Construction
Solutions

DOW CORNING

Product Selection Guide

Building Materials Protection Solutions from Dow Corning

Real Solutions for Real Market Needs

For more than 60 years, leading architects and building designers have relied on Dow Corning products for sustainable, lower-maintenance building materials protection solutions. From sealants and glazing compounds to water repellents and concrete admixtures, our innovative silane and silicon-based materials ensure longer-lasting performance with lower-cost maintenance. This guide showcases high-performance materials that help build long-lasting performance, energy efficiency and innovative solutions into all of your projects.

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Nature is a formidable enemy, and today's customers expect built-in protection and loss prevention. Give them the best with Dow Corning's latest technologies to build tomorrow's structures today.

Construction materials are exposed to damaging environments ranging from water ingression and abrasion by airborne particles to attack by organisms, spills and stains. Dow Corning products are designed to help improve the durability of building products and enhance end product capabilities. Our advanced solutions incorporate new types of fillers, raw materials, additives, processing techniques and product formulations. We bring you performance enhancement, innovative thinking, technical expertise and process improvement. And our technologies can help you invent the future of building materials protection with:

- **Hydrophobic treatments**
- **Resin and binding products**
- **Process aids**
- **Innovative collaboration to meet your specific needs**

Choose from a wide range of silanes, siloxanes, resins, additives, blends and emulsions to maximize substrate life, reduce maintenance and improve aesthetics. And, most importantly, meet customer demands for superior performance.

Because selecting the right building materials protection products now prevents costly repairs later.

We can help you differentiate your products and services.

Developing Tomorrow's Building Materials Protection Technologies

Look to Dow Corning and you will find the right solutions for meeting today's customer expectations and tomorrow's demands. Building on our long history of pioneering construction solutions, Dow Corning has invested significant development in continuing performance improvements for building materials protection, especially for:

- Dry mix
- Architectural coating
- Concrete maintenance and repair
- Gypsum
- Wood-based panels (OSB, MDF)
- Fiber-reinforced cement (FRC)

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Dow Corning Business and Technology Center (BTC), Seneffe, Belgium

Collaborating for success

Our science and your creativity can shape the next generation of high-performance construction materials. Building protection now costs far less than remediation.

Let Dow Corning show you the value our building materials protection products can bring as your innovation partner, working together to develop tomorrow's solutions for your customers.

As a global leader in silicone- and silane-based technology, you can rely on us for:

- Dependable, high-volume supply of silane and siloxane ingredients
- Proven products, alternative options and materials tailored to your requirements
- Silicone and silane expertise
- Confidential product development support

For more information about building materials protection – real solutions for real market needs – please visit **dowcorning.com/buildingmaterialsprotection.**

Turn to Dow Corning and let us help you invent the future of building materials protection.

Physical and Chemical Properties of Silicones

Silicones are present in many forms and functionalities and can be used in combination to yield the desired properties.

