

Turning Architects' Dreams into Reality



Much of our quality of life and our sense of community depend on our having safe and strong places in which to live, work and play. We demand safe, comfortable, stylish and enduring homes, schools, playgrounds, hospitals and places of worship.

Silicone high performance and high technology polymers are used in hundreds of ways in new construction and renovations. They make thousands of other construction materials work better and longer. More design options today means we can conserve resources for future generations.

Protect

Silicones protect the structural integrity of a building so it can stand the test of time. Silicone sealants, adhesives, structural glazes and coatings, because of their high resistance to heat, wind, moisture and chemicals, slow down erosion of buildings and building materials – even in the most extreme climates.

Strengthen

Silicones bring strength and enhanced structural performance to building materials. They bond even the most diverse materials together such as concrete, glass, granite, marble, aluminum, steel and plastics.

Enable

Modern architecture makes incredible demands on materials. Silicones can meet these demands by offering strength and exceptional design flexibility. For example, silicone sealants and glazing make insulating glass panels that are more resistant to heat, ultraviolet light and movement and are strong enough to be used in massive structures. Buildings can have more natural sunlight without compromising structural integrity or insulation. It is not surprising that silicones bring light into some of the world's most spectacular projects.

Preserve

Silicones revive historical buildings without compromising appearance. Silicone sealants and adhesives add a protective layer that strengthens and adds water repellency and "breathability" to natural material. In this way, they restore strength and permeability to crumbling facades, weakened structures and deteriorating joints without compromising the integrity of the original material.



Typical Applications

Silicones are used in the following applications to meet the long-term performance criteria and aesthetic concerns of builders, architects, design engineers, craftsmen and other trade professionals who construct and renovate buildings.

Engineering Sealants and Adhesives ●●●

Silicones are ideal for affixing materials and are used in expansion, construction, connection and movement joints (for example, in a bridge). The elastic joints provide the necessary give and take to hold something in place while absorbing the natural shifting and movement between materials resulting from fluctuations in temperature, humidity, wind and other environmental effects.

Silicone in new and remedial concrete pavement joints increases the life span of highways, airport runways, bridges, shipping yards, parking garages and residential streets. Silicones withstand the extreme expansion and contraction needs. At the same time, they do not react with materials such as fuel, hydraulic oils and cleaning solvents commonly found on busy industrial roadways.



Building Sealants and Adhesives ●●●

Exposure to the elements remains the principal worry of architects and builders of industrial and commercial structures. Silicone adhesives used in structural glazing protect the long-term quality and appearance of the facade. Whether silicone is manufactured with the material or applied to the finished surface, the final product will be virtually unaffected by sunlight, rain, sleet, snow, heat, cold, ultra-violet radiation and atmospheric contamination. Because design properties such as elasticity, tensile strength, hardness and adhesion do not change significantly over time, the building will have a longer life span and require less maintenance.

Structural sealants in protective or impact-resistant windows increase protection for building tenants or passersby in the event of severe weather, fire, seismic activity, explosions or criminal trespass. The unique silicone glazing systems are used in factory-laminated windows for new construction and adhesive film for existing windows. The result – increased safety by reducing the potential for broken glass being blown from its frames.

Structural glazing also exhibits excellent insulating qualities. Manufacturers often use silicones to make insulating glass panels and units for building exteriors. The glass effectively withstands cold winters and warm summers, ultraviolet light and humidity and benefits from silicones' low water absorption and improved adhesion.

Masonry Coatings ●●●

Silicones are added to coatings for decorative and commercial uses because they remain impervious to years of outdoor weathering. Silicones are a convenient addition to a variety of coating materials including powder paints, liquid paints, sealers and varnishes, enabling these coatings to be in "ready-to-use" water-based, powder and cream formulations. Coatings work particularly well in masonry, poured and precast concrete, fluted block, brick, stucco and more.

Silicone resin emulsion paints and plasters are among the most modern and successful types of finishes for facades. The silicone resin binder makes the pores water-repellent and strengthens their structure at the same time. Silicone primers also strengthen the underlying material and enhance the adhesion of the top finish.



Industrial Coatings and Maintenance ●●●

The term “industrial strength” may well have been coined to describe materials made with silicones. Industrial surfaces – bridges, oil platforms, railway cars – need to be highly resistant to many kinds of damaging conditions at once and must last longer than consumer coatings. Silicones in anticorrosive paints and plasters protect industrial surfaces and edifices so they last longer and look better.

