

## TREATMENT FOR APPLICATION

Timber treatment, timber durability and the life of timber in various applications is a complex topic to deal with. To fully explain it would take a lot longer than this factsheet. We have dealt with related items like moisture effects, basic durability, mould and flood prone areas in separate factsheets. Here, we will try to give you some understanding of treatment with wood preservatives and the levels that may be required in different situations. The intended end use and conditions can play a big part in determining the level of durability. Some factors to note are:

- If timber is physically protected from weather and termites the life expectancy should not be a concern. It is the action of moisture, termites and insects that cause degradation.
- All timber has a natural durability depending on the species. The natural durability is on a scale from Class 1 Highly Durable (eg. Ironbark) to Class 4 Non-durable (eg. Radiata Pine). As an example the life expectancy for above ground exposure is 40+ years for Class 1 and <7 years for Class 4 timber. **TPAA Tech Note #5**
- The non-durable sapwood of most species can be treated with preservative chemicals to relevant Hazard Class levels to increase durability. The Hazard Classes range from H1 (Inside above ground) to H6 (Marine Waters). **TPAA Tech Note #2**
- Design, detailing, finishing and maintenance are almost as important as the durability of the timber in creating successful outcomes. For instance, in outdoor exposed applications, one should detail to allow moisture to drain away, and protect horizontal surfaces, joints (where possible) and end grain.

Matching natural durability to the Hazard Class can be confusing as Durability Class 1 is for the most durable timber but the Hazard Class is H6 for the highest hazard. This may be simplified by thinking in either situation the higher the number the greater the biological threat. By understanding of the nature and frequency of the threat, you can specify the timber species and treatment required to suit the application. Let's go through some examples which may help clarify the thought process:

- ① We will start off with simple examples which relate to Hazard Classes. For non-durable timbers H2 preservative treatment protects against termites, H3 against above ground weather exposed, H4 against in ground exposure, H5 critical in-ground and fresh water application and H6 for salt water. The heartwood of durable timbers must be matched to the application. This is the basic premise and from here we can look at a combination of environment, use, durability and treatment in the next examples.
- ② LVL Scaffold planks and Formwork beams have gained popularity over the past 20 years and are now used extensively. These are manufactured from pine, typically Radiata Pine which is Durability Class 4. On top of this they are not preservative treated in any way. Despite being the least durable material with no preservative treatment this product in the application is durable. The timber as used on a construction site is normally kept well ventilated. It does get wet with rain but then dries out quickly so fungal decay due to moisture is not common. Termites and other organisms are also not common on construction sites. This assessment of the hazards has led to a lower cost product that still meets user expectations.
- ③ As an opposite scenario, consider a deck in a rainforest area with high humidity and minimal sunshine. According to the hazard class this only requires H3 treatment for the non-durable sapwood matched with appropriately durable heartwood.

Looking at the application for the deck joists they will most likely stay damp for considerable periods of time and there are also moisture traps present between the joists and decking. This is where an astute specifier could decide that H3 treatment may not be suitable for long term durability and that H4 treatment of the sapwood is required along with higher durability heartwood.

- ④ Timber in flood prone areas is another item which is commonly misunderstood. This is timber which is likely to get inundated infrequently for short periods of time. Many specifiers ask for either flood resistant timber (not sure what the actual definition of this is!) or revert to H3 preservative treatment. As seen in example 2 above, provided it does not get wet during normal use, flooded timber, as long as it is allowed to dry out following a flood event does not require any preservative treatment, even for non-durable timber species.

This factsheet has only touched the surface. There are a couple of good references to assist with specifying the right timber to ensure adequate outcomes. One is the Timber Service Life Design Guide which has been prepared by Wood Solutions (<https://www.woodsolutions.com.au/publications/timber-service-life-design-guide>). This guide drills down into locations of interest for a specific application to give expected service life for both treated and untreated timber. Another reference is the publication "Construction timbers in Queensland". This has a digital version that can be found at <https://qtimber.daf.qld.gov.au/>

When specifying timbers that are subject to possible degradation, it is important that you consider all of the above aspects in deciding both timber you use and then what level of treatment, if any, is applied.

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