

WEATHERING

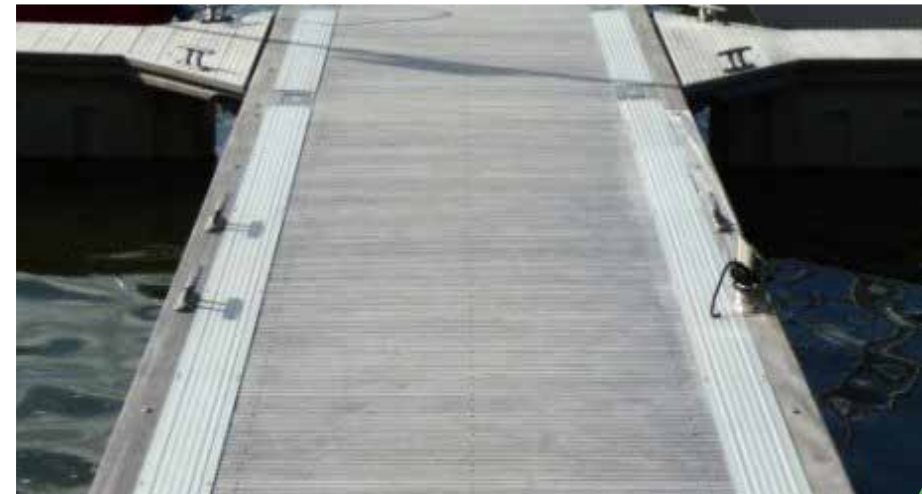
From a technical performance perspective, in respect of attributes such as durability and dimensional stability, there is no need to finish Accoya®. However, like any natural wood species, Accoya® is susceptible to weathering in outdoor circumstances.

All materials exposed to exterior conditions are degraded by a series of chemical, biological and physical processes. The surface of any wood will be disfigured by a combination of UV, moulds, algae, mildew, yeasts and pollution, Accoya® is no exception.

ABOUT ACCOYA®

Accoya® is the world's leading high technology wood. It is produced from sustainably sourced, fast growing softwood using a non-toxic modification process from the surface to the core. The result is a durable, stable and beautiful material with the performance characteristics of the most durable tropical hardwoods but with industry-leading environmental credentials.

A new world of sustainable and low maintenance products including windows, doors, decking and cladding is available using Accoya®. The exceptional durability provides for a minimum 50 year above ground and 25 year in-ground life.



UNCOATED ACCOYA®

GREYING

Because Accoya® has a very high resistance against rotting, a popular choice is to use it in various applications uncoated, and left to weather naturally to a silvery-grey colour. This greying of the surface of unprotected wood exposed to outdoor circumstances is caused by UV.

The rate of weathering will vary according to the amount of UV, elevation on a building, the surroundings and the surface structure. Depending on aforementioned influences Accoya® will grey out at a similar rate as most other wood species. Partial shading of a surface will lead to uneven greying.

However, prior to turning grey, uncoated Accoya® will go through a phase of bleaching where it turns a lighter shade of its normal colour. Surface growths are particularly apparent in this intervening period and can vary in level from board to board. This will become less distinguishable and objectionable after full (even) greying, but in this transition period the surface of Accoya® may look blotchy.

GREYING, SURFACE FIBRES

Unprotected wood used outdoors will eventually “grey” due to physical and biological processes that take place within the top layer.

UV light partly degrades the surface lignin. As this lignin holds the wood cells together, this degradation will lead to a rougher and more open surface.

This opened surface structure will both cause a change in colour and also allow surface moulds, yeasts, mosses and algae to penetrate and develop faster.

These types of growths can use many sources of nutrients, including extractives in the wood, free sugars, starch, and other available organic compounds, but do not degrade the wood structure itself. However, pigment produced by these moulds and yeasts, may discolour the surface.

With Accoya® they don’t cause rot, nor with natural wood species – their impact is solely aesthetic!



An example of such a blotchy transition period is shown in the image above (Dutch cladding project approximately a year after installation).

If this appears in decking (as in the example on page 6), it is easiest cleaned when the wood is uncoated.

APPEARANCE

A wet and a dry board may vary in appearance. Due to the installation details, the presence of a shaded area and the natural differences in the wood between boards, as for instance density variation or grain orientation, some may dry quicker than others.

Not only does this reflect on the appearance of a surface while drying, it will also have an influence on the development of moulds, algae and so on.



Shaded areas may promote development of algae.

SURFACE GROWTHS

Acetylation of wood as such – a non-toxic process – does not seem to have an influence on the resistance against surface mould and yeast growth. Independent review by BM Trada finds that Accoya® is similar or less prone to mould and yeast growth than unmodified pine.

In damp areas there is a high risk that surface growths will develop on Accoya®, as they would on other (soft-) wood species, but the incidence of blue stain development is rare.

Levels of mould or yeast developing on the surface during weathering of the Accoya® will highly depend on (macro) climatic factors such as moisture, temperature and sun light.

