

Conversion of preceramic polymer in ceramic layer

Unique chemistry, Ceramization

The unique preceramic polymer technology in EXOCOAT™ Ceramic+ converts to a ceramic layer through reaction with moisture from the air. Moisture from the air hydrolyses the polymer which then internally reacts to form a metal oxide ceramic layer. While being covalently bound to the surface these ceramic layers account for very durable and resistant films. The technology is also known as liquid glass or as glass like coatings. This stems from the chemical resemblance of glass and ceramic coatings both consisting of SiO_2 networks.



EXOCOAT™ Ceramic+
40% in butyl propionate
Density: 930 kg/m³
Clear colorless low viscous liquid



EXOCOAT™ Ceramic+ Yacht

by Axcentive

USP's Exocoat™ Ceramic+ based yacht care finish

- ➔ Long lasting performance
- ➔ True ceramic coating, hard, dense and transparent
- ➔ Easy to clean with extreme water beading effect
- ➔ Dirt repellent, making cleaning easier
- ➔ Economical, need only 10ml per m²
- ➔ One component system, easy to work with
- ➔ UV resistant
- ➔ Scratch resistant
- ➔ Can be applied on any underlying paint system
- ➔ Revives dull coatings (e.g. weathered coatings)

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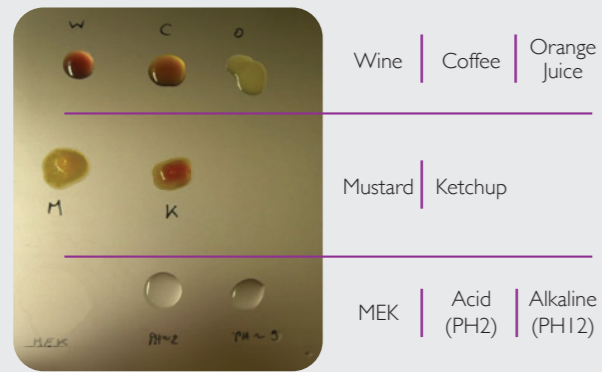
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Chemical resistance

Chemical resistance of EXOCOAT™ Ceramic+ was tested as a thin layer coating on a metal sheet. Below chemicals were deposited on the EXOCOAT™ Ceramic+ coated panel and let to dry for 24hrs.



After 24hrs the plate was cleaned using rinsing by tap water for 1 min.

Mechanical resistance

The mechanical resistance of EXOCOAT™ Ceramic+ was tested according to several abrasive tests among which the ISO 11998 with a nylon brush and a liquid based on water, silica sand and detergents.

3M Scotch Brite n°7448 Type S, 2.5g/L of sodium n-dodecylbenzenesulfonic in water



Test after 1000 abrasion cycles

EXOCOAT™ Ceramic+

Layer	Approx. 1 micron layer
Substrate	Coated steel
RESULTS	
Abrasion Resistance ISO 11998 1000 cycles	no effect
Jeans scuffing 200 cycles	no effect
Pencil hardness	7-8H
Scratch resistance ISO 1518	>10N

EXOCOAT™ Ceramic+ technology outperforms many existing market solutions across a wide range of properties, as detailed in the table below. EXOCOAT™ Ceramic+ is the only technology forming a durable covalent bond with the substrate.

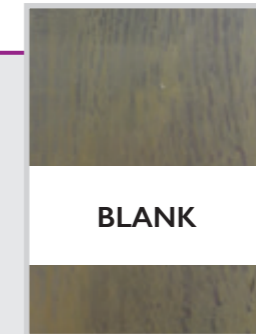
	Graphene wax	Carnauba wax	Polyethylene	Silicones	EXOCOAT™ Ceramic+
Weather resistance	✗	✗	✓	✗	✓
Hardness	✗	✗	✗	✗	✓
Aesthetics	✗	✓	✗	✗	✓
Durability	✗	✗	✗	✗	✓
Water Repellence	✓	✗	✗	✓	✓

DURABLE & RESISTANT

EXOCOAT™ Ceramic+ is completely resistant to acids and alkaline liquids, bird droppings and severe weathering. Coatings based on EXOCOAT™ Ceramic+ were tested according to international standards comprising chemical, weather and mechanical resistance tests.

Dirt Pickup Resistance

Comparative tests between bare and EXOCOAT™ Ceramic+ coated aluminum panels and wheels demonstrated a significant reduction in dirt pickup for the coated surfaces. The coating exhibited approximately 90% less dirt accumulation, highlighting its effectiveness in providing long-term resistance to dirt adhesion.



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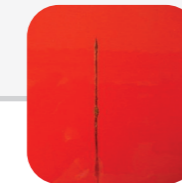
7 MICRON
EXOCOAT CERAMIC+

Weather Resistance

The weather resistance of EXOCOAT™ Ceramic+ was tested under various conditions and on various substrates. EXOCOAT™ Ceramic+ was tested as a thin layer according to ISO 9227 a neutral salt spray test and ISO16474 weatherometer test, which are both accelerated weather tests involving moisture and (UV) light. EXOCOAT™ Ceramic+ was also subjected to a condensation test according to ISO6270-2.

2-micron EXOCOAT™ Ceramic+ layer

Substrate	Saltspray ISO9227 (1000hrs)	Weathertest ISO16474 (1400hrs)	Condensation ISO6270-2 (1000hrs)
Aluminium 6061	No Defect Scribe <0.5mm	No Defect ΔE = 0.17	No Defect
Stainless Steel	No Defect Scribe <0.5mm	No Defect ΔE = 0.40	No Defect
Precoated Steel	No Defect Scribe <0.5mm	No Defect ΔE = 0.51	No Defect



EXOCOAT™ Ceramic+ was subjected to 3000hrs QUV with minimal effects on the gloss.

Gloss 3000hrs QUV before/after	121/115 (95% retention)
Easy to clean test after 500hrs QUV	Above side wiped by cloth

