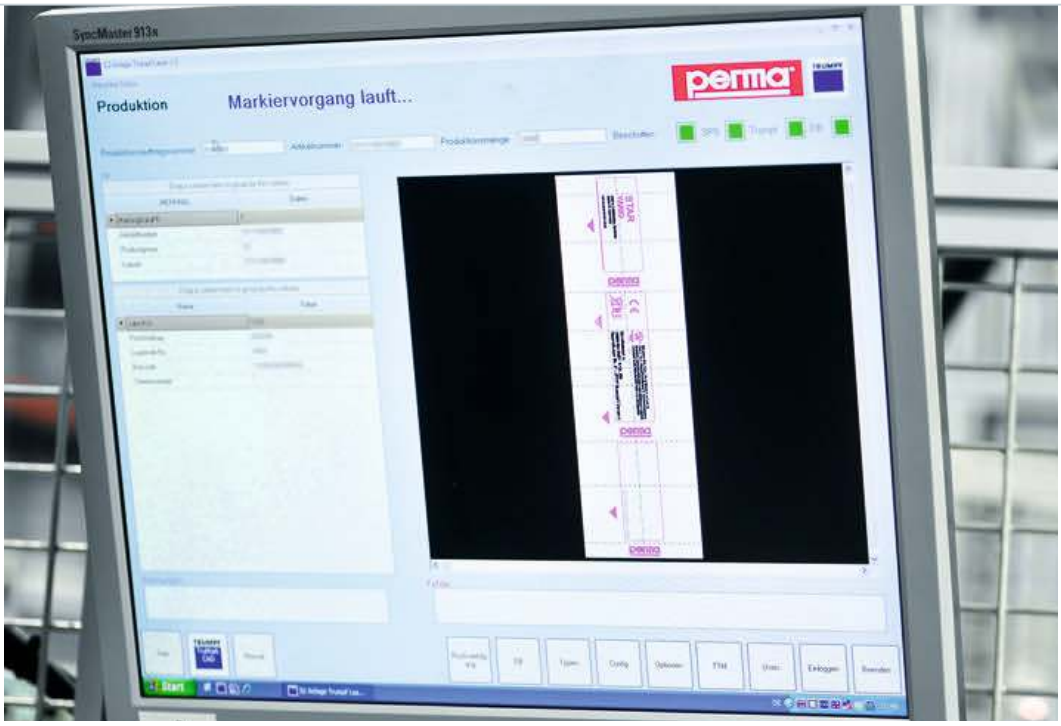

perma-tec relies on the marking laser and the optional Module Interface by Trumpf
(figure: Trumpf)

Profitable even for Small Batches

Laser Marking. A manufacturer of automated lubrication systems proves that laser marking systems can be used economically even for small lot sizes. The company recently switched from adhesive labels to laser marking for one of its plastic housings. Thanks to a new software module that simplifies the operation of the laser system, significant time savings can be made during job changeovers.

STEFFEN EHRENMANN

Seemingly minor details in a production system can quickly cause extensive damage. That is something the experts in automatic lubrication at perma-tec GmbH & Co. KG in Euerdorf, Germany, know only too well. That is because whenever parts move at high speeds – in motors, roller bearings or chains, for example – friction and heat are created. A shortage of lubrication with grease or oil can – in the worst case – shut down the entire production line, with expensive consequences. "Neither excess nor insufficient lubrication is ideal. By using perma-tec lubrication systems, which permit exact metering, our customers can increase the reliability and service lives of their machines and, as a consequence, their profitability," says Frank Wilm, marketing manager at perma-tec. Ever since 1964, the company has built automatic lubrication systems, which make it possible to ensure perfect lubrication for periods as long as 24 months. At the same time, this reduces the maintenance effort. Occupational safety is increased, as well, since the times spent in hazardous areas are minimized.

Laser Markings instead of Adhesive Labels

The lubricating systems work on the basis of electro-mechanical or electro-chemical concepts. Using the perma Star Vario as an example, the systems comprise a drive located in a plastic case and a lubricant reservoir made of plastic, the so-called lubrication canister (LC). About three years ago, management decided to introduce laser marking. Philipp Klöffel, responsible for job preparation at perma-tec, explains: "We chose laser marking because many of our lubricating systems work outdoors – in gravel crushing plants, for instance – where they are exposed to adverse weather, grime, and ultraviolet light. The adhesive labels we used to use faded through time. Laser marking, by comparison, is very rugged and thus more durable." At perma-tec, working with a laser was uncharted territory but, after a careful investigation of the market, the decision was in favor of laser marking systems by Trumpf Laser- und Systemtechnik GmbH. "It was the overall package that convinced us – including the

Translated from Kunststoffe 10/2013, pp. 246–246
Article as PDF-File at www.kunststoffe-international.com; Document Number: PE111500

Since the perma Star Vario lubrication system is frequently used in harsh environments, perma-tec recently began using marking lasers to engrave the serial number and additional information on the drive's black polyamide housing
(figure: perma-tec)

The laser beam creates a fine foam as it quickly writes the data on the outside of the cylindrical housing. The lettering is raised slightly, forms a good contrast of white against the dark background, and exhibits great durability
(figure: Trumpf)

Company Profile

Trumpf is a leading global technology company with machine tools, laser technology, electronics and medical technology as its business fields. Products manufactured with the company's technology can be found in almost every sector of industry. Trumpf is the world technological and market leader for machine tools used in flexible sheet metal processing, and also for industrial lasers.

