British Standard

BRITISH STANDARD

BS 5268-5: 1989

Structural use of timber —

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

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Civil Engineering and Building Structures Standards Policy Committee (CSB/-) to Technical Committee CSB/32 upon which the following bodies were represented:

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

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of the Civil Engineering and Building Structures Standards Policy Committee and supersedes BS 5268-5:1977 which is withdrawn.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 constructions*[1)];

— Part 6: Code of practice for timber frame walls;

— *Section 6.1; Dwellings not exceeding three storeys*[1)];

— *Part 7: Recommendations for the calculation basis for span* tables[1)].

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 CP 98 was then superseded by BS 5268-5:1977.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.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

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.

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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 species[2)] 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.

5.2 Wood-destroying organisms

It is clear from the considerations in clause **3** that timber in service may be attacked by wood-destroying organisms if certain conditions arise or prevail. The probability that this might happen can be predicted from an understanding of the environmental conditions that are likely to exist for the various service situations in which structural timbers are used. In other words, each different service situation can be associated with a level of risk that fungal decay or insect attack will occur. Thus in a persistently wet environment the chance of fungal attack occurring is higher than in a relatively dry situation. Where the timber will be constantly damp, treatment with an appropriate preservative or the use of a naturally durable timber may be considered essential; where the timber will always be dry, treatment with a preservative or the property of natural durability is unnecessary. The categories into which the levels of risk from wood-destroying organisms may be divided are defined in Table 2.

5.3 Safety and economic factors

Safety and economic considerations are less easy to define but nevertheless should have a marked influence on choice of timber. Clearly it is paramount that the structure remains safe throughout its service life, and the choice of materials should be such that the risk to persons or property is minimal over this period. However, where only a short service life is required this may be achievable without resorting to the use of durable materials. Cost of initial preservative treatment or the use of durable timbers should be balanced against the future cost of remedial treatments or replacement of failed components. Where the latter is likely to be high it is sensible to use durable components in the first instance. The categories associated with this classification are defined in Table 3.

Table 2 — Classification of risk categories related to wood-destroying organisms

Risk category[a]	Risk of fungal decay	Need for preservative treatment according to Table 4 and Table 5
1	Where conditions of use involve negligible risk of fungal decay	Unnecessary
2	Where there is a low risk of fungal decay	Optional
3	Where experience has shown that there is a high risk of fungal decay	Desirable
4	Where timbers are exposed to a continually hazardous environment leading to an unacceptable risk of fungal decay	Essential
M	Where timbers may be exposed to attack by marine borers	Essential

NOTE These five risk categories are based on the European Harmonization Committee (EHC) classification (as published in the EHC Reference Document 1988 (p 15).

[a] Where appropriate these categories are used to define the risk of insect attack in Table 4 and Table 5 by substituting the words “insect attack” for “fungal decay”.

Table 3 — Classification of risk categories related to safety and economic factors

Risk category	Safety and economic factors	Need for preservative treatment according to Table 4 and Table 5
A	Negligible	Unnecessary
B	Where remedial action or replacement is simple and preservation may be regarded as an insurance against cost of repairs	Optional
C	Where remedial action or replacement would be difficult and expensive	Desirable
D	Where collapse of structures would constitute a serious danger to persons or property	Essential

6 Preservative treatment of timber in various structural situations

6.1 Solid timber

The selection of preservative treatment for a given situation is based principally upon assessments of the following:

a) the risk which exists in the situation in which the member is finally used;

b) the natural durability of the timbers to be used;

c) the treatability of the timber being used (see Table 1);

d) the type and quantity of preservative required.

Table 4 and Table 5 give guidance on the selection of appropriate preservative treatment and are structured as follows.

1) Columns 1 and 2 of Table 4 and column 1 of Table 5 identify a selection of building components.

2) In column 3 of both tables is an assessment of the risk which is commonly associated with the named components in well designed buildings. Table 3 gives other factors which may influence the decision regarding need for treatment.

3) Column 4 gives the degree of natural durability which is recommended if timber is to be used without preservative treatment.

4) Columns 5 to 12 give details of the minimum preservative treatments which should be used on timbers which do not themselves have sufficiently high natural durability. Columns 5 to 8 concern the more permeable types of timber (as indicated in Table 1) whilst columns 9 to 12 concern relatively less permeable timber species.