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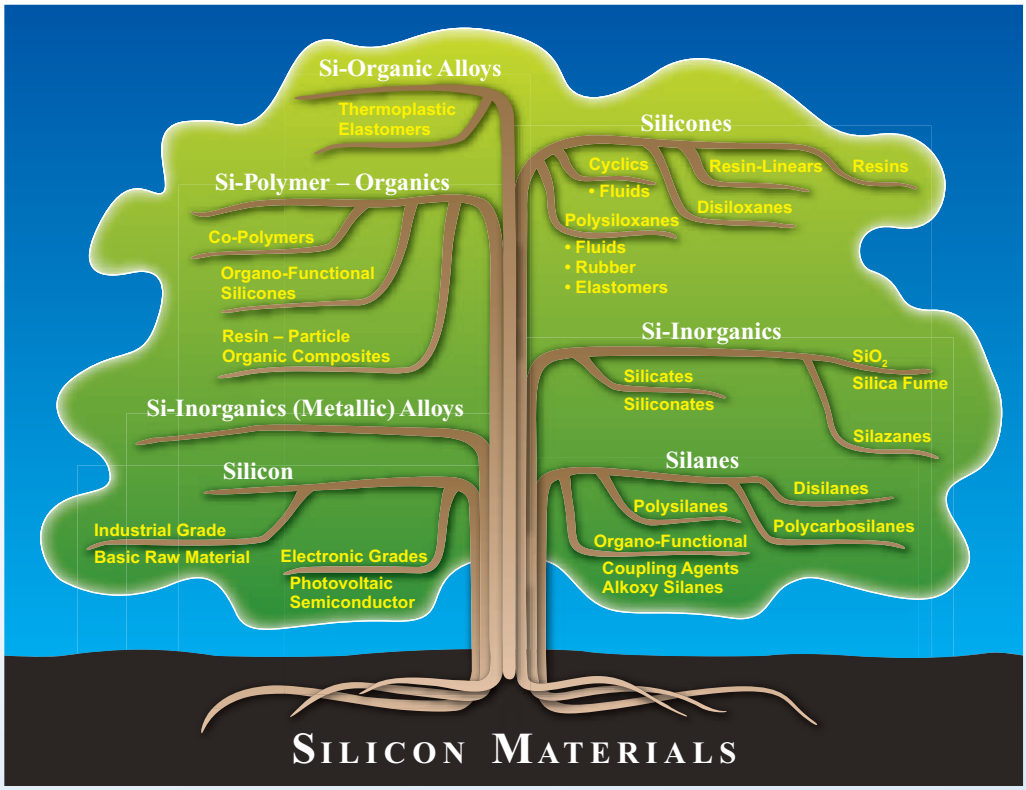
Silicone Chemistry – The Unique Properties of Silicones

Molecular Characteristics	Physicochemical Properties	Applications
• Highly open, flexible and mobile siloxane backbone - Si - O - Si - O - Si - O - • High bond strength 435 kJmol^{-1} Si-O (cf. 350 kJmol^{-1} C-C)	• Low surface tension and energy • High spreading and wetting capabilities • Permeable to gas and water vapor • Heat stability • Compatibility with organics • Weather resistance	• Lubricant • Antifouling • Release agent • Aesthetic feel (softness) • Comfort • High-temperature processing • Can be sterilized • Hydrophobic/ hydrophilic • Breathable

Figure 1. Customized Solutions

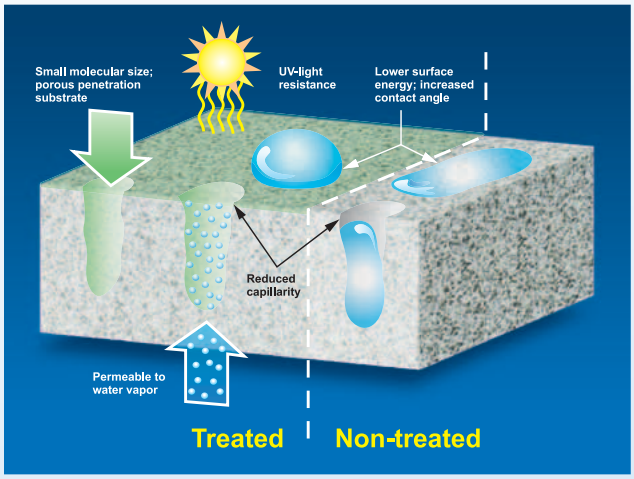


The silicon tree has many branches that allow Dow Corning to customize technologies. Contact us today to find out how we can partner with you to develop new silicon-based technologies to meet your business needs. Our team of technical, sales and marketing professionals is here to assist you with new product development concepts and current product enhancements.

