



SiOO:X

WOOD PROTECTION

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SiOO:X Wood Protection Product Specification

SiOO:X Wood Protection is a water-based wood impregnation system which uses proven silicate technology and natural materials to give wood long life surface protection. It is completely safe, inert and environmentally friendly.

The product is manufactured by Sioo Wood Protection AB, Gothenburg, Sweden.

SiOO:X uses a patented (WO 2007/11156) two component system consisting of the SiOO:X Wood Protector and SiOO:X Surface Protector. The two components are designed to be used together in exterior environments and interact synergistically to create a unique system to protect wood surfaces.

The effect is due to the properties of mineral silicates. In essence the method imitates how nature itself protects wood by petrification or creation of fossils. The SiOO:X system only contains natural mineral and plant-derived ingredients which are biocide and emission free.

Technical Specification

1. SiOO:X Wood Protector

The first stage of the treatment uses a mineral silicate solution that is able to penetrate many wood species very efficiently.

The SiOO:X Wood Protector contains potassium silicate and natural extracts of wood and plants. The pH value is approximately 11. Due to the alkalinity of the mineral silicate solution, SiOO:X Wood Protector penetrates most wood species very effectively. As a result of this, SiOO:X penetrates the microstructure of the wood fibres. It does it so well that SiOO:X can be used

on practically all types of wood. It is highly effective with ThemoWood. As with all treatments, the depth of penetration depends upon the permeability of the wood species. The level of water uptake of timber species is defined in terms of Treatability Classes as stated in BS EN 350-2. In most species sapwood is more permeable than heartwood. When brushing or spraying the wood protector onto planed timber it is often advantageous to sand the wood surface to remove the 'machining glaze'.

Over time, the mineral silicate cures by reacting with atmospheric carbon dioxide to precipitate an insoluble silicate network that is deposited inside the wood. When the crystals are deposited inside the wood cell wall this can improve the dimensional stability of the wood, as well as reducing the susceptibility of the wood to decay organisms. Where the crystals are deposited in the wood pores, this reduces the transport of liquid water into the wood. The deposited silicate crystals also harden and cement the wood surface, which discourages attack by wood-degrading insects. However, water vapour is still able to enter and leave the wood, so that it is 'breathable'. The silica layer also reflects heat. When the wood is first coated with SiOO:X it turns a yellowish-brown colour, but as the surface modification system cures the wood develops a silvery-grey patina.

The effectiveness of SiOO:X against decay micro-organisms is proved by recent 'pure-culture' tests according to the EN 113 protocol conducted by SP of Sweden, where it was found to meet the durability requirements for Use Classes 1, 2, 3.1 and 3.2 (EN 335-1).

2. SiOO:X Surface Protector

After the first stage of treatment with the Wood Protector, SiOO:X Surface Protector (a silane based emulsion) is applied. This cures by cross linking to form a flexible silica network and provides a water-resistant barrier preventing leaching of the mineral silicate before it has fully cured.

The formula is designed to combine SiOO:X Wood Protector and SiOO:X Surface Protector, but SiOO:X Surface Protector can also be used separately on mineral surfaces and wood.

The two products complement each other and interact. In doing so, major synergistic effects are created. SiOO:X Wood Protector opens up the wood for the Surface Protector to penetrate more effectively. SiOO:X Surface Protector in turn fixes the wood protection in the wood chemically as well as physically. Thus it has a double function as an extra fixing agent and a water repellent. SiOO:X Surface Protector is also open for diffusion of water vapour but creates an optimal environment for the two products in co-operation to effectively protect the wood. The silicon-oxygen bond that is formed during curing is completely stable to UV light, meaning that the SiOO:X Wood Protection system is chemically and physically inert.

Preparation for Treatment

For new timber, the best penetration of the treatment is achieved on a sawn surface. At the very least the surface should be sanded with no finer paper than 60 grit.

If necessary, for existing structures:

Clean the surface from oil, colour, dirt and grease.

1. Soak the surface with a cleaning agent. Allow a few minutes for it to penetrate the surface.
2. Clean with a rotating brush or a high pressure cleaner or a thick and soft brush.
3. If necessary use a sanding machine to clean the surface. This can also help with penetration of the formulation.