If the heartwood of a timber is of adequate natural durability to be used without treatment, then the relevant treatability class is that of its sapwood.

If, for any given component, all the treatments listed are shown to be suitable, the specifier should consider whether any factor outside the scope of this code influences the choice of preservative. For example, although creosote has been included amongst the recommended treatments, its suitability will depend on the purpose of the building. It should be recognised that for the interior of most domestic dwellings or inhabited premises, the use of creosote may be unacceptable on account of its smell, its oily nature and, when applied under pressure, its tendency to "bleed" from the timber surface.

The treatment recommendations given in Table 4 assume a desired service life of 60 years. The preservative treatments recommended in Table 5 are intended to give the service lives given in column 2 of that table. Where a lesser service life is acceptable for any situations in this code, guidance may be found in BS 5589.

Details of pressure treatment, immersion treatment and double vacuum treatment referred to in Table 4 are given in **7.3**.

6.2 Panel products

6.2.1 *General.* Although panel products other than plywood are used for structural purposes it is not considered at present appropriate to include reference in this standard to such products other than plywood.

6.2.2 *Plywood.* Certain types of plywood for structural use are included in section four of BS 5268-2:1988.

These plywoods are all manufactured with weather and boil proof (WBP) adhesives complying with BS 1203. Whilst this glue bond is suitable for wet conditions it has to be recognized that, if plywood is used in situations where it will become wet and remain wet in service, it should be adequately protected against decay unless inherently durable.

Preservative treatment or high natural durability is particularly recommended in the following situations:

a) in contact with the ground;

b) where exposed to the weather (even where protected by paint or some other finish, unless this forms a permanently effective seal);

c) where exposed to severe condensation.

Specifications for durable types of plywood (both naturally durable and durable through preservative treatment) are contained in BS 6566-7:1985. However, treatments for plywood are not so well established as those for solid timber and treatment facilities are restricted. Particular attention should be paid to the following:

1) the composition of the panels; when panels are made from veneers of different species, the type of treatment is determined by the least durable timber species;

2) the sealing or treating of edges exposed by cutting after preservative treatment.

Where the specifier decides to rely solely on design to ensure that plywood does not remain wet in service, it is important to ensure, particularly where new and unproven designs are employed, that the construction will be effective in maintaining untreated plywood in a dry condition (moisture content below about 20 %) during its service life.

The provisions in clauses **7** and **8** apply equally to plywood.

Table 4 — Timber in buildings

1	2	3	4	5	6	7	8	9	10	11	12	13
Situation	**Components**[a]	**Risk category (for fungal decay unless otherwise stated)** (see Table 2 and Table 3)	**Timber whose heartwood can be used without treatment** (see Table 1)	**Minimum preservative treatments**[b]								**Remarks**
				P and MR treatability group (see Table 1)				**R and ER treatability group** (see Table 1)				
				CCA[c]	**OS**[d]	**Boron**[d]	**Creosote**	**CCA**	**OS**[d]	**Boron**[d]	**Creosote**	
							kg/m^3				kg/m^3	
1. Roof timbers referred to in The Building Regulations. Materials and workmanship. Approved Document to support Regulation 7[e]	Rafters, purlins, joists, wall plates, sarking, etc.	4C for house longhorn beetle (see Remarks)	Hardwoods	P3 20 g/L	V/1 or M/10	Recommended	Not recommended	P3 30 g/L	V/1 or M/10	Recommended	Not recommended	See situations 2 and 3 for recommendations related to fungal decay risk.
2. Pitched roofs (dry) Refer also to situation above if relevant	(a) Rafters, purlins, joists sarking, etc.	2C for common furniture beetle; 1 C for fungal attack	the heartwood of all timbers except those whose heartwood is not well defined, e.g. spruce	P2 20 g/L	V/1 or M/3	Recommended	Not recommended	P2 30 g/L	V/1 or M/10	Recommended	Not recommended	
	b) Tiling battens	2B	Moderately durable of better (MD, D or VD)	P8 15 g/L	V/1 or M/3 [see Remarks 1)]	Recommended	80 [see Remarks 2)] or M/3 [see Remarks 1)]	pg 15 g/L	V/4 or V/3[f]	Recommended	80	1) For immersion treatment it is essential to loosen bands. 2) Not recommended if roofing felt is present.
	(c) Wall plates	2C	Non-durable or better (ND, MD, D or VD)	P2 20 g/L	V/1 or M/3	Recommended	80	P2 30 g/L	V/4 or V/3[f]	Recommended	80	

