland, Italy, the UK and Sweden, as well as sales and service partners around the globe.

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