

Running like clockwork

L.+G. Beck GmbH, located in Schwäbisch Hall, is one of the world's leading suppliers of drip oilers, oil level gauges and metering systems for minimum quantity lubrication, and has successfully established itself since the 1960s with its customized product range.



Fig. 1: With L.+G. Beck GmbH and its UNIOELER brand, Managing director Daniel Gutierrez Beck (left) and technical director Kai Friedrich (right) assert themselves as the world's leading supplier of drip oilers, oil level gauges and metering systems for minimum quantity lubrication.

The term "hidden champions" is often used to describe companies that are only a little or hardly known to the public, but are among the global pioneers and sales leaders within their markets. L.+G. Beck GmbH, therefore, undoubtedly holds the title of "hidden champion". Who would have known that the third-generation family business from the quiet town of Schwäbisch Hall, approx. 60 km from the state capital Stuttgart, with its 20 employees, would have become one of the world's market leaders for metering systems? The background of L.+G. Beck's unique story is simple: Almost nothing in the industry operates without lubrication. Lubrication is required wherever moving components such as chain drives need to be permanently and reliably lubricated. One of the special features of UniOeler is the production of metering systems for minimum quantity cooling lubrication systems. These are used in metal cutting for drilling, thread cutting, turning, milling, sawing, punching as well as for the non-cutting formation of various materials. For this purpose L.+G. Beck supplies fully automated minimum quantity lubrication systems. It is therefore no wonder that almost any machine manufacturer around the globe uses the systems of UniOeler. The USP, i.e. the Unique-Selling-Proposition of UniOeler, is

that almost all metering systems are manufactured in small batches according to customer requirements. In other words: Each lubrication system is individually tailored to the customer's needs. Important components for the functionality and quality of a UniOeler minimum quantity lubrication system are float switches. Float switches report at corresponding states at pre-defined minimum or maximum levels so that switching operations can be triggered. With regard to float switches, L.+ G. Beck has been cooperating with the company Jacob in Rommelshausen near Stuttgart since the early 1990s. Founded in 1922, the company with its 200 employees is one of the top manufacturers of float switches. Jacob's float switches can be found in almost all high-speed trains worldwide. The commitment of the two medium-sized companies is what sets them apart from the rest. Acting as an extension, so to speak, Jacob supplies just-in-time individually configured float switches, which can be fitted into the customer-specific UniOeler designs. For that reason, as a supplier, Jacob acts as a strategic partner of L.+G. Beck GmbH.



Fig. 2: UniOeler - high-end minimum quantity lubrication system (Figure: UniOeler)

Lubricant, an underestimated material

The use of lubricants has become indispensable in the modern technical world. No industrial process with mechanical movement can operate without lubrication. For example, lubrication is used for chain drives, in conveyor systems in mechanical engineering or in machining production as minimum quantity lubrication or minimum quantity cooling lubrication for the cooling of machining processes with small quantities of coolant. Kilometer-long transport routes and conveyor systems are not uncommon today, especially when it comes to internal logistics. To ensure the smooth functionality and long service life of chain drives and to avoid rapid wear and tear of such chain drives or even wear and tear of the chain, hundreds of lubrication points can be present on a conveyor system. Of course, an employee could be hired for this work who could apply the lubrication manually with an oil can or brush and go from one lubrication point to the next; but the "human error" element would then be inevitable. The industry 4.0 requirements of automation, as well as the demands for process safety with fixed and exact measurements makes semi- and fully automatic lubrication indispensable. Another advantage:

The lubricant levels are automatically monitored and, in the case of centralized lubrication, they generally only need to be refilled once a month.



Fig. 3a-3c: Installation of Jacob

Float switches for the production at L.+G. Beck GmbH

UniOeler.

It all began in 1961 with the drip oiler.

In 1961, the year the Berlin Wall was built and the year Yuri Gagarin became the first person to circumnavigate the globe from space, Lore and Günther Beck started to develop and produce simple oil level gauges, flow indicators and drip oilers. What clients value up to this day: The UniOeler drip oilers from L.+G. Beck offer the advantage that the drip metering is "automatically driven" by gravity and is reduced or increased through a regulating spindle. In addition, the filling level is visible through the glass container and it can be used as a storage or pressure compensation container.

Already during the early days, the virtues of L.+G. Beck were "passed on" as the "company DNA" to the two grandchildren Kai Friedrich, technical director and Daniel Gutierrez Beck, managing director. This included: The realization of customized products in small batches. There is a reason that the

slogan of the company's founder Günther Beck was: "Whenever one of our customers makes three requests for a specific product supplement, L.+G. Beck adopts it into the product portfolio". So, no sooner said than done: The first further developments of the drip oilers were already realized at that time. For industries with high dust exposure, dust protection covers made of brass have been developed, which are secured by a chain. Another customer requirement resulted from the need to install machine tools in cramped conditions in workshops. For example, the first drip oilers were designed with an outlet plug on the side so that the oil drop units could now be mounted on the side of the machine tool to save space. Thus the basic principle of the robust drip oilers with glass container has been developing step-by-step since the 1960s. As a result, countless variants are available today: These range from different capacities from 10 to 3,000 ml and various threaded connections to multiple drip oilers, oil dispensers, electric oil dispensers, compression oilers, electric drip oilers and multiple electric drip oilers. Accordingly, the product range surrounding drip oilers has been sold thousands of times worldwide since the 1960s. But there is one thing that Kai Friedrich and Daniel Gutierrez Beck are particularly proud of: There are still spare parts available for 30 year old UniOeler drip oilers.

