

## *User report User from Berlin*

### ***High-Performance Filtration for Ceramic Machining***

#### ***A Quantum Leap in Service Life and Process Reliability***

*In the high-precision manufacturing of components for the semiconductor industry, the quality of process media plays a central role. Particularly when machining ceramic materials, extremely abrasive particles place the highest demands on filtration technology. The example of a long-standing customer in Berlin demonstrates the impact that consistently enhanced multi-stage filtration can have on service life, process stability and cost-effectiveness.*



#### ***Initial Situation: High Wear Due to Insufficient Filtration***

*At the Berlin site, high-precision components are manufactured for subsequent use in lithography machines. During an initial machining step, the components are rough-machined, generating large quantities of ceramic abrasion. Subsequent finishing processes produce extremely fine particles in the range of just a few micrometers, which have a significant impact on surface quality and dimensional accuracy.*

*Previous filtration solutions, including centrifugal technology operated in bypass mode, were unable to meet these requirements adequately. A considerable proportion of fine, highly abrasive particles remained in the process medium, causing massive wear to pumps, machining spindles and other components of the CNC machines.*

*The result was short service lives and preventive replacement intervals: spindles on machining centers were sometimes replaced annually as a precaution – at a cost of around €50,000 per machine.*



### ***Introduction of Edge Filtration Technology***

*Based on Edge Technology, Lehmann-UMT developed the idea of further enhancing the filtration process and combining systems with additional filtration stages – tailored to the specific requirements of ceramic machining. Originally single-stage systems were transformed into multi-stage installations that progressively remove ceramic particles from the oil.*

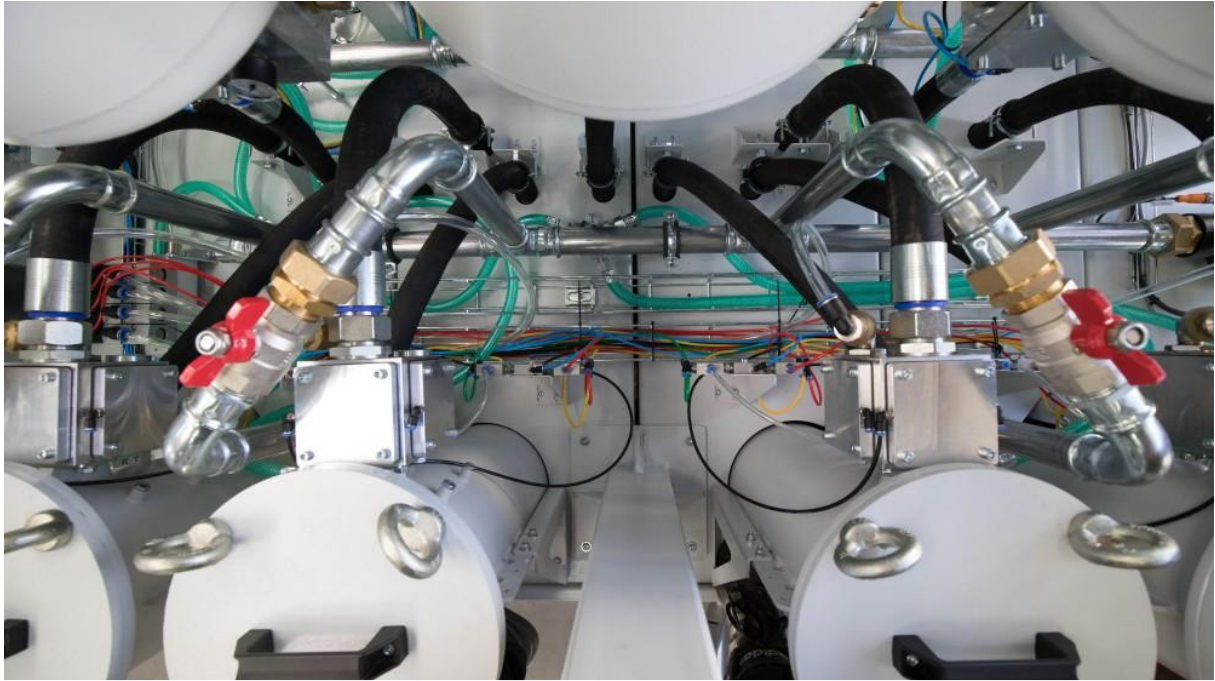
### ***Multi-Stage Filtration for Coarse and Fine Particles***

*Today, the systems used by Lehmann-UMT combine several filtration stages to reliably remove both high levels of contamination from rough machining and fine particles generated during finish grinding. Particles down to a range of 2–3 µm are filtered out.*

*The objective of this design is not only consistently high filtration quality, but also a significant extension of filter element service life while reducing energy consumption. Ceramic abrasion is considered particularly abrasive – comparable to permanent sandblasting within the system.*

*Many conventional filtration solutions fail because no stable filter cake forms or the filter elements quickly become clogged. The reusable filtration technology used here provides a technical solution that continues to function reliably even under these conditions.*

*For more than ten years, the customer has been operating over 40 Lehmann-UMT systems of this type, some of them in continuous 24/7 operation.*



### ***Significantly Extended Service Life and Increased Availability***

*The impact on machine service life is considerable. Components such as spindles, which previously had to be replaced regularly and preventively, now achieve service lives of several years. Production-related failures caused by filtration problems are now largely a thing of the past.*

*The filter elements themselves also have long service lives. In ceramic machining, they typically remain in operation for more than twelve months and are replaced based on their condition rather than on a time-based or preventive schedule. The systems independently monitor relevant process parameters and indicate when replacement is actually required. This avoids unnecessary replacement of spare parts.*