

Protectosil® SH

Protectosil® SH is a mixture of ethyl esters of different polysilicic acids for the consolidation of construction material.

Technical Data

Properties and test methods	Value	Unit	Method
Density (20 °C)	1.050 - 1.070	g/cm ³	DIN 51757
Viscosity (20 °C)	ca. 5,0	mPa·s	DIN 53015
SiO ₂ content	40.0 - 42.0	Gew. %	AN-SAA 0851
Flash point	> 62	°C	DIN 51755

Registration

Protectosil® SH

EINECS/ELINCS (EU):	Yes
AICS (Australia):	Yes
DSL/NDSL (Canada):	Yes
PICCS (Philippines):	Yes
TSCA (USA):	Yes
IECSC (P.R. China):	Yes
ENCS (Japan):	Yes
ECL (South Korea):	Yes

Protectosil® SH is a mixture of ethyl esters of different polysilicic acids for the consolidation of construction material.

Protectosil® SH is a colorless, low-viscosity liquid with an SiO₂ content of 40 %. The polysilicic acids still have a sufficient content of ethoxy groups, which can be activated by acid- or base-catalyzed hydrolysis. Condensation starts even during hydrolysis, with the formation of relatively large polymeric molecules. During storage of these hydrolysates, condensation continues until a gel is formed, the gelation rate depends on the degree of hydrolysis.

The action of the hydrolysates as binders is based on the continuation of the hydrolysis with subsequent gelation and dehydration to give polymeric SiO₂ structures.

Safety and Handling

Before considering the use of Protectosil® products please read its Safety Data sheet (SDS) thoroughly for safety and toxicological data as well as for information on proper transportation, storage and use. The Safety Data Sheet is available after registration on our website www.protectosil.com or upon request from your local representative, customer service or from Evonik Resource Efficiency GmbH, Product Safety Department, E-MAIL sds-hu@evonik.com.

Packaging and Storage

In an unopened container Protectosil® SH has a shelf life of 12 month if stored in originally sealed containers. The material should be protected against moisture and should not be stored at temperatures above 40 °C. Protectosil® SH is supplied in 25 kg pails, in 220 kg drums and 1.000 kg bulk containers.

Properties and Use

Protectosil® SH is used to deposit silicic acid formed as a result of complete hydrolysis. The resulting silicic acid bonds well to many mineral, inorganic substrates, such as natural stone, brick or terracotta stones. The deposition of a thin SiO₂ layer improves the chemical and thermal stability and mechanical properties. In the case of porous mineral substrates Protectosil® SH is used for stone consolidation. Depending on the kind of natural stone Protectosil® SH is used in specifically developed formulations as a silica source.

Protectosil® SH is immiscible with water, so hydrolysis therefore requires a co-solvent such as ethanol, methanol or white spirit. Mineral acids, ammonia, titanates or tin compounds are suitable as catalysts.

Directions for use:

The substrates to be treated should be air-dry and clean in order to ensure deep penetration of the active ingredient. During application the outside temperature and the temperature of the substrate should be within the range of 5 °C to 40 °C. The material should not be applied if there is strong wind or if it is raining. The treated area should be protected against rain for at least 2 days after application. Protectosil® SH is applied by spraying (e.g. airless spraying guns). For small areas a wash bottle can be used. For the consolidation to be successful the stones or masonry must be totally penetrated by Protectosil® SH. Therefore a wet-in-wet application until the material is not adsorbed anymore is recommended. The amount of application depends on the absorbency of the substrate, which means between 0,5-1,0 l/m². In most cases a solvent-based formulation of Protectosil® SH is applied. The determination of the penetration depth helps to check the sufficient amount of application. Excess ethyl silicate can be washed away from the surface using white spirit or alcohol. Non-absorbent substrates such as, for example, glass, wood, plastic, and metal cannot be treated with Protectosil® SH. Glass, wood and metal are not attacked by Protectosil® SH. Neither are most plastics used in construction. Therefore, covering is normally not necessary. To make it sure we recommend to carry out a test. In the worst case, product not absorbed by the substrate may react with atmospheric moisture to form a greasy, glossy silicone resin film, which can easily be removed if cleaned immediately using conventional cleaning agents, or alcohol.

All equipment and containers must be clean and dry. After use they can be cleaned with any organic solvent (methylated spirit, petrol or thinners). In order to check the right amount of application and the success of the consolidation it is recommended to prepare a sufficient large test area. If a hydrophobizing agent should be applied as well, it is recommended to wait 2 weeks after the application of Protectosil® SH. The following water repellents are applicable: Protectosil® BHN, Protectosil® 40 S and Protectosil® 60 SK.

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