
THE PERFORMANCE OF TREATED TIMBER IN GROUND CONTACT - **USE CLASS 4**

FACT FILE



This **Fact File** is published by the Wood Protection Association (WPA) to assist WPA members meet their duty of care obligation to their customers by confirming the specification, treatment and installation standards required to ensure components intended for ground contact applications (BS EN 335:1 Use Class 4) fulfil their desired service life expectation.

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treated posts**

1. Performance of preservatives

1.1 Copper-organic preservatives

“Copper-organics” is a generic term used to cover a range of different timber preservative technologies which fundamentally are based on a combination of copper together with an organic co-biocide. All of the four major UK industrial preservative suppliers have different products types that can be described as copper organic. These have been used and approved in other countries for varying numbers of years prior to being introduced to the UK.

These formulations are intended for both internal and outdoor timber applications as described in BS EN 335 Use Classes. Copper-Organic preservatives are especially suitable for very high hazard situations (Use Class 4 applications) where a component is in permanent contact with the ground, e.g. fencing, decks and boardwalks, path edge boards, timber embedded in masonry.

FACT Service life expectation is defined in BS 8417 - the minimum service life requirement is 15 years.

1.2 Preservative efficacy

All industrial preservatives sold in the UK have to be approved for use as directed under the control of Pesticides Regulations 1986 by the UK Health and Safety Executive. Approval requires that testing according to the criteria laid down in EN 599 part 1 is carried out to demonstrate performance.

Likewise, to be listed in the WPA Manual: *Industrial Wood Preservation: Specification and Practice*, a preservative must have been performance tested in accordance with BS EN 599-1 to demonstrate its efficacy in use.

FACT For ground contact applications, test procedures require severe leaching of treated timber before exposure to fungal attack. Field trials may also be used in which treated wood stakes are embedded in the ground and are monitored for many years.

This is the closest that it is possible to get to in-service conditions and further endorse the effectiveness of the wood preservatives now in use.

FACT Test procedures are reflected in the guidelines given to wood treaters by all UK wood preservative manufacturers and the WPA.

For a service life longer than 15 years, the WPA Manual recommends that data from field trials is used to enable the appropriate treatment to be specified with confidence – If in doubt at all about a species and meeting service life expectations, always consult your preservative supplier for guidance.

1.3 Global performance experience

FACT The WPA can confirm that all of the copper-organic preservatives listed in its Manual have been in use in other major world markets since the early 1990s. Although only widely adopted in the UK since 2004, their performance track record is tried and tested.

FACT When components like fence posts are treated in accordance with the specification and installation guidance recommended in the WPA manual they will meet desired service life expectations.

1.4 Analysis of post failures

FACT There has been no change in the number of samples that have been returned for premature failure analysis. It continues to average little more than a handful each year.

FACT Since 2004, analysis of posts that have failed after just a few years service have included examples of CCA and Copper Chrome preservatives as well as the so called “new generation” Copper-Organic formulations reinforcing WPA view that it is not the efficacy of the “new generation” preservative products that is in question.

FACT No industrial wood preservative can be expected to deliver a BS 8417 service life if the treatment is incorrect or wood with too high a moisture content is sent for treatment.

FACT Service life is further compromised by bad site installation practices (see section 4)

2. Fit for the purpose intended – legal and contractual consequences

FACT Consumer and contract law requires that any product must be fit for its intended use.

Reports of posts failing after 2-3 years suggests that suppliers could well be vulnerable to a fitness for purpose claim. The WPA recommends that all treaters carry out a review of their procedures to satisfy themselves that they are working in accordance with the requirements of their customers, WPA Manual guidelines and preservative chemical supplier.

3. Specification of correct treatment for Use Class 4

The WPA Manual Industrial Wood Preservation – Specification and Practice sets out the requirements for timber in ground contact based on BS 8417.

Fence and deck posts - Use Class 4

Service life 15 years

Service Factor	Permeable wood		Resistant wood	
	Penetration	Retention	Penetration	Retention
C/D	P8	CV1	P4	CV1

Service life 30 years

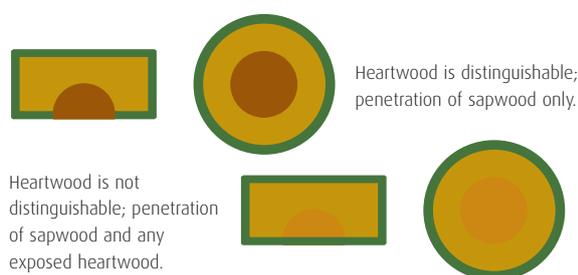
Service Factor	Permeable wood		Resistant wood	
	Penetration	Retention	Penetration	Retention
C/D	P8	CV1.5	P6	CV1.5

