

An industry in flux and upheaval

A series of developments are currently triggering far-reaching changes in industrial **CLEANING** technology. When asked about this in an interview, Gerhard Koblenzer explains:

»The goal is not yet clear – but the new requirements are.«

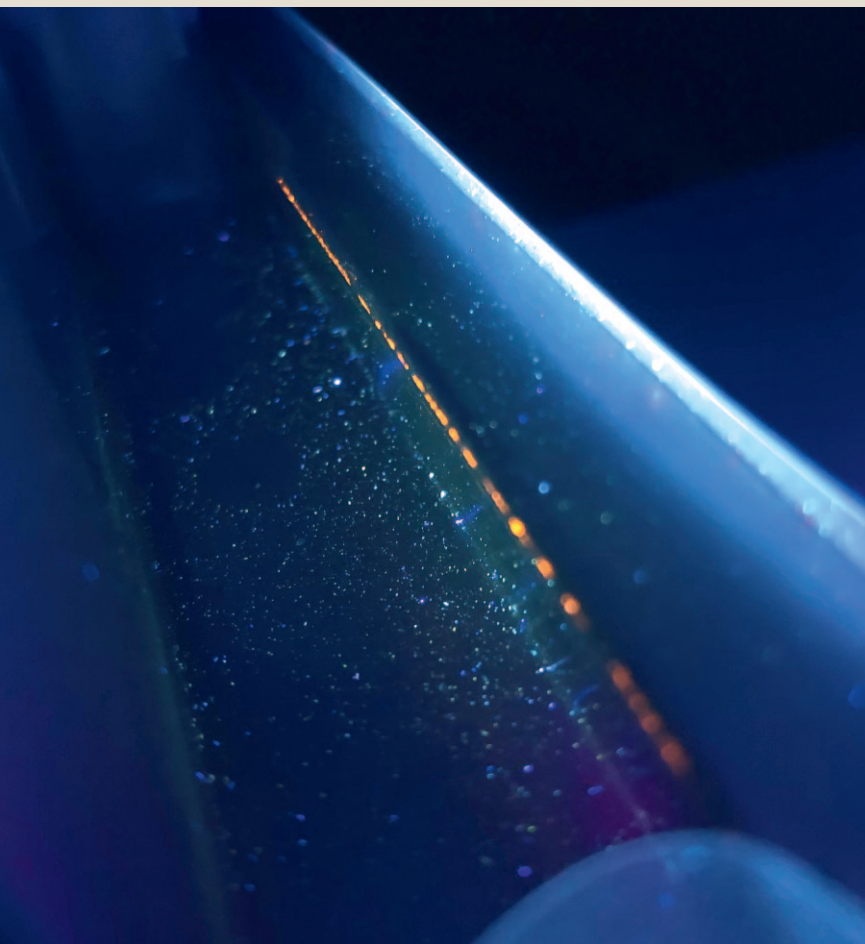


Figure 1. Ultra-fine particles in the one to two-digit µm range, made visible by UV light

For decades, German mechanical engineering has been the reliable cash cow of industry. But times have changed drastically. The industry has been suffering from a global slump in demand for some time now, which has already led to job cuts in a whole host of supply chains. The reasons for this change are manifold – demographic trends, new ways of working, digitalisation in all aspects of life, and consumer behaviour in relation to the environment and mobility, for example, all play a major role in this change. Whereas modern consumption demands a certain degree of individualisation in mass products, industrial production volumes in sectors

such as automotive are declining. Added to this are new production methods and processes, which of course also have a huge impact on industrial cleaning technology (**Figures 1 to 4**).

This all appears to be new and, above all, a lot to take in at once. However, the trends in this direction were already visible many years ago, even if it was not yet possible to predict when their effects would be felt. However, the multiple crises of the past have meant that all changes have accelerated and manifested themselves ad hoc in a very short space of time. The result: While the old and familiar is being called into question, the new goal cannot yet be clearly identified for various reasons. »The new requirements arising from the current situation are quite clear,« says Gerhard Koblenzer, CEO of LPW Reinigungssysteme GmbH, based in Riederich in Swabia, Germany (**Figure 6**). In this interview, Koblenzer reveals what we can expect from this upheaval and what manufacturers of cleaning systems need to prepare for.

microPRODUCTION: Gerhard, in your view, what is responsible for the disruption and upheaval and how does this affect industrial cleaning technology?

