

GUIDANCE NOTE

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Establishing the Performance of Modified Wood

Introduction

Although a range of wood properties may be affected by the modification process, the suitability of modified wood for a given end use is based on three main criteria: **durability** to wood-destroying organisms, **strength** and **dimensional stability** in changing humidity.

This Guidance Note focusses on durability and features of modified wood that may be different from preservative treated or naturally durable timbers. For further guidance on strength and/or dimensional stability, please contact the product manufacturer.

Durability – resistance to wood-destroying organisms

Specification of wood preservative treatment and naturally durable wood in the UK is made through a system of use classes and desired service lives.

The natural durability of a timber species against fungal attack is classified in terms of a durability class. This durability class relates to the resistance of the heartwood of the species and has historically been based on ground contact field testing and/or long-term practical experience.

For modified wood, the mechanism by which the durability is enhanced differs from that for preservative treated and naturally durable wood. In addition, the system by which durability against fungi is measured in preservative treated timber in ground contact is not universally applicable to wood modification as some modified woods may perform well out of ground contact but poorly in ground contact.

Where the consequence of failure of a wooden component is high, for example due to a risk to human safety or a high economic cost of replacement, a specifier may wish to choose wood with a higher durability than might otherwise be considered so as to comply with their duty of care.

Use Classes

The different service situations in which wood can be used have been categorised into a series of use classes. Five such classes, which describe the different service situations on the basis of the biological hazard likely at the in-service moisture conditions that may prevail, are defined in BS EN 335-1. See [WPA Guidance Note MW 1](#) for more details.

The allocation of a component to a particular use class assumes good design and maintenance of the construction. It should be recognised that if conditions arise during the service life of the component which change the environment around the timber, for example as a result of design faults, condensation, failure of other materials, poor workmanship or lack of maintenance, the risk of wetting can increase and therefore the recommendations for enhanced durability can change.

Measurement of Durability

The durability class of a particular type of modified wood is measured in accordance with BS EN 350 as if the modified wood were the heartwood of a naturally durable timber. The most durable materials fall into durability class 1 whilst the least durable fall into class 4.

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Field test data in support of performance claims is preferable to laboratory testing wherever practical and is essential for Use Class 4 and 5 applications. Where durability classes are used the wood must be modified across the full cross section of the wood. Some aspects of the sampling procedures given in BS EN 350 will not be applicable to modified wood but sampling procedures should be followed as closely as possible.

Always check with your supplier which durability class rating their modified wood products carry. The table below gives the minimum durability class suitable for some common example end use applications, but a modified wood substrate with a superior durability class will usually provide even better service life performance than that shown.

Durability Recommendations for Wood Components

EXAMPLE COMPONENTS	USE CLASS	MINIMUM DURABILITY CLASS <i>(against decay fungi)</i>		
		DESIRED SERVICE LIFE		
		15 years	30 years	60 years
External joinery/cladding	3 coated	4	3	2
Deck boards	3 not coated	3	2	1
Cladding	3 not coated	3	2	1
Fence posts/sleepers in soil contact	4	Consult Manufacturer*		
Timber in fresh water	4			
Timber in sea water	5			

* NOTE: Some chemically modified wood products have sufficient field test data to demonstrate that they can achieve sufficient durability for use in ground and/or water contact. A minimum of 10 years field data is recommended. Please consult manufacturers for further information.

Modified Wood Performance in Fire

The performance of modified wood products in fire can normally be enhanced using a secondary flame retardant treatment. Such treatments can also meet Building Regulations requirements, where applicable. Please check the WPA website for full details of recommended, independently assessed treatments and where they can be obtained.

Independent Quality Assurance

The WPA has two quality approval schemes under development for modified wood products. One provides an independent, expert assessment of the field data package underpinning claims for enhanced performance in Use Class 4 (*ground contact*) whilst the second involves the independent auditing of factory production controls used in modified wood manufacture. Please contact the WPA or consult our website for further details and scheme updates.



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For further information or advice, please contact:

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