

## Natural durability of Plato® WOOD Use class 3 applications

The determination of the natural durability of wood is described in the European standard EN 350-1<sup>1</sup>. Lab and semi-practice or service tests are used to determine the natural durability as specified in the EN 350-1, e.g. EN 113 (kolleflask test), ENV 807 (stake test) and EN 252 (graveyard test). Based on the results of these test methods a wood species can be classified in a certain durability class (see table 1). However, this classification and the associated service life expectation concerns durability in ground contact (use class 4).

*Tabel 1. Durability classes of solid wood*

	Durability class	Expected service life in ground contact*
1	Very durable	25 years and longer
2	Durable	15-25 years
3	moderate durable	10-15 years
4	Low durable	5-10 years
5	Not durable	Less than 5 years

\* in a temperate climate

A classification of the natural durability for other applications or use classes is not (yet) determined. At European level methods have been developed to determine the durability of wood for other applications or use classes. Examples are the L-joint test (EN 330), lap-joint test and the double layer test, test methods to determine the natural durability of wood in use class 3 applications (e.g. cladding, window frames, outer doors). Furthermore, existing test methods can be modified making them suitable to determine the so called application specific durability of a wood species. In the case of the EN 113 (Kolleflaktest) only those fungi are selected which are known to be hazardous for a specific application. Fungal species which are not hazardous are not used for that specific EN 113 test. In this way the natural durability of a wood species is related to the intended application.

The determination of the durability of wood for a specific application based on accelerated lab tests such as the EN 113 are however indicative. A long lasting semi-practice test and practical experience, obtained by monitoring several projects, must give final inconclusive about the resistance of a wood species against fungal decay and the expected service life.

So, natural durability requirements for wood species are necessary depending on the application and the expected hazards in this application. In table 2 a definition is given for use class 1-3, including a sub-division for use class 3, and the relation to the durability class (= durability class of a wood species applicable in the use class). Applications of timber in use class 3 relate in particular to joinery such as window frames, outer doors and cladding. Beside durability demands can also be required to other material properties such as dimensional stability, strength, coating and glueing properties, and fire resistance.

<sup>1</sup> Durability of wood and wood-based products - Natural durability of solid wood - Part 1: Guide to the principles of testing and classification of the natural durability of wood

**Table 2.** Definition of the use class and the relation to the durability class

Definition use class						Risk	Durability class <sup>2</sup>
Use class	Temperature	Relative humidity	Water contact	Sun/UV	Remarks		
1	10-25	30-65	None	Geen	Always inside	-	1-5
2	10-30	30-80	Accidental	Accidental	Humid rooms inside, exterior (completely) protected	-	1-5
3.1	10-35	30-90	Limited	Limited	Exterior (partly) protected (e.g. cladding)	+/-	1-4
3.2	10-35	30-95	Limited	Frequent	Standard exterior application (e.g. window frames, outer doors and cladding)	+	1-4 <sup>3</sup>
3.3	10-35	30-95	Permanent	High	exterior application with high risk in design (e.g. decking)	++	1-2

Results of several lab tests performed by independent research institutes<sup>4</sup>, show an indication of the natural durability of Plato<sup>®</sup>WOOD against fungal decay. It appears that the resistance against fungal decay is significantly increased after the Plato treatment. In general, this improvement is at least two durability classes, depending on the wood species, dramatically increasing the expected service life. According the British standard BS 8417 the expected service life will be twice as high after the Plato treatment, which means 30 years for applications in use class 3 (in stead of 15 years or less for untreated wood).

It is however always important to process, fasten and maintain the timber product properly (see our instructions which can be downloaded on our website [www.platowood.nl](http://www.platowood.nl), the Centrum Hout Instruction for claddings, the Dutch KVT directive, etc). For instance, a cladding should be fastened with sufficient ventilation behind the cladding. The coating of a cladding (e.g. oil, stain, lacquer) should be maintained on a regular basis as well, including cleaning, repair and reapply. On this way the timber performs better and the expected service life can increase to 50 years.

Since 2001 wood products of Plato International are applied in a large variety of building projects. Are you interested and do you want to visit a project, go to our website [www.platowood.nl](http://www.platowood.nl). There you will find an overview of a large number of projects including the associated information.

<sup>2</sup> The durability class is determined according to the EN 113 kolleflask test including the following fungi: *C. puteana*, *P. placenta*, *C. versicolor* (hardwood and softwood), *G. trabeum* (softwood) en *D. expansa* (hardwood).

<sup>3</sup> For durability class 3 and 4 appropriate actions should be taken, which guarantee a high resistance against decay or preventing the timber against long term moistening.

<sup>4</sup> Stichting Houtresearch SHR Wageningen, Agricultural University Wageningen, Ghent University, and Institut für Holztechnologie Dresden,