

Structural use of timber —

Part 5: Code of practice for the preservative treatment of structural timber

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- British Woodworking Federation
- Chartered Institute of Building
- Department of the Environment Building Research Establishment
- Princes Risborough Laboratory
- Department of the Environment (Housing and Construction)
- Department of the Environment (Property Services Agency)
- Greater London Council
- Incorporated Association of Architects and Surveyors
- Institute of Clerks of Works of Great Britain Inc.
- Institute of Wood Science
- Institution of Civil Engineers
- Institution of Structural Engineers
- International Truss Plate Association
- National Federation of Building Trades Employers
- National House-Building Council
- Royal Institute of British Architects
- Royal Institution of Chartered Surveyors
- Timber Research and Development Association
- Timber Trade Federation

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Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Definitions	1
3 The need for preservative protection	1
4 New timber in old buildings	3
5 Risk assessment	3
6 Preservative treatment of timber in various structural situations	5
7 Preservative treatment	12
8 Properties of treated timber	15
9 Safety	16
10 Checking preservative treatment	16
Appendix A Decision process for using preservative treatment and examples of the use of Table 4 and Table 5	18
Table 1 — Natural durability and treatability characteristics of selected timbers	2
Table 2 — Classification of risk categories related to wood-destroying organisms	4
Table 3 — Classification of risk categories related to safety and economic factors	5
Table 4 — Timber in buildings	7
Table 5 — Timber used for structural purposes other than buildings	11
Table 6 — Preservative treatments and relevant specifications	13
Table 7 — Pressure treatment	14
Table 8 — Immersion treatment	14
Table 9 — Double vacuum treatments	14
Table 10 — Approximate conversions	15
Table 11 — Anticipated minimum sapwood retention of CCA treated timber	17
Table 12 — Decision process for using preservative treatment	19
Publications referred to	Inside back cover

Foreword

This revision of BS 5268-5 has been prepared under the direction of the Civil Engineering and Building Structures Standards Policy Committee and supersedes BS 5268-5:1977 which is withdrawn.

Other Parts of BS 5268 are as follows:

- *Part 1: Limit state design, materials and workmanship (for later publication);*
- *Part 2: Code of practice for permissible stress design, materials and workmanship;*
- *Part 3: Code of practice for trussed rafter roofs;*
- *Part 4: Fire resistance of timber structures;*
- *Section 4.1: Recommendations for calculating fire resistance of timber members;*
- *Section 4.2: Recommendations for calculating fire resistance of timber stud walls and joisted floor constructions¹⁾;*
- *Part 6: Code of practice for timber frame walls;*
- *Section 6.1: Dwellings not exceeding three storeys¹⁾;*
- *Part 7: Recommendations for the calculation basis for span tables¹⁾.*

Recommendations on preservation of structural timber were originally given in CP 112.100:1952 which was revised as CP 98:1964. CP 98 was then superseded by BS 5268-5:1977.

The recommendations for preservative treatment or the use of durable timber given in Table 4 and Table 5 have been made after taking into consideration the degree of protection required for the end-use as described. They are made in association with a level of perceived risk that such protection will be required. Considerable alterations have been made in this revision to the presentation of risk assessment so that both the likelihood of decay and its consequences may be viewed separately. This allows the former to conform to the proposed European method of classification and is adopted in this code of practice in readiness for the intended harmonization of approvals for wood preservatives and preserved wood within the EEC.

Timber is used for a wide range of structural purposes and the recommendations given provide guidance on the level of treatment considered necessary in various service situations. For the purpose of this Part of BS 5268 such timber usage has been divided into two main groups:

- a) timber in buildings;
- b) timber used for other structural purposes.

Although this code of practice is concerned with the structural use of timber, there are certain non-structural components in buildings, e.g. windows, external doors and door frames, which are not listed in Table 4 under the heading of components, but for which preservative treatment needs to be considered. BS 5589 gives further guidance.

In this revision the specification for treatment of the timber components is in the form of treatment schedules for copper/chromium/arsenic (CCA) and organic solvent (OS) preservatives, and minimum charge loadings for creosote. The OS schedules for resistant and extremely resistant timbers are interim recommendations which may need to be revised in the light of experience.

