

## Product Information

The SiOO:X™ Premium Wood Protection System comprising SiOO:X Wood Protector and SiOO:X Surface Protector is a proven water based silicate treatment which, if correctly applied and cared for, provides long life and a beautiful natural finish. It can be applied to most timber surfaces.

### HOW THE PRODUCT WORKS

SiOO:X is a wood modification system which to work effectively needs to penetrate the timber substrate as far as possible. After the treatment application, and, activated by moisture a curing reaction commences, which forms a flexible silica network. Over time, the mineral silicate cures by reacting with atmospheric carbon to precipitate an insoluble silica network within the wood structure. This curing process continues for around three years. The result is that the timber surface is toughened and an even accelerated weathering takes place which is a permanent change. The cure rate is temperature dependent and will proceed very slowly in cold exterior conditions. In some situations where the surface is not exposed to rain, the silvery-grey surface appearance may not develop and this can be remedied by the application a water spray from time to time.



*Spruce 4 years after treatment*

### PREPARATION AND TREATMENT

SiOO:X is designed for treatment to professional standards. In wet and humid maritime climates such as apply in the United Kingdom and Ireland it is particularly important to achieve maximum impregnation of the SiOO:X treatment into the surface substrate and into all edges, end grains and any tongue and groove details. It is highly advisable to treat the back sides of timber exposed to external conditions. Any sawn ends must be treated with both the wood protector and surface protector. Good penetration of the wood is the key to a good finish. Both the wood protector and surface protector should be generously applied to the wood and an adequate time allowed between coats. The Wood Protector is water-based and is VOC-free, but is alkaline so that gloves and eye protection should be worn during application. Spillages onto unprotected surfaces should be washed away immediately because once the system has cured it cannot be removed easily.

To achieve adequate professional standards it is necessary to apply the treatment to sawn surfaces. On planed surfaces it is essential to remove machine glaze (using a 60 grit paper) to allow the treatment to penetrate the wood structure.

For new timber the best professional results are obtained by having the timber treated by SiOO:X approved factory coaters in controlled factory conditions resulting in optimum application rates and drying environment. The best results are obtained on kiln dried timber

below 20% moisture content. Treated timber should be separated on drying racks and ideally allowed to stand for an initial curing period before shipment.

On delivery to the project site, treated timber should be separated and any protective wrapping removed to allow air circulation.

#### **TREATMENT BY HAND**

SiOO:X can be applied by hand but this needs to be done in dry conditions in temperatures above 5 degrees centigrade. The surface should always be opened up by sanding and old timber cleaned beforehand. To achieve satisfactory results, professional standards need to be adhered to with a flooding of the treatment onto the surface and the removal of excess fluid. Adequate time needs to be given for drying and the standards reached in factory application adhered to as closely as possible. For best results, sawn surfaces are always preferred, but if the surface has a planed finish then it is essential to machine sand with 60 grit paper to remove the machine glaze. Penetration is the key to good performance with this product. Unless the timber can be treated and dried adequately inside, the best time to treat outside is in the spring and summer months. Outdoor treatment between October and April is not recommended.

#### **MODIFIED WOOD AND BIOLOGICAL DEGRADATION**

Wood is a complex natural material. It is subject to biological processes. In order to ensure that timber has a reasonably long life in service, it is necessary to resort to the use of wood preservation techniques to prevent, or at least slow, attack by biological organisms. Simplistically such attack can be divided into macrobiological (insects and mammals) and microbiological (decay fungi, staining fungi and moulds, and bacteria).

SiOO:X meets the EN standards for resistance to biological attack.

Fungi that cause discolouration of the wood are called staining fungi whilst those that grow superficially on the wood are referred to as moulds. Technically, staining is referred to as blue stain in wood in service. If it occurs, it manifests itself in a black/blue-grey spore appearance and feeds off the sugars and starch in the sapwood, not the cell wall structural molecules. It does not result in any significant loss of strength or mass of the wood. It can be an aesthetic challenge for modified wood.

Blue staining can occasionally occur in SiOO:X treated wood. It is not induced by the treatment. The staining fungi are dormant in the timber and experience shows that they are activated by damp and humid conditions typically experienced in the autumn and winter, especially in sheltered parts of a building. If this occurs, it happens in the 1 to 3 year time frame and then diminishes and disappears as the wood sugars are exhausted and as the SiOO:X silica networks build. In the summer months there is further diminution as photo bleaching occurs. This may be a particular problem in situations where sapwood is exposed on exterior faces, which is not good practice. If it is thought that sapwood may be present in the timber, then we recommend prior application of a clear proprietary biocide product, which should be allowed to dry before applying the wood protector.

If surface mould occurs it can be removed by cleaning with the SiOO:X Maintenance Wash. If blue staining occurs, cleaning can help. As the SiOO:X curing accelerates producing the silver grey appearance, an increasing obscuring of the staining occurs. Moulds tend to form in sheltered areas that act as pockets for damp air.

SiOO:X is produced in a pigmented form in light-grey and mid-grey which largely obviates the visual effect of any blue staining, should it occur.

#### **CLEANING AND MAINTENANCE**

Cleaning and maintenance are important. SiOO:X will give long life and require generally low maintenance. Where dirt, mould and algae occur, if possible, they should be washed away. Iron staining can be removed with an oxalic acid treatment. After cleaning it is necessary to re-apply the surface protector.

#### **THE IMPORTANCE OF GOOD DESIGN**

In order for fungal attack to occur, three components are required: water, oxygen and a source of nutrients. One of the best ways of preventing fungal attack is to prevent the wood from reaching a sufficiently high moisture content, and a good design of wood structures should ensure that this is the case. Problems occur when water can collect or regularly splash onto the wood.