Table 4 — Timber in buildings

1	2	3	4	5	6	7	8	9	10	11	12	13
Situation	**Component**[a]	**Risk category (for fungal decay unless otherwise stated)** (see Table 2 and Table 3)	**Timber whose heartwood can be used without treatment** (see Table 1)	**Minimum preservative treatments**[b]								**Remarks**
				P and MR treatability group (see Table 1)				**R and ER treatability group** (see Table 1)				
				CCA[c]	**OS**[d]	**Boron**[d]	**Creosote**	**CCA**	**OS**[d]	**Boron**[d]	**Creosote**	
							kg/m^3				kg/m^3	
3. Pitched roofs (risk of wetting). Refer also to situation 1 above if relevant	a) Rafters, purlins, joists, sarking etc.	3C	Moderately durable or better (MD, D or VD)	P3 20 g/L	V/2	Recommended	80	P7 30 g/L	V/4	Recommended	80	
	b) Tiling battens	2B	Moderately durable or better (MD, D or VD)	P8 15 g/L	V/1 or M/3 [see Remarks 1)]	Recommended	80 [see Remarks 2)] or M/3 [see Remarks 1)]	P9 15 g/L	V/4 or V/3[e]	Recommended	80	1) For immersion treatment it is essential to loosen bands. 2) Not recommended if roofing felt is present.
	c) Wall plates	3C	Moderately durable or better (MD, D or VD)	P3 20 g/L	V/2	Recommended	80	P7 30 g/L	V/4 or V/3[e]	Recommended	80	
4. Flat roofs: cold (enclosed beams), valley gutters	Joists, firrings and timber deckboards	3C (see Remarks)	Moderately durable or better (MD, D or VD)	P3 20 g/L	V/2	Recommended	Not recommended	P7 30 g/L	V/4	Recommended	Not recommended	In some situations e.g. high internal humidity this should be considered as 4C category . Refer to situation 1, if relevant.
5. Flat roofs: warm, inverted (exposed beams)	Joists, firrings and timber deckboards	2C	Moderately durable or better (MD, D or VD)	P3 20 g/L	V/1	Recommended	80	P7 30 g/L	V/4 or V/3[e]	Recommended	80	See remarks for situation 4.

Table 4 — Timber in buildings

1	2	3	4	5	6	7	8	9	10	11	12	13
Situation	**Component**[a]	**Risk category (for fungal decay unless otherwise stated)** (see Table 2 and Table 3)	**Timber whose heartwood can be used without treatment** (see Table 1)	**Minimum preservative treatments**[b]								**Remarks**
				P and MR treatability group (see Table 1)				**R and ER treatability group** (see Table 1)				
				CCA[c]	**OS**[d]	**Boron**[d]	**Creosote**	**CCA**	**OS**[d]	**Boron**[d]	**Creosote**	
							kg/m^3				kg/m^3	
6. External walls	(a) Timber frames that form a separate inner leaf or where there is a space behind the exterior finish	2C	Moderately durable or better (MD, D or VD)	P2 20 g/L	V/1 or M/10	Recommended	Not recommended	P3 30 g/L	V/4 or V/3[e]	Recommended	Not recommended	For commercial mixed species and European Whitewood see footnote[e].
	(b) Timber frames where exterior finishes are fixed directly to the sheathing or studs with no air space	3C	Moderately durable or better (MD, D or VD)	P2 30 g/L	V/2	Recommended	Not recommended	P7 30 g/L	V/4 or V/3[e]	Recommended	Not recommended	
	(c) Sole plates or bottom members of frame, when acting as a sole plate above DPC	3C	Moderately durable or better (MD, D or VD)	P2 30 g/L	V/2	Recommended	80	P7 30 g/L	V/4 or V/3[e]	Recommended	80	Check that DPC is compatible with treatment
	(d) Sole plates below DPC membrane or timbers set into concrete	4C	Durable or better (D or VD)	P3 30 g/L	Not recommended	Not recommended	100	P4 30 g/L	Not recommended	Not recommended	100	Check that DPC is compatible with treatment
	(e) Load-bearing joinery	4C	Durable or better (D or VD)	P3 30 g/L	V/2	Not recommended	Not recommended	P4 30 g/L	Not recommended (see Remarks)	Not recommended	Not recommended	Where a service life of 30 years is acceptable V/4 may be used for OS treatment in the R and ER treatability group.