All British Wood Preserving Association (BWPA) specifications referred to in this Part of BS 5268 are the 1986 editions. Copies have been deposited with the British Standards Institution.

¹⁾ In preparation

Product certification. Users of this British Standard are advised to consider the desirability of third party certification of product conformity with this code of practice based on testing and continuing surveillance, which may be coupled with assessment of a supplier's quality systems against the appropriate Part of BS 5750.

Enquiries as to the availability of third party certification schemes will be forwarded by BSI to the Association of Certification Bodies. If a third party certification scheme does not already exist, users should consider approaching an appropriate body from the list of Association members.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 20, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of BS 5268 gives recommendations for preservative treatment of timbers to be used for structural purposes in the United Kingdom to protect them from degradation by wood-destroying organisms. It does not cover the remedial treatment of existing timber in old buildings.

It does not deal with the protection of timber against fire, nor with preserving the appearance of timber against weathering or staining.

NOTE 1 All wood preservatives used in the UK have to be approved under The Control of Pesticides Regulations (1986). The Health and Safety Executive is the approving body.

NOTE 2 The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this Part of BS 5268 the definitions given in BS 4261 and BS 6100-4 apply, except that the term “decay” is used in preference to “rot”.

3 The need for preservative protection

3.1 General

Timber employed for structural purposes may be exposed to a wide range of environmental conditions. The risk of fungal decay or insect attack will differ for each service situation (see 3.2), as will the consequences of failure, e.g. damage to persons or property, cost of repair, ease of remedial action or replacement. This risk can sometimes be eliminated or reduced by good design (see 3.3). Where design is unlikely to provide adequate protection, a naturally durable timber (see 3.4) or the use of an appropriate preservative treatment (see clause 6) should be considered.

3.2 Risk of degradation

The conditions conducive to the attack of timber by wood-destroying organisms are described in BS 1282. However, the following key facts should be noted.

- a) Timber is not at risk from decay if it is kept dry, i.e. at a moisture content below about 20 %.
- b) The natural durability (see Table 1), i.e. resistance to decay of heartwood, varies with different timber species. The sapwood of all species is classified as either perishable or non-durable.
- c) Attack of sound timber by wood-boring insects is usually confined to sapwood. It can occur in both dry and damp situations.

- d) Only a restricted number of timber species²⁾ are naturally resistant to marine borer attack.

3.3 Design

In some instances design can reduce the risk of degradation by wood-destroying organisms. However, where reliance is placed entirely on design it is particularly important that the associated workmanship is of a high standard.

Penetration of liquid water from outside the building must be prevented at all times by ensuring that external components shed water satisfactorily.

Sources of moisture inside a building include damp originating from the ground, and water vapour generated through occupancy. In buildings with a high internal relative humidity, precautions have to be taken to prevent structural timber and wood based components becoming wet through condensation. This may occur in cold external walls and roofs unless suitable precautions are taken in the form of thermal insulation, vapour barriers and/or ventilation appropriate to the construction concerned (see BS 5250).

In some cases it is not possible to eliminate the risk of degradation by good design and in these cases naturally durable timbers and/or preservative treatment should be used. However the treatment of timber and other wood products with preservatives should not be regarded as a substitute for appropriate design features which minimize the risk of degradation by wood-destroying organisms. Rather, it is supplementary and the guidance contained in this code of practice with regard to the advisability of treatment and the processes to be used assumes that good design, workmanship and maintenance prevail.

3.4 Natural durability

If a timber component has sufficient natural resistance to decay by virtue of the natural durability of its heartwood it may be used without treatment even where a decay hazard exists. Sapwood should never be used in a hazardous location without preservative treatment. The degree of natural durability required for a range of situations is indicated in clause 6. The natural durability of a selection of commonly encountered commercial timbers is given in Table 1.

Where it is not possible to use timbers which have sufficient natural durability, preservative treatment should be used.

²⁾ See PRL Technical Note Number 59 *Marine borers and method of preserving timber against their attack*.