Gerhard: Until 2019, the automotive industry, including its various supply chains, was the main consumer of industrial cleaning systems. New mobility concepts, such as electric drive technology, fuel cells and autonomous driving, have brought about a radical shift. New developments in the combustion engine sector are now only taking place to a limited extent. This has resulted in a significant drop in investment in

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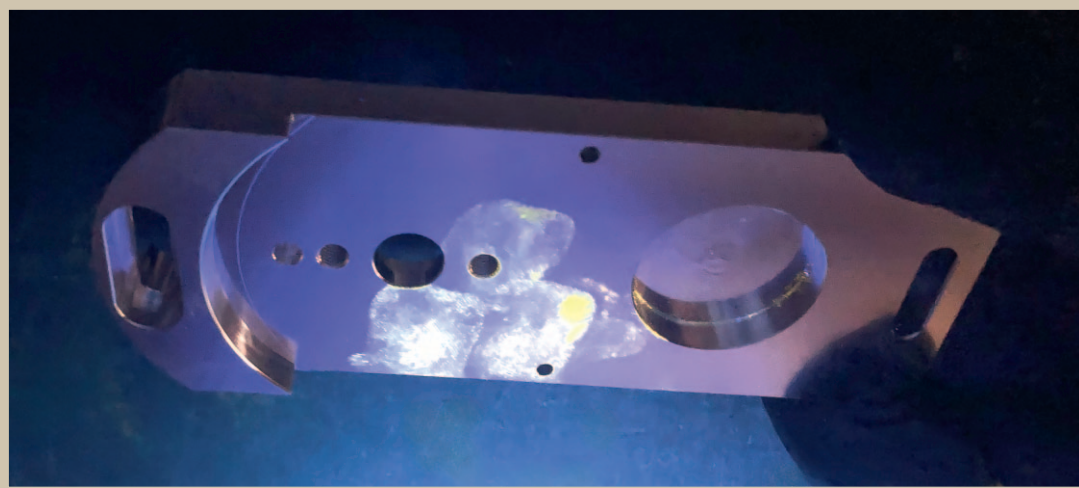


Figure 2. This is avoidable: Organic or inorganic fingerprints from handling or assembly

the corresponding systems and machines. The aforementioned new business areas are no substitute whatsoever for this loss, neither now nor in the future. This means that the cleaning technology sector is confronted with drastically different requirements in terms of technical cleanliness and, in some cases, with new players on the consumer end (Figure 5).

microPRODUCTION: How should the affected industrial sectors react?

Gerhard: The leap into new, supposedly lucrative segments, such as high vacuum technology, sensor technology or medical technology must be well planned. The first step for the companies concerned should be to think outside the box. Where have comparable requirements already been successfully implemented, including in other sectors? Where can this experience be transferred, and in which areas and fields do new solutions or processes need to be generated? Moreover, employees at all relevant levels must be trained and qualified in technical cleanliness in production and in the development of suitable cleaning processes and in monitoring/validating them. It is also necessary to communicate clearly with customers and suppliers who have demonstrable experience in the new tasks. And all this needs to take place before the actual procurement processes.

microPRODUCTION: What exactly are the new requirements?

Gerhard: The quality of the upstream processes must be reassessed and reorganised so that the higher cleanliness requirements for the compo-

nent can be achieved at all. Machining, assembly, handling, the cleanliness of the ambient conditions and the selection of suitable media all have an enormous influence. This calls for a whole new understanding of the process, including the early detection of deterioration and the traceable documentation of quality-relevant parameters. As already mentioned, this requires a new mindset and appropriate training of all those involved. Everything is different, more complex and also more expensive than before. This is why a 1:1 application of previous procedures is bound to fail.

microPRODUCTION: What advice would you give to companies that are not yet so familiar with the topic of technical cleanliness?