Table 4 — Timber in buildings

1	2	3	4	5	6	7	8	9	10	11	12	13
Situation	**Component**[a]	**Risk category (for fungal decay unless otherwise stated)** (see Table 2 and Table 3)	**Timber whose heartwood can be used without treatment** (see Table 1)	**Minimum preservative treatments**[b]								**Remarks**
				P and MR treatability group (see Table 1)				**R and ER treatability group** (see Table 1)				
				CCA[c]	**OS**[d]	**Boron**[d]	**Creosote** kg/m^3	CCA	**OS**[d]	**Boron**[d]	**Creosote** kg/m^3	
7. Floors	(a) Ground floor joists	2B [see Remarks 1)]	Non-durable or better (ND, MD, D or VD)	P3 20 g/L	V/1 or M/10 [see Remarks 2)]	Recommended	80	P7 30 g/L	V/4 or V/3[e]	Recommended	80	1) Where sub-floor ventilation is adequate; risk category is 3B where sub-floor ventilation or oversite treatment is inadequate. 2) Immersion treatment suitable for *Pinus* spp. only.
	(b) Timber in ground, sills in contact with brickwork, concrete etc. below the DPC	4C	Durable or better (D or VD)	P3 30 g/L	Not recommended	Not recommended	80	P4 30 g/L	Not recommended	Not recommended	80	
	(c) Fillets in concrete	4C	Very durable (VD)	P3 30 g/L	Not recommended	Not recommended	Not recommended	P4 30 g/L	Not recommended	Not recommended	Not recommended	
8. Timber in farm buildings	Timbers in contact with ground or manure. Slatted floors. Timbers liable to remain wet through being enclosed in brickwork, masonry or concrete, or through being inadequately ventilated.	4C for permanent structures	Durable or better (D or VD)	P3 30 g/L	Not recommended	Not recommended	120	P4 30 g/L	Not recommended	Not recommended	120	For other structural situations on the farm the recommendations given in situations 1 to 7 apply. Where double vacuum treatment is recommended. PCP in heavy oil in accordance with the BWPA Manual may also be used for timber in farm buildings. See also section three of BS 5589.

Table 5 — Timber used for structural purposes other than buildings

1		2	3	4	5	6	7	8	9	10	11	12	13
Structure		**Desired service life**	**Risk category** (see Table 2 and Table 3)	**Timber whose heartwood can be used without treatment** (see Table 1)	**Minimum preservative treatments**[a]								**Remarks**
					P and MR treatability group (see Table 1)				**R and ER treatability group** (see Table 1)				
					CCA[b]	**OS**[c]	**Boron**[c]	**Creosote**	**CCA**	**OS**[c]	**Boron**[c]	**Creosote**	
		years						kg/m^3				kg/m^3	
1. Timber in bridges, towers, masts, framework piling etc.	(a) In contact with the ground	40	4D	Durable or better (D or VD)	Sawn P3 30 g/L Round P2 30 g/L	Not recommended	Not recommended	120	Sawn P4 30 g/L Round P3 30 g/L	Not recommended	Not recommended	120	Species with non durable resistant heartwood, e.g. spruces, are excluded from this situation.
	(b) Not in contact with the ground	40	3D	Moderately durable or better (MD, D or VD)	Sawn P3 30 g/L Round P2 30 g/L	Not recommended	Not recommended	110	Sawn P4 30 g/L Round P3 30 g/L	Not recommended	Not recommended	110	PCP in heavy oil may be used for P and MR timbers if used in accordance with specification C4 of the BWPA Manual.
2. Timber in water cooling towers		30	4D	See Remarks	P4 50 g/L	Not recommended	Not recommended	240	Not recommended	Not recommended	Not recommended	Not recommended	It is essential to refer to BS 5589 for further details.
3. Timber in seawater, piers, jetties, piles etc.		15	MD	See Remarks	P4 50 g/L for certain species	Not recommended	Not recommended	180 to 400 according to species	P4 50 g/L for certain species	Not recommended	Not recommended	180 to 400 according to species	It is essential to refer to BS 5589 for further details.
4. Timber in freshwater lock gates, piles, etc.		30	4D	Durable or better (D or VD)	P4 50 g/L for certain species	Not recommended	Not recommended	160	P4 g/L for certain species	Not recommended	Not recommended	160	It is essential to refer to BS 5589 for further details.