Silicon → Silica → Silane → Siloxane	Features
Silicon = Si. Second most abundant element on Earth. Atomic number 14. Able to form four stable bonds like carbon.	Unique reactivity allows chemistry similar to carbon but, especially when bonded to oxygen, forms a longer, stronger, more flexible chemical bond.
Silica = SiO_2. The simplest compound of silicon. Very common as sand or quartz (crystalline) or refined forms such as silica fume, precipitated or fumed silica (amorphous).	Silica is used as a mineral reinforcement for many filled polymer systems and exists in many useful forms. Silica fume (microsilica) is an extremely effective pozzolonic material used in concrete to increase strength and chemical resistance and decrease porosity.
Silane. A molecule comprised of one central silicon atom with four attachments. The attachments can be any combination of organic or inorganic groups.	Alkoxy silanes with attached alkyl groups are efficient and effective water repellent treatments for concrete and masonry. Silanes with both organic and inorganic attachments are used as coupling agents with many useful variations.
Silicone or Siloxane. An oligomeric or polymeric compound with repeating Si-O (siloxane) "units."	Inherently resistant to UV, heat and oxidative degradation, silicones can be made as linear fluids, functional polymers and resins. By varying structure, attachments and molecular weight, they can be made into thousands of useful products.
Silicone Emulsion. In silicone technology, typically a silicone polymer suspended in water by means of stabilizing surfactants. More than one ingredient can be suspended within an emulsion.	Emulsion technology allows waterborne formulations to be used to deliver many types of ingredients that would otherwise require solvents or would be too viscous to use effectively.
Formulations and Blends. Multi-ingredient compositions intended for specific uses.	Formulated products can take advantage of more than one type of material in a common package. For example, silane reactivity and penetration can be combined with siloxane mobility and water beading. Blends and formulations can be made with basic fluids, diluted with solvent, made into emulsions or even transformed into powders.

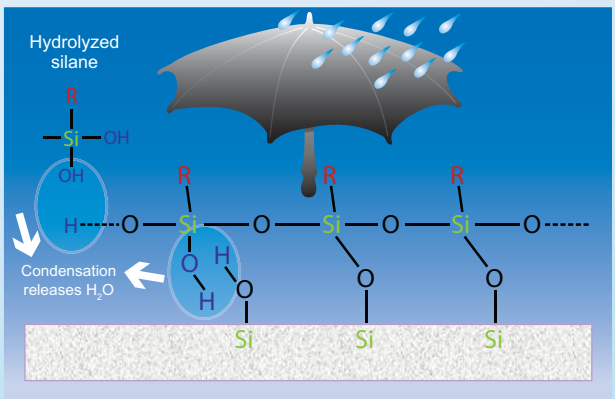
The terminology around silicon chemistry can be confusing. The above table will help you understand how the various forms of silicon can be developed into formulations to protect or enhance your construction products.

Figure 2. Silicone-based products penetrate deeply, forming a repellent layer within the substrate.



Most siloxanes and silanes are very small molecules, and when applied to the surface of a suitable substrate, penetrate deeply. They react with the substrate and themselves to provide durability. When cured, they allow water vapor transmission while preventing liquid water, which could contain dissolved chloride ions or acids, from passing into the substrate.

Figure 3.



SiOH groups formed when the silane reacts with water (hydrolysis) can further react with SiOH groups (via condensation) in the substrate and form chemical attachments. Condensation also occurs between silanes, forming an Si-O-Si polymer. The alkyl groups (R groups) orient away from the surface to very effectively repel water.

