

# BCL cladding panel performance

Issue date:

Client:

Project Ref/No:

Anticipated first maintenance due:

This document has been provided to give guidance on expected maintenance cycles for this specific contract.

Expected maintenance periods are dependent on the substrate timber species, the coating system chosen, and the expected exposure conditions. Our estimates are based on practical experience, supported by our test results, and reflect the combination of:

- Best practice building design
- Component design, manufacture, storage and installation in accordance with TRADA, Napier, and BRE recommendations
- Compliance with the requirements of BS EN 942: 1996
- Specified application of Teknos fully factory applied coating and mould inhibiting systems.



## BCL cladding panel design

Many of the causes associated with premature maintenance requirements on cladding are due to site fixing and installation. Teknos have evaluated the BCL panel system and believe it to contain the best solutions to overcome site fixing problems.

### Maintenance

Timber cladding exhibits a variety of natural characteristics which vary depending on the exposure environment and may cause minor coating imperfections. So it is important to inspect your cladding on a regular basis and to follow the Teknos maintenance recommendations to ensure longevity.

Teknos recommend at least annual inspection and repair of any minor areas of breakdown. Preventative rather than reactive maintenance will ensure the cladding is always protected, extend its service life and help keep lifetime maintenance costs down.

Full maintenance instructions are provided by the cladding installer and are available from the Teknos website: [www.teknos.co.uk](http://www.teknos.co.uk).

### General care

At least once a year inspect the cladding, washing it down with soapy water to remove any surface pollution and mould. This can be done at the same time as windows are cleaned.

Pressure washers must not be used as they may damage the coating.

Inspect the coated boards for signs of surface damage or splitting, coating breakdown, or discolouration of the timber surface beneath the coating, which indicates moisture ingress.

Inspect and clean out guttering and downpipes. Repair leaks, which can cause localised and excessive wetting of the cladding.

Spot repair minor areas of coating damage, shakes or open joints. Since repaired areas may appear more glossy, the entire board or wall section can be coated to maintain colour consistency.

Extractive and resin bleeding is a normal feature of many types of timber cladding and though sometimes unsightly will not normally harm the coating. Once dry, resin can be removed with a soft bristle brush and warm soapy water.

Teknos maintenance products can be purchased from our service centres in Banbury, Livingston and Magherafelt. Primers and topcoats are available in 1,3,10 and 20 litre containers and typically primer or topcoat will cover a surface area of 8 - 10 m<sup>2</sup> per litre.

## Exposure conditions/redecoration intervals

Exterior cladding, fully protected by Teknos coating systems, would be expected to give a service life in excess of 30 years when best practice is followed.

Our estimated period reflects the expected maintenance cycle for claddings and varies according to the timber substrate used, the coating system specified, and the exposure stress on the cladding as defined in BS EN 927-1.

The charts below illustrate the estimated periods and maintenance cycles for a number of commonly used cladding materials and show how these are influenced by exposure and design factors.

### Factors influencing maintenance cycles

The choice of timber species has a significant influence on paint system durability. Species with good dimensional stability, resistance to cupping, and to surface checking will extend service life and require less frequent maintenance. This is reflected in the longer maintenance cycles shown for some modified timbers, such as Accoya.

Timbers such as oak, though highly durable, are prone to splitting and checking on exposure, and discolour rapidly when wet. These timbers, if coated, require frequent maintenance and are often best treated with a non-film forming oil such as Woodex Aqua Wood Oil.

Breakdown of the coating is usually initiated by mechanical breakdown caused either by failure within the wood surface or dimensional changes in the board as moisture levels vary. Flexible (low modulus) water based acrylic coatings, such as Teknos' Aquatop 2600, provide greater resistance to this type of failure than oil based paints, but harsher exposure stresses inevitably shorten maintenance intervals.

Sunlight (UV) degrades the lignin in the wood surface, initiating breakdown, and shortening maintenance cycles. Coating pigmentation inhibits UV degradation in much the same way that sun creams protect exposed skin. If the pigmentation is low, as in translucent shades, the protection factor is less than more heavily pigmented coatings such as whites and opaque colours. This is reflected in the maintenance frequency.

Care is also required with very dark shades, such as ebony and black, which have high heat absorption in direct sunlight. At high temperatures, resin bleed and substrate checking can cause problems, with some timber species requiring more frequent maintenance.

