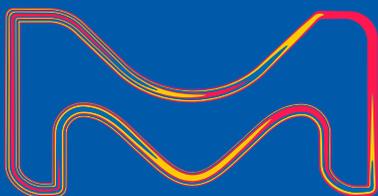




CAN RESISTANCE BE IRRESISTIBLE?

Empowering Surfaces with **Durazane®** – Protect your surfaces against the effects of scratches, high temperature, water, dirt and corrosion



EMD Electronics

The Electronics business of Merck KGaA, Darmstadt, Germany operates as EMD Electronics in the U.S. and Canada.



YES!

WHEN IT PROTECTS BEAUTY & VALUE

A classic car with perfectly polished body paint and gleaming exhaust pipes. The bright, shiny facade of a skyscraper that resists weathering. A spotless train. Offshore wind turbines which withstand the extremes of salt, water and UV radiation. What do these have in common? They are protected by coatings containing Durazane[®], which offers scratch protection, high-temperature resistance, water and dirt repellency and corrosion prevention.

Coatings with Durazane[®] result in durable surfaces that not only gleam as if they were brand new but also protect against all kinds of damage to preserve their beauty and value.

YES! WITH DURAZANE®

Durazane® is our answer to empowering surfaces. The products are either a unique class of high-performance binders (Durazane® 1000 and 2000 series) or additives (Durazane® 5000), and are proprietary to Merck KGaA, Darmstadt Germany. Durazane® is the perfect choice for ultimate surface protection in a multitude of high-value applications.

Binders

Durazane® 1000

Durazane® 1000 products are organic polysilazanes (OPSZ). When added to coatings, they form dense ceramic-like layers with a Si-N-Si and Si-O-Si structure. The layers are highly temperature resistant and provide good protection against corrosion and weathering. Because of their strong hydrophobic properties, they create an effective moisture barrier and make cleaning surfaces much easier.

Durazane® 2000

This is a series of inorganic polysilazane polymers (PHPS). When integrated into coatings, they add a thin film to surfaces, consisting of a quartz glass-like silicon dioxide. They add outstanding anti-scratch protection as well as excellent thermal and chemical resistance to coatings.

Unique advantages of Durazane® binders

- High hardness (up to 5H with OPSZ, up to 9H with PHPS – depending on formulation and substrate)
- Lasting protection to numerous types of surfaces
- Applicable in low to medium film thicknesses
- High thermal stability

Additives

Durazane® 5000

Our 5500 additive is based on functionalized particles developed especially for use in high-gloss, solvent-borne topcoats. We developed a polymerization process whereby polymer chains are covalently bound to the surface of each particle. These resin-like polymer chains on the nanoparticle surfaces, known as a polymer shell, are able to react chemically with the binder matrix via their functional groups. The purpose of this is to promote stability in the hydrophobic binder matrix and to ensure compatibility with other components of the coating's formulation.

Unique advantages of Durazane® additives

- Significantly improve scratch resistance and gloss retention at concentrations as low as 1–2.5% w/w
- No detrimental side effects on other film characteristics such as gloss, transparency, hardness, flexibility or chemical resistance



Find the Durazane® product that best fits your needs by going to our website and filling out the questionnaire. You may also speak to your local sales representative.

As your solution provider, we are proud to be the only manufacturer in the world offering the entire range of organic and inorganic polysilazanes as well as particle-based additives on a commercial scale.

YES! WITH SCRATCH PROTECTION

It's nearly impossible to keep cherished possessions like a classic car or a new kitchen in top condition. With just one careless move, their pristine surfaces are marred by scratches, and over time, they lose their glossy finish. Create coatings with our Durazane® 1000 and 2000 binders, which offer excellent anti-scratch properties as well as impact and abrasion resistance. Use Durazane® 5000 additives in clear coatings to inhibit the accumulation of minute scratches that would otherwise spoil surface beauty. Both our binders and additives can be applied to all kinds of interior and exterior surfaces. They protect not only beauty but also can help prevent corrosion in a multitude of applications.

Benefits

- Seals surfaces much longer than standard coatings or waxes
- Smooths surfaces significantly, making them easy to clean
- Reduces need for extensive washing

Areas of application

- Automotive parts
- Public transport such as trains and trams
- Aerospace components
- Building facades
- Interiors such as kitchens and bathrooms

Suitable substrates

- Various metals such as steel and aluminum
- Plastics
- Painted surfaces



YES! WITH HIGH-TEMP RESISTANCE

A coating's effectiveness can easily be reduced or even destroyed by thermal extremes – imagine a top-class motorcycle with a burned and stained exhaust pipe. One of the best ways to protect surface coatings is to bolster their thermal resistance, ensuring that they are capable of performing in all kinds of challenging environments. High-temperature resistance also helps products handle thermal-induced corrosion more effectively, thus safeguarding the functional and visual qualities of both the coatings and the products they protect. Our Durazane® 1000 and 2000 products provide you with perfect binders to formulate surface coatings that withstand temperatures above 1000 °C.