Table 1 — Natural durability and treatability characteristics of selected timbers^a

Common name ^b or commercial designation ^c	Natural durability (heartwood only) ^d	Treatability ^e	
		Heartwood	Sapwood
Balau (not including red balau)	D/VD ^f	n/a	n/a
Beech, European	P	P	P
Cedar, western red (imported)	D	R	R
Douglas fir-larch (USA and Canada)	MD	R/ER	n/a
Elm, English and Dutch	ND	MR	P
Ekki	VD	ER	MR
Fir, Douglas (UK)	MD	R	MR
Greenheart	VD	ER	n/a
Hem-fir (USA and Canada)	ND	R	n/a
Iroko	VD	ER	n/a
Jarrah	VD	ER	n/a
Kapur, Malaysian	VD	ER	P
Karri	D	ER	n/a
Kempas	D	R	n/a
Keruing, Malaysian	MD	R	MR
Larch, Dunkeld (UK)	MD	R	MR
Larch, European (UK)	MD	R	MR
Larch, Japanese (UK)	MD	R	MR
Merbau	D ^f	n/a	n/a
Oak, American white	D	ER	MR
Oak, European	D	ER	P
Opepe	VD	MR	n/a
Pine, Caribbean pitch	D	MR	P
Pine, Corsican	ND	MR	P
Pine, Parana	ND	MR	P
Pine, Scots	ND	MR	P
Radiata pine (New Zealand)	ND	R ^f	P
Redwood, European	ND	MR	P
Southern pine (USA)	ND	MR	P

Table 1 — Natural durability and treatability characteristics of selected timbers^a

Common name ^b or commercial designation ^c	Natural durability (heartwood only) ^d	Treatability ^e	
		Heartwood	Sapwood
Spruce, European (UK)	ND	R	n/a
Spruce-pine-fir (SPF) (Canada)	ND	R	n/a
Spruce, Sitka (UK)	ND	R	MR
Sitka spruce (Canada)	ND	R	n/a
Teak	VD	ER	n/a
Western whitewoods (USA)	ND	R	n/a
Whitewood, European	ND	R	n/a

^a This listing is an extension of that in appendix A of BS 5268-2:1988. Further details on durability and treatability may be found in BRE Digest 296 *Timbers: their natural durability and resistance to preservative treatment* 1985.

^b The common names used in this table are defined in BS 881 and BS 589.

^c Where a timber consignment is purchased under a commercial designation, e.g. hem-fir or spruce-pine-fir (SPF), the commercial designation should be referred to in this list, not the individual species within the consignment.

^d Durability grades are:
The durability of the sapwood of all species is either perishable or non-durable.

^e Treatability groups are:

^f Provisional rating. Balau can include some species assessed as MD.

4 New timber in old buildings

4.1 General

This Part of BS 5268 is concerned with pre-treatment of timber and does not cover the remedial treatment of existing timber in old buildings. However, timber is often employed in improvements and renovations to old premises that were built to standards different from those prevailing today.

Timber to be used in previously or potentially damp situations should be treated with preservative. Provided certain safeguards that attend modern construction, e.g. damp-proof membranes, external cavity walls and adequate ventilation, have been included, the provisions of clause 6 should be sufficient. However if these features are missing, or other factors are present that are likely to lead to persistently damp conditions, then an assessment of the risk (see clause 6) may require treatment appropriate to a higher risk category to be adopted.

4.2 Bats

The Wildlife and Countryside Act 1981 gives special protection to bats because of their particular requirements for roosting. Where restoration or reinstatement work is planned in buildings carrying evidence of bat occupation, the Nature Conservancy Council should be notified of this intent before work is started, especially where preservatives are used.

5 Risk assessment

5.1 General

Timbers used for structural purposes should remain sound and serviceable for the duration of the intended life of the structure or building they support. In this context the presentation of risk assessment in this code of practice may be divided into two parts. The first provides information on the inherent risk of attack from wood-destroying organisms associated with end-use. The second relates end-use to the need to avoid the consequences of failure, both in terms of economics and the safety of persons or property. These two factors should be considered together when selecting timber and timber treatments for specific end-uses.