Some 'chalking' of the paint film will occur over time due to the natural erosion of the microporous paint surface. This is quite normal and does not detract from the system

### Maintenance intervals for opaque coating

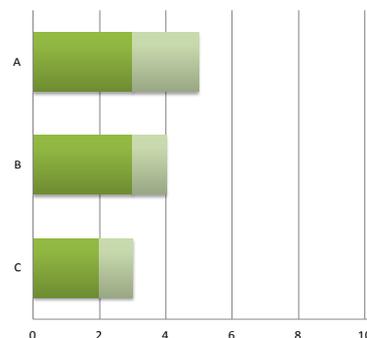
Design Factor	Mild exposure	Moderate exposure	Severe exposure
Sheltered	5 years	4 years	4 years
Partial shelter	5 years	4 years	3 years

Fig 1: European Redwood, Larch and Western Red Cedar

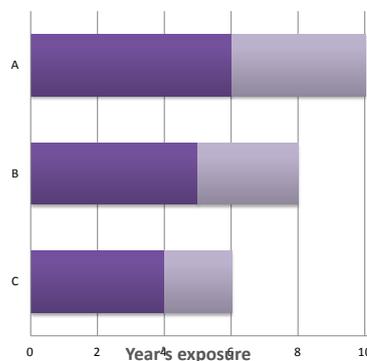
Design Factor	Mild exposure	Moderate exposure	Severe exposure
Sheltered	10 years	8 years	8 years
Partial shelter	10 years	8 years	6 years
Exposed	8 years	6 years	6 years

Fig 2: Accoya

### Influence of coating opacity on maintenance



Graph 1: European Redwood, Larch and Western Red Cedar



Graph 2: Accoya

Coating key:  
**A** Opaque finish  
**B** Parkland colours  
**C** Translucent

## Design and Installation

The long term performance of timber cladding is largely a function of design, manufacturing and installation practice. The notes below highlight some of the key elements of best practice and must be incorporated.

### Cladding materials and design

Timbers should be selected to minimise defects; chemically modified and heat treated timbers, which can offer improved stability, can also be considered. Timber selection should be guided by BS EN 942 Standards with, in the case of European Redwood, use of J2 graded section which minimises knot and other natural defects.

Timber selection must be in accordance with the durability, use, and exposure conditions described in BS EN 350 and BS EN 335. Where the natural durability of the timber falls outside the requirements of BS EN 335-2, it must be preservative treated as per BS EN 599-1.

When using double vacuum preservative impregnation, particularly with solvent based materials, the manufacturer's recommended drying times (typically 2-14 days) must be followed before coating. If using a water based, surface applied, preservative, such as Teknol Aqua 1410 or Aqua Primer 2907, the boards must be factory coated, on all surfaces, to a minimum dry film thickness of 80 µm before site exposure to comply with BS EN 599-1.

During processing and factory coating, cladding moisture content should be controlled following the guidelines set out in BS EN 942. As a broad rule of thumb, the moisture content of cladding during final fit should approximate to the equilibrium moisture content of the cladding in service.

All exposed edges and internal and external mould details must have a minimum 3mm radius, to avoid thinning of the coating.

All non vertical surfaces must allow efficient water shedding, with a minimum slope angle of not less than 15 degrees.

All component profiles to follow best practice design recommendations and for cladding as described in the relevant Trada, Napier and BRE publications. Key points to note:

- Installation and design must include air gaps at the top and bottom of the facade to allow ventilation of the back of the boards and preclude moisture ingress.
- A chalk line or jig block should be used to obtain 3mm clearance between board joints, allowing for board expansion and contraction in service
- Profile design should allow for individual boards to be removed and replaced without damaging adjacent boards or incurring significant maintenance cost.
- Cladding profile design should maximise water shedding to encourage rainwater run off and eliminate traps for standing water.

### Fixings

The design should incorporate concealed fixing where possible. Moisture ingress through surface fixings will cause

localised saturation and discolouration of the timber, creating a weak spot for Stain development and leading to localised failure.

If factory finished Cladding boards are fixed through the face, caps and fillers will help protect the fixing and a final site applied finish is required to ensure the integrity of the coating system.