Product Properties

General Description	Products	Dilution System	Chemistry
Silanes	XIAMETER® OFS-6264 Silane	Solvent	Alkyl methoxy silane
	XIAMETER® Z-6403 Silane	Solvent	Alkyl ethoxy silane
Water-Based Siloxane	*Dow Corning*® 1-6184 Water Repellent	Water	Water-soluble silane
Silane/Siloxane Blends (Solvent Dilutable)	*Dow Corning*® Z-6689 Water Repellent	Solvent	Solventless silane/siloxane blend
	XIAMETER® OFS-6595 Silane	Solvent	Solventless silane/siloxane blend
Silane/Siloxane Emulsions (Water Dilutable)	*Dow Corning*® 520 Dilutable Water Repellent	Water	Silane/siloxane emulsion blend
	Dow Corning® IE 6682	Water	Silane/siloxane emulsion blend
	Dow Corning® IE 6683	Water	Silane/siloxane emulsion blend
	Dow Corning® IE 6694 Water Repellent	Water	Low-VOC silane/siloxane emulsion blend
	Dow Corning® Z-70 Emulsion	Water	Silanol functional siloxane emulsion
Siloxane Blends	*Dow Corning*® 84 Additive	Water	Low-viscosity emulsion of elastomeric silicone
	Dow Corning® 85 Additive	Water	Medium-viscosity emulsion of elastomeric silicone
Hydrophobic Powders	*Dow Corning*® SHP 50 Silicone Hydrophobic Powder	Dry ingredient	Silane/siloxane-based powder
	Dow Corning® SHP 60 Silicone Hydrophobic Powder	Dry ingredient	Silane/siloxane-based powder
Siliconates	XIAMETER® OFS-0772 Siliconate	Water	Sodium methyl siliconate
	XIAMETER® OFS-0777 Siliconate	Water	Potassium methyl siliconate
Specialty Fluids	XIAMETER® MHX-1109 Fluid	Solvent	Silicon hydride functional siloxane
	XIAMETER® PMX-0930 Silanol Fluid	Solvent	Silanol functional siloxane
	Dow Corning Toray BY 16-606 ▲	Solvent[1]	Functional siloxanes
	Dow Corning® BY 16-846	Solvent[1]	Functional siloxanes
	Dow Corning® Z-6288	Solvent[1]	Alkoxy functional silsesquioxane
	Dow Corning® 2-9034 Emulsion	Water	Organo-siloxane emulsion
Silicone Resin Emulsion	*Dow Corning*® IE-2404 Emulsion	Water	Silicone resin emulsion

[1]Products can be used under certain conditions in water-containing mixtures. Please consult your Dow Corning Technical Service Associate or refer to the specific product data sheet for additional details.

The product marked with a "▲" is sold via the XIAMETER® Web-enabled business model from Dow Corning, which offers high-quality, reliable standard silicone products online, at market-based prices. Visit **www.xiameter.com** to order this product or to learn more.

Substrate/pH Type	Active Ingredient, %	Typical Actives Usage Level, %	Specific Gravity, kg/L	Flash Point, °C (°F)
Alkaline or neutral substrates such as concrete, mortar and brick, stone (pH slightly alkaline to 12)	97	40 or 100	0.93	26.6 (79)
Alkaline or neutral substrates such as concrete, mortar and brick, stone (pH slightly alkaline to 12)	98	40 or 100	0.88	62 (144)
pH neutral to 10	98	3.5 to 7.5	1.05	27 (81)
Neutral and moderately alkaline substrates such as brick, stone and aged concrete (pH neutral to 10)	98	5 to 15	0.96	10 (50)
Neutral and moderately alkaline substrates such as brick, stone and aged concrete (pH neutral to 10)	99	5 to 15	1.02	44 (111)
Alkaline or neutral substrates such as concrete, mortar and brick, stone (pH slightly alkaline to 12)	40	5 to 20	0.99	>100 (212)
Concrete or cementitious materials	60	0.25 to 1	0.9	>100 (212)
Alkaline or neutral substrates such as concrete, mortar and brick, stone (pH slightly alkaline to 12)	40	5 to 20	1.00	>100 (212)
Alkaline or neutral substrates such as concrete, mortar and brick, stone (pH slightly alkaline to 12)	60	5 to 20	1.02	>100 (212)
Hydrophobic additive in cementitious-based materials (pH neutral to 10/admixture); APEO-free material	60	0.15 to 0.5	0.99	>100 (212)
Alkaline substrates such as concrete, mortar, brick, stone	60	2 to 5	1.1	>100 (212)
Alkaline substrates such as concrete, mortar, brick, stone	60	2 to 5	1.1	>100 (212)
Hydrophobic powder additive in cementitious-based materials	20	0.5 to 2	0.61	>100 (212)
Hydrophobic powder additive in cementitious-based materials	30	0.5 to 2	0.7	>100 (212)
Neutral, bricks, ceramics (pH neutral to 10)	32	0.5 to 3	1.25	>100 (212)
Neutral, bricks, ceramics (pH neutral to 10)	40	0.5 to 3	1.29	>100 (212)
Natural stone: limestone, sandstone, marble and granite (pH neutral to 12)	100	5 to 30	0.98	30 (86)
Perlite admixture or post-treatment material	100	0.5 to 5	0.98	100 (212)
As an admixture-type additive for neutral and alkaline factory-manufactured ALC boards – for air cure	100	0.1 to 3	0.94	>80 (176)
As an admixture-type additive for neutral and alkaline factory-manufactured ALC boards – for auto claved	100	0.1 to 3	0.92	>100 (212)
Fiber-reinforced composites, concrete and masonry admixture or post-treatment	100	0.1 to 5	0.98	>100 (212)
Hydrophobic additive for wood sealer formulations	50	2 to 8	0.94	>100 (212)
Renders/paints/stucco on cementitious material	50	3 to 10	1.02	>100 (212)

