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# ACTIVE PAINTS TO IMPROVE INDOOR AIR QUALITY

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Forest based composites for façades and interior partitions to improve indoor air quality in new builds and restoration



# Indoor Air Quality (IAQ)

Impact on  
human health  
and comfort

## Factors

- Particles
- Microbes
- Chemicals, e.g.  $\text{NO}_2$ , VOC
- Humidity
- Ventilation
- Temperature



Source: [www.baulinks.de](http://www.baulinks.de)

## Emission sources

- Construction material
- Furniture
- Paints
- Cleaning agents
- Pets
- Pollutants from outside



There is no „typical indoor environment“

# Common methods to improve IAQ

- Controlling pollution sources
- Increasing ventilation rates
- Using air purifiers
- New: photocatalytic remediation technology to eliminate pollutants



TiO<sub>2</sub> is a widely used photocatalyst to eliminate organic and inorganic pollutants



Idea: incorporation in paints, that can be applied on different surfaces inside buildings



Source: GSky Plant Systems, Inc.; Gsky.com



© netcomposites

# Some available active (?) interior paints

Company	Product
Caparol	CapaSan
Auro	Airfresh wallpaint No. 328
Dyo	Nano / Nanotex
Sto	StoColor Climasan
Amnova	LUNO - Active Paint
Wolfgruben Werke	W545



# Some available active (?) interior paints

- Certificates available → methods and conditions not described



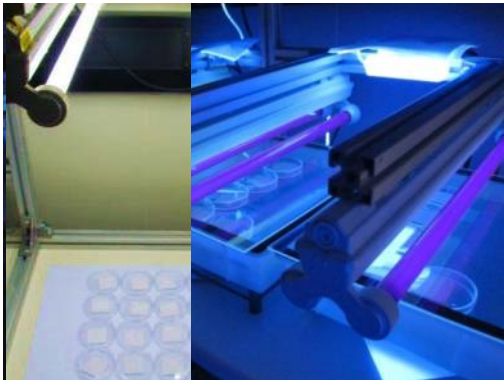
# Some available indoor active (?) TiO<sub>2</sub> powders

Company	Comments
Sigma Aldrich <ul style="list-style-type: none"><li>Aeroxide P 25 (Degussa)*</li><li>China Reagent plus</li><li>Canada</li></ul>	21 nm particle size Not specified 99,8 % Anatas
Sachtleben <ul style="list-style-type: none"><li>Hombikat UV 100</li></ul>	Not specified
Kronos Titan GmbH <ul style="list-style-type: none"><li>VLP 7000</li></ul>	Anatas

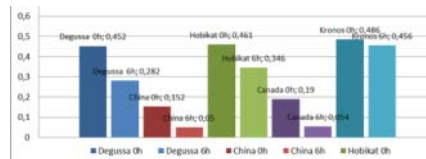
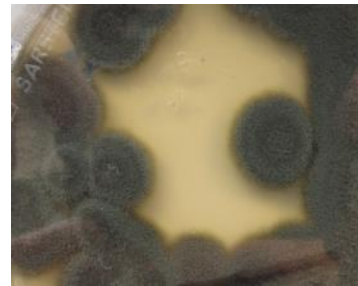
▶ No comparable data for photocatalytic indoor activity of paints and powders available.

# Our approach

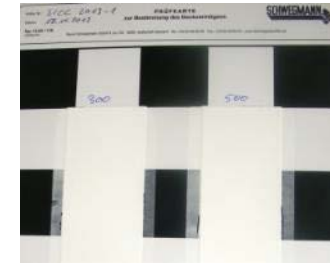
Development of appropriate methods



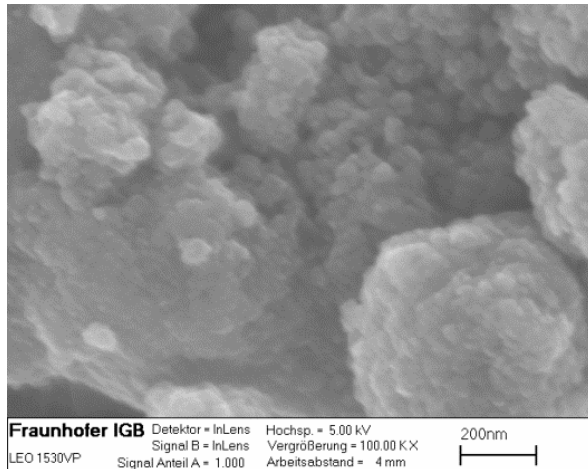
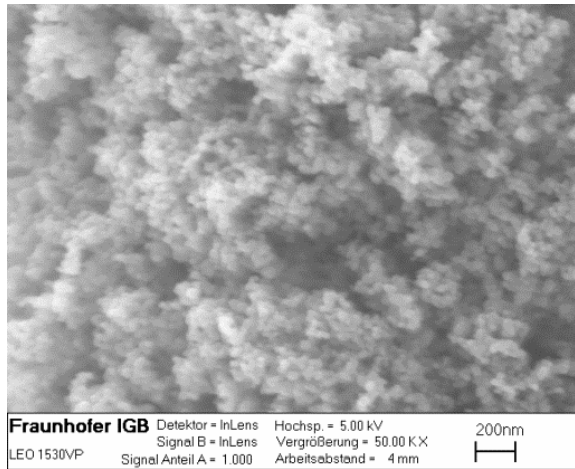
Testing activity of available paints and powders against VOC and microorganisms



Development of new active formulations/ paints to apply onto interior partitions

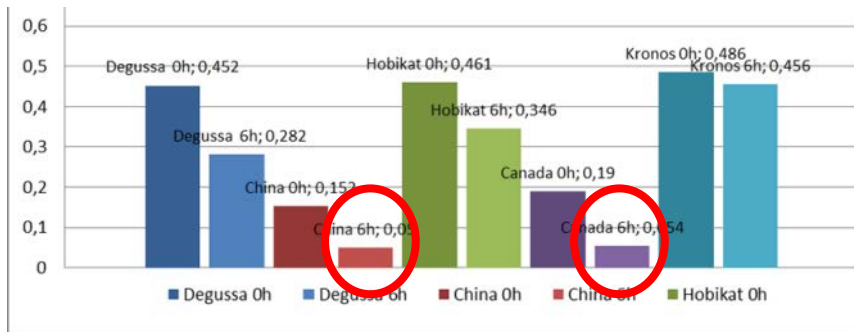


# Some results – analyses of powders



SEM: different morphology of TiO<sub>2</sub> particles

## ■ Evaluation of powders



Some powders showed good activity  
→ limitation: costs!

Standard TiO<sub>2</sub> in paints: ca. 2 €/kg

TiO<sub>2</sub> (left): ca. 5-10 €/kg

TiO<sub>2</sub> (right): ca. 300 €/kg

Extinctions of all tested commercial powders at t=0 minutes and t= 6 hours