

## About US

### 1. Item Nano-Bionic

**Nano** means: extremely small and thin, comprised of the smallest particles. The protective nano-layer is only 3-4 nm thick, which is a millionth of a millimeter and much thinner than a human hair.

**Bionic** means: based on natural processes – our products reproduce the well-known “Lotus Effect”. Lotus flowers have a unique rough surface that automatically channels water droplets into a certain position. Water beads and immediately rolls off, thereby removing any dirt and dust particles. The result is a **self-cleaning, easy-to-clean** and hydrophobic (**water repellent**) surface.

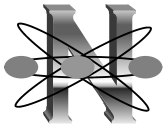
**Nano-Bionic** is an interdisciplinary combination of: nano, biology and technology

### Nature's Bionics - Roll-off-Effect



### Abstract of Technology

**Nano-Bionic Nanotechnology is a new high-end technology**, based on natural processes. The minute size of the Bionic-nanoparticles or nanostructure is one of the primary reasons for their unique characteristics. The application of Bionic-nanoparticles increases the overall surface area. Consequently, nanostructures have extremely large surfaces, a fact which significantly impacts their properties. Therefore, nanostructures are extremely minute in terms of their dimensions, whereby their surface properties play a very important role by comparison with the material volume properties involved. The unique characteristics of these tiny Bionic-structures are determined not only by the type of source material, but also, and in particular, by the form and size of the Nano-Bionic structures and the ways in which they are produced and applied. The Nano-Bionic structures must also form a chemical and molecular bond with the surrounding material.



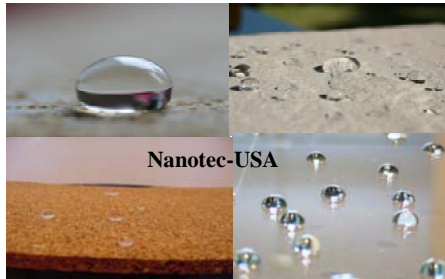
## NANOTEC-USA

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### Nano-Bionic "Roll-off-effect"



Nano-bionic treatment of a surface causes water to bead. The contact (roll-off) angle of the droplets is so high as to automatically increase the self-cleaning, dirt and water repellent effects on the treated surface.

## 2. About Nanotec-USA

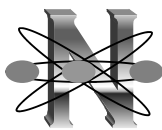


**Nanotec-USA founded the concept of "Nano-Bionic Vehicles" in the United States. The President and Founder of Nanotec-USA, John W. Moore pictured here with the World's first Dodge Viper made completely NanoBionic with our Bionic Self-Assembling treatments.**

**"Our goal is to make Nano-Bionic Vehicles available World Wide."**

**Nanotec-USA** ranks among the first Bionic-nanotechnology and Nano-Bionic surface treatments companies in the United States. The founder of Nanotec-USA, John W. Moore has 14 years experience in surface polishing and restoration of glass, paint, plastic and various metals. Mr. Moore also has a background in anodizing of various grades of metal, hard coat anodize, and other related processes dealing with metal finishing. Nanotec-USA has teamed with leading nanotechnology labs worldwide to further the development of their product line, along with a firm basis in nanotechnology and bionic engineering. This has helped Nanotec-USA to successfully bring exceptional Nano-Bionic products delivering strong benefits in their everyday use to the market. Nanotec-USA currently has access to several different Nano-Bionic products for the treatment of diverse surfaces. The range is divided into three quality grades: consumer, commercial and industrial. The products are particularly valuable for refining industrial surfaces such as facades or glass, and in easy-to-clean and self-cleaning treatments for vehicle windshields, paintwork, wheels/rims or kitchen surfaces made of stainless steel, etc. Nanotec-USA offers consulting and substrate compatibility testing for most industries to include Military, Law Enforcement, Aerospace, Automotive, Marine, Cooking and baking just to name a few.

The company headquarters is located in the Washington D.C. area. With the launch of the new Nano-Bionic Car systems, the products have found the perfect placement with professional users, automotive manufacturers since Nano-Bionic surfaces become super hydro-dynamic (producing a laminar flow of air and water over the Nano-Bionic surface) reducing wind drag (increased aero-dynamics), dealerships and so on. The Nano-Bionic Car's glass, paint, wheels and plastics will be easier to clean/self-cleaning and protected from environmental contaminants for years, not months. We also have Nano-Bionic treatments for yacht, kitchen refinement, clear plastics, aviation and aerospace surfaces, concrete and stone, textiles and much more.