Hydrophobing Products

Dow Corning silane, siloxane and emulsion products have a proven history of providing water repellency and enhanced protection as a post-treatment, admixture and in-situ treatment for common construction substrates. Our water repellent line provides protection from rebar corrosion, efflorescence, freeze-thaw damage, water penetration, oil penetration, mold and mildew.

Our real solutions meet your real market needs

Dow Corning can help you meet your customers' rising expectations for building materials protection and lasting, low-maintenance damage prevention. Our solutions for **hydrophobic treatments** offer:

- Ease of use & handling
- Formulation flexibility
- Water repellency
- Efflorescence control
- Cost-effectiveness

Hydrophobic Materials

Products	Dow Corning® Z-6689 Water Repellent	XIAMETER® OFS-6595 Silane	Dow Corning® 1-6184 Water Repellent	Dow Corning® 520 Dilutable Water Repellent	Dow Corning® IE 6682	Dow Corning® IE 6683	Dow Corning® IE 6694 Water Repellent	Dow Corning® Z-70 Emulsion	XIAMETER® PMX-0930 Silanol Fluid	Dow Corning® SHP 50 Silicone Hydrophobic Powder	Dow Corning® IE-2404 Emulsion	Dow Corning® 2-9034 Emulsion
Substrates												
New Concrete				S		S	S					
Old Concrete	M	M	S	S		M	M					
Concrete Block	S	S		O	S	O	O					
Concrete Roof Tiles	M	M	O	O		O	O					
Fiber-Reinforced Cement			O	O	M	O	O					
Damp Proof Coursing	S	S	M		S							
Pavers, Flagstones	M	M	S	O	O	O	O	O				
Bricks	M	M	O	S		S	S					
Mortar, Grout	M	M		M		M	M			O		
Stucco, Render, EIFS								M		O	M	
Floor Tiles & Terracotta	M	M	O	S		S	S					
Limestone												
Sandstone	M	M		S		S	S					
Marble												
Granite												
Gypsum											S	
Perlite						O	O	O	O			
Wood												M

M Main Application S Secondary Application O OEM Use

Paint and Render Materials

Dow Corning® silicone resin emulsions enable you to develop paint, render and stucco formulations that better protect exterior substrates such as masonry, plaster or EIFS from the detrimental effects of weather, water and industrial pollutants.