[a] Components of risk category 1 have not been listed. Some examples of structural timber components for which preservative treatment even of low durability species is considered unnecessary are:
timber studs of internal walls and partitions;
first and upper floor joists;
internal stair and other internal components.

[b] OS formulations should be of class F (or F/N) for protection against fungal attack and class N (or F/N) for protection against insect attack. CCA, boron and creosote provide protection from both fungal and insect attack.

[c] Excessive preservative uptake is likely for loads which consist of 80 % or more of sapwood (class P and MR). In such instances a Lowry empty-cell process with the same pressure and final vacuum stages and solution concentration may be used. To qualify, such consignments should be identified by the supplier or an appropriate authority.

[d] Boron diffusion and organic solvent treatment are restricted to woodwork in which the surface or surfaces exposed to the weather will be painted or given some other protective finish which will be maintained in service.

[e] The Approved Document refers to the need to treat roof timbers against attack from house longhorn beetle. All roof timbers within the void space of a roof are included for buildings being constructed in certain defined geographical regions of the UK.

[f] The standard schedule for organic solvents (OS) fungicidal treatment of timbers in the R and ER treatability group is V4.
Commercial mixed species and European Whitewood can be highly absorptive of preservative treatment and this will result in excessive uptake with risks of post treatment bleeding of preservative from individual pieces. Such bleeding can stain or have a deleterious effect on materials such as dpcs and plasterboard.
Even protracted drying times may not prevent such problems.
In such cases where indicated in the table, the V3 schedule may be used by agreement between specifier and processor [most frequently in situation 6(a)].

7 Preservative treatment

7.1 Preparation of timber before preservative treatment

7.1.1 *General.* It is essential that timber submitted for preservative treatment is in a suitable condition as in **7.1.2** to **7.1.5**.

7.1.2 *Condition of timber.* The timber should be free from all signs of attack by wood-destroying fungi or insects.

NOTE Timber showing signs of attack by sap-stain fungi or pinhole borers is acceptable, subject to agreement between the interested parties.

As preservative treatment of seasoned timber does not afford protection against deep-seated infection or dote, care should be taken to exclude timber infected with incipient decay.

The surfaces of the timber should be free from extraneous matter, e.g. water, mud, dirt and inner and outer bark. They should also be free from any paint, polish, or other surface finish.

If timber is frozen the penetration of preservative is limited. Care should be taken not to treat timber in this condition.

7.1.3 *Moisture content.* It is essential that the moisture content of the timber is at the correct level[3)] for the type of treatment to be received.

For boron diffusion it is essential that the moisture content be greater than 50 %.

Undried timber or timber with a moisture content higher than 28 % may be prepared by the Boulton Process for treatment with creosote as specified in BS 913 although extreme caution should be exercised when using this procedure.

All other treatments require the moisture content to be below 28 % throughout the zone to be treated. For creosote and CCA treatment it is essential to dry to this moisture content before treatment, and for certain end-use situations a lower moisture content may be required.

Since organic solvent preservatives do not affect the moisture content of treated wood, commodities should be treated with these preservatives in their final machined state and at the moisture content consistent with their end-use.

Methods for determining moisture content are detailed, for example, in BS 4072-2[3)].

7.1.4 *Fabrication before treatment.* All cutting, drilling, profiling and sanding of the timber should be carried out before treatment. All wood waste arising from these operations should be removed before treatment.

Sawn timbers rated as resistant to preservative, 75 mm or thicker and intended for exterior use, may benefit from incising before treatment.

7.1.5 *Mixed charges.* Timbers for which different schedules are appropriate, due to either size or species, should not be treated in the same charge, unless the most intense schedule can be applied without detriment to the more easily treatable timbers. If charges of mixed species or timber of different resistance to penetration are to be treated, the schedule should be that appropriate to the most resistant of the timber species present and the largest section size.

7.2 Preservatives

For most preservatives British Standards exist that define their composition and the processes by which they should be applied (see Table 6). Other preservatives are covered by the BWPA Manual (1986).

Most preservatives afford protection against both decay and insect attack. However, those of the organic solvent class may be formulated with or without an insecticide and care should be taken to specify the correct grade. Also many organic solvent preservatives are available in water-repellent grades, and it is advantageous to use this type in exterior situations.