SiOO:X Wood Protector is alkaline. Protect glass, aluminium etc, by masking. Should it be necessary, wipe off spillage with a wet rag. Use eye protection and gloves. If the solution solidifies it is difficult to remove. On glass it can be scraped away by carefully using a razor-like blade.

Climate Conditions for Treatment

The treatment is to be applied under cover or in the open in dry conditions to avoid rain during treatment.

The treatment is not to be carried out at temperatures below 5 degrees centigrade or externally in direct sunlight on very hot sunny days. If treating by hand outside in the UK the best times to treat are between April and October.

Application of the Treatment

Factory treatment

Factory treatment is **always to be preferred** as better quality control is achieved. Sioo has approved treatment companies, see www.sioox.org.uk , who are experienced in applying SiOO:X and with initial preparation. As the treatment is applied under cover in controlled conditions the process can proceed at any time.

Step 1 – SiOO:X Wood Protector

When the wood is dry, apply SiOO:X Wood Protector twice with an interval of at least 2 hours. Put it on evenly and abundantly with a soft brush, roller, sprayer, or vacuum coater. The surface of the timber should be fully saturated (including the end grain). Brush it out till all liquid on the surface is gone. Stir it during treatment. After at least 4 hours the Surface Protection treatment should be applied. On standard surfaces 1 litre is sufficient to cover 6-8 sq. metres with the first coat and 10-12 sq. m with the second coat. On new sawn surfaces the amount required may increase by up to 30%.

SiOO:X Wood Protector withstands some light showers of rain, but not prolonged or heavy downpours. If heavy rainfall occurs it is essential to repeat the treatment.

Step 2 – SiOO:X Surface Protector

When the SiOO:X Wood Protector has dried for at least 4 hours, and before it rains, the coating of SiOO:X Surface Protector should be applied. Put it on evenly and abundantly with a soft brush, roller or a sprayer. Permit the fluid to be absorbed for a few minutes. Then continue until the wood is saturated. One litre will cover 8-12 sq. metres.

The surface is ready to use after about an hour. After 10–14 months the components have fully hardened.

N.B. Consumption of the treatment fluid varies depending on the type of wood, surface structure, moisture content and age.

Safety Considerations

SiOO:X Wood Protection contains no ingredients that mean it has hazardous properties and that necessitate an obligation to label. Accordingly, there are no hazardous substances as set out in the directive 67/548/EEC or 1999/45/EEC, or persistent, bio-accumulative toxic substances according to annex XIII or substances on the Candidate list. In addition, there are no harmful substances or parts of the product that are designated as irritating.

Both components are non-toxic and emission free.

Safety Data Sheets are available for both components and should be taken as integral to this specification.

Exposure Limitations/Personal Protection

Exposure limit values

Does not contain substances and such concentrations that restrictions are necessary

Exposure limitations at the workplace

1. Respiratory protective equipment

When spraying in an enclosed area or if ventilation is inadequate use suitable face protection.

2. Protective gloves

Wear protective gloves when handling

3. Eye protection

Wear close fitting goggles or a face visor if there is a risk of splashing

4. Protective clothing

Wear protective clothing as needed

Wash with soap and water after handling

Maintenance

Should the treated surface be damaged in assembly and construction apply more SiOO:X Surface Protector to the damaged area. If major damage occurs first apply the SiOO:X Wood Protector.

With correct application SiOO:X will give a life of up to 15 years. Sioo Impregnation hardly requires any maintenance. If possible keep the surface clean. Dirt should be removed. Should a part of the bright treated surface be scraped off, just apply more SiOO:X Surface Protector. The bright surface will return within a few months. If major damage is done also SIOO:X Wood Protector should be applied.

SiOO:X is completely free of biocides. In some circumstances and especially in warm and prolonged humid conditions there may be cases of grey staining developing under the protection system. Where this occurs, it is restricted to the sapwood. This is a natural part of the weathering process and as the SiOO:X system cures this will become less noticeable. This does not indicate that wood decay is taking place. Black spot may sometimes occur on the surface and this can be removed by washing with a neutral cleaner or SiOO:X Maintenance Wash. In susceptible areas recurrence of black spot can be reduced by re-applying the Surface protector, or in more severe cases re-applying the Wood Protector followed by the Surface Protector.

On horizontal surfaces it is recommended that a second coat of the Surface Protector is applied after a year. At this stage clean the surface with an alkaline cleaner and a soft brush and then make a second application.