### Factory finishing

Most modern factory finished cladding coating systems use water based acrylic resins because of their durability and flexibility. These systems dry much faster than traditional solvent paints, allowing for faster handling, but require a period of time to fully cure before developing full water resistance. A minimum temperature of 15°C is recommended during coating and drying operations and Teknos' recommended over coating and drying schedules must be followed at all times.

When using vacuum or brush coaters, ensure the coating is uniformly applied to achieve the specified dry film thickness across all weathered surfaces. Uneven film application will reduce service life and require more frequent maintenance.

Non exposed surfaces should be coated to a minimum 60µm dry film thickness to provide protection and reduce stresses on the board.

All End grain must be sealed with 2 coats of Teknoseal 4000 in accordance with Teknos' cladding system specifications. This is especially important on finished boards cut during installation.

### Transport and site storage

Boards must be protected from the elements during transport.

Site storage areas should be well ventilated and not subject to extremes of temperature. Remove any airtight packaging before storage to ensure free ventilation and prevent condensation forming. Store the boards off the ground on suitable bearers.

If stacking finished boards face to face, always interleave with a protective paper or "Jiffy Foam". Avoid films that contain Plasticisers as these will adhere to the coating surface.

Under no circumstances should boards get wet before installation.

Reducing exposure stress will significantly reduce maintenance and increase the durability of a coating system. Where possible building design should give consideration to roof overhangs and recessing clad sections, normal design features in European countries where clad buildings are common. Avoiding or limiting cladding features on elevations exposed to direct weathering should also be considered.

### Building design

Stress grooves must be machined into the back face of the boards to minimise warping and twisting.

## Installation, storage and wall construction

### Important installer responsibilities

1. Seal all site cuts with two coats of Teknoseal 4000 end grain sealer
2. Use a chalk line story pole or jig block to obtain 3mm clearance between board joints
3. Nails must penetrate solid wood (sheathing and stud) by 30mm. Nailing to sheathing alone does not properly secure the cladding
4. Claddings must not be installed over wet sheathing. Use kiln dried sheathing and strapping. Allow rain soaked materials to dry prior to installation.
5. Butt joints must be tight, treated with two coats of end grain sealer, and made over solid wood to provide secure nailing.
6. Do not lift pieces to allow for alignment. Cut along the top and touch up the cut. Raising one end may result in unlocking.

### Making walls waterproof

Weatherproofing exterior walls requires the proper application of an approved sheathing membrane under the cladding. The purpose of the sheathing membrane is to provide a continuous barrier to prevent drafts and the entry of wind driven rain into the wall cavity.

Joints in the cladding are not designed to prevent passage of wind and rain. Passage of wind and moisture into the wall may occur, with sustained exposure to strong winds. Moisture may be driven through nail penetrations and overlap joints of sheathing membrane. In such exposures, improved resistance against moisture penetration may be obtained by

a modified construction technique known as the Rain Screen Method in which the cladding is fastened to vertical wood strapping placed over the sheathing membrane and attached to the wall studs. This construction technique provides an air space for wind driven moisture to flow by gravity down the back face of the cladding to vents at the bottom of the wall. To maintain the Teknos warranty, cladding must be installed on strapping.

### Installing over rigid insulation

Timber cladding should not be applied directly over rigid insulation. Rigid foam sheathing can cause moisture to accumulate on the back of cladding, causing staining, buckling, and damage to finish coats. Application over rigid foam sheathing must meet the following conditions:

1. Cladding must be applied to strapping, creating an air space between cladding and rigid foam or fibreglass.
2. Strapping must be a full 30mm thick and kiln dried. The air space allows for the venting of accumulated moisture.
3. Use thicker cladding patterns in widths of 150mm or less. Thick, narrow cladding is more stable than thinner, wider patterns and better able to resist dimensional changes.
4. Lighter opaque colours will maximise heat reflection and reduce dimensional movement.

### Caulking

If caulk is used where cladding meets corners, windows, doors and trim, use colour matched or clear caulking. Take care to avoid creating water traps or inhibiting ventilation of the back of the boards and, as an alternative in critical areas, consider the use of cover moulds in jointing details.

## Teknos UK and Ireland

Teknos is one of Europe's leading suppliers of industrial wood coatings. We provide technical support and delivery services throughout Western Europe from 3 service centres, located at Swerford, near Banbury, Livingston and Magherafelt, NI. For further information, please contact your local service centre.

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 The Wood Window Alliance