7.3 Methods of application

7.3.1 *Copper/chromium/arsenic (CCA).* CCA preservatives should be applied in accordance with BS 4072-2, using the relevant treatment schedule given in either Table 4 or Table 5. Where a charge consists of species of both treatability groups the R and ER schedule should be used. The schedule codes are defined in Table 7.

CCA preservatives are applied by the full-cell or Lowry empty-cell process, as follows.

a) *Full-cell process*

1) The period of initial vacuum starts when pressure has been reduced to at least – 0.8 bar[4)]. This level should be maintained for the whole period on completion of which the cylinder should be flooded with the preservative solution before releasing the vacuum.

[3)] For poles the moisture content requirements and method of determination are given in BS 1990-1:1984.

[4)] For approximate conversions to other commonly used units see Table 10.

2) For P2 to P7 the pressure period begins when a level of 12.4 bar has been reached (10 bar for P8 and P9). This level should be maintained for the required period. Timber should not be subjected to a hydraulic pressure of greater than 14 bar.

b) *Lowry empty-cell process.* Where a 20 g/L solution is specified the full cell process may be replaced by the Lowry empty-cell process, but using a 30 g/L solution. To do this no initial vacuum need be applied. After loading, the cylinder should be flooded with the preservative solution and pressure applied as in a) for the times shown above.

With this process the net absorption will be equivalent to 60 % to 70 % of that achieved by a full-cell treatment. Sapwood loading will be comparable to a full-cell process using a 20 g/L solution (see **10.3.3**).

7.3.2 *Organic solvent (OS) preservatives.* OS preservatives complying with BS 5707-1 should be applied in accordance with BS 5707-3, using the relevant treatment schedule given in Table 4 of this code of practice. Where a charge consists of species of both treatability groups the R and ER schedule should be used. The schedule codes are defined in Table 8 and Table 9.

7.3.3 *Boron diffusion.* Boron diffusion treatment has to be carried out on unseasoned timber at source and should comply with the BWPA Manual 1986.

7.3.4 *Creosote.* Pressure treatment with creosote should be carried out in accordance with BS 144-2[5)]. Immersion treatment with creosote where recommended in Table 4 should be in accordance with the BWPA Manual 1986.

Table 6 — Preservative treatments and relevant specifications

Treatment	Composition	Application
Pressure treatments:		
creosote	BS 144-1[a]	BS 144-2[b]
copper/chromium/arsenic (CCA)	BS 4072-1	BS 4072-2
Boron diffusion treatment[c]	BWPA[d]	BWPA[d]
Double vacuum treatments:		
organic solvent (OS) preservatives (fungicide only)	BS 5707-1 Type F	BS 5707-3
organic solvent (OS) preservatives (with fungicide and insecticide)	BS 5707-1 Type F/N	BS 5707-3
pentachlorophenol (PCP) in heavy oil	BS 5707-2	BS 5707-3
Immersion treatments:		
creosote	BS 3051	BWPA[d]
organic solvent (OS) preservatives (fungicide only)	BS 5707-1 Type F	BS 5707-3
organic solvent (OS) preservatives (with fungicide and insecticide)	BS 5707-1 Type F/N	BS 5707-3

[a] In preparation. Pending publication reference should be made to BS 144 and BS 3051.
[b] In preparation. Pending publication reference should be made to BS 913.
[c] Freshly felled timber is treated at source with *di* sodium octaborate. Seasoned timber cannot be treated by this process.
[d] Refer to the BWPA Manual 1986.

[5)] In preparation. Pending publication reference should be made to BS 913.

7.4 Handling and processing timber after treatment

7.4.1 *General.* It is essential that timbers which are cross-cut, notched or drilled for bolts after any impregnation treatment have the exposed surfaces or bolt holes liberally treated by brushing, spraying or dipping with wood preservative as recommended by the manufacturer unless otherwise specified in the relevant commodity specification. It should be understood that this does not restore the full value of the original treatment.

If rip sawing or profiling is carried out after treatment, it is essential to retreat the timber in accordance with the original specification.

7.4.2 *Copper/chromium/arsenic (CCA).* Timber treated with CCA preservatives becomes wet during processing and a period of redrying may be required after treatment. Even where the nature of the commodity does not require such redrying, a period of seven days before use should be allowed for the preservative salts to fix, i.e. become non-leachable. It is essential to stack timber carefully during this period because wetting and drying will cause timber movement and in some cases may cause distortion. It is essential that metal fittings are of a suitable composition and that they are not applied to the treated wood until this fixing period has elapsed (see BS 4072-2).