Benefits

- Protects against wear, abrasion and stains
- Manages exhaust heat effectively by reducing heat loss in car manifolds and headers
- Lowers fuel consumption when pistons are coated
- Reduces heat flow and transfer in thermal barrier coatings, thus dropping thermal stress imposed on coated components
- Limits heat-loss areas such as exhaust and system pipes

Areas of application

- Automotive parts
- Public transport such as trains and trams
- Aerospace components
- Industrial plants and pipes

Suitable substrates

- Various metals such as steel and aluminum



YES! WITH WATER & DIRT REPELLENCY

Even under the best circumstances, there's always something that can spoil appearances: grubby hands mess up stainless-steel sinks, cars get splashed with mud, vandals leave their marks on trains and facades. Cleaning can be extremely time-consuming and costly, and in the case of removing graffiti, aggressive chemicals may even be needed. You can't keep all dirt at bay, but by formulating coatings with the right functional ingredients, you can arm materials with the best protection. The magic word is hydrophobicity. Our Durazane® 1000 binders repel water and dirt, and help keep surfaces in mint condition.

Benefits

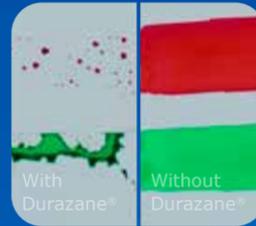
- Keeps dirt under control
- Prevents damage caused to paints by abrasion and aggressive cleaning chemicals
- Reduces cleaning costs
- Saves cleaning time
- Preserves pleasant tactile quality of surfaces

Areas of application

- Automotive parts
- Public transport such as trains and trams
- Marine sector
- Building facades
- Interiors such as kitchens and bathrooms
- Industrial plants

Suitable substrates

- Various metals such as steel and aluminum
- Plastics
- Glass and ceramics
- Painted surfaces



YES! WITH CORROSION PREVENTION

Weathering, high humidity, exposure to salt water and other harsh conditions can cause corrosion and surface rust on many types of metals. Even aluminum-based materials can be harmed. On boats, building facades, cars and industrial facilities such as wind turbines, corrosion can be highly worrying due to maintenance and safety requirements. When you provide corrosion control, it is not just about keeping up appearances; it's also about preventing further damage to steel and other metals, especially on the surface. Integrate our Durazane® 1000 binders into coatings to protect surfaces and actually ward off the elements that cause corrosion – and keep high-quality materials looking good.

Benefits

- Protects against corrosion caused by chemicals, road salt, humidity, weathering and aggressive atmospheric conditions like smog
- Extends the lifetime of coatings
- Requires less maintenance

Areas of application

- Automotive parts
- Printed circuit boards
- Public transport such as trains and trams
- Marine sector
- Aerospace components
- Building facades
- Interiors such as kitchens and bathrooms
- Industrial pipelines
- Wind turbines

Suitable substrates

- Metals such as steel, aluminum, copper and silver
- Plastics



YES! WITH POWERFUL PROTECTIVE PROPERTIES

	DURAZANE® 1000 SERIES, ORGANIC POLYSILAZANES, COATING BINDERS	DURAZANE® 2000 SERIES, INORGANIC POLYSILAZANES, COATING BINDERS	DURAZANE® 5000 SERIES, PARTICLE-BASED SOLUTIONS, COATING ADDITIVES
PRODUCT PROPERTIES	Transparent, low-viscosity polymers available as 100% active	Low-viscosity polymers available as 20% solution in various solvents	Durazane 5500: dispersion in butyl acetate (50% solids)
SURFACE FEATURES	Scratch protection, water and dirt repellency, high-temperature resistance, corrosion prevention	Scratch protection, water and dirt repellency, high-temperature resistance, corrosion prevention	Microscratch resistance
GENERAL CURING CONDITIONS	Thermal, moisture or UV cure (depending on product)	Thermal and moisture cure	Curing conditions depend on binder systems – curing options not restricted by use of our additives
CHEMICAL STRUCTURE AND MODE OF ACTION	Organic polysilazane polymers transform into dense ceramic-like layers upon curing 1–30 µm, medium surface hardness (up to 5H depending on formulation and substrate), strongly hydrophobic surface	Inorganic polysilazane polymers transform into glass-like layers upon curing <1 µm, high surface hardness (up to 9H depending on formulation and substrate), hydrophobic surface	Functionalized silicon dioxide particles with surface OH-functionality allow incorporation into binder matrix
FEATURES AND BENEFITS	The products form ceramic-like layers that are highly temperature resistant and provide excellent corrosion protection and weathering resistance. Due to their strong hydrophobic properties, they provide good protection against graffiti and exhibit easy-to-clean properties	Coatings based on inorganic polysilazane resins provide a wide range of substrates with scratch protection, excellent barrier properties, chemical and thermal resistance	Scratch protection of surfaces in glossy or matte coatings Scratch protection of surfaces for solvent-borne 2K PU clear coats
SUITABLE SUBSTRATES	Can be applied on various metals, plastics, glass, wood, marble, stone, ceramic and other substrates	Can be applied on various metals, polymer films, plastics, and can also protect existing coatings	Can be applied on various metals, plastics, glass, wood, marble, stone, ceramic and other substrates
PRODUCT COMPATIBILITY ADVICE	Blends of different OPSZ and/or PHPS products and each of these in combination when formulating with selected resins in solvent-borne formulations are possible. No compatibility with water, protic solvents such as alcohols and other acidic components.		Best performance in solvent-borne 2K PU systems
APPLICATION ADVICE	OPSZ and PHPS can be applied via spray coating, wiping or dipping. Proper preparation of substrate is crucial for maximum adhesion and coating performance. Remove any moisture, oils and contaminants with a degreasing solvent. Keep the bottles tightly closed and away from moisture.		