In 2012/13 the company – which has approximately 9,900 employees – achieved sales of EUR 2.35 billion (preliminary figures). With around 60 subsidiaries and branches, the Trumpf Group is represented in almost all the countries of Europe, North and South America, and Asia. It has production facilities in Germany, China, France, Great Britain, Japan, Mexico, Austria, Poland, Switzerland, Singapore, the Czech Republic and the USA.

→ www.trumpf.com

compact system, the software, linkage and integration, and customer support. The concept offered by Trumpf was the one that simply worked best," says Kuno Bühner of the R&D department at perma-tec.

Foaming Dark-colored Plastics

First, the automatic lubrication specialists gathered information at the Trumpf Laser Applications Center in Ditzingen, Germany. They brought with them plastic parts straight from production. The purpose was to clarify the operating parameters and to determine whether the material used here – a nearly black polyamide – was suitable for laser marking. The lettering had to be high-contrast and clearly legible – and needed to be applied to the surface of the housing in exactly the required position and in unvarying quality. "Right from the first trial," Bühner recalls, "it was clear that nothing would have to be added to the plastic resin to prepare it for laser marking. When we launched the second laser application, two years later and using a different material, we optimized the contrast and color of the foamed area by adding the iriodin effect pigment. This let us use the laser to mark the drive housing of our perma Star Vario model." The foaming method is especially suitable for marking dark-colored plastics. The plastic is heated briefly, normally with a wavelength of 1,064 nm, and caused to fuse. Gases are liberated. Gas bubbles are trapped when the plastic cools, and they reflect light in a diffused manner. The slightly raised lettering is clear and legible when seen against the dark background.

The second laser marking system (the TruMark 3020 model), which perma-tec put into operation this year, had to master additional challenges, since the surface to be lettered was not flat. Instead, the curved surface of a circular component was to be marked. Inserting and removing the component from the laser system is automated with a moving turntable. "Here it was necessary to ensure that the product was rock steady and is absolutely in the correct position. We achieved that – in close cooperation with the applications engineers at Trumpf," Bühner recalls.

New Software Module Saves Set-up Time

"In this second installation, the software we have selected is very simple and logical in terms of integration, controls, programming, configuration and operating →

With the development of the Module Interface (MI), a new software option has become available for TruTops Mark. This makes it easier for the operator to integrate the laser marking system into the existing production structure. It also facilitates machine control and administration for the marking jobs. In this way, perma-tec saves time when changing between jobs, and this is especially important when handling small lots
(figure: Trumpf)

the laser marking system," Klöffel reports. Trumpf has since recently made available the Module Interface (MI) software for TruTops Mark – a custom solution that makes it easy for the user to integrate the laser marking system into the existing production infrastructure, to operate the system, and to manage the marking job data. perma-tec has already discovered the enormous advantages this brings about. In this installation, the software module is connected to the programmable logic controller. "We saw two factors as being especially important. One was the traceability of the products while the other was easy operation and system flexibility," Bühner explains. Before the drive housings for the lubrication system are marked with the laser, however, several testing stations, operating in parallel, check the drives right down to the last detail. Every drive is assigned a unique inspection number, which is stored inside the unit. Klöffel adds, "An important demand was that the software be able to read the inspection number before marking, to forward the number to the laser system, and to couple it with the serial number, which is then lasered on the outside. This makes it possible to use the serial number, whenever needed, to determine the original test results for the drive and when it was manufactured, should customers inquire." The second major decision-making criterion for the new software module was the demand for flexibility and short set-up times. "Now it is easy," Klöffel states, "to squeeze in a small job for just ten parts while executing a large order." "The user interface is very simple and clear and was configured to meet our needs. The operator need only enter the new job order, the item numbers, and the quantity to be processed. Then the software works in the background to call up the graphics file for the appropriate, user-specific label and forwards the file to the laser marking machine," Bühner continues. When compared with the old marking method using adhesive labels, perma-tec has significantly reduced the lost time between jobs. What used to take about 15 minutes is now finished in just a few clicks. "In the past, labels had to be changed, the printer readjusted, operating instructions might have had to be read, and a sample was printed and checked. That has been eliminated, and that saves time," Klöffel notes. Since perma-tec also turns out custom orders with short production runs, the time savings when changing the marking job are all the more important. With 20-second cycle times, perma-tec can carry out a large number of marking operations each day, and that at superb quality.

Innovation Plans for the Future

The Module Interface app can easily be linked to existing databases and ERP systems. This is where perma-tec sees an additional benefit, to be realized in the near future. Because then the sequence of the many small orders can be planned more efficiently. "At present we are still in a transitional phase. But next year we will be installing a new ERP system and the laser marking system will be integrated at that time," says Wilm. "Since we started manufacturing automatic lubricating systems way back in the 1960s, and since we have continuously made them more sophisticated, we are the world's market leader for single-point lubrication systems. We intend to hold that leadership position by way of ongoing innovations," Bühner summarizes. ■

perma-tec marketing manager Frank Wilm, R&D expert Kuno Bühner, and Philipp Klöffel, responsible for job preparation (from left to right)
(figure: Trumpf)

Specializing in Automatic Lubrication

For 50 years now, the perma brand has been synonymous with innovative, creative lubrication concepts. Automatic lubrication systems made by **perma-tec GmbH & Co. KG** can be found all around the world, in almost every sector of industry. perma products are used especially in core applications – conveyor belt systems, electric motors, pumps and ventilation systems. perma-tec has a staff of about 200 employees around the globe. The headquarters at Euerdorf is augmented in foreign markets with seven company representatives and a network of dealers in more than 60 countries.
→ **www.perma-tec.de**

THE AUTHOR

DR.-ING. STEFFEN EHRENMANN, born in 1980, is marking laser product manager at Trumpf Laser- und Systemtechnik GmbH, Ditzingen, Germany.