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### 3. Nano-Bionic - Background

Nanotechnology and Nano-Bionics are key technologies of the 21st Century. Their exceptional innovation potential will permanently change the face of the economy throughout every sector. Products that were unimaginable years ago are now real possibilities.

Surfaces are coated in order to improve the properties of the product materials and adapt them to more rugged environments. Now that the "age" of conventional processes has passed, the proliferation of new materials in today's economy and everyday life calls for better and more durable solutions with respect to the quality, protection and functionality of surfaces.

Nanotechnology is by far the most efficient answer to these needs. The coatings are a nearly invisible and aesthetically pleasing way to change and improve the properties of surfaces. However, almost all nano "coating products" contain silicones, waxes, oils, CFC etc. which make those useful only for a short time, and often causes damage to the original surface, like turning yellow. Such common nano-products are also cost-intensive, both as a result of the need to repeat their application after only a short period and due to cleaning costs. Another possible method today is "photocatalyse" which merges surfaces like glass with titandioxid. This photocatalyse method decomposes organic particles – not inorganic ones – by-and-by due to sun and daylight and before that due to the hydrophilic effect of this method, inorganic industrial dust and organic pollution are spread on the surface. This method does not produce the desirable effect of preventing surfaces from getting contaminated, especially from inorganic industrial contamination and is therefore as well, not a state-of-the-art solution.

**Nano-Bionic** technology is the most efficient, effective and durable method available. It prevents treated surfaces from organic and inorganic pollution, such as insects, salt, calcium, dust, sand, ferric oxide, industrial contamination etc. Based on natural processes, Nano-Bionics guarantee effectiveness through mechanical means – without silicones or other pollutants, without sealing pores, is extremely durable, self-cleaning and easy-to-clean, both water and dirt repellent. It is **as good as nature**.

The surface to be treated with a Nano-Bionic coating must be free of residues from cooking oils, petroleum, detergents and silicones, in order to ensure long-term effectiveness.

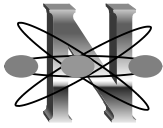
### 4. Technology concept & method



For the production of Nano-Bionic materials, specially designed nanoparticles only a few nanometers in size are produced using a unique process. Roughly 5,000 nanoparticles would fit across the width of a human hair.

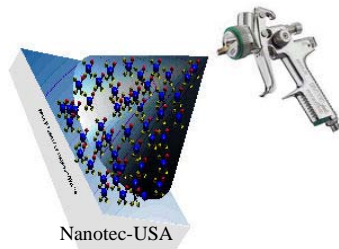
#### a) Sol-Gel-Process

- In the **Sol-Gel Process**, the source materials are suspended in a fluid medium (**Sol**). A chemical trick prevents the materials from amalgamating into larger structures.
- Within a certain temperature range, the Sol evaporates very rapidly on a material interface (depending on temperature).

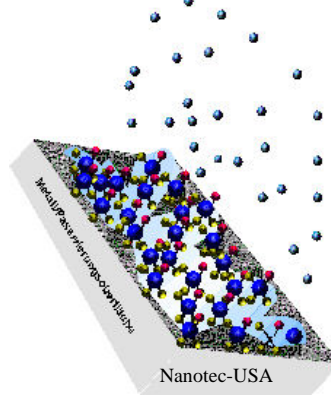


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### Application



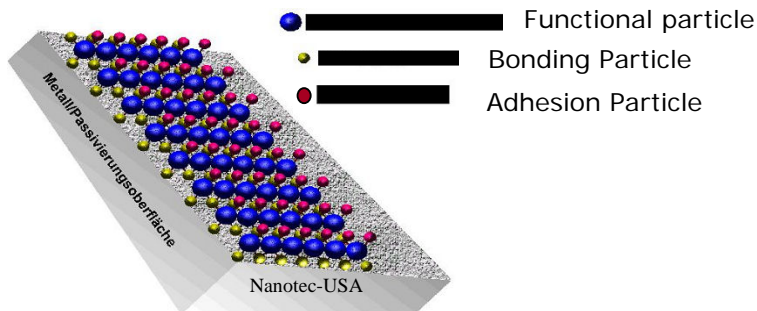
### Drying



- Depending on the properties of the surface, special "functional molecules" can be added to the source mixture.
- These integrate themselves into the nano-network during self-assembling.