Other influences are location specific, such as proximity to vegetation, pollution and dirt accumulation (rough sawn surface!). Lastly, the natural differences in the wood will also play a role.

While these surface growths do not cause decay themselves, they are often associated with the beginning of fungal decay of wood. However, on the non-toxic surface of Accoya® surface moulds may grow, but there will be no concurrent beginning of rot, that might affect its integrity.



Rough sawn surfaces are more conducive to build-up.

SURFACE FIBRES

Uncoated Accoya® may show some surface fibres after being exposed for some time. However, the main reason for the occurrence of surface fibres has been the misuse of pressure washers. Using such cleaning devices with too high a pressure will lead to the damage of the uppermost surface layer of wood. Accoya® being softwood in nature, it is therefore important to limit the pressure used.

In addition to that, as explained previously, UV light (which is a part of sunlight) is responsible for partly degrading the lignin in wood surfaces. As this lignin holds the wood cells together, this degradation will lead to a rougher and more open surface. This may be perceived as fine fibres on the surface, which will eventually erode.

The higher the amount or intensity of UV the surface is subject to, the faster this process will develop. It should be noted that these fibres are formed on all exposed wood species, including Accoya®, particularly on flat surfaces like decking. A ribbed deck profile will tend to cause an accumulation of these fibres, making it all the more noticeable.



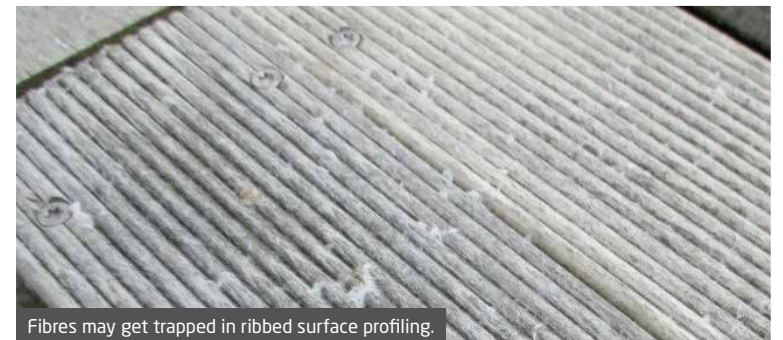
Natural occurring surface fibres on decking.

SPRING

In rare cases, certain harsh climatic conditions may lead to a special form of surface fibres unrelated to UV-degradation. Typically, this involves an apparently extreme amount of surface fibres in spring, usually after a prolonged snow cover. A prolonged moisture load combined with a repeated freeze-thaw cycle during winter may lead to a mechanical disintegration of the (uppermost) wood surface.

Holzforschung Austria has indicated that Robinia and thermally modified woods are particularly affected, but also Larch, Teak and Sapeli are prone to such behaviour.

In all of these cases the durability of the Accoya® wood is not compromised in any way. However, it is recommendable to periodically wash any loose fibres off, as they may flock together and become a spot for organisms to settle, which may lead to disfigurements.



Fibres may get trapped in ribbed surface profiling.

OTHER STAINING

RESINS

In rare cases individual uncoated boards may exhibit a reddish brown staining after installation. This is the result of natural extractives being transported to the surface as moisture in the boards evaporates. These discolorations will tend to fade and wash off over time.

The rough surface of Accoya®, as received, contains a high level of resins and other process residues visible as discoloration. This will fade in sunlight if left exposed. Sticker marks or discoloration after profiling will also fade with UV exposure.

FASTENERS

Staining around fasteners may occur when a non-corrosion resistant steel is used. The low levels of acetic acid left in the Accoya® after the acetylation process may affect the fasteners and cause rust stains. Please refer to section 06 of the Wood Information Guide for information on appropriate fastener selection.

Also, fasteners may transport water to and from the sub-frame, which can contain natural extractives or

added preservatives. Especially preservatives containing copper may cause greenish staining of the Accoya® surface. Isolating the sub-frame from the Accoya® will reduce that risk.

CLEANING AGENTS

Discolouration can also be caused by aggressive cleaning agents that might even affect the Accoya® itself.

SILHOUETTE

Some projects have shown a distinct pattern reflecting the sub-frame behind the Accoya®. This is caused by heat transfer from the building to the Accoya® boards, which will decrease the average moisture content at the location of the interface.

Dryer conditions mean less mould growth, which is why the interfaces are clear where the rest of the board surface shows mould. Note that this effect can be observed on any façade with any kind of cladding or panelling material.

PREVENTIVE MEASURES

Surface mould development can be reduced or delayed by decreasing the level of moisture the wood is subject to or by application of a solution with an appropriate mouldicidal efficacy (e.g. bio-cidal clear primer).

DECK CLEANING

Without the use of preventive measures, regular cleaning will be needed to control the build-up of a biofilm of a wooden deck.

