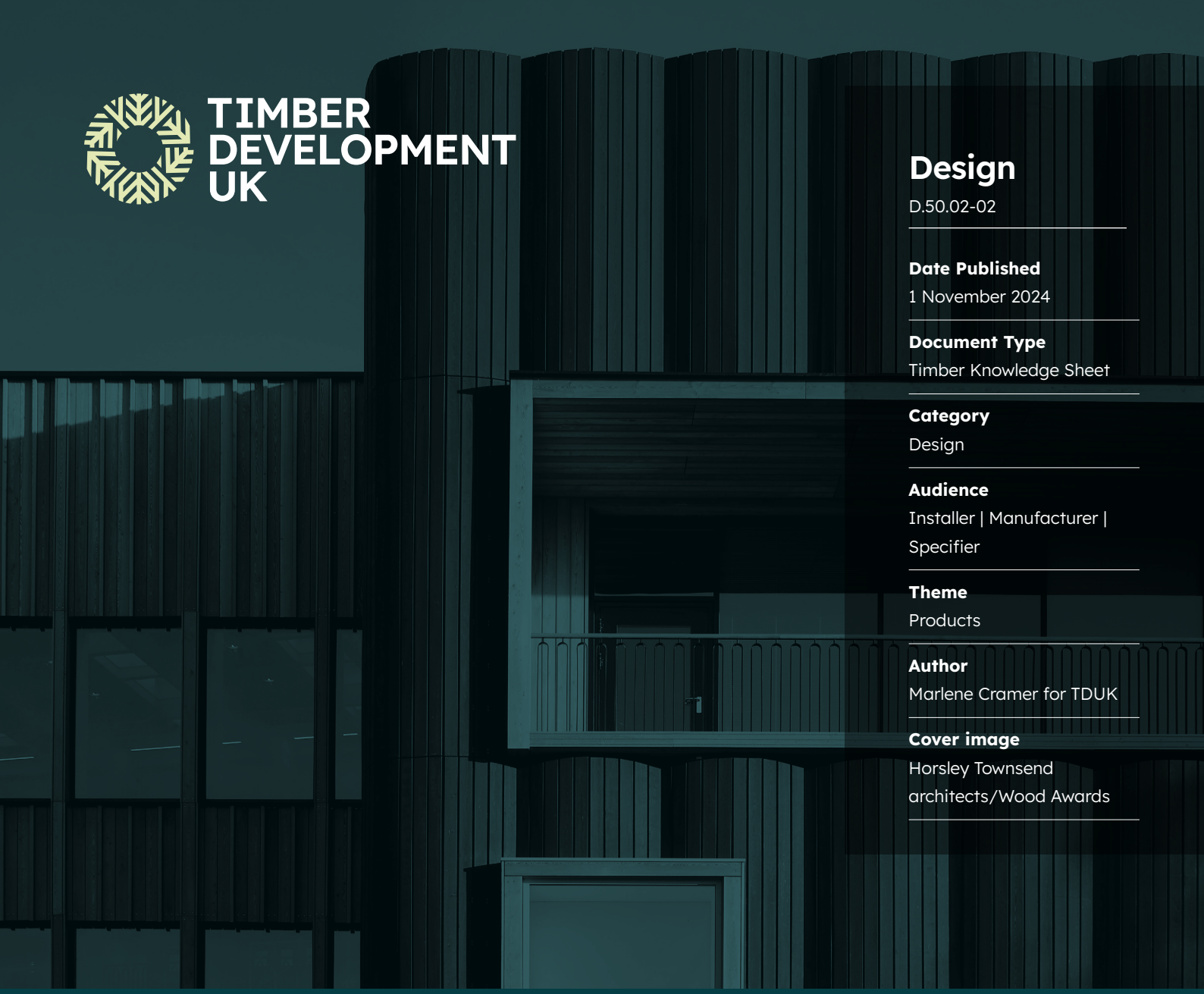
TIMBER DEVELOPMENT UK



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Preservatives

Depending on its natural durability and desired end use, timber and timber products may benefit from extra protection offered through preservative treatment.

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Preservatives

By adding a preservative treatment, timber can be made more durable. This enables the use of softwoods and other non-durable timbers in applications susceptible to wood-consuming organisms like fungi and insects.

Designing for Moisture

Since preventing exposure to moisture is critical in preventing timber decay prevention, **BS EN 335:2013 Durability of wood and wood-based products - Use classes** defines five use classes that correspond to typical use situations of timber products to facilitate design and material choices.

BS EN 460:2023. Durability of wood and wood-based products provides guidance on which natural durability class a timber product requires in each use class, so it cannot be decayed by fungi before reaching its intended service life.

