On trend: small and complex

A high-pressure cooling lubricant supply is essential for the production of precision turned parts

Feindreh specialises in turned parts with fine geometries and diameters from fingernail to finger thickness.

The machining service provider Feindreh in Arnsdorf is increasingly focussing on the manufacture of small parts from a diameter of 0.3 mm, which may have relatively deep bore holes and fine contours. The modernly equipped company achieves optimum results on its long lathes since they have been equipped with KNOLL LubiCool® high-pressure units. Machining has become faster, more precise and more reliable and the tool life has been extended significantly.

In 2023 F&G Normteile Dresden GmbH became Feindreh GmbH, Arnsdorf – "a change in name that reflects our new strategic direction", explains Managing Director Anja Peplinski, who in 2021 together with Michael Grünler took over the management of the company founded by their fathers. The two individuals quickly realised that the core business up to now – standard parts such as cylindrical pins and bolts for the automotive industry – could not be operated economically in this country over the long term. Energy and labour costs have become too expensive. There is also a decreasing number of employees who can use cam-type machines.

New strategic direction

"The future belongs to precision turned parts that are manufactured on modern CNC lathes", says Anja Peplinski. "The smaller, finer and more sophisticated they are, the more we want to take on the jobs, even when the technology and know-how requirements in these areas are particularly high. We happily accept these challenges and have adapted most of our machinery along with peripheral equipment and measurement technology." Of the 80 lathes already half of them are state-of-the-art CNC machines, short and long lathes, which are designed for the flexible production of precision turned parts. The remainder are cam-controlled lathes, which Feindreh requires for the production of standard parts. They remain an important component of the portfolio because not everyone can manufacture such µm-accurate cylindrical pins for the automotive industry. Firstly, a certification of the quality management in accordance with IATF 16949 is required. Secondly, the component surfaces often still have to be refined after turning through grinding processes and galvanic finishing.

In 2022 Feindreh invested in a centerless grinding machine Cube 350 from the premium Swiss manufacturer Tschudin for particularly demanding standard parts. This machine allows adherence to diameter tolerances in the range of 2 µm and the realisation of surface qualities up to Rz=1.5 µm / Ra=0.05 µm. Through Tschudin contact was also made with KNOLL Maschinenbau, Bad Saulgau, a company that is one of the world's leading providers of filtration systems and pumps for metalworking. "CEO Urs Tschudin recommended a KNOLL cooling lubricant system for reliable and high-quality oil cleaning. Because this is perfect for getting the best from the machine", reports Production Manager Jan Weber. That is why the Feindreh managers decided to purchase a two-stage cooling lubricant system with a KNOLL KF 600-E compact filter for pre-cleaning and a downstream MicroPur® superfine filter.

High pressure – a productivity and quality factor

Experiences with this KNOLL system were extremely positive and laid the foundation for an intensive partnership, which mainly covers the high-pressure cooling lubricant supply of new short and long lathes. "We need the appropriate machines in order to be able to implement our strategic alignment to small, complex precision turned parts in top quality", explains Anja Peplinski. "This is why we decided at an early stage to gradually introduce new Star long lathes to our portfolio, in various sizes and configurations." Jan Weber adds: "However, it doesn't end there. We also need a high-pressure supply of cooling lubricant for sophisticated machining such as deep-hole boring or deep grooves. Our previous high-pressure systems were in need of improvement, so we gladly accepted the offer from KNOLL to test an upgradable high-pressure unit LubiCool®-S."

Following the test phase it was clear to the Feindreh machining team: the LubiCool®-S high-pressure unit was here to stay,

They are the favourites of Feindreh machining specialists: the two KNOLL LubiCool®-M systems, which supply cooling lubricant to the SR-20 long lathes from Star Micronics as needed.

The KNOLL LubiCool®-S high-pressure station is located under the rod loader.

Feindreh specialises in turned parts with fine geometries and diameters from fingernail to finger thickness.

and we ordered more of these devices. Feindreh currently has six KNOLL LubiCool®-S, which are installed on Star Micronics SB-12 and SR-20JII long lathes. Two more have been ordered. "This shows how satisfied we are", says Jan Weber. It is down to the fundamental advantages that the high-pressure supply of cooling lubricant offers. "Some components cannot be machined at all without high pressure, for other components the subsequent deburring is eliminated. In addition, the tool life is extended considerably – the cooling lubricant hits the cutting edge precisely thanks to high pressure. This is supported by the AWL quick-change system specially developed by ARNO."

Compact design saves valuable production space

Jan Weber also sees the individual strengths of the KNOLL LubiCool®-S devices in the design that is so compact meaning they can be positioned at short and long lathes under the rod loader. He is also impressed with the attainable 100 bar: "As a result, we achieve short breaking chips, which enables higher cutting speeds that are reflected in shorter machining times." Matthias Wachter, KNOLL sales representative responsible for LubiCool® high-pressure systems, explains: "Our proven KNOLL KTS screw spindle pump generates the pressure and allows us to produce on average 9,000 parts per year. It is so wear-resistant that our customers can expect lifetimes up to six times longer than comparable pumps. This brings with it correspondingly high process reliability."

This turned part has a double-slotted design. The otherwise necessary deburring is eliminated with the high-pressure machining.

