

# KRONOS<sup>®</sup>

## specialities

### KRONOClean product range

**KRONOClean 7000** is a photocatalyst displaying not only activity in UV radiation, but also pronounced photoactivity in visible light. It is suitable for use in applications for eliminating unwanted odours (e.g. kitchen smells) and soiling on surfaces (e.g. nicotine), for air purification (amines, aldehydes, nitrogen oxides, mercaptans, etc.) and for improving room air quality (interior paints) in conjunction with paper, plastic films, window profiles, fibres, etc.

**KRONOClean 7050** is a photocatalyst designed for use in conjunction with UV radiation. It is suitable for eliminating unwanted odours (e.g. vehicle emissions) and soiling on surfaces (e.g. soot), for air purification (nitrogen oxides, sulphoxides, chlorinated hydrocarbons, etc.) and for improving air quality (exterior paints) in conjunction with plastic films, window profiles, paints, fibres, etc.

Titanium dioxide photocatalysts KRONOClean	Standard classification <sup>1</sup>	Stabilised with compounds of these elements	TiO <sub>2</sub> -content <sup>2</sup> min. [%]	Density <sup>2</sup> [g/cm <sup>3</sup> ]	Bulk density <sup>3</sup> [kg/m <sup>3</sup> ]	Oil absorption (ISO 787/5)
<b>KRONOClean 7000</b>	A1	-	87.5	2.9	350	~67
<b>KRONOClean 7050</b>	A1	-	85.0	2.9	300	~61

**1** The classification A1, A2, R1, R2, R3 corresponds to DIN EN ISO 591, Part 1.

**2** The titanium dioxide content and density of the pigments depend on the type and quantity of the treatment substances used to improve the application properties. Pure rutile has a density of 4.2, while pure anatase has a density of 3.8.

**3** The bulk densities of the pigments are approximate values and may vary, depending on the storage conditions.

## KRONOClean<sup>®</sup> 7000

TiO<sub>2</sub>-photocatalyst

degrades pollutants with visible light and with UV radiation

### Applications

**KRONOClean 7000** is optimised for high photoactivity and can be used:

to eliminate unwanted odours (e.g. in the kitchen) and degrade dirt on surfaces (e.g. nicotine)

for air purification (amines, aldehydes, nitrogen oxides, mercaptans, and similar)

for room deodorisation (interior paints)

in coatings, plastic films, window profiles, fibres, concrete, etc.

### Properties

#### KRONOClean 7000

- is an ultra-fine TiO<sub>2</sub> with no pigmentary properties
- catalyses the degradation of organic and inorganic molecules when irradiated with visible light, as well as UV radiation
- is a pale-beige powder and has virtually no colouring properties in the quantities generally required
- is resistant towards air, moderate temperatures and pH values between 4 – 9
- successfully suppresses the formation of NO<sub>2</sub> (more than 80%) compared to conventional TiO<sub>2</sub>-catalysts

### Product Characteristics (typical)

TiO <sub>2</sub> -Content (ISO 591)	> 87.5 %
Crystal modification	anatase
Density (ISO 787, Part 10)	3.9 g/cm <sup>3</sup>
Crystallite size	approx. 15 nm
Specific surface area (BET)	> 225 m <sup>2</sup> /g
Bulk density	350 g/l
Oil absorption <sup>1</sup>	~ 67 g/100 g
Water demand <sup>1</sup>	~ 210 g/100 g
Max. processing temperature	200 °C
Application pH-range	4 – 9

## KRONOClean<sup>®</sup> 7050

TiO<sub>2</sub>-photocatalyst

degrades pollutants with UV radiation

### Applications

**KRONOClean 7050** is optimised for photoactivity in UV radiation and can be used:

to eliminate unwanted odours (e.g. automotive exhaust gases) and degrade surface soiling (e.g. soot)

for air purification (nitrogen oxides, sulphoxides, chlorinated hydrocarbons, and similar)

for air deodorisation (exterior paints)

in plastic films, window profiles, paints, concrete, etc.

### Properties

#### KRONOClean 7050

- is an ultra-fine TiO<sub>2</sub> with no pigmentary properties
- catalyses the degradation of organic and inorganic molecules when irradiated with UV radiation
- is a white powder and has virtually no colouring properties in the quantities generally required
- is resistant towards air, moderate temperatures and pH values between 3 and 11
- suppresses the formation of NO<sub>2</sub> (more than 70%) compared to conventional TiO<sub>2</sub>-catalysts

### Product Characteristics (typical)

TiO <sub>2</sub> -Content (ISO 591)	> 85.0%
Crystal modification	anatase
Density (ISO 787, Part 10)	2.9 g/cm <sup>3</sup>
Crystallite size	approx. 15 nm
Specific surface area (BET)	> 225 m <sup>2</sup> /g
Bulk density	300 g/l
Oil absorption <sup>1</sup>	~ 61 g/100 g
Water demand <sup>1</sup>	~ 280 g/100 g
Max. processing temperature	500 °C
Application pH-range	3 – 11

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Comparison/Product	KRONOClean 7000	KRONOClean 7050
Colour	Beige powder	White powder
Fields of application	Indoor and outdoor applications	Outdoor applications
Cut-off wavelength [nm]	535	388
NO degradation, UV* [mmol/(h·m <sup>2</sup> )]	74.0	84.0
NO <sub>x</sub> degradation, UV* [mmol/(h·m <sup>2</sup> )]	57.8	33.2
NO degradation, Vis** [mmol/(h·m <sup>2</sup> )]	24.6	1.4
NO <sub>x</sub> -degradation, Vis** [mmol/(h·m <sup>2</sup> )]	19.2	1.0
Acetaldehyde degradation, UV* [mmol/(h·m <sup>2</sup> )]	34.8	38.2
Acetaldehyde degradation, Vis** [mmol/(h·m <sup>2</sup> )]	0.6	0.1

\* Radiation intensity 10 W/m<sup>2</sup> → Mean UV radiation in a Central European year

\*\* Radiation intensity 1700 lux → Typical office lighting

## Composition

Titanium dioxide is chemically inert and insoluble in aqueous and organic solvents. Hot, concentrated sulphuric acid or hydrofluoric acid, or acidic or alkaline melts, are needed for the digestion process, e. g. for analysis.