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20 years in the business for industrial parts cleaning – From "washing parts" to high-purity cleaning

You can't make an omelet without breaking eggs – according to the saying, almost every manufacturing or processing company and institution is aware of the relevance of cleaning and the strong influence of contamination in process chains. In the world of the Fraunhofer Institutes, too, the question of cleaning processes and associated competences arose in the 2000s. This was soon followed by the birth of the Fraunhofer Cleaning Alliance. This group is now celebrating its 20th anniversary. Up to now, a wide variety of Fraunhofer institutes and facilities have been developing cleaning processes for a broad range of industrial challenges, using innovative technologies. At parts2clean 2023 in Stuttgart, Germany, at the Fraunhofer joint booth no. D28, in hall 10 and during the expert forum will be present the newest cleaning technologies and services.

This year, the Fraunhofer-Business Area Cleaning looks back on 20 years of successful research and development in the field of industrial parts cleaning - an occasion for a review of highlights and achievements to date, but also to take a look at many current developments and research results and to look ahead to the future.



None of the now 77 institutes and facilities of the Fraunhofer-Gesellschaft has dedicated itself exclusively to the industrial cleaning of surfaces, but there are many institutes that, due to their technological focus, inevitably have to deal with cleaning processes in order to be technologically successful.

However, this technological competence has hardly any external visibility. This situation already existed in 2001, which is why Dr. Konrad Wissenbach from the Fraunhofer ILT started an internal Fraunhofer survey to find out who was actually involved in cleaning processes and who was interested in working together. This initial contact finally led to the founding of the Fraunhofer-Cleaning Alliance on December 5, 2002. The founding members were the Fraunhofer Institutes FEP, ICT, IGB, ILT, IPA, IPK, IST and IWS.

The establishment of an administrative office at Fraunhofer IPK as a central point of contact for interested partners and customers of the member institutes and the launch of a dedicated website for the visibility of competences, laboratory opportunities and business areas were the basis for a successful start of this long-term cooperation.

parts2clean and expert forum with bundled Fraunhofer competence from the very beginning

A significant activity of the newly founded alliance in its very first year was the joint planning and successful start of the trade fair parts2clean in Friedrichshafen, Germany, which was launched in 2003. From the very beginning, today's Fraunhofer-Business Area Cleaning has been involved in the technical orientation of parts2clean, which has been able to successfully assert itself on the market and thus can also celebrate its 20th anniversary this year together with the current organizer – Deutsche Messe AG. In particular, the accompanying parts2clean expert forum has been the trade fair's visitor magnet from the very beginning. The expert forum is currently organized and moderated by the Fraunhofer-Business Area Cleaning together with the German Industrial Parts Cleaning Association "Fachverband industrielle Teilereinigung e.V. (FiT)". Featuring three days of events and 58 lectures, it continues to form a stable backbone of parts2clean as the largest expert event in this field.

Innovations and standardization with applied research

The member institutes of the Fraunhofer-Business Area Cleaning have implemented and continue to implement innovative trends and developments in this cross-industry technology, thus often enabling the mastering of new industrial challenges. Some examples of this are uniform standards through the VDA19 series, high-resolution imaging detection of residual contamination, blasting processes with CO₂ and lasers, AI-supported cleaning processes through to environmentally friendly cleaning media. Currently, a DIN standardization committee is also working on issues of standardization and assistance for the targeted processing of cleaning tasks.

Around the year 2000, no one could have imagined that automotive production would also require work in cleanrooms, but such assembly and cleaning processes are now required on a large scale for the safe functionality of many assemblies. Even sheet metal fabricators are increasingly delivering to end customers who demand cleanroom quality for the parts they supply. Although the term "washing parts" still persists, today's cleaning processes increasingly have the character of precision surface finishing.

To make the right decisions for development strategies in the field of industrial parts cleaning, detailed knowledge of the market is an essential basis. This is why Fraunhofer-Business Area Cleaning conducts regular market surveys and publishes the results as a market study. After 2007 and 2012, the last survey was conducted in 2020 in the middle of the market situation shaken by Corona. This made it possible to collect additional information on the resilience of the parts cleaning industry, which is valuable for strategic decisions.

