NanoSlic® NS 1500 Coating

INTRODUCTION

NanoSlic NS 1500 is a revolutionary permanent ceramic nanocoating based on proven NanoSlic technology. NS 1500 can be applied to painted, coated and base metal surfaces, to impart a unique range of beneficial properties. NS 1500 can be applied to glass and plastic trim. It provides a contact surface that is hydrophobic, oleophobic, UV and chemically resistant. Furthermore, NS 1500 is a multi-layerable formula that enables the user to boost the level of protection as needed.

ATTRIBUTES

- Outstanding Hydrophobic and Oleophobic Properties
- "Easy-to-Clean" and Repels Most Materials
- Molecular Bond to Painted or Metallic Surfaces.
- High Film Hardness
- Easier to Apply than Other Coatings
- Clear, Glossy finish
- Environmentally Friendly Formula

TECHNOLOGY

NS 1500 is a hand-applied ceramic coating based on revolutionary NanoSlic technology. The coating chemically bonds to the surface while forming a hydrophobic and oleophobic nanolayer to protect paint and enhance gloss. NanoSlic has a robust, abrasion resistant surface that stands up to repeated cleaning.

PRE-CLEAN

The paint or metal surface should be completely clean of foreign materials. Painted surfaces should be cleaned to the level required for a superior paint application. If new, and not exposed to exterior conditions, clean with a no-residue soap, rinse, dry and then wipe with isopropyl alcohol. If the paint has been exposed to exterior conditions, a clay bar treatment may be necessary before these same steps. Metal surfaces will require the same cleaning steps.

APPLICATION

** See separate NS 1500 application instructions below for more detailed information.*

CURING

NanoSlic will dry to tack free in 20-30 minutes. Do not disturb the coating or re-coat during this time. The coating begins to cure as soon as solvents begin to evaporate. The coating will reach 7H hardness after 18 hours and will fully cure to 9H hardness in 3 days at room temperate. Rain-ready in 12 hours.

TEST RESULTS

Physical Properties	Values
Appearance	Clear High Gloss
Specific Gravity @ 23°C	1.02 g/cm^3
Viscosity @ 23°C	3-5 cP
Nonvolatile content	10-12%
Static contact angle, water	105* Degrees
Dry Time	20-30 minutes tack free
Film Thickness	80-100 nm
Pencil Hardness	9H*

ENVIRONMENTAL

NanoSlic coating solvents are not classified as VOCs and have been determined not to add to global warming. They use no Perfluorooctanoic acid (PFOA), a substance currently being investigated by the EPA. NanoSlic coatings are ECNA, REACH, RoHS and RoHS II compliant.

** Bulk polymer properties.*

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ADDITIONAL TEST DATA

Property	Test/Specification	Result
Contact Angle	ASTM D7490	105°
Static Contact Angle, n-hexadecane	ASTM D7490	63 °
Pencil Hardness	ASTM D3363	9H*
Roll-Off Angle	Glass Substrate	20°
Adhesion, Cross Hatch	ASTM D3359	5B (no loss)
UV Resistance	QUV, ASTM G154 16, 500 hours	Pass
Salt Fog Resistance	ASTM B117-18, 500 hours	Pass
Refractive Index		1.4
Water Vapor Permeability		0.02 g/100 sq. in./day
pH Resistance	pH 2-12, 4 hours @ 72°F/23°C	No Change
Solvent Resistance	All Common Solvents 24 hours/72°F/23°C	No attack
Flexibility	Mandrel Bend, ASTM D522-17, Method A	Pass, (No loss, cracking)
Electrical Resistivity	IPC-CC-830	6.9 X10^6 Megohms *
Dielectric Constant (Volts/Mil)	IPC-CC-830	12,000 Volts/mil *
Film Thickness		80-120 nm/layer

Bulk polymer

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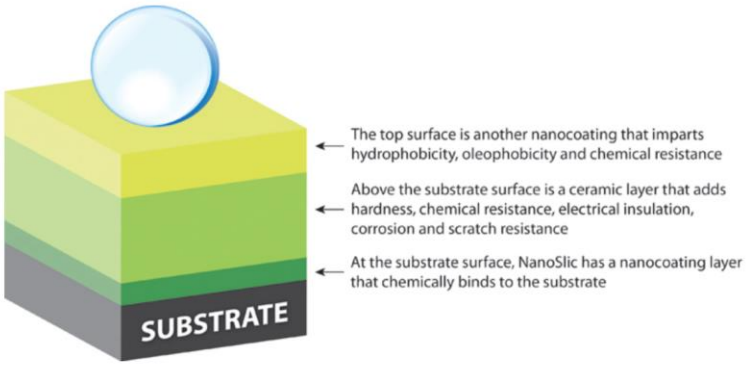
TECHNOLOGY

NanoSlic is a ceramic coating that is both hydrophobic and oleophobic. NanoSlic integrates three functional layers that form upon application. At the substrate interface, NanoSlic has a nanometer thick layer that chemically binds to the substrate. Above that is a ceramic layer that adds hardness, chemical resistance, electrical insulation, corrosion, and scratch resistance. The top surface imparts hydrophobicity, oleophobicity, and chemical resistance. NanoSlic can be defined as a "hybrid" coating, combining the benefits of a ceramic coating and a nanocoating.



NanoSlic's unique hybrid structure works in 3 ways:

- Forms a dense network of strong chemical bonds to the substrate
- Forms an inert, high-performance binder polymer layer
- Forms a highly hydrophobic and oleophobic contact surface

NanoSlic's unique structure and chemical composition prevent normal degradation when applied to many surfaces. This means greater efficiency, reduced maintenance, longer life and ultimately significant cost savings. NanoSlic not only adds physical protection to surfaces but also contributes to a cleaner cosmetic appearance.

NanoSlic is largely composed of silica, structured with silica bonds. As such, NanoSlic materials are inherently capable of maintaining properties at temperatures well beyond non-ceramic polymers. NanoSlic coatings are resistant to most solvents and will be unaffected by a wide range in pH. Because 9H hardness is achieved in most NanoSlic formulations, significant scratch resistance is improved. By incorporating specific functional groups to the polymer, various properties can be achieved including ambient temperature curing, heat-induced crosslinking and other physical properties. Interesting and useful surface effects can be achieved such as NanoSlic's characteristic hydrophobicity and oleophobicity.

Low surface energy and ceramic structure make NanoSlic a unique nanocoating. NanoSlic is a revolutionary coating technology that offers many of the benefits of "advanced ceramics" but does not require a high cost, multi-step process that includes "firing." NanoSlic can be applied to a wide variety of surfaces. The required thickness of the coating will depend on the application and the desired result. NanoSlic protects and enhances surfaces of metals, glass, ceramics, polymers and coatings and many plastics. It is scratch resistant and creates a surface that is easy to clean. Curing takes place at room temperature or can be accelerated with heat.

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