

# SURFACE TREATMENT

The durability of wood depends on how severely it is exposed to the elements, insect infestation or mould growth. Kerto products resist well to many weak acids and alkaline, and solvents. The best way to improve the long-term durability is to protect the structure from the weather with roofing or cladding etc. This protection also reduces the need for surface treatment. The key for long lasting surface coating is regular monitoring and retreatment of damaged areas.

## GOOD COATING SYSTEMS PROVIDE:

- Shield from UV radiation
- Prevents external absorption of rainwater and moisture
- Allows water vapour to permeate
- Protects against mildew and blue stain

## WEATHER PROTECTION

Weather protection for Kerto products consists of physical protection against greying, crack formation and deterioration of the surface.

Weather protection or weathering effects refers primarily to the effects of UV radiation and moisture. The effect of light causes the wood to become discoloured and grey on its surface. Changes in moisture levels lead to contraction or swelling, or changes in the strength properties. The changes in strength properties are known and can be predicted. Kerto products can be protected against UV and moisture effects by correct construction methods and surface treatment.

Colour pigments or UV-absorbers prevent greying of the wood surface. It is also important that the edges are correspondingly protected, since moisture can penetrate to the inside via the end grain areas in the edges.

The surface coatings are usually not permanent and therefore they require regular maintenance or replacement. Seek more information from the surface coating manufacturer.

## UV PROTECTION

Fully weathered wood surfaces have a silver-grey appearance. This is caused by various photo-chemical, biological and physical processes.

If fading to grey is not desired, an adequately pigmented coating system or a coating containing special additives must be selected. The higher the proportion of pigments, the greater the protective effect. The layer thicknesses should fulfil the minimum requirement throughout. More information are provided in the technical data sheets of the coating manufacturers.

## MOISTURE PROTECTION

The most important task of the coating system is to protect the wood against moisture. Structures should be designed in such a way that they are not exposed to a long term high moisture environment. Kerto products and structures resist a temporary exposure to the elements well without decay, provided that they are allowed to dry afterwards. Long term exposure increases the risk of mildew.

The coating system should form a thick enough layer so that it will prevent the unwanted absorption of moisture to the wood. The layer thickness is described by the non-dimensional diffusion resistance coefficient  $\mu$  and its product with the layer thickness [m]. The result is the diffusion-equivalent air layer thickness  $s_D$  [m]. The diffusion resistance coefficient  $\mu$  is a key material value which depends on the composition of the coating. The coating should be chosen in such a way that it allows water vapour to permeate from the product.

### THE FOLLOWING $s_D$ VALUES ARE RECOMMENDED FOR THE INDIVIDUAL COMPONENTS:

Dimensionally stable components	$s_D \geq 1.2$ m
Conditionally dimensionally stable components	$0.5 \text{ m} \geq s_D \geq 1.0$ m
Non-dimensionally stable components	$s_D < 0.5$ m

The  $\mu$  values should be obtained from the coating manufacturer. The required layer thickness can then be determined as  $s_D / \mu$ .

## KERTO WEATHERGUARD® – TERMOPORARY PROTECTION AGAINST RAIN

Kerto WeatherGuard is a Kerto product with a hydrophobic surface coating. The surface coating rejects rainwater and therefore reduces the amount of moisture absorbed by the product while at the same time allowing water vapour movements from and to the product. The reduced moisture absorption further improves the dimensional stability and reduces swelling of the treated Kerto product during the construction time. WeatherGuard does not affect Kerto's strength properties. WeatherGuard treated Kerto products are delivered like non-coated products and can be finished afterwards with, for example paint.

## WOOD PROTECTION

Wood protection can prevent the damage to the wood as a result of infestation by organisms (e.g. insects or mould). Such damage leads to the loss of load-bearing capability or usage properties. Discoloration from blue stain or mildew do not cause the loss of load-bearing capability.

## CORRECT SELECTION OF THE COATINGS SYSTEM

The durability of the coating depends on various factors:

- The base material and how it has been prepared
- The exposure level to sunlight
- Colour of the coating, light or dark
- Exposure level to moisture

The coating system should be a complete combination and the system should properly be matched for the base material and for the relevant external conditions. The choice of the wall construction and size of the components should be taken into account.

