

# Vinyl over Timber Subfloors.

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A scenario that flooring professionals in Australia and New Zealand are experiencing more often is when a customer requests the installation of vinyl or plastic flooring or underlay over a timber subfloor. This can be a plastic moisture vapour barrier used in an underlay, or an LVT or Hybrid floor, which is more correctly known as an Expanded Polymer Core (EPC) or Solid Polymer Core (SPC) floating vinyl. Unfortunately, this brings several challenges and some rather serious consequences for the building.

Installing a Class 1 vapour retarder over a wood floor is never advisable. Class 1 vapour retarders – also known as ‘vapour-impermeable membranes’ or ‘moisture vapour barriers’ – are typically used to prevent moisture from entering buildings. They serve various purposes, such as:

- Under concrete slabs intended for residential or commercial interior use
- Over the ground surface in crawl spaces
- Beneath joists to prevent moisture intrusion into the subfloor assembly

In Australia, we also use moisture vapour barriers over concrete slabs to reduce moisture transmission into timber floor systems. More recently, PE film has also been recommended over concrete slabs with a high alkalinity level to prevent Alkalinity Hydrolysis from affecting vinyl products.

Wood is a natural material with vulnerability to moisture and decay – which can shorten its service life. When moisture is trapped and wood is enclosed by an impermeable membrane like a plastic barrier, the same natural decomposition process that occurs in the forest with dead trees can affect the wood floor.

Within a home, nature seeks equilibrium, causing water vapor to migrate from areas of higher temperature and relative humidity to areas of lower temperature and relative humidity – a phenomenon known as vapour drive. Vapour drive typically transports moisture from unconditioned spaces to the indoor space through the floor assembly.

Vinyl, plastic composite, and laminate flooring are generally impermeable to moisture. So, what happens when such impermeable floor coverings are installed over a wood floor? Trapped moisture in the wood floor, caused by the vapour-impermeable covering, can lead to decay, rot, mould, and mildew issues.

From both above and below, anything marketed as ‘waterproof’ implies that it won’t allow moisture to pass through. Trapped moisture in a wood floor or subfloor assembly is undesirable because wood floors are responsive to moisture, expanding with increased moisture and contracting with reduced moisture levels. Therefore, wood floors serve as indicators of indoor conditions.

So, what can happen? Often the first sign of an issue is a callback to a job due to movement underfoot, creaking, damaged end joints or buckling boards. When you arrive on site, you will notice that there are sections of the floor that appear buckled, but there is a distinct ‘lump’ under the floor. In fact, I recently inspected two separate floating floor installations (laminated) with a combination underlay that had parquetry underneath. The parquetry had become trapped below the moisture vapour barrier and taken on moisture to the point it popped and caused the floating floor to buckle upwards. Now these were parquetry over a concrete slab, but the same things (and worse) can happen with timber-framed subfloors.

By the time the floating or vinyl floor has buckled due to subfloor concerns on timber subfloor, there are often more serious structural concerns developing in the subfloor system. Some concerns that are being inspected include:

- Tenting timber floorboards
- Sheet flooring pulling free of joists
- Joists arching off bearers
- Decay in joists and bearers leading to collapse
- Substantial mould growth

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All these issues can become significant structural concerns that can be extremely costly to remediate. So, it's best to avoid the problem all together. We do this by conducting thorough subfloor inspections before starting any works. This should include moisture testing of the subfloor – if it isn't suitable for a solid timber install, it likely isn't suitable to trap moisture in either.

The other thing to do is provide clear information to your clients that subfloor moisture can fluctuate seasonally, and that insufficient drainage and ventilation can lead to long term issues.

The flooring industry in Australia has witnessed the vinyl and plastic composite flooring category outperform other categories in terms of growth percentage in recent years. Although this trend might be leveling off, it still holds a significant share of the market. This popularity is due to several factors:

- **Affordability.** These products are cost-effective and have disrupted the entry-level wood flooring market.
- **Realistic Appearance.** These products increasingly resemble real wood, making them difficult to differentiate at first glance.
- **Easy Installation.** They can be installed by individuals with minimal skills.
- **'Waterproof' Assurance.** While this term is debated, it implies resistance to liquid and vapor forms of water.

For less-informed sales professionals, who often influence the final flooring choice, these features make for easy selling points. Unfortunately, when these products are sold and installed inappropriately, they can contribute to health and structural-related failures.

Durability, aesthetics, and ease of maintenance are crucial factors in homeowners' flooring choices. When asked about their preferred flooring for their 'dream home', two-thirds of homeowners in Australia express a preference for wood floors. We need to educate our customers on the fact that a wet environment isn't remedied by using a 'waterproof' floor system – this is just a band aid on a bullet hole. We need to encourage our clients to address moisture-related concerns on site for the health of both the occupants and the building. After all, no one wants the warranty cost of replacing a structural floor when we only sold a floating floor to begin with. 📍