7.4.3 *Creosote and organic solvent (OS) preservatives.* The moisture content of timber is not increased by treatment with creosote or organic solvent preservatives and in this respect the product can be used immediately after treatment. However, for organic solvent preservatives in certain situations, e.g. prior to painting or for enclosed use, time should be allowed for the carrier solvent to evaporate before further processing or installation.

Table 7 — Pressure treatment

Schedule code	Initial vacuum [see **7.3.1** a) 1)]	Pressure period [see **7.3.1** a) 2)]	Final vacuum
	min	min	
P2	30	60	15 min or until a vacuum of – 0.8 bar is achieved, whichever is the longer
P3	30	90	
P4	60	180	
P7	30	120	
P8	5	5	
P9	5	20	

Table 8 — Immersion treatment

Schedule code	Immersion period
	min
M3	3
M10	10
M60	60

Table 9 — Double vacuum treatments

Schedule code	Initial vacuum		Impregnation		Final vacuum	
	Pressure	Time	Pressure	Time	Pressure	Time
	bar	min	bar	min	bar	min
V/1	– 0.33	3	0	3	– 0.67	20
V/2	– 0.33	5	1	5	– 0.67	20
V/3	– 0.17	10	1	40	– 0.83	20
	– 0.33	0	2	15	– 0.83	20
V/4	– 0.83	10	1	60	– 0.83	20
	– 0.83	10	2	15	– 0.83	20

Table 10 — Approximate conversions

(a) Vacuum		
-bar	mmHg	inHg
0.17	125	5
0.33	250	10
0.67	500	20
0.83	625	25
(b) Pressure		
bar	kgf/cm^2	PSIG
1.0	1.0	15
2.0	2.1	30
10.0	10.3	145
12.4	12.8	180
14.0	14.5	200
NOTE 1 bar = 10^5 N/m^2 = 10^5 Pa = 750 mmHg		

Evaporation can be facilitated by open stacking, preferably under cover in a well-ventilated area, and will normally take between two and seven days according to the uptake of preservative and prevailing conditions.

7.4.4 *Boron diffusion.* Boron diffusion treatment is carried out on green timber at source and treated timber is usually supplied already dried. For most purposes timber treated in this way can be machined or worked on site without retreatment of cut surfaces, with the exception of longitudinal conversion of timber more than 50 mm thick, which is not recommended. It is essential to protect boron-treated timber against wet weather conditions during prolonged storage.

8 Properties of treated timber

8.1 General

The main types of preservative employed (creosote, water-borne and organic solvent) have widely different secondary properties which influence the field in which each has a particular value. Where these properties impose a limitation on their use for a particular commodity this is noted in the appropriate clause. Some general comments on the utilization of treated wood are given in this clause.

8.2 Strength

Normal preservative treatment does not affect the strength properties of timber to any extent that is of practical significance.

8.3 Metal components

Under some conditions, metal fastenings may become corroded through contact with CCA treated timber and the preservative manufacturer should be consulted about any possible interactions of this kind (see BS 4072-2 for fuller information).

Provided the timber remains dry there is little risk of interaction of treated wood with ferrous metal fittings. Where corrosion of steel or galvanized steel may be expected to occur, even with untreated timbers, corrosion is more severe in the presence of CCA preservatives. It is important not to apply any metal fittings until the period of fixation of these preservatives is complete.

There is very little service evidence on which to base advice on the interaction of preservative treated wood with other metals.

Precautions should be taken to avoid contact between uncoated aluminium sheeting and copper-containing preservatives.

8.4 Adhesives, sealants and weatherseals

The interaction of adhesives, sealants and weatherseals with preservatives is a complex subject and cannot be adequately covered in general terms. Use of these materials with preservative treated timber should not be undertaken without first having sought advice from the manufacturer.

8.5 Decorative finishes

In general, timber treated with a water-borne or organic solvent preservative, which is formulated for subsequent painting, can be painted or stained normally. However, it is important that an adequate drying period should be left between preservative treatment and finishing. This can vary for different preservative types and the manufacturer's advice should be followed.

