

DISCOLOURATION OF COATED WINDOWS & DOORS

TRANSLUCENT COATINGS

Discolouration of coated joinery is one of the most common site complaints on newly installed factory finished joinery. Milky discolouration in translucent systems can happen in cold conditions when the joinery has been wrapped or is stored in damp conditions. This discolouration will disappear within a few days of the joinery being installed as the residual moisture dissipates into the atmosphere and the coating achieves full cure.



Example: Milky discolouration

OPAQUE COATINGS

For opaque systems the issue will show itself as micro blistering but in severe cases the blisters can be much larger. Again, these will disappear as the moisture dissipates into the atmosphere.

Staining of opaque coated joinery is a more complex phenomenon and generally results from two main sources: soluble extractives or tannins; and resins, both of which are naturally present in timber. Tannins are the main cause of staining in hardwoods, whilst resin exudation tends to be more prevalent in softwood varieties, particularly around knots.

As well as timber species, the severity of staining is also influenced by the growing region, knots, preservation treatment, processing, and exposure conditions. Moisture plays a major part in tannin migration through the coating system and site problems occur most often when dry joinery from the factory is exposed in warm moist conditions. The rapid uptake of moisture as the joinery conditions, tends to mobilise the resin and tannins, whilst heat and sunlight draw them to the coating surface.

With good timber selection, care in the preservation process and appropriate coating selection, the problems can be significantly reduced and in most cases wholly eliminated.



Example: Microblistering

MOISTURE

Following application, waterbased coatings are touch-dry very quickly as the carrier (water) evaporates from the surface of the applied coating. However, it takes significantly longer for the coating to through dry and even longer to fully cure.

The drying of the applied coating system is dependant on many factors including temperature, the moisture content of the timber, applied coating thickness, drying times, elapsed time between applied coats, storage conditions and relative humidity.

This means that in times of high humidity or cold damp weather, the joinery may be exposed to weather or excessive moisture from the building process before the drying/curing process is completed. Under these circumstances it is possible that translucent finishes will become milky in appearance and the surface of opaque finishes will microblister.

As the coating cures these effects will disappear and it is in no way detrimental to the long term performance of the coating system.

Proper drying enables the coating to maintain its elasticity and therefore its long term durability.



SOLUBLE EXTRACTIVES AND TANNINS

Many tropical and naturally durable timbers contain soluble extractives that are released when the timber is wetted by a coating. Such extractives can discolour the coating film, and the effect is most pronounced with standard waterbased coatings. Western Red Cedar is perhaps the most extreme example of a species prone to this type of staining. However, grades of Iroko, Idigbo, Sapele, Brazilian Mahogany and Meranti can also show evidence of tannin staining as can individual batches of other timbers and modified timber products. Variation in the growing region can produce significant changes in the mobility of extractives found in a specific timber species.

SOLUTIONS

Timber selection may help to minimise the problem, although in many cases it can be difficult to predict if tannin staining will occur. Fortunately, with the appropriate selection of coatings, preventing tannin staining is relatively straightforward in most situations.

Waterbased isolating primers, such as our ANTISTAIN AQUA 2901, which form a barrier against tannins and help inhibit their mobility, will in most cases eliminate the problem.

When applying stain inhibiting primers it is important that subsequent sanding is kept to a minimum to avoid removing the protective layer and this is particularly important on profile edges and rounds.



Example: Knot bleed

The conditions during coating, like temperature of paint, substrate and drying will have a high impact on the inhibition properties, as low temperatures will prolong drying and staining is more likely.

For softwood that contains knots the 1 component isolation primer is ANTISTAIN AQUA 5210-00, which minimises yellowing from knots and hearthwood inlet.

The best possible reduction of yellowing is achieved with the 2 component solution ANTISTAIN AQUA 5300 in either white or colourless version.

Always refer to the Technical Datasheet for full instructions on how to use Teknos products.

For further support, contact your local Teknos coating expert or visit [teknos.com](https://www.teknos.com)