Preserved, Pure and Precious - nanoGuard® for Building and Interior

Dr. Michael Overs
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• Brief profile of Nanogate AG
• nanoGuard®: product range
• nanoGuard®: in Södra Länken
• nanoGuard®: technical background
• nanoGuard®: additives
• nanoGuard®: graffiti protection
• Summary
Nanogate AG Göttelborn
Nanogate AG: Business Units

New Technologies

Building & Interior
Sports & Leisure
Automotive & Engineering
Functional Textiles
In the Following, you will get ...

... an overview about some applications of our building protection system nanoGuard®
For mineral surfaces, Nanogate AG provides coatings and additives at

- facilitating cleaning,
- protecting surfaces and materials,
- reducing aggressive cleaning processes,
- providing lasting improvements in surface appearance

and thus mineral surfaces with a long lasting quality feature.
nanoGuard®: Some of the Systems

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Short Description</th>
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<tbody>
<tr>
<td>nanoGuard® StoneCare</td>
<td>Impregnation for concrete and brickwork</td>
</tr>
<tr>
<td>nanoGuard® Stone Protect</td>
<td>Impregnation for concrete and brickwork</td>
</tr>
<tr>
<td>nanoGuard® P-Protect</td>
<td>Impregnation for plaster surfaces</td>
</tr>
<tr>
<td>nanoGuard® AddProtect-B</td>
<td>Additive for colours and paints</td>
</tr>
<tr>
<td>nanoGuard® AntiGraffiti</td>
<td>Non-sacrificial graffiti base protection</td>
</tr>
<tr>
<td>nanoGuard® AntiGraffiti SL</td>
<td>Non-permanent graffiti protection</td>
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Stockholm City Tunnel

Södra Länken Tunnel

- part of the planned Stockholm motorway ring
- opened in October 2004
- 4.6 km length
- 17 km of piping
- longest urban tunnel in Europe
- more than 130,000 cars per day
nanoGuard® facilitates Maintenance in Tunnels

- Extensive study: tunnel safety increases with light.
- Work of light artists.
- Use of a special light-coloured concrete
nanoGuard® facilitates Maintenance in Tunnels

- Traffic dirt.
- Dirt coming from the upper mountain.
- Reduction of tunnel safety.
nanoGuard® facilitates Maintenance in Tunnels

- Heavy soiling penetrates pores and capillaries.
- Use of aggressive chemicals and lots of water.
- Problem of waist water, needed time and extremely high costs.
nanoGuard® facilitates Maintenance in Tunnels

- Application on new concrete parts.
- Effective pre-cleaning of soiled concrete parts if necessary.
- Easy spray application of nanoGuard® StoneProtect.
**nanoGuard®** facilitates Maintenance in Tunnels

- Coating works as an invisible barrier.
- No chemical bond between dirt and concrete.
- Cleaning already with dry rag possible.
nanoGuard® facilitates Maintenance in Tunnels

- Effective cleaning without using any detergents and acids.
- Reduced waist water, time and maintenance costs.
- Protection of material and environment.
Water repelling agents are combined in a chemical process ... to form a micellar system that can be used as base material ... for water born impregnations and additives.
nanoGuard® StoneProtect : Material Basis

Micelles, in which the water-repelling agents are stabilised in water ...

... make contact with the surface, combine chemically, open ...

... and form a vapour-permeable, chemically bound impregnation.
nanoGuard® enhances Colours and Paints

Soiling on painted surfaces

nanoGuard® AddProtect-S / -B

Customers request:
- compatibility with base products
- reduced soiling

Background:
nanoGuard® facilitates Maintenance in Tunnels

- More than 20 year old painted concrete surface as a test surface.
- nanoGuard® AddProtect-B as an additive in an epoxy system.
- Test period: 11.2008 to 05.2009.
### nanoGuard® Graffiti Protection

<table>
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<tr>
<th>Permanent</th>
<th>Non-Permanent</th>
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<tr>
<td>nanoGuard® AntiGraffiti</td>
<td>nanoGuard® AntiGraffiti + nanoGuard® AntiGraffiti SL</td>
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</table>

- **Permanent**
  - Not visible
  - Permanent: multiple graffiti remove
  - Remove of graffiti with biological degradable graffiti-removers.

- **Non-Permanent**
  - Visible
  - Non-permanent: Graffiti is removed together with AntiGraffiti SL.
  - Removal of graffiti with high pressure washer.
nanoGuard® improves Graffiti Removal

Easy and perfect graffiti removal.

Customers requests:
- invisibility
- residue free graffiti removal with water biologic degradable graffiti removers

Background:
Easy and perfect graffiti removal.

Customers request:
- perfect cleaning
- cleaning without aggressive cleaning agents

Background:
- non-treated
- impregnated
- wax
- cleaned
- wax
- colour
... was developed to reduce maintenance!
... is available in different forms!
... can be applied on different mineral substrates!
... improves concrete surfaces in tunnels!
... works as an anti-graffiti-material!
... reduces the need of detergents and solvents!
... protects the environment!