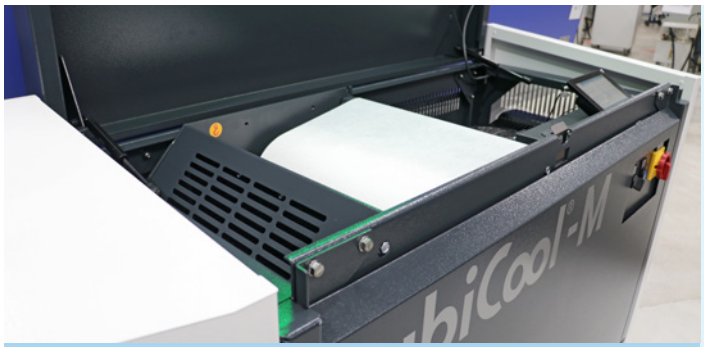
(f.l.t.r.) Anja Peplinski and Jan Weber from Feindreh GmbH are committed to the partnership with KNOLL Maschinenbau, represented by Matthias Wachter and Markus Rölleke. They are particularly impressed by the LubiCool® high-pressure units: "With these high-pressure units we have opened the door to advanced machining possibilities."

The exchangeable filter element of the LubiCool®-S with a filter fineness up to 15 µm ensures that even the smallest chips, fine particles and foreign substances are separated from the cooling lubricant. Jan Weber explains: "It takes less than one minute to replace the filter cartridge. The dirty one goes into our cleaning system where it is cleaned and available to use again – almost as good as new. This is economical and user-friendly." The responsible KNOLL field worker Markus Rölleke adds: "The SmartConnect control concept developed by our engineers is also user-friendly. It includes a small touch display on which the user can set the desired pressure stage and other parameters. The user can also call up various system operating data on the touch display. An LED light strip on the outside of the housing visualises the key states in eight colours."

High availability and minimum maintenance effort

As the LubiCool®-S systems were almost reaching their performance limits for larger orders, KNOLL recommended the next device up, a LubiCool®-M. "The fact that we were once again granted a trial period was a big help to us", says Managing Director Anja Peplinski happily. "When we saw that the

The KNOLL LubiCool®-S high-pressure station is "small, smart and simply clever". In addition to the KTS high-pressure pump, it includes a filter cartridge that can be replaced quickly and a small touchpad for operation that enables the monitoring and visualisation of the key system operating data.



The KNOLL LubiCool®-M high-pressure station: In addition to the powerful KTS high-pressure pump, an efficient KF belt filter and the touchpad of the user-friendly control system are also located under the cover.

The LubiCool® can be installed in just 30 minutes thanks to its plug-and-play system. With the standard interface it can be connected to all metal-cutting machine tools. Retrofits are also possible and easy to do.

The Tschudin centerless grinding machine Cube 350 is supplied by a two-stage KNOLL cooling lubricant system (in the background) with a compact filter KF 600-E for pre-cleaning and a downstream superfine filter MicroPur®.

At Feindreh all new long lathes from Star Micronics are supplied with high pressure by KNOLL LubiCool® units.

LubiCool®-M was fit for our purposes, we immediately ordered a second one."

The two high-pressure units are able to make available up to 150 bar pressure and a volume flow rate up to 30 l/min. Feindreh therefore installed them at the more powerful long lathes SR-20JII from Star Micronics. It is mainly parts with larger diameters made of non-ferrous metals, such as copper, aluminium and lead-free brass, that are machined on these lathes. Jan Weber and his production team are impressed with the KNOLL LubiCool®-M systems: "They are virtually maintenance-free. Because they work with a filter fleece that seems like it lasts forever even when machining lightweight materials."

Matthias Wachter also points out that the new LubiCool® devices can also be operated with an app: "This allows the operators to easily view the key operating data at any time and check, for example, whether the life of the filter cartridge of the LubiCool®-S is enough to cover the unattended shift. The pressures and other settings can also be changed via the app."

This option is very well received by Anja Peplinski and Jan Weber: "We are in the process of increasing the automation and digitisation of our production. It's great that KNOLL also provides support in this direction." They praise the partnership with KNOLL: "It is the entire package that makes us so satisfied – the quality of the products, the user-friendliness, the low maintenance effort and the exemplary service, that is very rapid despite the distance from Bad Saulgau."

AT FEINDREH, ARNSDORF

Feindreh GmbH – precision in the smallest dimensions

Feindreh GmbH with its headquarters in Arnsdorf is a family-run company that produces 200 million turned parts annually with 100 staff and 90 machines on a production space of 5,000 square metres. The range of services includes turning, grinding and notching. On the one hand, Feindreh specialises in standard parts for the automotive industry, which are manufactured in medium-sized to large series. On the other hand, there are complex turned parts with small diameters from 0.3 to 16 mm, which are increasingly the focus for the future. The customers mainly come from the automotive industry and electronics, mechanical engineering, measurement and control technology, as well as medical technology. The company is certified in accordance with IATF 16949 (quality management) and ISO 14001 (environmental management).

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KNOLL Maschinenbau GmbH

KNOLL is the leading provider of conveyor systems, filtration units and pumps for metal processing. These transport and separate chips and cooling lubricants. The comprehensive product range offers systems for decentralised or centralised applications.

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