Figure 3. Minimal organic residues from the production processes (emulsions), made visible by UV light

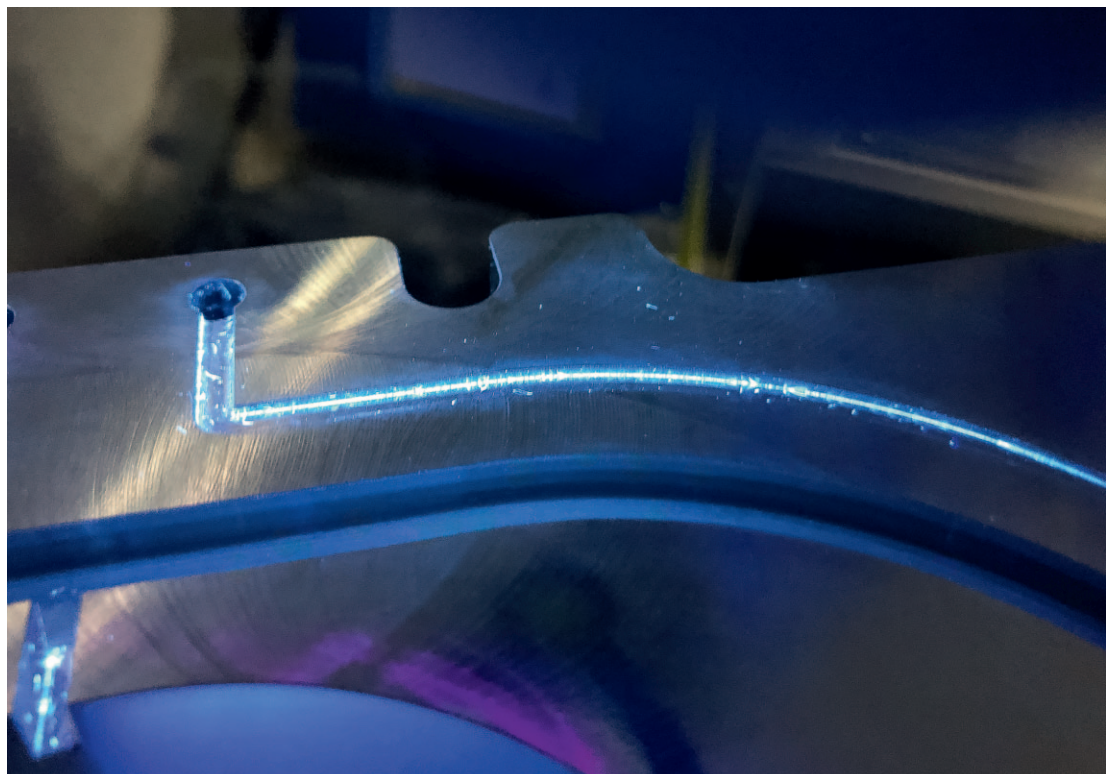




Figure 4. Cleaning agent residues made visible on a component. In high-purity cleaning, the necessary cleaning chemistry is often a major challenge in achieving high cleanliness requirements

Gerhard: It is generally advisable to get external help on board when designing new processes or evaluating and optimising existing ones. If possible, this should be done before any investment decisions are made. Even if a production process with its successive individual operations already exists, bottom-up planning should be conducted that takes the required technical cleanliness aspect into particular consideration. To begin with, this has nothing to do with

the design of a cleaning process. Rather, it is about evaluating the various factors that influence the cleanability of the component in advance. Only then can measures be configured that guarantee the required result for the respective components/assemblies right up to their place of use. In addition, it is advisable for newcomers and those making a career change to precision and ultra-fine cleaning not to start with the most ambitious cleaning tasks straight away. Taking a step-by-step approach with a correspondingly adapted investment plan allows the company to build up a learning curve accompanied by a success curve.

microPRODUCTION: How are you dealing with this globally changed situation at LPW?

Gerhard: We were already dealing with the impending change processes in the industrial sectors relevant to us worldwide more than ten years ago, and we have gradually adapted our structures, products and services accordingly. The assimilation

