

### Standards and associations

#### Standards for air-purification and standards in preparation

##### **ISO 22197-1:2007**

Fine ceramics (advanced ceramics, advanced technical ceramics) - Test method for air-purification performance of semiconducting photocatalytic materials – Part 1: Removal of nitric oxide

##### **ISO 22197-2:2011**

Fine ceramics (advanced ceramics, advanced technical ceramics) - Test method for air-purification performance of semiconducting photocatalytic materials - Part 2: Removal of acetaldehyde

##### **ISO 22197-3:2011**

Fine ceramics (advanced ceramics, advanced technical ceramics) Test method for air-purification performance of semiconducting photocatalytic materials Part 3: Removal of toluene

##### **ISO/CD 22197-4**

Fine ceramics (advanced ceramics, advanced technical ceramics) Test method for air-purification performance of semiconducting photocatalytic materials Part 4: Removal of formaldehyde

##### **ISO/CD 22197-5**

Fine ceramics (advanced ceramics, advanced technical ceramics) Test method for air-purification performance of semiconducting photocatalytic materials Part 5: Removal of methyl mercaptan

##### **ISO/WD 22197-6**

Fine ceramics (advanced ceramics, advanced technical ceramics) - Test method for air-purification performance of semiconducting photocatalytic materials - Part 6: Removal of formaldehyde under indoor lighting condition by test chamber method

#### Standards for water-purification

##### **ISO 10676:2010**

Fine ceramics (advanced ceramics, advanced technical ceramics) Test method for water purification performance of semiconducting photocatalytic materials by measurement of forming ability of active oxygen

#### Standards for light sources in preparation

##### **ISO/FDIS 10677**

Fine ceramics (advanced ceramics, advanced technical ceramics) Ultraviolet light source for testing semiconducting photocatalytic materials

##### **ISO/CD14605**

Fine ceramics (advanced ceramics, advanced technical ceramics) Visible light source for testing semiconducting photocatalytic materials

#### Microbiological Standards and standards in preparation

##### **ISO 27447:2009**

Fine ceramics (advanced ceramics, advanced technical ceramics) Test method for antibacterial activity of semiconducting photocatalytic materials

##### **ISO/DIS 13125**

Fine ceramics (advanced ceramics, advanced technical ceramics) – Test method for antifungal activity of semiconducting photocatalytic materials

##### **ISO/WD 17094**

Fine ceramics (advanced ceramics, advanced technical ceramics) - Test method for antibacterial performance of semiconducting photocatalytic materials under indoor lighting environment

### Standards for self-cleaning

#### ISO 10678:2010

Fine ceramics (advanced ceramics, advanced technical ceramics) Determination of photocatalytic activity of surfaces in an aqueous medium by degradation of methylene blue

#### ISO 27448:2009

Fine ceramics (advanced ceramics, advanced technical ceramics) Test method for self-cleaning performance of semiconducting photocatalytic materials – Measurement of water contact angle

No standards have yet been published in the European context, but they are currently being elaborated by the national committees. However, national standards already exist in a number of Member States, e.g. Germany's DIN 52980:2008 on the determination of photocatalytic activity by degradation of methylene blue.

#### CEN / TC 386 (Photocatalysis)

(European committee for standardization )

- WG1 „Terminology”
- WG2 „Air-purification”
- WG3 „Water-purification”
- WG4 „Self-cleaning”
- WG5 „Medical applications”  
– closed
- WG6 „Light sources”
- WG7 „New technologies”
- WG8 „Microbiological applications”

### Health and safety information

The Occupational Exposure Standards (OES) for titanium dioxide in the air at the workplace have been set at 3 mg/m<sup>3</sup> total respirable dust <sup>[1]</sup>. Titanium dioxide is not expected to have any mutagenic, carcinogenic, fibrogenic, toxic or allergenic effects if this value is adhered to.

[1] Data checked by the Titanium Dioxide Manufacturers Association Technical & Environmental Committee, a sector group of CEFIC.

Within in the discussion concerning the directive of biocidals, the European Commission has stated, that the photocatalysts based on titanium dioxide act during the abatement processes as a pure catalyst and is not consumed within the reactions (“Manual of decisions for implementation of Directive 98/8/EC concerning the placing on the market of biocidal products”, last changes: July 10th, 2008). Photocatalysis is a process using a photo-physical effect and has not to be treated according to the directive of biocidals.

### Registrations and standards

EINECS No.: 236-675-5 titanium dioxide  
CAS No.: 13463-67-7  
International  
Standard: ISO 591-2001

The International Standard divides titanium dioxide pigments into two types, which are then classified in groups:

Type A, anatase / Group A

Type R, rutile / Group R

Photocatalysts belong to the subtype A1

### REACH

All the requirements of REACH Regulation 1907/2006/EC are met. Pre-registration for KRONOS TiO<sub>2</sub> was completed punctually. The Pre-Registration No. - and the Registration No. following registration - can be found in the current Safety Data Sheet for TiO<sub>2</sub>. These declarations are valid for all KRONOS locations in Europe.