



Wood Protection
Association

in collaboration with



Timber Trade Federation
growing the use of wood

GUIDANCE NOTE

Ref: WPA TW 8

Issue 2: December 2020

**Make
sure
it's** **4** **Use Class 4**
GROUND CONTACT

Understanding Use Class 4 (UC4) Preservative Treated Wood

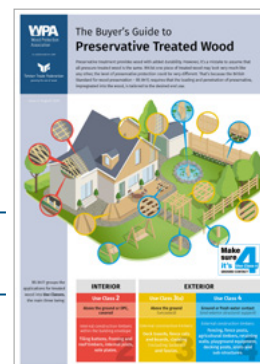
Overview

Consumer and contract law require that any product offered for sale must be fit for its intended use and a wood product impregnated with preservative is no exception.

The minimum standards for the treatment of wood are set out in *British Standard BS 8417* and the *WPA Code of Practice - Industrial Wood Preservation (January 2021)*. In these standards the level of treatment is tailored to the application '**Use Class**' of a wood product as defined in *BS EN 335 (Durability of wood and wood-based products)*.

Use Class 4 is for end uses where wood is **in contact with or very close to the ground and frequently wet**.

See the **WPA/TTF Buyer's Guide for Preservative Treated Wood** for more details on the correct application of Use Classes



Specification of correct treatment for Use Class 4

The table overleaf identifies common Use Class 4 components and specifies the minimum preservative penetration for both 15 and 30-year **desired service life (DSL)** categories in wood species that are classed as either permeable or resistant to treatment. Compliance is achieved by meeting these requirements to an acceptable quality level (AQL). *Please contact WPA for further details on other specialist UC4 applications such as heavy-duty railway sleepers and wood in fresh water.*

A written specification should always include:

The component type and size for example *decking support joists 45mm x 95mm (and strength class if this is important to the application eg. C16 or C24);*

The treatment Use Class eg. **Use Class 4 (UC4);**

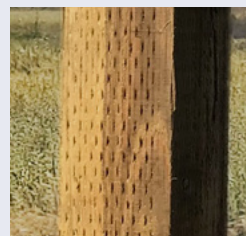
15 years will be taken as the default service life unless 30 years is specified. You may also wish to specify the component **species**.

Preservative penetration

Penetration requirements differ depending on whether **heartwood** material can be distinguished from **sapwood** or not.

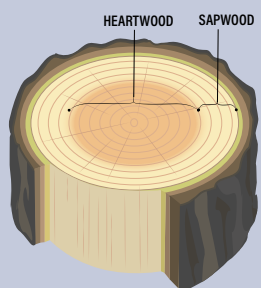
With **spruce**, typically it cannot be distinguished and so, to meet the requirement of BS 8417, penetration to either **6 mm (15 years)** or **12mm (for 30 years)** has to be achieved in any exposed surface in sawn material. In roundwood products, where heartwood is not exposed, only sapwood penetration has to be achieved. However, heartwood may sometimes be exposed where regularising cuts through the outer sapwood layer.

Penetration requirements can be difficult to achieve in resistant species such as spruce or where there is a heartwood penetration requirement (even for permeable species such as pine). **Mechanical incising** of the surface is now used widely to help achieve the desired penetration.



Preservative retention

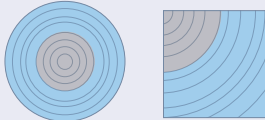
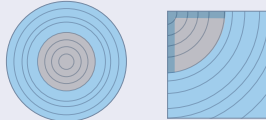
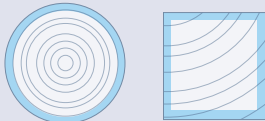
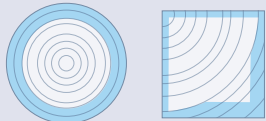
Retentions are expressed in terms of the preservative manufacturer's recommendation for the given use class, which for **UC4** is **R4 (for 15 years)** and **R4 x 1.5 (for 30 years)**. R4 is based on laboratory and field tests as specified in BS 8417 and EN 599-1. These R values are the minimum required retention in the zone requiring analysis (which in all cases mentioned here is the same as the penetration depth).



Understanding Use Class 4 (UC4)

Preservative Treated Wood

Table 1: Preservative treatment recommendations for common Use Class 4 components

Timber Components	Species Selection ¹	15 year DSL Penetration Requirement ²	30 year DSL Penetration Requirement ²	Other considerations ³
Fence and deck posts, deck substructures (whether in direct soil contact or not) Soil retaining walls, raised beds, bridge timbers (above water)	PERMEABLE All Pine species	Full sapwood (NP5) 	Full sapwood plus minimum 6mm into exposed heartwood (NP6) 	Incising will normally be required to achieve the heartwood penetration required for 30-year DSL .
	RESISTANT Spruce, Larch, Douglas Fir	Minimum 6mm into sapwood (NP3) 	12mm into sapwood plus minimum 6mm into exposed heartwood 	<i>See note overleaf concerning differentiation between sapwood and heartwood.</i> Spruce will normally require incising to achieve NP3 . All resistant species will normally require incising to achieve 30-year requirements.

NOTES:

- BS EN350 gives four classes to indicate the treatability of the sapwood and heartwood for a range of wood species. For UK preservative treatment purposes, however, only two classes are used: permeable (Treatability Class 1) and resistant (Treatability Classes 2, 3 and 4), in both cases based on the treatability of the sapwood.
- Diagrams showing preservative penetration are for illustrative purposes only – actual penetration will vary by species and heartwood/sapwood ratios within each component treated.
- Sampling requirements under the WPA Benchmark quality scheme: Check on retention and penetration levels initially once every 6 months by analysis of typically 13 treated samples. See WPA Benchmark scheme document for further details.



Specification & Installation Check List

DO establish the Use Class of the timber you need, before ordering.

DO tell your supplier in writing, that the wood must be treated to that particular Use Class to comply with BS 8417. Ask them to verify that the wood supplied meets your Use Class specification – on the delivery note and invoice or a treatment certificate.

When buying from stock always check to which Use Class the wood has been treated.

DO NOT substitute wood that has been treated for an indoor application for use in an external application – failure is inevitable.

For wood in permanent ground or fresh water contact, or providing exterior structural support, Use Class 4 levels of protection **MUST** be achieved. Anything less and service life, structural safety and customer satisfaction will be compromised.

If using a cement-based mix to fix posts in the ground, ensure that water can drain away from the foot of the post. Do not make a 'boot' for a post out of concrete as this will keep the bottom of a post wet for long periods and increase the risk of decay. Tests show different preservatives may react differently with components in cement and preservative suppliers should be consulted for specific advice on use of cement when installing treated posts.

When cross cutting, notching or boring treated timber products during installation, **ALWAYS** apply an end grain preservative treatment to freshly exposed areas – to maintain the integrity of the protection. **NEVER** put cut ends in the ground, even if end grain coated.

