



Showcasing Innovation & Olympic/world cup activity

Bringing Nanotechnology to your Business

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Aims of Showcasing Innovation

- To help you understand nanotechnology through advice, information & demonstrations
- To highlight the benefits of the technology for your sector
- To introduce commercially available nanotechnology products
- To provide practical hands-on experience of application and maintenance

Aims of Showcasing Innovation

- To provide access to nanotechnology expertise & current research
- To offer nanotechnology products relevant to your sector
- To support you in using nanotechnology within your business
- To set up a nano user group to share experiences and good practice

NANOTECHNOLOGY

'Smart' Coatings

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Would you like to:

- Develop further your work area?
- Reduce your maintenance costs?
- Add a new & innovative service to your offer?
- Have an edge over your competitors?
- Make your staff more efficient & productive?
- Provide an eco-friendly service?

What is nanotechnology?

- Fairly new science (approximately 8 years)
- Originates from Greek word meaning “dwarf”.
- Defined as ‘engineering at a very small scale’
- Nanometre is one billionth (10^{-9}) of a metre
- One hundred thousandth the width of a human hair!
- At nanoscale, things change and can reveal whole new properties

(Source: Institute of Nanotechnology)

- 1st generation nanotechnology products developed by scientists are ‘smart’ nano coatings

[Introduction to Nanotechnology](#)

(YouTube, 2008, 3.11 mins)

<http://www.youtube.com/watch?v=8BTGzVScBso>



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World



Marble

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What are nanotechnology coatings?

- Easy to apply
- Can be applied to most surfaces
- Look and feel of materials stay the same
- Create easy to clean surfaces
- Clear and invisible treatment
- Long lasting effects
- Large and small scale applications
- Environmentally friendly

Benefits of nanotechnology coatings?

- Once treated, surfaces can become
 - **Water-proof**
 - **Oil-proof**
 - **Rust-proof**
 - **Anti-mist & Anti-fog**
 - **Anti-static**
 - **Resistant to bacteria & viruses**
 - **Resistant to stains**
 - **Streak-free – no smearing or drying marks**



Water droplets on a wood surface treated with BASF's "Lotus Spray". *Image Courtesy of BASF, Germany.*

(Source: Nanoforum Education Tree, 2004)

Where can Nano coatings be applied?

- Wood
- Plastic
- Glass
- Textiles
- Stone
- Metal and
- Ceramics



No more biological growth!

Building exteriors

The strong oxidation effect of the coating effectively removes mould and protects the surface integrity



BEFORE



Nanocoatings in the News

Bio-contamination protection in Hong-Kong subway

Self-cleaning, air purification Church in Italy



Stadium in Dubai Air purification & self-cleaning roof



Self-cleaning building materials a possible weapon in fight against smog

By KARL RITTER
ASSOCIATED PRESS

STOCKHOLM, Sweden — From catalytic converters to alternative fuels, the fight against big-city smog has for years been fought inside combustion engines and exhaust pipes.

Now, scientists are taking the fight to the streets by developing "smart" building materials designed to clean the air with a little help from the elements.

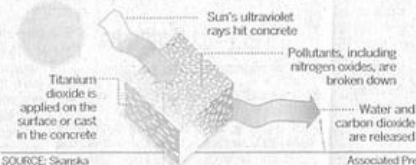
Using technology already available for self-cleaning windows and bathroom tiles, scientists hope to paint cities with materials that dissolve and wash away pollutants when exposed to sun and rain.

"Among other things, we want to construct concrete walls that break down vehicle exhausts in road tunnels," said Karin Pettersson, a spokeswoman for Swedish construction giant Skanska. "It is also possible to make pavings that clean the air in cities."

The Stockholm-based company is part of a \$1.7 million Swedish-Finnish project to develop catalytic cement and concrete products coated with titanium dioxide, a compound often used in white paint and toothpaste

Concrete that cleans itself

Swedish and Finnish companies are developing concrete coated with titanium dioxide to break down pollutants. The concrete surface would be easier to clean and help reduce air pollution.



while the nitrogen oxides yield nitrate salts.

Research in the field has been made possible by the revolution in nanotechnology — science dedicated to building materials from the molecular level. The catalytic properties of titanium dioxide become active when it is applied in a very thin layer, or in microscopic particles.

A range of self-cleaning products coated with titanium dioxide, including windows and ceramic tiles, are already on the market but the focus has mostly been on their practical value rather than the environmental impact.

In Rome, the Dives in Misericordia church, designed by U.S.-based architect Richard Meier, is made of self-cleaning concrete that helps keep the surface shiny white. In Japan, several modern buildings including the Marunouchi Building in downtown Tokyo, are covered with photocatalytic tiles to reduce discoloring from pollution.

"Now we have to change and think of the product not just for architectural purposes, but also for environmental purposes," said Francesco Galimberti,

SEE SELF-CLEANING, PAGE 2F

Waiting areas



Applications



plastics



Hydrophobic protection for concrete and clay bricks



Nano protection against graffiti

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Applications

No more dirt accumulation

No more UV discoloration and weathering stains

Over 5 Years of protection!



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Applications



Bathrooms



Windows



Cars

Applications



Stainless Steel Lifts



Untreated

Treated

Applications



Buildings



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Nanotechnology 'Smart' Coatings for the your Sector

- Save time on cleaning
 - Easy & fast cleaning
- Add new service to your business offer
 - More hygienic environment
 - Surfaces remain cleaner for longer
 - Less prone to spread of infection
 - Reduces chemicals costs
 - Surfaces only need water-based cleaning
 - Cutting edge 21st Century service
 - Unique selling point
- Become an Eco-Friendly 'Smart' Business

Nanotechnology 'Smart' Coatings

Big opportunities in the small world of nanotechnology for

- ✓ You
- ✓ Your Clients
- ✓ The Environment

Take Action Today !!!

- See technology in action