Underestimated knowledge - industrial parts cleaning

The development of the Fraunhofer-Business Area Cleaning is seamlessly linked to the endeavor to impart knowledge in the field of industrial parts cleaning, an area that was still an underdeveloped area on the ground 20 years ago. In addition to several special seminars on sub-topics of industrial parts cleaning at the member institutes, a joint annual basic seminar has been held in Dresden, Germany, since 2009.

Frank-Holm Rögner, current spokesperson of the Fraunhofer-Business Area Cleaning and a pioneer in this field, explains: "This three- or four-day series of events is an important element for knowledge transfer and has already received a lot of positive feedback. We have also been able to maintain the seminar as an online format during the corona period. However, it can only convey the basics of cleaning processes in a very condensed form. There has been a demand among us and many interested partners for more comprehensive training, because unfortunately professional training does not yet exist in this specialist area."

Intensive efforts by the Fraunhofer FEP in this direction resulted in the approval of the "CLOU" project funded within the framework of the InnoVET competition after approximately eight years, on 01.02.2021.

"Among other things, the concept of an extra-occupational training to become a 'Certified professional Specialist (m/f/d) for industrial Parts Cleaning' is now being developed and currently being tested together with the Sächsische Bildungsgesellschaft für Umweltschutz und Chemieberufe Dresden mbH (SGB). This is a milestone for this industry!" continues Frank-Holm Rögner enthusiastically.

The Fraunhofer Institutes FEP, IGB, IGCV, IPA, IPK, IPM, IST, IVV and IWS are currently members of the Fraunhofer-Business Area Cleaning. Since 2019 the administrative office is located at the Fraunhofer FEP in Dresden and continuously takes care of the ongoing development of the expert forum at parts2clean and other seminars and events for all partners who have a need and interest in knowledge and developments as well as technologies in the field of industrial parts cleaning.

For individual challenges that require the development of a specific cleaning solution, the office connects the respective right contact person among the Fraunhofer Institutes and is available to companies and partners for everything starting with consulting and feasibility studies up to the development of customized solutions or machines.



20 years Fraunhofer Business Area Cleaning

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**Fraunhofer Business Area Cleaning at parts2clean from the very beginning
(left: 2003, right: 2022)**

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Fraunhofer - Business Area Cleaning at parts2clean 2023

26-28 September 2023, Stuttgart Exhibition Center
Hall 10, booth no. D28
www.reinigung.fraunhofer.de

Expert forum at parts2clean

Numerous presentations by members of the Fraunhofer - Business Area Cleaning await you at the parts2clean expert forum. You can find more information at:
<https://www.parts2clean.de/event/parts2clean-fachforum/for/105967>

This is what you can expect at the Fraunhofer joint booth:

- Hydrophobic coatings on ultra-thin glass
- Phase fluids for parts cleaning
- Cleaning for remanufacturing
- CAPE® - the mobile cleanroom concept
- PuriCheck, automated determination of technical cleanliness
- AI-based image processing around the cleaning process
- F-Camera mini
- F-Scanner 1Dmini on the robot
- Co-Control 3D
- CleanAssist
- The variety of the multitool laser
- Professional training to become a "Certified professional Specialist (m/f/d) for industrial Parts Cleaning".

Celebrate our anniversary with us:

We will celebrate our anniversary together with you during a trade fair breakfast on 28 September 2023, starting at 08:00 am. We ask for an informal registration by email to reinigung@fep.fraunhofer.de.

The **Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP** works on innovative solutions in the fields of vacuum coating, surface treatment as well as organic semiconductors. The core competencies electron beam technologies, roll-to-roll technology, plasma-activated large-area and precision coating as well as technologies for organic electronics and IC design provide a basis for these activities. Thus, Fraunhofer FEP offers a wide range of possibilities for research, development and pilot production, especially for the processing, sterilization, structuring and refining of surfaces as well as OLED microdisplays, organic and inorganic sensors as well as optical filters. Our aim is to seize the innovation potential of the electron beam, plasma technology and organic electronics for new production processes and devices and to make it available for our customers.