

# Flooring treatment options

There is much confusion with the ever increasing product choices that are flooding the market place. Many tradesmen continue to use the same products that they have used for years, not even considering another option. The question is always how to optimally treat and maintain a surface over a hopefully long life. Customers are more demanding these days and need to be correctly informed of their options.

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Commonly we have used polyurethanes and the logic of this is (pardon the pun) clear: good quality polyurethanes offer an impermeable finish, as long as the surface is not worn or broken, and a hard-wearing gloss or semi-gloss surface. However, there are many downsides for the person applying the finish, including the emission of isocyanates and solvents during application and curing process, and the ongoing release of low-levels of remaining solvent over following weeks and months for the occupants.

These chemicals are sensitisers, and can have health effects, including the potential to contribute towards 'sensitisation' – the

development of hyper-sensitivity by the immune system.

Other downsides include the difficulty of spot-repairing polyurethane floors, which work by creating a layer on top of the timber, without leaving visible seams or requiring a major sanding operation. Also, the edge bonding effect can lead to problems such as uneven gapping or, with soft timber, the board itself may split.

Polyurethanes are available today in a variety of penetrating and hybrid products, such as tung oil/ polyurethane products, as well as a number of water-based and lower emission urethanes.

Water based products are often called 'non-toxic' urethanes. One reason for their introduction was to reduce the effects of solvent 'off gassing' and its effect on humans and the environment. These coatings are not as hard as the traditional two pack polyurethane varieties and preparation and the higher cost of the product is then reflected in the installation price.

There are a number of negative issues with these that are generally not considered such as quality problems with some of the lacquers, disposal problems and, for storage stability, the use of biocides (substances such as pesticides and fungicides), which kill living organisms [**Environmental Protection Agency NSW**]. Being a coating system, once the surface is worn off, to achieve an even look the floor would generally require the re-sanding of the whole floor area.

In spite of all the efforts in the past years and with some success, lacquer producers have not been able to offer water based lacquers containing 100% of the qualities obtained by the solvent containing systems.

One advantage is that many can be recoated, however, it should be with the same product and to a perfectly clean floor. If not, the two coats may reject each other, which then causes an 'orange peel' effect that only sanding will fix.

Many are surprised with the modified tung oil group of products and believe them to be 'non-toxic and environmentally



A spotted gum flooring in public gym.



A recycled tallow wood flooring in a home in Barwon Heads.

friendly'. Tung oil modified polyurethanes – commonly known as oil modified polyurethane (PU), are basically a PU resin in a tung oil base plus some other solvents, eg turpentine and white spirits. These sometimes become also known as a 'tung oil' finish.

From a chemistry point of view, there's not much difference between the oil based and the traditional solvent based PUs other than the latter having lower boiling solvents and therefore drying faster (preferred by commercial applicators). As far as floor finishes go, the oil modified PUs tend to have more oil on the surface and less PU polymer and, as a result, a less protective layer so that they wear out faster. Again, if the surface is broken and/or worn off, sanding may be the only form of repair.

All PUs (including water based) contain some sort of cross linking agent, typically a toluene di-isocyanate (TDI). TDI is very hazardous, causing some respiratory problems including asthma. The solvent based PU tends to 'liberate' more TDI than the water based and oil modified PUs. The solvents

used have their own hazards and some may cause cancer.

Interestingly, just because one cannot smell something it does not mean that it is not there quietly 'off gassing'.

Currently, the product labelling laws in Australia are behind Europe and the US so most of this type of information isn't clearly spelt out. Only when ALL ingredients, no matter how minor, are included on the label, as is the case with European products such as Livos, can we make true comparisons.

For a general overview of hazardous chemicals in the home, take a look at <http://householdproducts.nlm.nih.gov/index.htm>

### The alternatives

Another approach is to use 'natural' penetrating oils. Upsides to these include the ease of rejuvenation and spot-repairing without sanding (oil can simply be rubbed on the worn areas leaving no visible edges) and the avoidance of issues such as uneven gapping – a not uncommon polyurethane experience with some cheaper or poorly applied products.

There can also be downsides including a softer finish, slower drying times and poorer surface sealing if applied incorrectly and, in some cases, the release of natural irritants and sensitisers such as terpene d'limonene (found in citrus extracts) and aldehydes.

### What are the choices?

Some of the 'green' alternative on the market include products such as **Livos Natural Hardening Oils**, pure tung oil, **Organoil** and **Bio Floor Varnish** and others. This said, there are many shades of 'green' and you should check the pros and cons of a product before using. This in itself can be rather difficult due to many misconceptions and the misinformation in the market place.

Livos floor oils achieve a natural and easy to maintain surface and are a one product application – no thinning and no priming.

These natural penetrating oils are durable and low toxic and a real alternative to the tradition methods of treating floors. Although these products contain solvents (plant based organically farmed sources and are sourced from renewable raw materials), Livos claims that the lowest toxicity solvent is used and that there is a 95% decrease in the first one hour of application.

A huge advantage in the life of such an oiled floor is that it can be spot repaired or rejuvenated if or when required. No sanding back is required therefore prolonging the life of the timber floor.

Melbourne builder, **Andrew LiRosi** says he uses Livos products for many commercial and residential projects because tenants are back in the next day and don't complain about the odour:

instead there is a "mild, pleasant, natural smell of linseed oil".

A floor professionally finished with natural hardening oils may initially be more expensive than polyurethane and solvent based acrylic finishes, however, the ease of maintenance, time and cost savings and low odour means treated areas can be occupied sooner. Long term, it is a more cost effective and sustainable way of finishing a floor.

It is important to be aware that some products labelled 'green', 'eco friendly' or 'non-toxic' are as stated to a degree. However, they may include substances that are listed as undesirable on various EPA listings and can cause irritation as well as endangering our waterways.

To make an informed decision on what is the most suitable product to use one should source as much information as possible. This in itself can be a minefield. Data and technical information with a full list of components / ingredients should be easily and readily available. Ask for references, see a sample, photos etc. Do a test sample. Consider also that you may need to compromise, eg the gloss level for a healthier option or adhering to a curing period.

If all this is too much for you then at least, follow the directions. Contact the manufacturer for more detailed application methods and what not to do. Often it is due to the wrong application technique and not the product when the result is not as expected.

**Angela Petruzzi and her husband Robert** have had extensive experience in the sanding and oiling of floors. Their passion is to provide healthier alternatives that work. **Peter Stuedle, Urban Green Living**, is a chemical engineer and has his own architectural consultancy practice. ■