Service Factor: Although different components may fall into the same Use Class, the risk of failure or consequence of failure may be quite different. Service Factor is used to guide the specifier or user about risks and consequences. Factor ‘C’ indicates where risk of failure is high and/or where replacement of timber or remedial action is difficult and expensive, – an example would be domestic fencing; Factor ‘D’ indicates where risk of failure is high and/or where failure of timber components would result in serious danger to structure or persons – an example would be highway fencing or environmental barrier. If Service Factor ‘C’ applies, treatment is desirable; if ‘D’, treatment is essential.

Penetration Class: P8 means full sapwood penetration; P4 requires minimum 6 mm lateral penetration into sapwood; P6 requires minimum 12 mm lateral penetration into sapwood.

The above requirements differ depending if heartwood can be distinguished from sapwood or not. With spruce, typically it cannot be distinguished and so to meet the requirement of BS 8417, penetration either to 6 mm (P4) or 12 mm (P6) has to be achieved in any exposed surface in sawn material. In rounds, heartwood is of course never exposed and only sapwood penetration has to be achieved.

This is illustrated in BS EN 351-1 as follows (P4 or P6):



Spruce is an economical material for fencing particularly in the agricultural and domestic markets.

FACT To achieve P4 preservative penetration consistently within quality limits as defined in EN351, spruce should be dried before treatment to at or just below or above fibre saturation point.

Mechanical incising of the surface may also be used to help achieve the desired penetration.

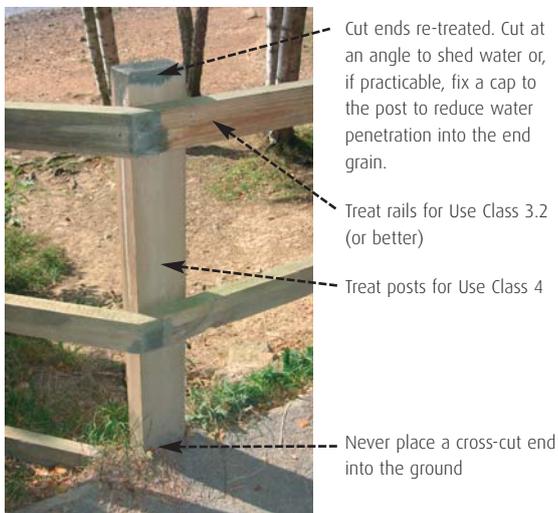
Care should be taken during the drying process to avoid the outer layers drying too quickly leading to pit closure and increased resistance to penetration.

Retention: For 15 year desired service life, the CV (Critical Value) from Use Class 4 BS EN 599 tests is the minimum required retention in the analytical zone (which in all cases mentioned here is the same as the penetration depth). This retention is the amount required to prevent attack by the most aggressive organism in the range of tests carried out.

For 30 year desired service life, the requirement is 1.5 times the CV, though manufacturers may recommend a different retention if they have long-term field trial data (normally at least 10 years), confirming the retention that achieves control in actual ground contact tests.

4. Best practice fence posts installation facts

- 4.1 Only treat timber products in their final dimensions.
- 4.2 Re-working at the installation site should be limited to cross cutting, boring, drilling or notching. All exposed surfaces should then be given two liberal brush coats of a suitable preservative as recommended by the manufacturer of the industrial wood preservative used in the original treatment.
- 4.3 It is important to remember that the penetration achieved by brush is less than that achieved in the pre-treatment process and it is best to avoid or minimise re-working.
- 4.4 Treated wood must never be rip sawn along its length. If this takes place, it must be returned to the treatment plant and retreated prior to use.
- 4.5 The cross cut end of a treated post must never be embedded in the ground.



- 4.6 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.

For treated timber to be used in Use Class 4, always put an uncut end in the ground.



The reputation of timber for fencing is put at risk with bad practice like the photograph opposite – cross section reduced to fit a non-draining hole and no retreatment!

BS1722 requirements

FACT The fencing standard, BS 1722, requires that “the implementation of its provision is entrusted to appropriately qualified and experienced people”.

The WPA endorses this view and is committed to working with other trade bodies such as the Fencing Contractors Association to improve awareness of the specifications and installation practices required to deliver timber fencing components with a long service life.



You can help get the message across by supporting the WPA’s “Make Sure It’s 4” campaign – raising awareness about the correct treatment specification for ground contact timber.