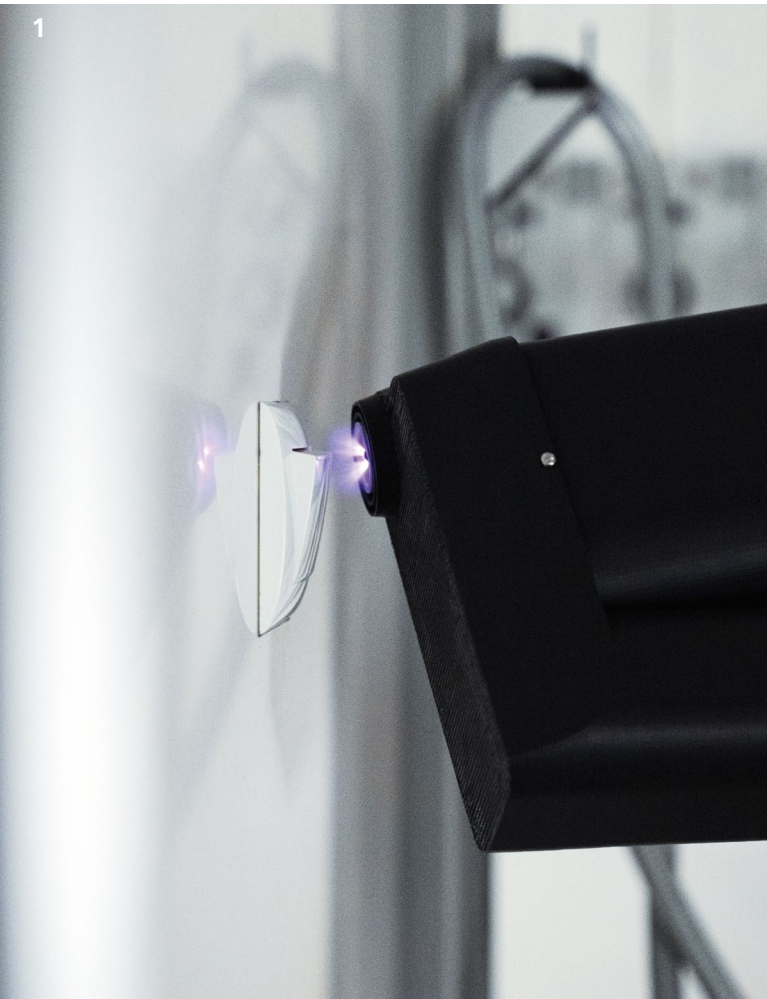


## From research

# Automated cleaning and pretreatment

The COVID-19 pandemic has clearly demonstrated the importance of quick and easy cleaning and disinfection systems in our everyday lives. In public buildings, medical facilities or in the mobility sector: everywhere, there is an indispensable need for sustainable surfaces which can be cleaned as easily as possible. The Fraunhofer IST is therefore working on the development of automated procedures which are adapted to the surface and the soiling in order to ensure efficient and material-friendly cleaning.



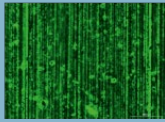
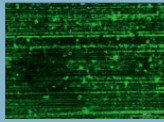
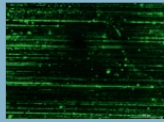
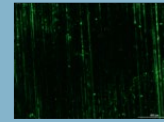
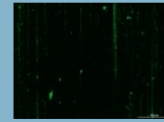
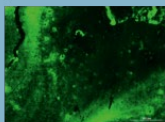
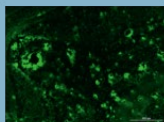
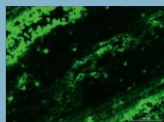
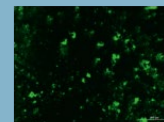
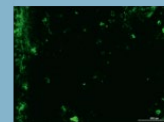
## Sustainable solutions for clean surfaces

Indoor spaces or the interiors of vehicles are characterized by a high diversity of materials and different geometries. Materials with a high-quality appearance, functional surfaces with touch functions, and textiles are exposed to the most varied stresses and requirements. Optimal cleaning procedures designed to ensure the longevity of the materials and surfaces are extremely complex, as in many cases a different cleaning agent has to be used for each surface. This causes high costs, major environmental pollution and often also leads to errors that can result in irreversible damage to the surfaces.

## Multifunctional surfaces and innovative self-sufficient cleaning systems

At the Fraunhofer IST, we offer customer-specific solutions for multifunctional surfaces which possess, for example, antimicrobial, dirt-repellent or flame-retardant properties. We thereby employ comprehensive surface analytics and are therefore able to evaluate, amongst other factors, the layer composition and stability as well as wetting and microbiology. In addition, we are developing new cleaning systems and sensors.

*Compact plasma source with integrated high-voltage generator and extraction system with ozone filter for cleaning and pre-treatment.*

Time [s]	10	30	60	120	300
Stainless steel					
Silicon wafer					

Verification of the cleaning effect for triglycerides (cf. skin fat) by means of fluorescence studies following plasma treatment.

This includes the development of compact plasma sources that can be integrated into robot-guided and mobile self-sufficient systems, as well as systems for the in-situ production of ozonated water.

### Outlook: Automated cleaning

Comprehensive knowledge of surface and material properties as well as different cleaning systems makes it possible to offer cleaning procedures adapted to the particular problem. In the future, sensors for the identification of material and soiling are to be integrated into the cleaning systems in order to develop automated cleaning procedures that are data-based and adapted to the material and the soiling, as well as new surfaces that can be optimally cleaned.

### The project

The “MobDi” project is part of the “Fraunhofer vs. Corona” action program, which supports numerous other pandemic response initiatives.



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