



An important consideration when building with timber is predicting how long the structure will last. Whilst insects, decay or rotting organisms and marine borers can all attack wood, some timber species have the ability to resist attack better than others. The natural durability of a species to resist attack by wood destroying organisms is an indication of how long that timber will last when it is exposed to a defined set of exposure conditions without any additional preservative protection.

The natural durability of timber species vary, even so within the wood from the same species of tree, depending on whether its sapwood or heartwood. As a general rule sapwood is regarded as non-durable whereas the heartwood can be rated as slightly more durable to highly durable. The heartwood durability varies considerably in the case of commercially available species and can be very low, especially those commonly grown in plantations, e.g. softwoods such as pines, spruce's, and hardwoods such as eucalyptus grandis/saligna and its hybrids.

The sapwood and heartwood of the aforementioned species are rated as non-durable and it is vital to ensure proper preservative treatment of the permeable sapwood portion to increase the durability. The durability of preservative treated timber will be influenced by factors such as the ratio of mostly permeable sapwood versus mostly impermeable heartwood, the level of treatment (H Class) and the final end-use. For instance, in the case of timber poles the treatment of the outer sapwood will protect the untreated inner heartwood, but in the case of sawn timber it would be dependent on the ratio of treated sapwood versus untreated heartwood.

The success of preservative treatment of non-durable timbers is also dependent on the permeability of a species, e.g. imported Spruce, which is finding increasing popularity due to its aesthetic look and dimensional stability versus locally grown pine, is rated as non-durable. Spruce however, is regarded as an impermeable species, meaning not even the sapwood is treatable even by pressure impregnation. Spruce is therefore untreatable and remains non-durable.

Internationally a natural durability classification system is used based on the probable life expectancy of untreated heartwood.

Natural durability classification:

<u>Natural Durability Class</u>	<u>Probable in-ground life expectancy (years)</u>	<u>Probable above-ground life expectancy (years)</u>
1	More than 25	More than 40
2	15 to 25	15 to 40
3	5 to 15	7 to 15
4	0 to 5	0 to 7

A timber species is assigned into a Natural Durability Class based on data from field trials. If there is no data available, then experience and expert opinion are used. The Durability Class of a species may be changed as data becomes available.

A special report, published in 1986 by the then National Timber Research Institute of the CSIR, lists the results of 334 commercially available and imported timber species that were subjected to subterranean termite and decay fungal field exposure tests. The results provided a relative perspective on the performance of untreated heartwood, and if the above classification system was to be applied based on the results documented in the report the following durability rating could be attributed to some known commercial plantation species.

<u>Specie</u>	<u>Natural Durability Class</u>
Pinus radiata	4
Pinus patula	4
Eucalyptus saligna/grandis	3-4
Eucalyptus cloeziana	2
Eucalyptus paniculata	1

Actual performance of the above timbers is however affected by factors such as: the presence of wood preservative chemicals if amenable to preservative treatment; building techniques, design and detailing; as well as the climatic and exposure conditions where the timber is to be used, etc.

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For more information on preservative treated timber, contact SAWPA at 011 974 1061 or admin@sawpa.co.za, or visit our website at www.sawpa.co.za