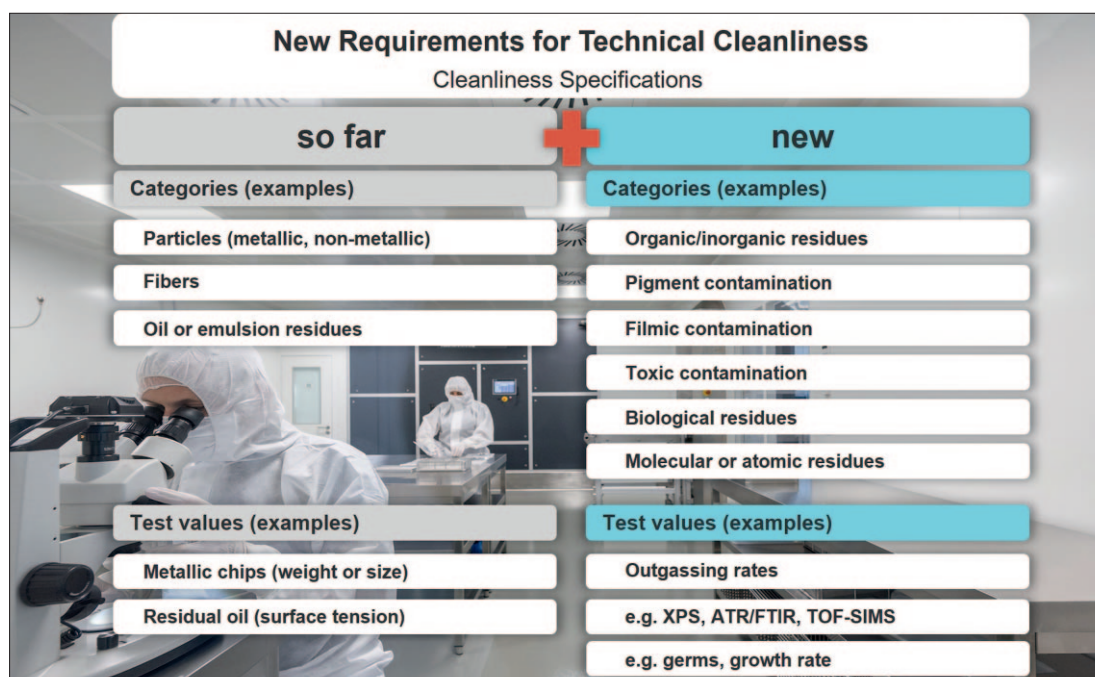


Figure 5. The many changes have led to new requirements for technical cleanliness



Figure 6. Gerhard Koblenzer is CEO of LPW Reinigungssysteme GmbH and knows the answers to current challenges

of machine and process technology was our first priority. In parallel we also trained our employees. We then expanded the infrastructure by setting up ultra-clean test and trial areas in order to significantly expand our range of services. This includes our application engineering to support our customers in the planning and optimisation of ultra-clean production

processes. We also have a cleanroom-based contract cleaning service specifically for the new tasks. Furthermore, we have developed standard system concepts over the past year that allow our small and medium-sized industrial customers to make step-by-step investments for which we can provide them with technical support. We are currently working on bringing new systems to market for validated monitoring.

> CHECKLIST

Questions to address when attempting to achieve a high level of technical cleanliness

If customer or new cleanliness requirements make it necessary to adapt processes to a higher level of technical cleanliness, the following considerations will help you to implement them:

- What specific cleanliness requirement is the new task based on, and do I know when and where it is actually required?
- Do my staff have sufficient knowledge of the processes and are they technically qualified?
- Do I know how the upstream processes affect the feasibility of these requirements?
- Is my existing cleaning system capable of reliably performing the required cleaning task in the process?
- Are the environmental parameters suitable to prevent unwanted cross-contamination?
- Is the quality of the media provided (such as water, air, compressed air) sufficient for the requirements?
- Can the cleanliness achieved be maintained through to the final point of use?
- Can I recognise changes that could have a negative impact on the overall process result at an early stage?
- Are the quality-related individual steps subject to traceable monitoring?

microPRODUCTION: Would you be so bold as to predict the future? What do we need to be prepared for?

Gerhard: Higher and constantly changing requirements will define day-to-day life in the coming years. On top of this there will be major fluctuations in the respective market segments. As I mentioned earlier, it is impossible to identify a definitive goal or adopt the usual linear approach. Humans are creatures of habit, so dealing with particulate pollution in the context of the then existing drive concepts, for example, was common practice for industry players. But now, similar to the late 1990s, greater flexibility and a more analytical approach are required again. In a sense, we are going back to our roots, focussing on the fundamentals of industrial cleaning technology and technical cleanliness in production processes. This has been forgotten in many places due to daily automotive practice. Now this knowledge and the corresponding approaches need to be revived and brought back to the fore. And that in itself has a certain appeal, does it not? ■