Photocatalytic coatings, such as titanium dioxide (TiO₂), are suitable for manifold applications due to their potential for decomposing a great variety of substances and materials. In the open air, photocatalytic active coating systems are able to reduce environmental contaminations and to clean surfaces of various materials.

Examples for cleaning effects are:
- Degradation of contaminants, such as deposition of exhaust emissions
- Antimicrobial effects, e.g. towards bird droppings
- Suppression of algal growth

Quality and Environmental Friendliness –

Laboratory testing

Investigations on a laboratory scale are cost-effective tools for demonstrating specific photocatalytic activities: large numbers of test specimens can be tested in parallel screening tests. Experiments with simulated sunlight allow environmentally relevant statements. Large-scale screens allow different coatings to be tested against many different pollutants and their activities compared. Such pollutants may include:
- Organic compounds: biogenic hydrocarbons and terpenes, anthropogenic hydrocarbons
- Particle-bound organic compounds: polycyclic aromatic hydrocarbons, polychlorinated dibenzo-p-dioxins
- Biological contaminations: organic depositions such as bird droppings or algae

Preparatory steps for testing the efficiency towards the growth of algae.
Quality and Environmental Friendliness –

Testing under outdoor conditions

The large-scale testing of photocatalytic coatings under outdoor conditions provides valuable information about the behavior and performance of such coatings in their normal operating environments. This generates data of much higher environmental relevance than laboratory tests.

Time-lapse effects, e.g. taking temperature fluctuations into account, can be included in the test strategy. Moreover, coated and uncoated materials can be tested comparatively to underline the advantages of specific photocatalytic active coating systems.

The large grounds of the Fraunhofer Institute for Molecular Biology and Applied Ecology IME make it possible to use specifically adapted or constructed experimental facilities. Controlled areas allow the application of isotopically labeled substances enabling the quantitative determination of the transformation or degradation of pollutants. The altitude of the IME and its location in a pure air area offer favourable prerequisites for intensive UV-irradiation.

With the aid of chemical and biological / ecotoxicological analysis the product specific activity and the ecotoxicological environmental impact can be determined and assessed in detail.

Your Advantage

- We provide a product specific documentation about the photocatalytic efficiency.
- The experimental designs will be specifically adapted to your product.
- All experimental scales from laboratory testing (screening) to outdoor experiments can be made available.
- We provide advice and consultation on relevant legislation.

Our Services

- We offer a large spectrum of investigations and an individual investigation programme.
- We offer comprehensive and competent consulting.

Laboratory investigations

- Documentation of the decomposition of manifold depositions and the self-cleaning effect of photocatalytic coatings
- Rapid product assessment

Testing under field conditions

- Scientific documentation of the advantages of specific coating systems
- Documentation of the environmental friendliness

Spectrum of investigations

- Inorganic and organic analysis (as sum parameters or substance specific)
- Application of $^{14}$C-labeled compounds to solve specific problems
- Ecotoxicological analysis

Testing under outdoor conditions: Cultivation of algae – application – device for the collection of rain water.