	DURAZANE® 1500 RAPID CURE	DURAZANE® 1500 SLOW CURE	DURAZANE® 1800	DURAZANE® 2200	DURAZANE® 2800
CHEMISTRY	Alkoxy organic PSZ	Alkoxy organic PSZ	Vinyl organic PSZ	Si-H/Inorganic PSZ	Si-H/Inorganic PSZ
CURING METHOD	Ambient	Ambient	Heat	Heat	Ambient
FILM THICKNESS UP TO	25 µm	25 µm	25 µm	3 µm	3 µm
CURING SPEED	+++	++	+	+	+++
TEMPERATURE STABILITY	++	++	+++	+++	+++
FILM DENSITY	++	++	++	+++	+++
SCRATCH PROTECTION	++	++	++	+++	+++
CHEMICAL RESISTANCE	+++	++	++	+++	+++
WATER REPELLENCY	+++	+++	+++	++	++

YES! WITH THE RIGHT PRODUCT

ORDERING INFORMATION FOR DURAZANE® 1000

Organic polysilazanes	Item no.	Package sizes
Durazane® 1033*	214042	1 kg, 5 kg, 150 kg**
Durazane® 1066*	214047	1 kg, 5 kg, 150 kg**
Durazane® 1085*	214328	1 kg, 5 kg, 150 kg**
Durazane® 1500 rapid cure	214043	1 kg, 5 kg, 150 kg**
Durazane® 1500 slow cure	214044	1 kg, 5 kg, 150 kg**
Durazane® 1800*	214049	1 kg, 5 kg, 150 kg**

** Only available in the US and India

ORDERING INFORMATION FOR DURAZANE® 2000

Inorganic polysilazanes	Item no.	Americas	Asia	Europe	Package sizes
Durazane® 2200	213603	•	•	•	860 g, 1 quart***, 4 kg
Durazane® 2400-15	585107	•	•	•	860 g, 1 quart***, 4 kg
Durazane® 2800-15	585110	•	•	•	860 g, 1 quart***, 4 kg

*** Only available in Asia | 1 quart = 946 milliliters

ORDERING INFORMATION FOR DURAZANE® 5000

Particle-based additives	Item no.	Package sizes
Durazane® 5500	100149	1 kg, 10 kg, 50 kg, 180 kg

* **Please note:** Organic polysilazanes are subject to U.S. re-export jurisdiction and are prohibited from export to any country identified in Country Groups D:1 (Armenia, Azerbaijan, Belarus, Cambodia, China (PRC), Georgia, Iraq, Kazakhstan, North Korea, Kyrgyzstan, Laos, Libya, Macau, Moldova, Mongolia, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, Vietnam), E:1 (Iran, North Korea, Sudan, Syria) or E:2 (Cuba). Countries listed above are designated in Supp. No. 1 to part 740 of the EAR, version from August 3rd, 2018. Please note that only the latest country list on the BIS website is and will be binding (<https://www.bis.doc.gov/index.php/regulations/export-administration-regulations-ear>).

Technical data sheets, specifications and regulatory documents are available separately upon request.

Empowering Surfaces

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Simplifying Identification

We provide materials for durable and secure recognition and detection

there is **More to explore**

"More to explore" is our brand promise. That's because we offer far more than solutions just for protective coatings. We are the creative possibility developer. With inventiveness, expertise and specialty chemicals, we develop valuable functional future-oriented solutions to empower your surfaces and simplify the identification of your products.

Explore more on our website: [moretoexplore.info](https://www.moretoexplore.info)

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