Sunlight and your floors

It has long been known that sunlight can affect wood. Many people will have moved a carpet, mat, table runner, etc. and seen that the wood beneath was a different colour to that around it or seen the effects where very intense sunlight has bleached timber, be that a floor, a deck or a piece of furniture. The effects are widely noted by timber suppliers, prefinished flooring manufacturers, furniture makers, with all of them suggesting that direct sunlight be avoided where possible, window dressings be used, etc, etc. In Vic and NSW, the Building Authority note in their documents regarding 'tolerances' on buildings projects that 'Colour variations due to natural causes such as sunlight are not defective'.

Detailed information however can be difficult to find and often is general or incomplete. Here we hope to be able to give you all of the information you need to understand what happens, how Bona products perform in relation to the effects of light and what steps you can take to manage floors where you have the possibility of light affecting them. Primarily we will concentrate on the effects of UV light on wood as this is the most common issue people experience but we will also take a brief look at the bleaching of timber as well.

A little about the science…

It has long been known that wood reacts to exposure to UV light in the presence of oxygen. The oxidation process affects different timber species to a greater or lesser extent with the severity of the change and speed varying greatly. UV light comes in various different wavelengths. A normal single sheet of glass will block almost all UVB light and around 25% of UVA. If you have double glazing, commercial glazing systems, a protective tint or UV films on glazing the amount of UV light reaching the floor will be reduced. However, it is important to understand that reducing the level of light exposure does not stop the oxidation process but merely slows it down and extends the time taken for the process to be completed.

All newly sanded wood will change colour in response to the effects of UV light. Experience has shown that the reaction to UV light is a finite process which is usually completed within a year. The vast majority of the colour change occurs within the first 3 – 6 months. If anything is covering the timber during this time that prevents light from reaching the wood then this area cannot react and thus looks different, usually lighter, than the exposed timber surrounding it. If the covering is moved the wood beneath will react and 'catch up' in colour to the other timber but often the edges of where the covering sat remain visible even when the timber overall is one colour. Unless all UV fractions are prevented from reaching the wood then changes will inevitably occur.

A simple way to see the effects of UV light on timber is to take a piece and sand it back to clean raw wood. Wrap one end tightly in black plastic so no light reaches the wood. Then expose it to daylight for a few weeks. When you remove the plastic, you will be able to see the colour difference the sunlight has made.

In general terms, hardwood timbers will darken in appearance, different species react more or less strongly. Softwood timbers react in a similar way but some softwood species can become lighter in colour. The most usual description of the colour change caused by UV light is that the floor has darkened, gone yellow or has a more honeyed appearance.

The effects of UV light on finish systems

In the past finishes for timber flooring in Australia would have been solvent based and would contain alkyds or aromatic polyurethanes. These raw materials are well known to contribute to the change in colour caused by exposure to UV light. The colour of the finishes when coated on glass can already be seen to have a yellow or honeyed shade. However, in addition to this, solvent based finishes when exposed to light react to the UV fraction becoming more yellow as time passes. Many of the coatings also become more brittle. All of this 'colour' is added to the changes caused to the

wood by exposure to light as solvent based finishes do not ‘block’ UV light and prevent it reaching the timber, resulting in a dark yellow plastic look.

Bona water-based primers and finishes are based on aliphatic components meaning they are not affected by UV light and do not change colour or undergo any physical changes. The products are therefore categorized as non-yellowing as they do not contribute to any colour change caused by light. Work by CSIRO showed that Bona finishes can affect the passage of UV light through to the timber and thus slow the rate of any colour change. However, the finishes cannot stop UV light from reaching the wood beneath them and therefore the coated wood will still react and change colour.

This is true for all Bona coatings including Bona White. When using Bona White it is still possible for some colour change to be seen. This is because the product is not obliterating the appearance of the wood, like paint, but is a slightly tinted clear film thus still allowing the character of the wood to be visible but also allowing UV light to pass through it.

If using Bona Craft Oil 2K or DriFast Stain it would be expected that these materials would bring a reasonable level of protection against colour change from UV light although some slight changes may still be seen, particularly with pastel colours such as Frost, White, Grey, Sand, Ash, etc.

Bleaching of timber caused by light

Direct exposure of timber to strong sunlight can result in bleaching of the wood, in exactly the same way as curtains can be bleached. With ‘blonde’ timbers such as Oak, Ash or Blackbutt all colour can be taken from the boards leaving them almost white in colour. Species such as Ironbark take on a grey washed out tone whereas red species, such as Jarrah, will often change to a consistent light brown hue.

Floors that have been coloured using Bona Craft Oil 2K or DriFast Stain have some level of protection against colour change due to bleaching with a good degree of colour fastness. However, continued exposure to strong direct sunlight over many months will still result in colour change / fading occurring.

What steps can I take to control the changes to my floor?

As we have noted above, the colour change caused by exposure to UV light is a finite reaction with the vast majority of the colour change occurring in the first 3 – 6 months after a floor has been finished. For most people their concern isn’t the fact that their floor has changed colour slightly so much as they can see the contrast to the original appearance after moving a mat or plant pot or a large piece of furniture that was very low to the floor.

If you can cope without mats or can plan to move things around regularly across the first few months then it is possible to manage the issue. This prevents there being clearly defined differences which can happen if you have a mat back on the floor 7 days after completion of the flooring and don’t move it for a year. Once the colour change is broadly completed it is possible to put whatever furniture, etc. that is needed back on the floor with no restrictions.

The use of UV films, window dressing, etc, etc. can help to control the changes, and in effect alter the timetable, but as noted earlier it is all but impossible to stop changes occurring.

Stopping bleaching of a floor is easier as it is only very direct sunlight exposure that needs to be controlled. In that instance the use of window dressings, external shades, reflective window films, etc. can resolve the vast majority of the issues experienced.

If a floor has been affected by UV light colour changes and it is felt that the resulting changes are too large to live with then sanding and sealing the floor again will result in a new surface with no differences visible as the phenomenon only affects the very top layer of the wood. Steps can then be taken to prevent the same effects being seen once more. The effects of bleaching is more difficult to predict but again in most cases a normal sanding / coating process will restore the floor.