Technical Update: Specifying the use of timber externally

This technical document provides additional guidance relating to how timber can be specified for use externally within a construction project.

Executive summary

Timber has a wide range of uses within construction, however it can be confusing when you're trying to specify the correct type. This article will aim to provide additional guidance around what factors should be considered when specifying timber externally.

What factors should be considered

It's important that the chosen timber is suitable for the location, weather and environment. In order to ensure the correct timber is chosen, both the durability and use class need to be considered. In addition, if the timber is to be treated, it should be suitable for the intended use.

Durability class

The durability class is the ability of the timber of a given species to resist decay and infestation by insects. The timber durability class of a given species gives a good estimate of how long the timber will last and it is measured in years. It is important to note that timber durability classes relate only to the heartwood of any species and not the sapwood which is considered Class 5, non-durable for all species of timber.

Heartwood relates to the inner dead part of a stem or trunk and it provides the structural support for the tree. The sapwood is the youngest part of the stem or the trunk and it transports nutrients and sap. The durability classes do not however take into account other factors such as moisture, temperature, competency of the installation.

TRADA defines five durability classes for timber and they are:

Durability Class	Designation	Timber Life
1	Very Durable	25+ Years
2	Durable	15-25 Years
3	Moderately Durable	10-15 Years
4	Slightly Durable	5-10 Years
5	Not Durable	0-5 Years

The above should only be used as a guideline as local conditions and some of the factors discussed above can play a role in timber durability, however in general, more durable timber species will last longer than less durable species of timber.

TRADA have a useful webpage which lists different wood species and their durability class; it can be accessed from: https://www.trada.co.uk/wood-species/.

Please note, although oak is considered to be in a durability class of 2-4 we do not accept its use in all circumstances, particularly where it forms part of the external wall of a structure. For further information, please see Appendix C of our Technical Manual. Your warranty surveyor should be informed as soon as possible if you intend on using oak in your project.

Technical Update: Specifying the use of timber externally

Use Class

Alongside durability, the use class of the timber should be carefully considered. The end use of the preservative-treated timber is classified into 5 categories by BS EN 335-1 and is widely used in the construction industry to help determine the level of treatment (more on that below) that is required based on the environment the timber is to be used (or its use class).

Use Class	General Use Situation
1	Interior, dry
2	Interior, dry, occasional but not persistent wetting. Condensation of water on the wood may occur
3	Exterior, above ground, exposed to the weather. Sub-divided into: 3.1 Limited wetting conditions (coated) 3.2 Prolonged wetting conditions (uncoated)
4	Exterior in ground contact and/or fresh water.
5	Permanently or regularly submerged in salt water

Treatment process

Preservative treatment provides natural wood with additional durability. However, not all pressure treated wood is the same, the level of preservative protection could be very different. That's because the British Standard for wood preservation – BS 8417 – requires that the loading and penetration of preservative, impregnated into the wood, is tailored to the desired end use (the above use classes). Two main types of treatment processes exist, these are high pressure and low pressure.

High Pressure vacuum treatment is good for getting timber suitable for external use and it can provide the timber with a 15-60 year service life. The preservatives are forced deep into the cellular structure of the wood and additional additives can be added to change the colour of the timber or to aid in water repellence.

Double vacuum low pressure treatment is used for use classes 1, 2 and 3.1 (Coated) and can deliver a service life between 30-60 years. The treatment provides an effective envelope of protection around the timber.

As per the guidance in our Technical Manual: BS 8417 should be used when determining the preservative treatment required. Tables 1 to 3 of BS 8417 must be referred to in order to identify 'Use classes, 'Service Factor code' and durability class of wood for the desired service life.

Please note, it is important that any pre-treated timber be re-treated if it is cut to expose untreated end grain. The treatment should be coloured so it can be proven that the end grain has been treated.

The below table has been taken from Appendix C of our Technical Manual and it shows various timber components, their minimum natural durability recommendations for a desired service life of 15 or 60 years and their use class.

Technical Update: Specifying the use of timber externally

Natural durability recommendations for timber components (based on natural durability against fungi given in BS EN 350-2)

Component	Use Class (table 1 BS 8417)	Minimum durability class of wood for which heartwood can be used without treatment		Examples of service situations
		Desired service life=		
		15 years	60 years	
Internal joinery	1	5	5	Internal joinery and timbers in upper/ intermediate floors not built into solid walls
Roof timbers (dry)	1	5	5	Wood in pitched roofs except tiling battens and valley gutter members
Roof timbers (dry)(Longhorn beetle area)	1	3	3	As above
Roof timbers (risk of wetting)	2	4	2	Tiling battens,Wood in pitched roofs with high condensation risk, flat roof timbers, ground floor joists
External walls/ground floor joists	2	4	2	Frame timbers in timber frame houses, ground floors joists
Sole plates above DPC	2	3	2	Sole plates
External Joinery (non-load-bearing coated) and cladding (coated)	3 coated	4	2	Coated cladding, soffits, fascias, windows and doors, valley gutter timbers
Fence rails, deck boards and joists, external joinery (non load-bearing uncoated) and cladding uncoated	3 uncoated	3	1	Uncoated cladding, decking timber that are not in contact with the ground
Deck posts	4	2	1	
Poles	4	2	1	
Sleepers	4	2	1	

Above table is adapted from BSI Standards Publication BS8417:2011+A1:2014 Preservation of wood – Code of practice, Tables 1 & 3

Warranty requirements

In summary, for timber that is used externally, the most appropriate durability class, use class and preservative treatment to BS 8417 should be specified based on the required service life (60 years for structural elements and 15 years for individual components not integral to the structure).

Every care was taken to ensure the information in this article was correct at the time of publication. Guidance provided does not replace the reader's professional judgement and any construction project should comply with the relevant Building Regulations or applicable technical standards. For the most up to date Premier Guarantee technical guidance please refer to your Risk Management Surveyor and the latest version of the Premier Guarantee technical manual.

2 Shore Lines Building | Shore Road | Birkenhead | Wirral | CH41 1AU
T 0800 107 8446 | **E** info@premierguarantee.co.uk | **W** www.premierguarantee.com