

Press release

Gehring Naumburg Application

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Oemeta MWF reduces complexity at Gehring while benefiting the environment and employee health



In pole position with a multifunctional metalworking fluid

(Uetersen/Naumburg) The power density of modern Formula 1 engines would be unthinkable without the honing machines produced by world market leader Gehring. Gehring's components facility in Naumburg has to work with even more precision in order for the company's machines and their legendary dynamic tools to meet tolerance specifications. And since nothing should be left to chance, the company relies on Oemeta's expert-developed metalworking fluid (MWF) in its machining processes, leading to a 2.5-fold increase in service life and drastically reduced complexity – not to mention beneficial effects for employees and the environment. This is all made possible by the intelligent use of the innovative two-component HYCUT system.

"Ninety-five percent of our machines are purchased by the automobile industry," says Gerhard Simon, the Chief Executive Officer of Gehring Naumburg GmbH & Co. KG. "That includes the Formula 1 racing teams." The cylinders must be perfectly honed down to half a μ so that these small 1.6-litre V6 engines with their high power density can provide approximately 800–1000 hp at a rate of 15,000 rpm. But honing doesn't just play a crucial role in Formula 1; this technology is now used in every internal combustion engine worldwide. The special

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grinding technology used by Gehring honing machines optimises engine combustion, reduces consumption, increases cleanliness and complies with health guidelines. It goes without saying that the machinery used on these engines should meet the same high standards.

At the components facility located in the town where the company was founded, quality standards are met with ease

The heads of operations in Naumburg meet these standards with ease. It's here at number 5, C.-W.-Gehring-Straße, that Christoph Willi Gehring founded the company in 1922 and built the first honing machine in 1935. He probably didn't know back then that he and his company would eventually become a world market leader for this process, the "finer and more precise surface machining of round bores". Today, the Naumburg facility manufactures base model honing machines and systems, which are put into use at the central plant in Ostfildern in southern Germany to meet customer requirements. For example, there is a magnificent 24-metre-long system in use in the neighbouring town of Bad Cannstatt which processes V6 engine blocks with a nearly inconceivable cycle time of 32 seconds.

The employees in Naumburg work with steel, stainless steel, aluminium and cast iron to manufacture the highly precise components, with the predominant processes being turning, milling, boring and grinding. Since 2014, operations there have relied on Oemeta's versatile two-component metalworking fluid HYCUT and the local trade and service partner HMM Mineralöle.

Complex objectives with high demands

Their initial goal was clear: reducing the number of different metalworking fluids in use while advancing production technology. Gehring places particular value on good surface quality. The company also wanted to reduce its impact on the environment and meet strict health requirements. Regular measuring, good on-site service and quick responses as standard were additional objectives. One reason for this was to enable a departure from the rigid cycle of refilling individual machine tanks every 9 months. And last but not least, Gehring also sought to bring down the high costs of waste disposal.

One thing is for certain — these goals were achieved very quickly thanks to the team-oriented approach of QMR Lutz Geweniger, who is responsible for workplace safety at Gehring, the company's maintenance specialist Ralf Köppl, Oemeta field service team Torsten Schindler and Stephan Ebeling, and the HMM area director Peter Wachsmuth. And yet, the project wasn't without its challenges. The primary issue was the very hard water in Naumburg, with a hardness of 35 °d and a chloride content of 60 mg/l. Beyond that, many MWF

mixing stations did not offer much space. This was compounded by issues of tramp oil and foam development with the previous product. But, above all, the sheer variety of different MWFs needed to be reduced. "People used to have their 'own' oil for 'their process' and 'their machine'," recalls Geweniger. "This complexity with all of the ins and outs involved needed to be eliminated. We wanted to find a versatile oil which would meet all of the requirements at once." Easier said than done if you know that every machining process requires its own specialised MWF.

Cooling lubricant is a highly complex issue

Stephan Ebeling and Torsten Schindler are familiar with such requirements and how to meet them, even though they know that "MWFs are a very complex issue with regard to technology as well as environmental and health management." With Oemeta's product HYCUT, a versatile two-component MWF, they found what they were looking for right away. At the core of the HYCUT system are ester-based oils which can be used as a machining oil, an MWF or a hydraulic agent and which are compatible with one another, eliminating the need for intermediate cleanings, for instance.

