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Timber flooring treatment options

Traditional or alternative: petrochemical or plant based

BY ANGELA PETRUZZI

Having gone to the trouble of sourcing an environmentally preferable timber, such as recycled or Forest Stewardship Council (FSC) certified, the question is how to optimally treat and maintain it over a hopefully long life.

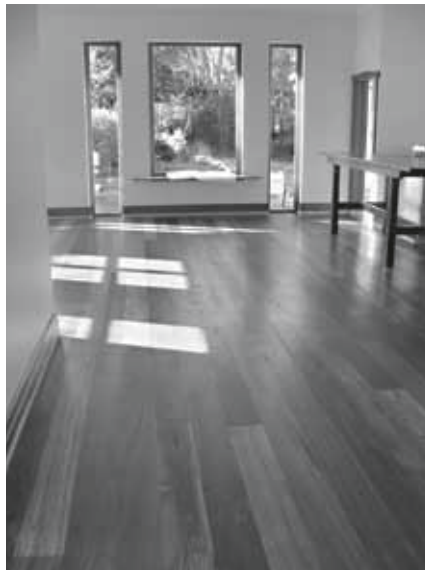
Traditional

Polyurethane

Commonly we have used polyurethane (PU) products and the logic for this is (pardon the pun) clear: good quality polyurethane offers an impermeable finish, as long as the surface is not worn or broken, and a hardwearing gloss or semi-gloss surface. However, there are some downsides: for the person applying the finish, the emission of isocyanates and solvents during the application and curing processes; and the ongoing release of low-levels of remaining solvent over the following weeks and months for the occupants. Bear in mind that small children and pets are closer to the floor than adults are.

These chemicals are sensitisers, and can have health side effects including the potential to contribute towards 'sensitisation,' the development of hypersensitivity 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. The edge bonding effect can also lead to problems such as uneven gapping, where a number of timber floor boards stick together and other boards open up significantly along a joint, or with soft timber the board itself may split.

Polyurethanes are now available in



a variety of penetrating and hybrid products, such as tung oil/polyurethane combinations, as well as a number of water-based and lower emission urethanes.

Water based products

These are often called 'non-toxic' urethanes. One reason for their introduction was to reduce the effects of solvent off-gassing on humans and the environment. These coatings are not as hard as the traditional 2-pack polyurethane varieties, and extra preparation plus the higher cost is then reflected in the price a contractor would charge for using these products.

There are a number of negative issues that are generally not considered, such as quality of some of the lacquers, disposal problems, and the use of biocides (substances that are capable of killing living organisms) for storage stability.

Being a coating system, once the surface is worn off, the floor would generally require re-sanding of the whole floor area, in order to achieve an even result. One advantage is that many of these products can be recoated without sanding back, if there is no damage. However, recoating should be done with the same product and to a perfectly clean floor. If not, the two coats may then reject each other, causing an 'orange peel' effect that only sanding will fix.

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

Modified tung oil

Many believe that the modified tung oil group of products are 'non-toxic and environmentally friendly.' Tung oil modified polyurethane – commonly known as oil modified polyurethane – is basically a polyurethane resin in a tung oil base plus some other solvents e.g. turpentine and white spirits. These are sometimes also referred to as a 'tung oil finish.' From a chemical point of view, there's not much difference between the oil based and the solvent based polyurethane – other than the latter having lower boiling point solvents and therefore drying faster, which is preferred by commercial applicators. As far as floor finishes go, the oil modified product tends to have more oil and less polymer on the surface, and as a result provides a less protective layer that wears out faster. Once again, if the surface is broken or worn off, sanding may be the only form of repair.

All polyurethanes (including water

based) are produced using some sort of cross-linking agent, typically a Toluene-diisocyanate (TDI). TDI is very hazardous, and can burn eyes and skin, as well as cause respiratory problems. The solvent-based polyurethanes tend to 'liberate' more TDI than the water based and oil modified ones. The solvents used have their own hazards, and some may be carcinogenic. Just because one cannot smell something, it does not mean that it is not there – quietly off-gassing.

Alternative

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.

There can also be downsides, including a softer finish, slower drying times and poorer surface sealing if applied incorrectly. In some cases, there is also the release of natural irritants and sensitisers such as terpene d'limonene (found in citrus extracts) and aldehydes (very reactive organic compounds that contribute to local and regional ozone production).

Some of the alternative 'green' products on the market include products such as *Livos* floor oils, pure tung oil, *Organoil* Floor Oil, *BIO* Floor Varnish and others. There are many shades of green and you should inform yourself of the pros and cons of a product before using it. This in itself can be rather difficult due to misconceptions and misinformation in the market place.

Safety note

When using natural oils, always store cleaning cloths, polishing pads, sponges, etc in an airtight metal container between applications overnight. Better still, wash them and spread them out to dry. Never leave cloths that are even slightly damp in a pile, as there is a danger of combustion caused by plant oil content in the product. Once completed, wash and dry well before disposal.

Livos floor oils

Livos floor oils achieve a natural and easy to maintain surface, and is a one product application, requiring no thinning and priming. These natural penetrating oils are durable and low toxic, and are a real alternative to the traditional methods of treating timber floors. They do contain solvents, however *Livos* claims that the lowest toxicity solvent is used, and that there is a 95% decrease within the first hour after application.

