



SODIUM SILICATE / WATER GLASS TECHNICAL BULLETIN

The marvels of chemistry have provided our high-tech world with a wide array of useful elements and compounds. One of these important compounds, is sodium silicate, also known as *water glass*

Sodium silicate is non-flammable, non-explosive, and non-toxic. However, it can be hazardous for unprotected skin and eyes owing to its strong alkaline nature . . . the effects though, vary depending on the strength of the solution. It may cause a bit of skin irritation in diluted form, to chemical burns in its most concentrated state.

Water glass is an important component in many industries and processes, being inexpensive and abundantly available.

Concrete Sealing: Sealing a concrete surface with sodium silicate eliminates dust and prevents the penetration of liquids such as water, grease and oil. For sealing concrete, mix 1-part water glass to 4-parts water and apply to a clean concrete surface. Allow the application to dry and apply two additional coats

Ceramics: In ceramics and pottery production, sodium silicate is used as a *deflocculant*, which is an ingredient that helps clay slip produce a smoother flow. In casting-slips it reduces viscosity and eliminates the need for large amounts of water to dissolve the clay.

Water glass is also widely used to create those desirable crackle effects in wheel-thrown pottery. To use it, a vase or bottle is built up fairly narrow and with thick walls. Then sodium silicate is brushed on it surfaces where a crackle finished is desired. After a few minutes, the wall of the piece is stretched outward with a rib or hand. The result is a wrinkled or cracked look, giving the piece a sense of age and beauty.

Magic Water: Sodium silicate, is also the main agent in ceramic "magic water", which is used in joining clay pieces, such as handles, or in welding seams, and joining pieces of clay. Magic water is produced by combining one gallon of water with three tablespoons of liquid sodium silicate and one and a half teaspoons of soda ash.

Auto Repair: Because of its properties of solidifying when heated, sodium silicate makes an excellent sealant. It is often used in automobile repair to resurrect a blown head gasket or cracks in an engine block. Adding water glass to the cooling system can halt these types of leaks. That is because a certain amount of the coolant flowing through the crack gets converted into steam upon exiting the system. This leaves behind molecules of liquid glass to fill the crack. The extreme heat inside that crack melts the liquid glass molecules, helping any subsequent molecules stick together and form a solid sheet of glass.

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Adhesive Use: Sodium Silicate has excellent adhesive properties, too, especially for porous surfaces, such as paper and cardboard where an inexpensive, fast processing adhesive is required. Because of this characteristic, liquid sodium silicates are widely used as adhesives in making fiber drums and paper tubes.

Other adhesive applications for sodium silicates include label adhering, bonding of wood, metal foils or glass to porous substrates, glass fiber insulation bonding, as well as the fabrication of foundry molds, bricks and abrasive wheels.

Preserve Eggs: Sodium silicate was also used as an egg preservation agent through the early 20th century with great success. It is still used today. To preserve eggs this way, use one part of water glass to of nine parts of water. Place unwashed eggs in a container and cover the eggs with the sodium silicate solution to about one inch higher than the eggs themselves. Store the container in a cool place until you are ready to use them. Eggs preserved this way can last up to twelve or more months.

Mold Making: For refractory use, water glass is a useful binder of solids, such as refractory sand, vermiculite and perlite. When blended with these aggregates, water glass can be used to make molds for casting molten metals, or hard, high-temperature insulation board used for refractories

Home Brewing: Other uses of sodium silicate include home brewing.

Dye Fixative: It is used as a fixative in the dyeing industry

For further information, please contact, Environmolds at 908-273-5401 or info@environmolds.com.