Minimum quantity lubrication.

The need for thousands of liters of cooling lubricant is a thing of the past. All you need now is a fraction of that.

Kai Friedrich and Daniel Gutierrez Beck outline the change for the UniOeler brand into the modern industrial era. The tried and tested drip oilers continue to be in demand, but with the increasing demand for automation and highly accurate quantity metering, especially for minimum quantity lubrication, high-precision metering systems and level measurement are becoming increasingly important. Level measurements are needed because the lubricant units are increasingly installed in the machines themselves for reasons of conserving space and because the filling levels can no longer be seen from outside. Kai Friedrich and Daniel Gutierrez Beck explain: "To give an idea of the performance of our UniOeler minimum quantity metering system, instead of machining processes that require several thousand liters of cooling lubricant, only a fraction per hour, i.e. around 2 mL of lubricant, is required for the same operation. The UniOeler minimum quantity dosing systems operate with correspondingly high precision: In the microspray range, for example, 43 drops produce just one mL of oil. The high-pressure piston pumps in the UniOeler minimum quantity dosing systems operate at about 80 bar and can be infinitely adjusted precisely from about 3 mm³ to about 85 mm³ per piston stroke, at a cycle frequency of up to 5 Hz. The pump units are installed in separate housings. In this way, it is possible to not only manufacture smaller systems with two or three lubrication points, but also high-end minimum quantity lubrication systems with up to 20 dosing pumps. A task to think about: Different metering quantities and cycles can be set for each of the 20 metering pumps. In addition, the metering pumps can be equipped with hose lengths of 50 cm to 25 meters, enabling the lubricants to be transported over longer distances.

Modern times for lubrication systems.

Individually tailored and a one-stop solution.

For L.+G. Beck, modernity means that lubrication systems are configured more and more individually for the customer. For smaller lubrication systems, additional outlets for lubrication units can be provided on request as a precautionary measure, which can then be used at a later date. Some customers have lubrication systems equipped with interfaces to electrical controls. The lubrication can then be switched off in the evening via a PLC and switched on again in the morning at the start of a shift. "Meeting the demand for individual lubrication systems comes naturally to us", said the managing director Daniel Gutierrez Beck. The majority of customer enquiries come from the technical departments in search of a solution. Customers rarely make purchase decisions on the basis of price, but on the overall functionality of the system. Kai Friedrich emphasizes that more and more customers want complete and maintenance-friendly systems. Thus UniOeler systems are delivered with fittings, hoses and connection material, i.e. "Plug'n Play". In these times of automated production in 3-shift operation, the maintainability of a lubrication system is crucial. The maintenance and repair of UniOeler lubrication systems is fast: Hoses, pumps and accessories can be replaced in a few easy steps.



Fig. 4: L.+G. Beck managing director Daniel Gutierrez Beck during production

with a ready-to-install Jacob float switch.

The strengths of the partners Jacob and L.+G. Beck complement each other.

The future of level measurement.

The companies L.+G. Beck and Jacob have been already working together since the beginning of the 1990s. Jacob supplies small float switches in a wide range of variants and designs in batches. To the extent that L.+G. Beck offers customized systems, the float switches at Jacob are also manufactured and supplied individually.

The float switch from Jacob is usually installed in a UniOeler cylinder glass.

Depending on customer requirements, a second float switch can also be installed. This way, the upper float switch measures the maximum level and the lower one the minimum level. As levels change, the Jacob float switches monitor both dry running and overfilling of the vessel. The measured values are output via relay outputs, so that when the minimum level in the glass or plexiglass container is

reached, a pump can be triggered which automatically fills the container. Once the maximum height is reached, the pump is switched off accordingly. The technical manager of L.+G. Beck, Kai Friedrich emphasizes: "Jacob has been our specialist for monitoring liquids for many years. Never change a winning team. We rely on the quality float switches from Jacob".

The Jacob portfolio includes float switches, level sensors, optical sensors and suction lances, which can be realized in large and small series as well as customized individual pieces. The majority of Jacob float switches are produced in small series as customized versions up to a maximum of 500 pieces. Off-the-shelf solutions do not exist. Solutions are precisely tailored to the needs of companies such as L.+G. Beck.

What does the future of level metering look like? Jürgen Osswald, Team Leader JES (Jacob Engineered Sensors) at Jacob outlines: "Many customers today want capacitive, precise and timely level measurement. It should be possible to output measured values as analogue or digital signals in accordance with the stand height reached and to display them as percentages or in length, volume or mass units". Jacob has already set the course for the future and is currently developing processes based on ultrasonic technology. An ultrasonic sensor sends and receives the ultrasonic pulses between the surface of the medium and the sensor. The filling levels can then be continuously calculated from the running time of the signal. Jacob is expected to be ready for the market in 2020. This will possibly open up a further field of close cooperation between L.+G. Beck and Jacob.

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Press release

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