

# PRESS RELEASE

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## **Robust and application-oriented: A new industrial standard for determining the photocatalytic activity of surfaces**

**Everything spotless – almost without cleaning! Who would not want that? Particularly in the sanitary area, self-cleaning ceramics and tiles or glass for shower cubicles can not only make everyday tasks much easier but also prolong the service life of the products.**

This self-cleaning effect is achieved, for example, through the use of photocatalytically active materials or surface coatings. When light of the appropriate wavelength falls on the photocatalytically active surface, organic contaminants are decomposed. There is also an additional secondary effect: The light causes a so-called “hydrophilization” of the surface, making it “water-loving”, for example water forms a film that can infiltrate the dirt particles, enabling them to be rinsed off more easily. In order to be able to compare the photocatalytic activity of different products, the German industrial standard DIN 52980:2008 is applied, whereby the verification is carried out via the degradation of methylene blue. In the past, strong fluctuations of the measurement results occurred repeatedly in practice, and a number of weak points in the current method have also been pinpointed in the scientific literature.

“For the Fraunhofer Institute for Surface Engineering and Thin Films IST, this was an incentive to work in collaboration with partners from industry and research in order to develop a robust and application-oriented German industrial standard for characterizing the photocatalytic activity of surfaces,” explains Frank Neumann, Head of the Working Group Photo- and Electrochemical Environmental Engineering. “The cooperation project was also an excellent opportunity for MRC to take up exciting approaches from research in order to introduce them into standardization work together with our long-standing partners and to transfer them into new product ideas,” confirms Dr. Marcus Götz, Managing Director of MRC Systems GmbH in Heidelberg.

Within the framework of the BMWi-funded project, the partners MRC Systems GmbH (Heidelberg), BCE Special Ceramics GmbH (Mannheim), the Forschungsinstitut Glas/Keramik FGK (Höhr-Grenzhausen) and the Fraunhofer IST (Braunschweig) examined the specifications of the previous measurement methodology and subsequently formulated proposals for adaptations and amendments in a draft revision of the standard.

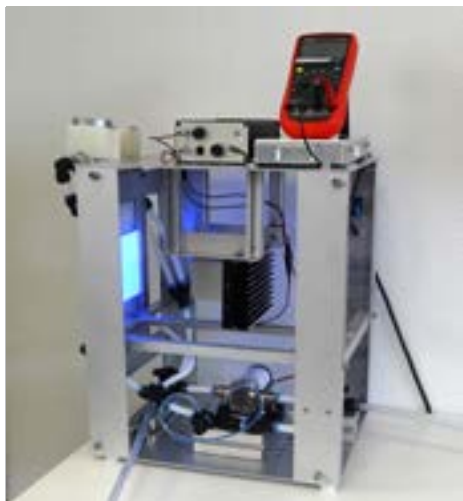
**FRAUNHOFER INSTITUTE FOR SURFACE ENGINEERING AND THIN FILMS IST**

In addition to a new procedure for large-format samples, new standards were hereby also developed and characterized as well as investigated with regard to their reusability. They are composed of long-term stable ceramics with defined graded photocatalytic coating. A round-robin test coordinated by the Fraunhofer IST shows that the measurement results when utilizing the new application-oriented standard and the new test methodology are significantly more precise and reliable than with the original procedure: The coefficient of variation of the reproducibility is now only 4.95 percent as opposed to the original 30.6 percent. The Fraunhofer IST and the Forschungsinstitut Glas/Keramik (FGK) are actively involved in the Photocatalysis Working Committee of the German Institute for Standardization DIN. During the project, there was already a consistent close exchange taking place with the institutions and industrial companies represented there in order to ensure the practical suitability of the obtained results.

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The realization of the research project “Entwicklung eines robusten und anwendungsnahen deutschen Industriestandards zur Bestimmung der photokatalytischen Aktivität von Oberflächen – DePhakto” (Development of a robust and application-oriented German industrial standard for the determination of the photocatalytic activity of surfaces – DePhakto) was made possible through funding within the framework of the program “WIPANO – Wissens- und Technologietransfer durch Patente und Normen” (WIPANO – Knowledge and technology transfer through patents and standards) with funds from the Federal Ministry for Economic Affairs and Energy – BMWi with the funding code FKZ 03TNG016C.



**Prototype of the measuring facility for large-format samples. ©MRC Systems GmbH**



**Prototypes of ceramic photocatalysis standards. ©FGK**

The **Fraunhofer Institute for Surface Engineering and Thin Films IST** is an innovative partner for research and development in surface technology, with expertise in the associated product and production systems. The aim is to develop customized and sustainable solutions: from prototypes, through economic production scenarios, to upscaling to industrial magnitudes – and all this whilst maintaining closed material and substance cycles. The Fraunhofer IST is one of the seventy-five institutes of the Fraunhofer-Gesellschaft, Europe’s leading research organization.