### b) Self-organization of Nano-Bionic products

- The nanoparticles structure themselves spontaneously.

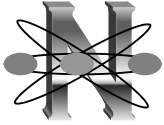


### c) Long-term effectiveness

- The Bionic-nanoparticles form a molecular bond with the substrate.
- They can only be removed through repeated abrasion or extremely potent acids or corrosives.

### d) Quality and functionality

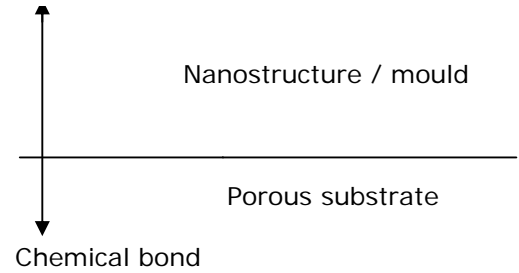
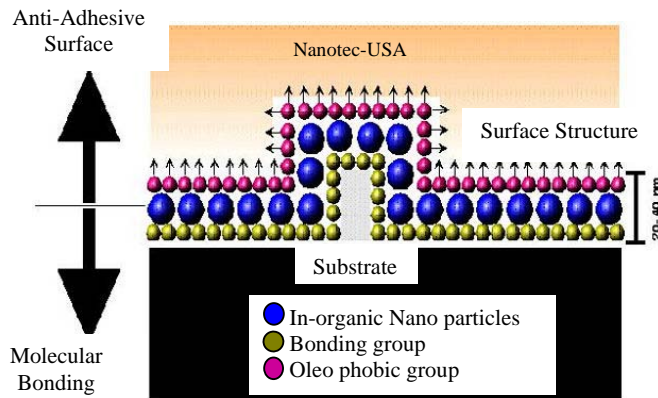
- Nano-Bionic coatings are intelligent, water and dirt repellent, ultra-thin surface treatments that are invisible to the eye.
- They allow the material to breathe, are UV stable, stand up to chemicals and temperatures, and are durable and purely mechanical in nature.



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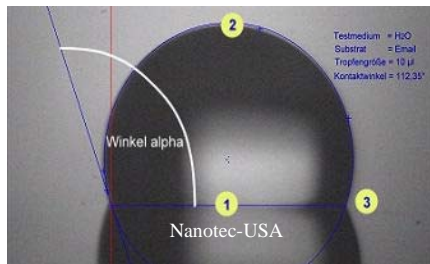
**e) Nano-Bionic layer structure**

The small size of the nanoparticles means that pores are not simply *covered*, but rather *modified and encompassed* by the nanostructure within the pore.



**f) Hydrophobisation**

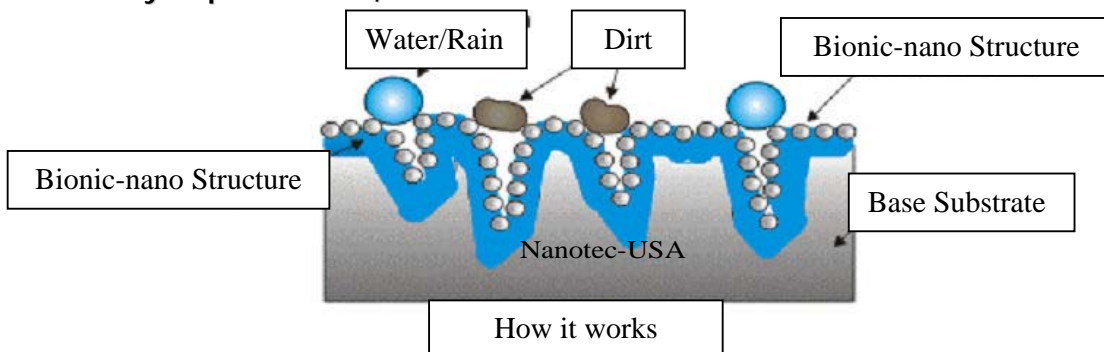
On the outside, the Bionic-nanoparticles create a non-adhesive surface by reducing surface tension, so that dirt cannot hold fast.