Thanks to advances in silicone technology, today’s exterior paints and coatings last longer and stand up to sun, salt, pollution and age better than ever. Paints made with silicones offer exceptional adhesion, pigment dispersion, and chemical, weather and stain resistance. Newer silicone-enhanced paints keep the exterior coating flexible so it withstands freeze/thaw cycles without cracking, chalking, peeling or blistering. Chemicals such as oil, gasoline, salt spray and acid rain are less likely to corrode surface treatments. Stains and abrasions from pollution, traffic and other abuse will not affect the life span of the surface.

Water Repellent Additives ●●●

Water inflicts the most serious damage to buildings. Water and moisture can corrode the facade, deplete the binding agents in joints, diminish the thermal insulation qualities of a structure and increase health risks by transporting harmful substances like bacteria into the heart of a building.



Silicone-based masonry water repellents provide the most effective protection against water. Added to any variety of paints, plasters and finishes, the repellents make the construction material more water-repellent and optimize the water repellency, water resistance and water-vapor permeability of the coating. Unlike other coatings, silicone water repellents do not seal the pores but form a very thin layer on the pore walls to reduce water intake without compromising the materials vapor permeability or “breathability.” Water is prevented from penetrating the material from the outside but moisture that has accumulated inside can escape.

Water repellent treatments are particularly effective in normal and reinforced concrete, aerated concrete, natural stone, limestone, brickwork and sand-lime brick. In glass, silicone prevents fogging due to the invasion of moisture.

Conservation and Restoration ●●●

Many of the world’s culturally significant buildings were built with natural materials – porous sandstone and porous limestone – that are particularly susceptible to weathering. Silicone sealants and adhesives restore the material to its original strength by penetrating the stone (through to the undamaged core) and reinforcing the natural mineral. This process does not compromise the physical characteristics of the stone or the structure such as its vapor permeability or “breathability” and its thermal and hydric behavior. In fact, silicones will enhance many of those characteristics. Silicones are also applied uniformly so they do not stain or streak.



Consumer Benefits

Consumers benefit daily from expanding applications of silicones in commercial and industrial construction. The industry continues to improve upon current applications and technologies so they are more versatile, easier to use and more cost-effective.

- Silicones have tremendous cost-savings benefits. Their durability and flexibility lends itself to a range of manufacturing and application options that ensure convenience, quick installation and minimal repair.
- Silicones ensure construction materials stay affixed and absorb stress and movement so a structure is strong and safe, whether it is a wooden floor, swimming pool, concrete bridge or skyscraper with glass edifice.
- Silicones extend the service life of exterior coatings and finishes. Even under extreme conditions, they retain their chemical and

weathering resistance. These coatings are optimal for shipbuilding, bridges, oil rigs, industrial plants, containers and pipelines.

- Today's exterior paints last longer. In many applications, silicones make it possible to apply fewer coats without sacrificing color, coverage or protection.
- Silicones produce airtight seals that do not react with materials sealed in or out of a container – such as liquids, gases or solids in chemical tanks, sewage and containment systems or farm silos.
- Silicone coatings and sealants are instrumental in making safe the floors in houses, oil rigs, ocean liners and manufacturing plants where the build-up of grease, bacteria or oils could be hazardous.
- Silicone cement-lime mixes and finishing plasters are water resistant, flame-resistant, abrasion-resistant, easy to clean and paint and less vulnerable to bacteria and fungus because silicones are not a good host to bacteria. Silicone applications on unglazed brick and natural stone interior walls make it easier to clean and remove grime, graffiti and posters.
- Silicones enhance energy efficiency. An efficient insulating facade with silicone-enhanced glass panels minimizes thermal loss and reduces the costs of heating and cooling a building.

Society Benefits

- Continued advances in silicone applications and technology enable builders, architects and design engineers to erect buildings with more exacting design and structural demands.
- Using silicones will reduce cleaning, maintenance, operational and replacement costs for new and older buildings.
- Silicones enable the restoration of some of our most prized historical landmarks and ensure we will be able to enjoy these and other architectural feats for generations to come.
- Silicone-containing adhesives and sealants have revolutionized modular home construction.
- The elastic nature of some silicone seals in structural glazing applications (for example, the weather seal in glass buildings) can help reduce damage and physical harm from small to medium-scale earthquakes.
- Silicones help offset the depreciation of buildings due to water decay, corrosion and deterioration.
- Silicones have inspired important and innovative architecture and enable previously unimaginable design opportunities. Silicones help create more than buildings – they help create beautiful skylines.