In normal situations a wooden deck should be cleaned once a year, preferably in spring. More frequent cleaning may be necessary in case permanently shaded areas can't be avoided, e.g. on the north side of a house or in the immediate vicinity of bushes, big trees or forests.

Polluted surfaces can be cleaned with a stiff brush and clear water; planed surfaces are easier to clean than sawn surfaces. Pressure washers can be used but only with a suitable control device as a direct high pressure water spray can damage all wood - including Accoya®. If using a pressure washer it should be carried out with some experience and due care.

For more information on deck cleaning, contact your sales representative for the relevant information sheet.

A New-Zealand housing project with a very distinct batten silhouette showing in the cladding surface.



PUBLIC POOL DECKING, OESINGEN, SWITZERLAND



This deck in Oesingen was photographed when newly installed (left), after 10 months (middle) and after 30 months of weathering (right).

OFFICE CLADDING, VROOMSHOOP, THE NETHERLANDS



A part of the South facing façade was cladded with Accoya® in April 2010, with no maintenance since. The pictures below (left to right) show this cladding in July 2010, 2012 and 2014.

* Please note that these examples are fully dependent on local circumstances and are location specific.

COATED ACCOYA®

Please be aware of the fact that greying of the Accoya® surface, as with other wood species, will also occur when a clear or translucent coating system is used, especially if this coating doesn't contain sufficient UV blockers.

As moulds are capable of growing on and through coatings, coating systems (both translucent as well as opaque) should contain an effective mouldicidal component to reduce the risk of growth on and beneath the coating and possible disfigurement.

Pigments added to a clear coating will add to the UV protection and camouflage mould/yeast disfigurement. However, it is advisable to test a sample area first with pigmented stains, because as with other wood types and being a natural material, the porosity of Accoya® may vary.

Another measure to reduce risk of mould/yeast growth on and through coatings is the use of a thicker layer, as this will reduce moisture absorption. These film-forming coatings are typically appropriate for cladding. Sealing of board ends is common practice in the industry and will be very beneficial in achieving good results.



Accoya® with grey stain appearing weathered

VERTICAL APPLICATION

In case of a vertical application as cladding, a film-forming system will be more resilient than a stain or a semi-film forming system. When using an opaque base coat, preferably an effective and well applied anti stain blocking primer is to be included.

Applying a grey stain can give a weathered appearance from the installation of the project, as depicted above.

HORIZONTAL APPLICATION

Note that film-forming systems are not recommended for decking boards because of possible slip risk and risk of moisture accumulation when the coating is compromised by mechanical loads. Improving ventilation will reduce moisture build up in boards in a horizontal application.

PREVENTIVE MEASURES

For optimum life expectancy of any specific system, always adhere to the maintenance recommendations of the coating manufacturer.

Generally speaking, regular localised remedial work in areas with high use intensity will prolong the interval for a complete renovation of the coating.

Regular cleaning (preferably with a soft brush and clear water) will help reduce the risk of moulds growing through the coating.

Jet washing should be avoided with coated surfaces as the high pressure water could damage the coating layer and decrease the service life.

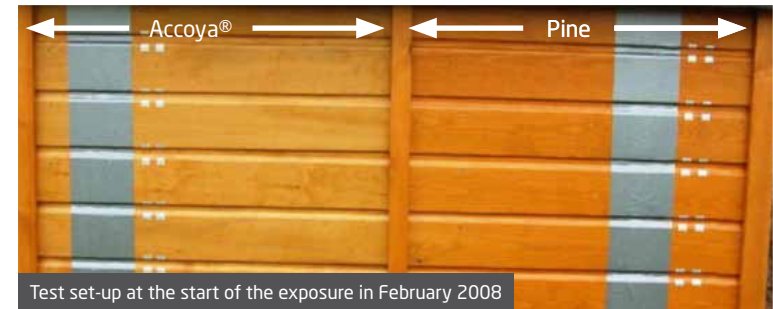
TEST RESULTS

A south-facing cladding rig was set up at BM Trada for the comparative performance evaluation of Accoya® and unmodified pine coated with a semi-translucent stain.

The translucent stain system consisted of a pigmented primer with two topcoats. The cladding boards used were machined to a rebated shiplap profile with the upper edge rounded to a radius of $\pm 10\text{mm}$.

After nearly 7 years of south-facing exposure in a challenging environment the Accoya® boards were found to be in a largely serviceable condition with only 2 of the 7 cladding boards showing discernible evidence of stress in the form of mould or mildew growth.

The pine boards were found to have developed severe blue-stain disfigurement leading to patchy and discontinuous disfigurement beneath the coating. The integrity of the coating on the pine boards was found to be severely compromised. Severe flaking and peeling of the coating had occurred not only along the rounded shoulder details but also on the flat faces where surface fissures and checking had occurred.



For more information on this subject, please contact your local sales office. General guidelines for best practices on applying coatings can be found in the resource centre of the download section of accoya.com.

WWW.ACCOYA.COM



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