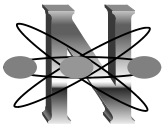
- 1: Interfacial energy between the droplet and the material substrate
  - 2: Surface tension of the droplet
  - 3: Interfacial energy of the material
- The greater the angle of Alpha, the lesser the adhesion of the droplet to the surface!**

**g) Action of Nano-Bionic hydrophobisation**

**Schematic representation: Nanoparticle, Water/Rain, Dirt, Nano hydrophobisation, Material substrate**



The aim of hydrophobisation is to eliminate the absorbency of building materials or the surfaces to be treated, so that they remain resistant to the effects of weather and other environmental factors after cleaning and repair work.



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### h) Two main effects

1. Perfect, vapor permeable protection of the surfaces
2. Easy-to-clean and self-cleaning surfaces

### i) Benefits of Nano-Bionic products:

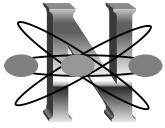
- Water resistant (hydrophobic)
- Repels organic (insects etc.) and inorganic pollution, like dust, sand, ferric oxide, industry contamination etc.
- Extremely thin (3-4 nm), aesthetically and invisible
- Based on natural processes, free from hazardous pollutants
- Bionic Self-cleaning and Easy-to-clean
- Clear view during rain
- Bionic resistance and rejection of dirt
- Significantly reduces cleaning and maintenance costs, reduces wash frequency
- Increases and improves stability of brightness and gloss
- Pores remain dirt-free
- Protection from environmental factors
- Ice and snow repellent
- Cold- and heat-proof
- UV stable
- Glare elimination through light
- Stable and withstands steam cleaning
- Detergent-resistant
- Durable long term stability
- Protects against scratches
- Increases and preserves value of material
- Improves aerodynamics
- Reduces Aero-drag
- Super hydro-dynamic Laminar flow
- Resists grease and oil
- Increases bacteria resistance
- Approved and certified for use with food
- Protects against fogging and oxidation
- Prevents moss and algae
- Saltwater resistant

### j) Nanotec-USA Nano-Bionics products are **free from**:

- Acrylics
- Silicones
- Fluorocarbons
- Siloxanes
- Waxes
- Petroleum
- Oils
- Butoxyl
- Xylol
- Acetone
- Fluorides
- Phenols
- Hexadecane
- PTFE

### k) Perfect vapor permeable protection

- Naturally occurring particles like water, dirt, bacteria, algae, molds etc. are prevented from contact with the substrate since these are far larger than the spaces in the Bionic-nanostructures.
- The Nano-bionic structures leave open spaces between themselves, the surface remains 100% vapor permeable.



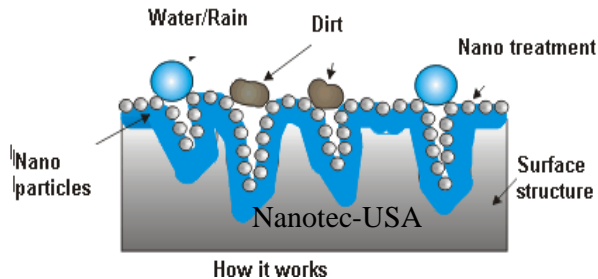
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### l) Easy-to-clean to self-cleaning surface



The Bionic-nanostructures change the tension properties of the surface. The forces of cohesion of contaminant particles that come into contact with the Bionic-nanostructures are greater than the adhesive force of the surface. Treatments that are not truly Nano-Bionic and are working with siloxanes, PTFE and the like, fill the voids and clog the pores. Unlike Bionic-nanoparticles which work by docking directly to the substrate's individual molecules.

### m) Nanotec-USA Nano-Bionic surface treatment works on the following surfaces:



- Glass / glass facings
- Buildings and stones, stone facings
- Marble, all types of flooring
- Ceramics
- All parts of cars – windshield, paint, wheels, interiors, plastic, aluminum ...
- Textiles
- Stainless steel
- Silver
- Wood and teakwood
- All parts of yachts: decks, antifouling, wood, masts, sails, heads ...
- Plastics
- Paper
- Airplanes, buses, trains, missiles ...
- Solar installations
- Etc. ...



Treated T-3 Aviation Grade Aluminum



Acry Glo® Aerospace painted panel treated with AeroGuard Paint treatment shows Laminar flow function