Our real solutions meet your real market needs

Dow Corning can help you meet your customers' rising expectations for building materials protection and lasting, low-maintenance damage prevention. Our solutions for **paint and render materials** offer:

- Surface protection
- Easy maintenance
- Improved, long-lasting appearance

Product Properties

Products	Description	Dilution System	Chemistry	Active Ingredient, %	Typical Actives Usage Level, %	Specific Gravity, kg/L	Flash Point, °C (°F)
Dow Corning® IE-2404 Emulsion	Co-binder	Water	Silicone resin emulsion	50	3 to 10	1.02	>100 (212)
Dow Corning® Z-70 Emulsion	Hydrophobic agent	Water	Silanol functional siloxane emulsion	60	0.15 to 0.5	0.99	>101 (214)
Dow Corning® IE 6682	Primer for cementitious substrates	Water	Silane/siloxane emulsion blend	60	0.25 to 1	1	>100 (212)

Our real solutions meet your real market needs

Dow Corning can help you meet your customers' rising expectations for building materials protection and lasting, low-maintenance damage prevention. Our solutions for **process aids** offer:

- Ease of processing
- Improved productivity
- Reduced energy & waste
- Cost-effectiveness

Process Aids

Dow Corning products act as foam controllers, release agents, wetting agents and catalysts.

The products listed in this section represent only a portion of Dow Corning's total technical offerings. We also provide services to help evaluate your process and find the optimal solution.

Here are examples of process aids that are good starting points for construction material processing. Many more products exist in the Dow Corning product line. Not all process aids will work in every process. Please consult your Dow Corning technical contact to determine which process aids will meet your specific needs.

Process Aids	
Products	Examples of common products that can be used in construction processes
Wetting Agents	XIAMETER® OFX-5211 Fluid
Antifoams	XIAMETER® AFE-2010 Antifoam Emulsion XIAMETER® AFE-0310 Antifoam Emulsion XIAMETER® AFE-2210 Antifoam Emulsion
Mold Release	*Dow Corning*® 2418 Release Emulsion
Beading/ Anti-blocking Agents	*Dow Corning*® 51 Additive *Dow Corning*® 52 Additive

Protecting buildings saves energy

Beyond the cost savings of longer-lasting, more durable buildings, Dow Corning building materials protection products can save energy costs, too. Treating substrates with hydrophobic materials from Dow Corning makes your buildings more energy-efficient, reducing two leading causes of structure heat loss:

- Heat loss from evaporation of absorbed water in untreated materials – As water evaporates, changing from liquid to vapor, it draws heat energy, cooling the substrate and structure, and increasing energy consumption.
- Thermal conductivity – Testing shows that thermal conductivity of wet material is higher than that of dry material.

Hydrophobing technologies from Dow Corning keep substrates dry, reducing thermal conductivity and increasing your energy efficiency.

The heat loss from evaporation of treated, dry substrates compared to untreated, wet substrates is visibly demonstrated with infrared imaging.

Two brands to serve you

Whether you need industry-leading innovation or greater cost efficiency, Dow Corning can help. *Dow Corning*® brand solutions are dedicated to meeting your needs for specialty materials, collaborative problem-solving and innovation support. Learn how we can help you at **dowcorning.com/construction**.

If you need to buy high-quality, standard silicone materials at market-based prices, we can help you achieve that through our Web-enabled XIAMETER® brand and business model. Learn more at **www.xiameter.com**.

Let us help you invent the future of building materials protection.

Need more information?

Visit dowcorning.com/buildingmaterialsprotection.

The Dow Corning website gives you immediate access to:

- **Product samples**
- **Product literature and technical data sheets**
- **Technical articles and presentations**
- **Customer service**
- **Information about services and solutions**
- **The name of a technically knowledgeable Dow Corning distributor near you**

Product Information

For more information about Dow Corning products for building materials protection, please visit **dowcorning.com/buildingmaterialsprotection**

Contact Information

For local contact information, please visit **dowcorning.com/ContactUs**

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