Nano-Clear® Coatings

Breakthrough Nanotechnology

Extreme Corrosion, Chemical, Abrasion & UV Resistance

http://www.nanocoatings.com or (810) 227-0077
Surfaces exposed to the environment, may be damaged by elements such as water, snow, ice, heat, dirt, smog, humidity, brake-dust, grime, salts, chemical attack, and acid precipitation.

This is particularly so with regard to building materials such as paint surfaces, fiberglass, anodized aluminum, airplanes, boats and motor vehicles.

Painted surfaces may also be subject to loss of gloss from micro-scratching due to surface cleaning and from ultraviolet degradation due to long-term exposure to sunlight. Painted surfaces may also subject to chemical attack from acid rain, bird droppings and cleaning while using acid based cleaning products.

The above problems are, of course, well-known to those whose products are regularly exposed to the environment.
ENVIRONMENTAL EFFECTS ON AUTOMOTIVE COATINGS

The automotive industry, for example, commonly applies protective clear coatings and sealants over textured plastics, painted metals, wheels and tire rubber to mitigate the effects of environmental exposure, use and desire for a better appearance.

Most off-the-shelf retail coatings and sealants used in the auto industry, are typically thermoplastic acrylics, acrylic silane based, silicone based or polyurethane based dispersions.

These and other conventional coatings, sealants and waxes, however, are still quite temporary and susceptible to:

- chemical attack
- being scratched
- chipped
- damaged from cleaning
- weathering damage
- environmental conditions
- loss of gloss
- normal use

What is needed?

An improved surface coating that protects automotive surfaces more thoroughly than existing technologies.
ENVIRONMENTAL EFFECTS ON MARINE COATINGS

The marine industry, for example, commonly applies protective coatings, sealants and waxes over oxidized gel-coatings to mitigate the effects of environmental exposure to the sun including oxidation, water damage and desire for better appearance.

These and other conventional marine coatings, sealants and waxes are still quite susceptible to;

- water damage
- being scratched
- chipped
- damaged from cleaning
- weathering
- environmental conditions
- normal use

What is needed?

An improved surface coating that protects in-service marine surfaces more thoroughly than existing technologies.
The building material industry, for example, commonly applies protective coatings over aluminum, fiberglass and steel surfaces to mitigate the effects of environmental exposure to the sun including oxidation, smog, acid rain damage and desire for better appearance.

These and other conventional industrial coatings are still very susceptible to;

- UV degradation
- weathering
- acid rain
- water damage
- environmental conditions
- normal use

**What is needed?**

An improved surface coating that protects industrial materials more thoroughly than existing technologies.

A permanent surface coating that is backed by a long-term warranty for durability.
Nano-Clear® Coating Technology

Nanovere Technologies introduces the world’s first ambient cure clear coating to exceed industrial, marine and automotive OEM specifications.

**Nano-Clear for Autobody, Marine & Aerospace – 10 Year Warranty**
Permanently restores original color, gloss, surface hardness and extreme UV resistance back into “oxidized” autobody clear coatings, marine gel-coats, anodized aluminum siding, fiberglass, spinnaker sails...

**Nano-Clear for Industrial Applications – 10 Year Warranty**
Permanently restores original color, gloss, surface hardness, chemical resistance and extreme UV resistance back into “highly oxidized” painted surfaces including steel, aluminum, fiberglass...

Nano-Clear is a highly cross-linked hybrid polyurethane based nanocoating system.

**COATING BENEFITS:**
- Restores color, gloss, surface hardness and UV back into oxidized surfaces.
- High scratch resistance (4H pencil hardness over aluminum).
- Gasoline, acid rain, bird droppings, motor oil and solvent resistance.
- Extreme weathering resistance (100% gloss retention after 5 years).
- Self-cleaning; water, dirt, ice & brake-dust repellency.
- Available in gallons, pails, drums and totes.
Nano-Clear® Application Potential

Nano-Clear restores, enhances and extends the life of highly oxidized painted surfaces by 10 years. Nano-Clear application potential includes restoring original color gloss, surface hardness and UV resistance back into;

- fleet vehicles
- trains & tank cars
- painted steel buildings
- paint steel structures
- boat hulls
- Transocean liners
- highly oxidized paints
- oxidized fiberglass
- oxidized marine gel coat
- anodized aluminum siding
- outdoor lawn furniture
- industrial equipment
- epoxy coated bridges

\textit{Nano-Clear® provides permanent gloss retention and surface protection against scratching, chemicals, corrosion and UV degradation.}
Nano-Clear is a one-component industrial grade formulation that cures rapidly in the presence of atmospheric moisture. Nano-Clear forms an extremely cross-linked film with far superior scratch, abrasion, chemical and UV resistance over any leading two-component industrial clear coating. Suitable for use over newly primed, basecoat, topcoat or highly oxidized epoxy, polyurethane or polyester topcoat.

<table>
<thead>
<tr>
<th>Dry film property*</th>
<th>Spec</th>
<th>Nano-Clear</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pencil Hardness</td>
<td>-</td>
<td>4H</td>
<td>ASTM D3363</td>
</tr>
<tr>
<td>Pendulum Hardness (Persoz)</td>
<td>-</td>
<td>&gt; 250</td>
<td>ASTM D4366</td>
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<tr>
<td>Abrasion Resistance</td>
<td>-</td>
<td>8.4 mg</td>
<td>ASTM D4060</td>
</tr>
<tr>
<td>(CS-17, 1kg, 1000 cycles)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact Strength (kg-cm)</td>
<td>-</td>
<td>&gt; 140</td>
<td>ASTM D2794</td>
</tr>
<tr>
<td>Water immersion test</td>
<td>-</td>
<td>Pass</td>
<td>ISO 2812-2</td>
</tr>
<tr>
<td>(240 hours @ 50°C)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CASS @ 50°C</td>
<td>-</td>
<td>Pass</td>
<td>JIS H8502-7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(240 hours)</td>
<td></td>
</tr>
<tr>
<td>% Gloss retention (&gt; 1500 hours QUV 313)</td>
<td>-</td>
<td>&gt; 100</td>
<td>ASTM D4587</td>
</tr>
<tr>
<td>% Gloss retention (&gt; 2000 hrs Xenon WOM)</td>
<td>-</td>
<td>&gt; 99</td>
<td>ASTM G155</td>
</tr>
<tr>
<td>MEK resistance</td>
<td>-</td>
<td>&gt; 1500</td>
<td>ASTM D4752</td>
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* Fully cured clear coat on bare aluminum panels @ 72°F at RT for at least 24 hours prior to testing.
Nano-Clear® Film Properties
Dynamic Mechanical Analysis

Nano-Clear® Coatings are manufactured using proprietary 3D nanostructured polymers. These 3D nano-scale networks form the polymer backbone of all Nano-Clear Coating Systems. Dynamic Mechanical Thermal Analysis (DMTA) is utilized to calculate the "crosslink density" of coating polymers.

Nano-Clear Coatings provide extreme crosslink density as measured using DMTA, including remarkable surface hardness, chemical resistance, extreme UV resistance and high flexibility. Interestingly enough, Nano-Clear Coatings do not contain any nanoparticles like many marketed nanocoatings. Rather, all Nano-Clear Coatings rely on crosslink density to exceed automotive OEM and aerospace OEM technical specifications.
Interested? Questions?

Contact Nanovere Technologies directly at (810) 227-0077 or questions@nanovere.com or visit us at http://www.nanocoatings.com

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