Pure tung oil

Using pure tung oil only (derived from the cold pressing of the tung nuts) involves several applications of the oil. The Real Milk Paint Co. website (www.realmilkpaint.com/floortung.html) has more details. Believe it or not, some people actually put more than seven coats on!

The system 'works' by the oil oxidising (slowly) in air and hardening as a result. The tung oil system's downside is that there is not much body to the dried oil and the oil keeps soaking in, therefore not leaving much on the surface and eventually leaving a 'dry' unprotected surface. In addition, the combination of dirt and water plus any residual acids in the timber eventually turns the timber grey. Thinners such as citrus oils and turpentine are often added to force the oil into the timber, but these can cause problems, especially to those already sensitive to smell or having a weak immune system.

Organoil Floor Oil

The Hard Burnishing Floor Oil is a durable timber preserving oil containing natural tung oil. It has been designed to meet Australian conditions. However, application is difficult to master and the manufacturers themselves recommend that only a skilled trades person with industrial machinery should prepare a floor and apply the product.

BIO Floor Varnish

BIO products are made from plant extracts and natural materials. The transparent interior floor varnish provides a colourless, hard but flexible dirt and water-repellent finish. Degreasing or priming of surfaces may be required before use, and the varnish needs to be thinned using *BIO* Thinner. Teak Oil and Hard Floor Wax are other floor products to consider.

Informed choice

One should be aware that some products labelled 'green,' 'eco friendly,' or 'non-toxic' may include substances that are listed as undesirable on various Environmental Protection Agency listings, and can cause irritation as well as endangering our water ways.

Currently, the product labelling laws in Australia are behind Europe and the US – so most of this sort of information isn't clearly spelt out. Encouragingly, a recent flooring trade magazine made reference to proposed changes in SA that seeks to ensure that ALL ingredients, no matter how minor, are included on the label – as is the case with European products. Only then will we be able to compare apples with very bad apples!

To make an informed decision on what is the most suitable product to use one should source out as much information as possible. Technical data sheets, with a full list of components/ingredients, should be easily and readily available. Obtain information from users of the products, certainly not from someone who hasn't even used the product before. Ask for references and to see a sample, perhaps do a test sample on your own floor. Consider also that you may need to compromise e.g. the gloss level for a healthier option, or adhering to a curing period. Above all else, follow the directions; often a less than expected finish is due to the wrong application technique and not to the product itself.

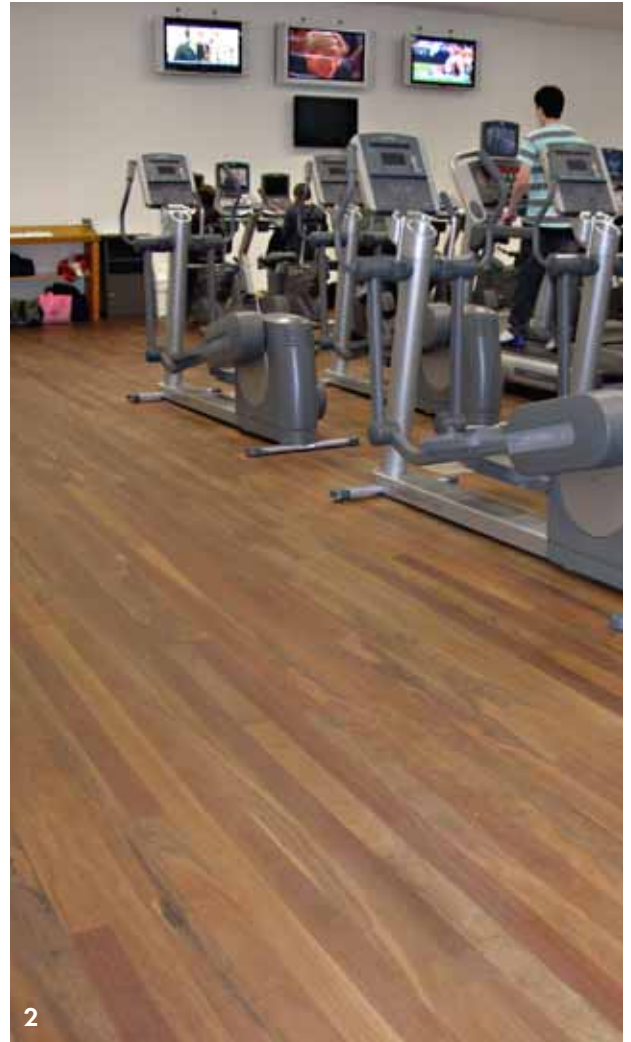
A floor finished with any of these natural hardening oils may initially be more expensive than polyurethane and solvent based acrylic finishes. However, the ease of maintenance, time and cost savings, and the low odour means treated areas can be occupied sooner. Long term, it is a more cost effective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

Angela and her husband Robert have had extensive experience in the sanding and oiling of floors. Their passion is to provide healthier alternatives that work. Livos Australia, 03 9779 3405, www.livos.com.au



• Hazardous chemicals

For a general overview of hazardous chemicals in the home – have a look at the USA's National Library of Medicine's household products database (<http://householdproducts.nlm.nih.gov>)



1. In areas of high wear, the ability to spot repair natural finishes is of great importance.
2. Alternative finishes are not restricted to domestic applications – as shown here in a gym.
- 3-4. Every room in the house will benefit from the use of natural coatings.