As a cutting and grinding oil, the water-miscible HYCUT offers extremely high lubricating performance and significantly reduces component wear and tear. Since it is made from synthetic ester oils, it is also very resistant to ageing, guaranteeing a long service life. Moreover, HYCUT's high washing performance ensures clean machines and parts, and its exceedingly good swarf removal improves the efficiency of grinding operations in particular. As an emulsion, HYCUT is special in that oil and additives can be controlled separately. This ensures seamless adaptation to a variety of process, material and lubricating performance requirements. Individual components can be added in specific doses over the entire service life of the emulsion.

Four mixing stations for four production processes

Once the right product was found, a centralised supply needed to be established while taking into account the turning, boring, milling and grinding processes and the requirements associated with them. First and foremost, two 1,000-litre tanks were installed — one for the HYCUT ET 46 and one for the additive BX. Then the pipework leading to the MWF tanks was installed, complete with hose reels and dispensing nozzles. Dosage is controlled by Dosatron mixing devices. Four stations are supplied by hose reels and dispensing nozzles and divided according to the process at hand.

These stations control the concentrations of the individual components in the required dosage for the different processes. This means that the requirements of every manufacturing process can be met by supplying the optimal HYCUT mixture, functioning as either a

machining oil or an MWF. For example, for machining, a mixture of just 3–4% HYCUT ET 46 and 3% BX additive suffices; for grinding, a mixture of 1–3% HYCUT and 3% BX additive. With the previously used product, concentrations of over ten percent were required.

Air quality at the facility improved immediately

“One result was observed immediately,” Geweniger explains. “The facility’s air quality improved very rapidly and the employees felt more comfortable there.” Ebeling explains why: “Fewer aerosols are formed thanks to the ester-based HYCUT’s droplet size.” Other improvements were seen in addition to the financial savings and health benefits — the complexity triggered by using many different oils was no longer an issue, all machining processes led to better surface textures, swarf removal rose and tools lasted longer.

“Most of all, the service life of the MWF improved,” reports HMH’s Peter Wachsmuth, who was initially responsible for on-site control and maintenance. By regularly measuring and recording important data such as pH, concentration and more, Gehring is now able to refill MWF on a situational basis. Geweniger shares his enthusiasm: “Instead of refilling in a rigid nine-month cycle, we can now run for about two and a half years on a single filling. We’re really excited about that.” This is because it means less frequent waste disposal — better for the controller and better for the environment. HMH also trained Gehring employees to conduct maintenance and control procedures independently for improved efficiency. QR code-supported software is in the pipeline to make this job even easier.

Optimal formulations lead to a thoroughly positive result

The results are thoroughly positive — all of the company’s goals were achieved. “This is also thanks to our chemists and application engineers in Uetersen,” Ebeling says, “because they always manage to find the optimal solution for every on-site situation and every process.”

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((Company information Oemeta Chemische Werke GmbH))

A history of quality — leading through innovation

Oemeta is a fourth-generation family-owned and -managed company. For more than 100 years, we have developed industrial lubricants for metal, glass and ceramics processing and supplied them to companies around the globe. Our focus on water-miscible cooling lubricants and broad application expertise has made us a leader in this specialist field. We draw on our sound knowledge of the market and our close relationships with our customers to develop products that are characterised by their high quality and reliability. By working closely with our clients, we develop intelligent, customised and cost-efficient solutions — resulting in cutting-edge, innovative and technologically advanced high-performance products. Oemeta’s products are consistently recognised as the industry standard. Inventions such as the two-component metalworking fluid and multifunctional oil have led to lasting process improvements and cost savings for renowned manufacturers in the automotive and metalworking

industries. With seven foreign subsidiaries and more than 30 sales partners, Oemeta's product and service philosophy is represented in the most important industrial nations.

((Company information GEHRING))

Precision technology for internal combustion engines and electric motors

Under the brands Gehring and copperING, the Gehring Group offers innovative production solutions for highly efficient conventional and electrified powertrains. The fine machining company has driven the development of honing technology for over 90 years. With its laser roughening, coating and honing processes, it supplies the automobile industry with solutions to current challenges surrounding internal combustion engines. The Group's portfolio also covers e-mobility production technology which sets new standards in the flexible serial production of electric motors.

((Product information synthetic ester oils))

What are synthetic ester oils?

In the production of synthetic ester oils, the fatty acid, which is chemically generated from natural oil, is specifically reacted with the fatty alcohol also obtained from natural or synthetic sources. In this way, the chemical constitution and the degree of purity are precisely controllable. Synthetic ester oils, like natural plant oils, are mineral oil-free and biodegradable, but in most cases much more durable and powerful.