For Kerto laminated veneered lumber, the moisture protection provided by the coating system is particularly important, since skin cracks occur in the face veneers as a result of contraction and swelling of the product. This means that the diffusion-equivalent air layer thickness  $s_D$  of coating systems for conditionally dimensionally-stable components should be between 0.5 and 1.0 m. Such a level is basically achieved only with covering coatings. For dispersion or alkyd resin paints their water vapour diffusion resistance value  $\mu$  should be between 5,000 and 10,000 and the final layer thickness of at least 100  $\mu\text{m}$  throughout the coated surface. If the moisture nevertheless penetrates into the Kerto members, for example at penetration points of connectors, from edges or similar areas, such a thick coating may tend to flake. This is emphasized especially in a large continuous surfaces.

## KERTO PRODUCTS COATING GUIDELINES

- Apply the required chemical wood protection agent in the case of load-bearing and bracing components.
- Add the coating system as soon as possible to prevent the effects of UV radiation to the wood's surface. If needed, sand product's surfaces prior to coating.
- Fill the faulty areas such as fallen knots with substitute wood compound.
- Choose primer with blue stain and mildew protection.
- The member edges should be slightly rounded in order to ensure that the coating film is also present with an adequate layer thickness on the edges.
- Apply the coating agent with an adequate thickness. Apply the coating agent at least in two layers to ensure proper drying of the layers.

For the coating of Kerto, the actual project should in all cases be discussed in detail with the coating agent manufacturer.

## COATING SYSTEMS FOR SURFACE PROTECTION

### PRIMERS

Primers can be water or solvent-based. Water-based primers can lead to swelling of the surface, which in some cases may require an additional sanding. The Surface should be pre-treated with a primer or an impregnation which provides protection against blue stain and mildew. Primers can be pigmented or transparent, although they should in all cases be suitable for the overall coating system. Primers alone do not provide adequate weather protection.

### COLOURLESS COATINGS

Colourless coatings are not suitable for exterior areas due to the lack of protection against greying due to UV radiation.

### GLAZES

Glazes are transparent, and reflect only a small part of the light, so that the grain of the wood is still visible. Depending on the bonding agent content, these are divided into thin- and thick-layer glazes.

Thin-layer glazes have a low solids content (up to 30 % non-liquid components). Therefore they do not form a film and dissolve away due to weathering. Though, this means that these thin-layer glazes do not provide adequate protection against moisture. Weathered glaze must be renewed regularly. The renewal of thin-layer glaze coatings is however quite easy as with regular maintenance of the thin-layer glazes the old layers does not need to be removed. These thin-layer glazes do not tend to flake.



**On weathering, the skin cracks of Kerto product inevitably caused the manufacturing process, open to some degree. The surface of the product becomes rough or flaky. Small areas of veneer may become detached in the area of joints, and cracks may also occur more frequently in joint areas. Cracks and bulges may also occur in the area of knots in the face veneers.**

Thick-layer glazes have a higher solids content (30–60 % non-liquid components), and therefore they form a film on the surface of the wood, which creates better protection against humidity than thin-layer glazes. They offer good durability, although damaged areas must be repaired immediately, since otherwise the film-forming coatings will flake off.

Thick-layer glazes do not contain fungicides for wood protection.

#### PAINT SYSTEMS

Paints containing pigments offer the best protection against greying due to UV radiation. Particularly high-coverage systems based on resin form a coating which is impermeable to vapour. In general the properties range from the high-diffusion coating systems to the thick-layer diffusion-inhibiting window paint.

In the case of light coloured coatings, primer must prevent the penetration of wood constituents. These paints offer good durability, although damaged areas should be repaired immediately, as otherwise film-forming coatings will flake off.

#### EDGE AND END PROTECTION OF KERTO PRODUCTS

An essential component of a coating system is the moisture protection of Kerto edges and ends. For Kerto-S the ends and for Kerto-Q all edges should be moisture protected because the moisture absorption through the open end grain is much faster than through the side grain.

For every coating system, a suitable means of edge protection must be used. Care must be taken to ensure that the edge protection is applied with an adequate thickness, which must also be renewed when applying renovation coatings. The edges must also be rounded so as to be able to apply an even layer thickness.



**Permanent elastic sealants are unsuitable for permanent edge protection. These should not be used either as edge protection or as joint sealants between the panelling and underneath construction.**

Make the most of **Metsä Wood**