Use Class	Description (BS EN 335)	Durability (BS EN 460)	Biological Threat
1	Interior, dry	5 is sufficient	Insects [Termites - not found in the UK]
2	Interior, or under cover, not exposed to the weather	5 is usually sufficient; 3 is sufficient	Insects Fungi [Termites - not found in the UK]
3	Exterior, above ground 3.1 - limited wetting 3.2 - prolonged wetting	3 is usually sufficient; 2 is sufficient	
4	Exterior, in ground contact, and / or freshwater	2 is usually sufficient; 1 is sufficient	
5	Permanently or regularly submerged in salt water	2 may be sufficient; 1 is sufficient	Marine borers

TABLE: Correspondence between Use Class and Durability Class of timber

The service life of a timber product depends on choosing the right species for the circumstances, balancing exposure and resistance. This requires considerations, informed by **BS EN 460:2023**:

- Which conditions will the timber experience in each design? Which doses of abiotic (non-living) and biotic (living) exposures are to be expected? Can exposure be further reduced by design?
- What service life is expected of the timber product? Which conditions would render the timber product useless (e.g., discolouration or mechanical failure)?
- Which risks are involved should the system fail? How likely is it that the system degrades to the point of failure during service life? Does the system need additional controls, maintenance, or safety nets?
- Which product could be used? Which inherent resistance to the given conditions does the product have? Does the product fulfil other requirements (cost, aesthetic, environmental)?
- Can the resistance be increased by certain protective measures? Can the design be improved to offer more protection? Should protective treatments be used?

Surface finishes can further improve resistance beyond timber's natural durability, and they are available in a wide range of aesthetic and functional options.

For timber in permanent ground or freshwater contact, or providing exterior structural support, Use Class 4 levels of protection must be achieved.

Surface finishes can either form a physical barrier to moisture (film-forming finishes) or they can penetrate the timber and increase its hydrophobia (penetrating finishes).

Service Factor Codes

During project specification each timber component should be assigned a service factor code to assess the need for preservative treatment.

Service Factor Code	Risk and Failure Consequences	
A	Negligible risk of failure	Optional
B	Low risk of failure; preservation regarded as insurance against cost of repairs, and/or replacement or remedial action is not difficult or expensive	Advisory
C	Risk of failure is high and/or where replacement or remedial action is difficult and expensive	Desirable
D	Risk of failure is very high and/or where component failure would result in serious danger to structures or people	Essential

Preservative Treatment Types

There are different timber preservative treatments to achieve varying levels of protection. The minimum standards for the treatment of wood are set out in **BS 8417:2014 Preservation of wood code of practice** and the **Wood Protection Association Code of Practice - Industrial Wood Preservation**.

The level of protection conferred by a timber preservative depends on its method of application. Brush, dip or spray applied products will afford a degree of protection but don't meet BS 8417, which requires the use of penetrating processes. For extended service lives of 15, 30 or 60 years, typically only timber that is pre-treated by an industrial penetrating process can give the required level of protection for the life of the component.

Preservative Type	BS 8417 Use Class	Application	Products
Copper-organic (water-based)	1, 2, 3 and 4	High pressure application, suitable for situations where risk of biodeterioration is high. The treated timber has only a mild smell and is unlikely to radically discolour adjacent materials. Treatment imparts a greenish colour to the timber making it easy to identify. A dye can be added to impart a brown colour. Treatment will cause timber to swell, raise the grain and may cause some distortion.	Tanalith Wolmanit Celcure Impralit
Microemulsions (water-based)	1, 2 and 3 Coated	Low pressure (double vacuum) application process. Although water-based, the treatment has little effect on dimensions of timber but may raise the grain. It tends to be tinted for identification purposes. Can be used on joinery items where surface appearance is not of prime importance.	Vacsol Wolsit Protim
Organic solvent (or light organic solvent product)	1, 2 and 3 Coated	Low pressure application process. Does not change the dimensions of timber or raise its grain; nor change the colour of the timber (unless tinted for the purposes of identification), thus particularly suitable for joinery products.	Protim
Heavy oil-based / Creosote	3 Uncoated, 4 and 5	High pressure application process. Treatment with creosote reduces moisture movement in timber. It can be difficult to paint over and can stain absorbent materials with which it comes into contact. The use of creosote is restricted to products produced using an industrial application process; and to particular applications. See 'TW6: Creosote and Creosote-treated Wood', Wood Protection Association	Creosote

TABLE: Timber preservative types

Storage and woodworking

Since many applications require timber to be installed within an appropriate moisture content range to avoid excessive movement in service, it is important to ensure treated timber is conditioned down to within this range prior to use.

Since metal-based preservative treatments reduce the accuracy of electrical resistance-type moisture meters, the moisture content of timber components can only be measured accurately if insulated probes are driven through the preservative treatment envelope.

As far as possible, all cutting, drilling, profiling, and shaping of the timber should be carried out before treatment. Where post-treatment reworking is unavoidable, it should be limited to cross-cutting, boring, drilling, or notching. Exposed surfaces should then be given two liberal brush coats of a suitable preservative as recommended by the preservative manufacturer.

Interaction of Preservative-Treated Timber with Other Materials

In some cases, preservative treatment may compromise the performance of materials in contact with timber. For example, using water-based preservative treatments with PVA-bonded timber may weaken and cause failure of the glue lines.

It is important that only non-corrosive (for example, galvanised or stainless steel) fixings be used with preservative-treated timber to prevent premature failure of the fixings due to corrosion.

When specifying galvanised fixings with preservative-treated wood, it is important to consider the different levels of protection offered by galvanising methods and whether additional measures, such as separation using plastic spacers, may be required.