((Info box labelling obligation))

No labelling required according to GHS

Mineral oil based cutting oils with a kinematic viscosity of 20.5 mm²/s or less, have to be classified as "aspiration toxic, may be fatal if swallowed and enters airways". Ester oil based products like HYCUT are much more human compatible and label-free!

((Info box tramp oil))

No chance for tramp oil!

Water-miscible cooling lubricants contain emulsifiers which disperse the base oil into fine oil droplets. Since HYCUT contains emulsifiers that are optimised for ester oils, mineral tramp oils are not emulsified into the cooling lubricant. The tramp oil is separated at the surface and can thus be easily removed, for instance by means of suitable oil skimmers.

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Image no. 23-01 OE_GE-Behälter.jpg

From single filling to centralised supply: Oemeta's HYCUT ET 46 has reduced the complexity of MWF supply at Gehring in Naumburg.



Image no. 23-02 OE_GE-Maschine.jpg

The power density of modern internal combustion engines would be unthinkable without the honing machines produced by world market leader Gehring.



Image no. 23-03 OE_GE-WzgSpindel.jpg

Gehring's components facility in Naumburg has to work highly precisely in order for the company's honing machines and their legendary dynamic tools to meet tolerance specifications.



Image no. 23-04 OE_GE-MischStation.jpg

The pipework includes four mixing stations which add the required dosage of additives depending on the production process.



Image no. 23-05 OE_GE-Pistole.jpg

Centralised supply of Oemeta MWF and on-site filling via flexible hose reels and nozzles at Gehring.



Image no. 23-06 OE_GE-Pistole2.jpg

Clever solutions down to the smallest detail — the nozzles are locked in place upside down to prevent droplets from accumulating on the ground.



Image no. 23-07 OE_GE-People.jpg

The team responsible for quickly achieving the company's goals (from left): Lutz Geweniger, Gehring; Stephan Ebeling, Oemeta; Peter Wachsmuth, HMH; Ralf Köppl, Gehring.



Image no. 23-08 OE_GE-People2.jpg

Their cooperative efforts quickly yielded excellent results — the service life of the MWFs more than tripled from nine months to two and a half years.

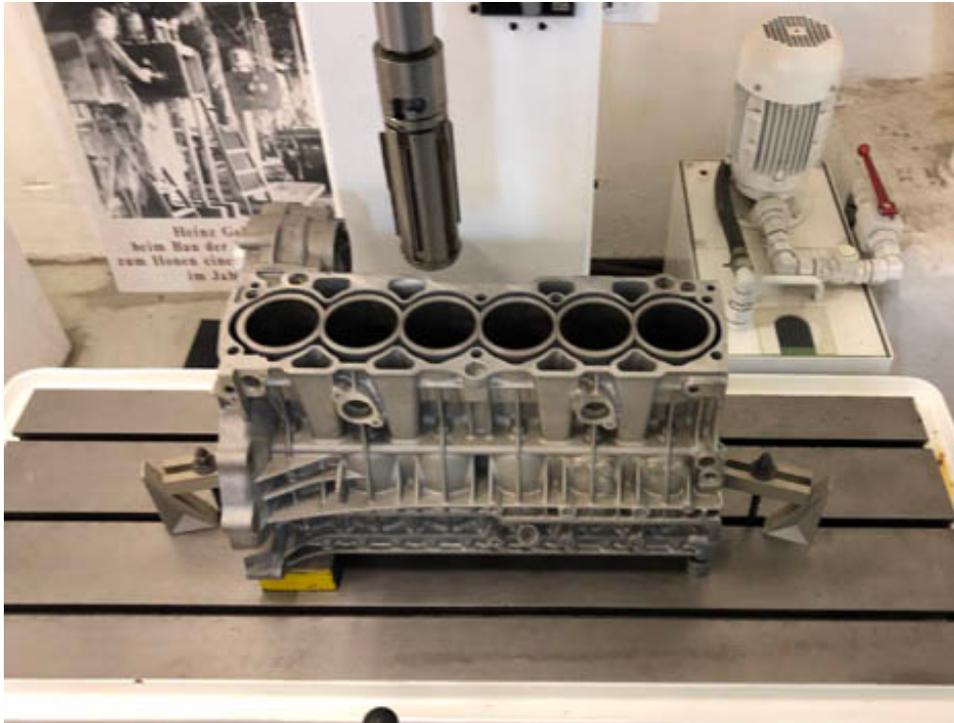


Image no. 23-09 OE_GE-Historisch.jpg

In 1922, Christoph Willi Gehring founded his company in Naumburg and in 1935, he built the first honing machine for "finer and more precise surface machining of round bores".