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Application comparison of the MAXFLOW compact filter system

## **Machine tools producer achieves unrivalled test results**

Precision machine tools are of paramount importance for automotive suppliers or the semiconductor industry, for example for injection pumps, hot plates or silicon and sapphire wafers. In all cases the demands are very stringent regarding surface quality and dimension accuracy. Such high standards of precision and quality have prevailed for over 200 years now at the company Peter Wolters GmbH, a leading producer of high-precision machine tools and systems located in Rendsburg Schleswig-Holstein, Germany. This market leader produces system solutions for fine finishing, lapping, honing and polishing processes. The equipment they produce is used in the metal-working industry and in the electronics, ceramics, plastics, glass or semiconductor industries. Their customers, mainly from the automotive parts supply sector, require machines that work at the highest technical standard and combine optimal product quality with efficient processes. To fulfil this demand, Peter Wolters GmbH is always on the lookout for innovative components to complement and improve its leading manufacturing technologies. For this reason, the MAXFLOW compact filter system from GKD – GEBR. KUFFERATH AG has been subjected to testing in continuous operation since spring 2008.



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### **MAXFLOW Compact System 1000-503 installed**

Dimension and shape accuracy is ensured during the grinding process not only by the machine tools but also by the cooling lubricant which cools and lubricates both the grinding discs and the workpieces. The quality of the oil is crucial for the grinding quality achieved. During the grinding process, the oil gets contaminated with fine metal filings and dust from the grinding discs themselves. Even a low level of contamination reduces the abrasive capability of the discs, resulting in deterioration of grinding precision and a shorter service life for the high-grade grinding discs. This makes enduringly reliable reprocessing of the cooling lubricant a key factor for success in the process.

In the past, the use of conventional filter solutions like paper belt filters, centrifuges, edge chip filters and precoat filters resulted in recurrent problems like poor filtrate, high energy costs or a high degree of lubricant entrainment, especially during filtration of aluminium filings.

In their search for improvements, the responsible technologists at Peter Wolters took notice of the innovative MAXFLOW filter system of GKD – Gebr. Kufferath AG. Since early 2007, this system has been in use under practical conditions at one of Peter Wolters' customers – the precision contract grinding works Paul Jores GmbH located in Bad Sobernheim in Germany's Rhineland-Palatinate. Thanks to the new component filter system MAXFLOW, which combines filtration and briquetting in a single unit, the quality of filtration and the application results at Jores have been significantly improved. Furthermore, this compact filter enables particle separation down to the micron range.

Reason enough to subject GKD's MAXFLOW filter system to intensive tests to investigate its capabilities and its application potential. For the comprehensive tests, a MAXFLOW-CS1000-503 with lifting pump and coolant chiller system was installed in Rendsburg.



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Peter Wolters decided on a system configuration consisting of one filter head, in which static filter discs - made of several layers of different GKD stainless steel mesh types selected for the specific process – are aligned vertically, and a round tank system with a capacity of 1,000 liters. A dirt tank integrated into the clean tank and equipped with a tapered run-off prevents deposits from accumulating on the tank floor. The filtration rate is up to 200 liters per minute with filter porosity down to 5  $\mu\text{m}$ .

Filtration with MAXFLOW takes place according to the cross-flow principle, with the filtrate streaming around the filter discs. The filter cake is detached from the disc filters through automatic backwashing of the filter and the solid residues are ejected as briquets or as sludge. Thanks to this procedure and the individualised configuration of the filter media, in the vast majority of cases the use of filter aids are not required.

In order to get a wide range of results in the test phase, the compact filter installed at Peter Wolters GmbH was used in the widest possible range of applications and with a variety of working materials. In addition to filtration results, the parameters being tested also included the service cycle of the oil or the volume of residues and a longer service life for the capital-intensive grinding tools.

### **Unrivalled results for aluminium filings**

Since February, MAXFLOW has been demonstrating particularly impressive results in the filtration of aluminium filings. Alternative filtration methods fail here because the filings produced during aluminium applications are very small and sharp and therefore very difficult to filter. MAXFLOW achieves optimal filtration results in this type of application thanks to the multi-layered stainless steel blended mesh type YMAX<sup>®</sup>. "The quality of filtration MAXFLOW delivers met the requirements of Peter



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Wolters. The filtrate is almost completely free of particles, which enormously improved the service cycles of the cooling lubricant oil.

In addition, the fact that filter aids are not required substantially reduces the volume of waste, as the residue ejected is no longer infiltrated with cellulose. This also makes waste disposal much easier, as the briquets are more homogeneous in their composition and only need to be transported away.

Another great advantage of MAXFLOW is its capability for customised modification, allowing the system to cater for even the most specialised production parameters. From Peter Wolters perspective, the compact filter system is miles ahead of other filter methods in this respect. At Peter Wolters' suggestion, the filter unit at Rendsburg was equipped with a gauge glass and a spigot on the feed pipe to the clean tank. In this way one can check the quality and purity of the oil during the filtration process.

MAXFLOW's modularity demonstrates that retrofitting or adaptation to changing customer requirements are not a problem, even after installation. One of the modules in the MAXFLOW concept is a cooling system that leads off the heat generated during the grinding process. Especially grinding processes that require precision in compliance with micronic tolerances are highly susceptible to fluctuations in temperature. The cooling lubricant oil must therefore be held consistently at a certain temperature to ensure the required tolerances. A cooling coil integrated into the MAXFLOW tank not only ensures optimal consistency of the filtrate but also keeps the cooling lubricant oil at an optimal process temperature of approx. 20 °C.

"In spite of the somewhat higher acquisition costs, the compact MAXFLOW system tops alternative filter methods through its unique filter quality," was



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the verdict of Peter Wolters. From their perspective, even centrifuges or paper belt filters are no match for this.

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### **GKD – GEBR. KUFFERATH AG**

The owner-run technical weaver GKD – GEBR. KUFFERATH AG is the global market leader for metal and plastic woven solutions as well as transparent media facades. Under the umbrella of GKD – WORLD WIDE WEAVE the company combines three independent business units: SOLID WEAVE (industrial meshes), WEAVE IN MOTION (process belt meshes) and CREATIVE WEAVE (architectural meshes). With its six plants – including the headquarters in Germany and other facilities in the US, South Africa, China, India and Chile – as well as its branches in France, Great Britain, Spain, Dubai, Qatar and worldwide representatives, GKD is never far from its customers.

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