However, highly porous zones are sometimes encountered, particularly in European redwood, which can rapidly absorb excessive amounts of preservative solution. Such timber can give rise to finishing problems, particularly if treated with organic solvent preservatives, and extended drying periods will be necessary.

Copper naphthenate preservatives may give rise to staining problems with light coloured paints. Timber treated with creosote or PCP in heavy oil is not recommended for overpainting.

8.6 Flammability

The solvents commonly used for applying organic solvent preservatives are flammable and it is essential that care be exercised in applying such materials. However, once the solvent has evaporated from treated wood the timber is no more flammable than untreated wood.

When the surface of creosoted timber has dried, the timber is no easier to ignite than untreated timber, but it has different burning characteristics from those of untreated timber.

9 Safety

9.1 Solutions

All preservatives should be handled with care and in accordance with The Control of Pesticides Regulations 1986 and manufacturers' specific instructions.

9.2 Treated timber

When handling freshly treated timber, protective gloves should be worn, For timber treated with creosote or organic solvent preservatives adequate ventilation is also required.

CCA treated timber should be held for 48 h or till drip dry, whichever is the longer, before dispatch or erection.

No special precautions are necessary in handling timber treated with water-borne salts or organic solvent preservatives once the timber has dried, but it is essential to observe the normal practice of washing hands before handling food or smoking. Timber treated with creosote or PCP in heavy oil does not dry out in the same way as that treated with water-borne or organic solvent preservatives, and continued precautions may be necessary if the surface is oily.

If it is necessary to machine or sand treated timber, an efficient dust extraction system should be used.

9.3 Waste disposal

There are mandatory requirements governing the safe disposal of wood-preservative and treated-wood wastes, e.g. The Control of Pollution Act 1974. For information concerning the recommended methods for the disposal of these materials reference should be made to DOE *Waste Management Paper No. 16: Wood Preserving Wastes.*

It is essential that wood waste from treated timber is not used for animal litter.

10 Checking preservative treatment

10.1 General

There are two aspects of preservative treatment which the user commonly wishes to check. The first is whether the treatment has been carried out at all and the second is whether it has been carried out according to the specified procedure. The former is more easily verified than the latter.

10.2 Detection of preservative

The chemicals used in wood preservation comprise a diverse range of substances differing in the ease with which they can be detected in wood in situ.

Creosote is recognizable by its odour and colour; copper-containing preservatives such as CCA and copper naphthenate colour the wood green.

Other preservatives are usually colourless. Some products may be detected by spray reagents but others may need chemical analysis (see BS 5666-2).

10.3 Quantitative requirements

10.3.1 *General.* For most preservatives there is a chemical procedure whereby it is possible to estimate the amount of preservative in a sample of treated wood (see BS 5666). Although this information does not allow a direct conclusion as to whether or not the specified treatment has been carried out it can often provide an indication of the type of treatment given.

10.3.2 *Boron diffusion and creosote treatments.* Timber treated by the boron diffusion process is required by its specification to have a defined cross-sectional loading and a defined core loading on the basis of an 80 % compliance (see the BWPA Manual 1986). Creosote treatments are specified in terms of a minimum average net retention and an extended pressure period.

10.3.3 *Other treatments.* For preservative processes other than boron diffusion and creosote, specifications are defined in terms of processing parameters and thus there are no defined loading requirements. Verification of the treatment thus rests on knowledge of the process carried out. Many treatment plants are largely automatic in their operation (though with the possibility of operator intervention) and many preservation processors issue treating certificates to assure customers that the requirements of any specification named on a certificate have been satisfied. However the only certain way to be sure that treatment has been carried out as required is to witness all aspects of the treatment process.

NOTE With organic solvent preservatives, most preservative manufacturers will express an opinion concerning the loading of preservative in which a given treating schedule is likely to result. However, there is insufficient agreement to permit information on this aspect to be included in this code. When appropriate data have been generated and collected, it is expected that these will be published as an amendment to this code.

In the case of CCA preservatives, analysis of species with permeable and moderately resistant sapwood (see Table 1) (excluding those species where the sapwood and heartwood cannot be differentiated, e.g. whitewood) can provide a good indication of whether the recommendations of this code of practice have been complied with. With these species the sapwood should be fully penetrated and have a minimum sapwood retention as shown in Table 11.

Table 11 — Anticipated minimum sapwood retention of CCA treated timber

Treatment solution concentration	Minimum sapwood retention
g/L	kg/m^3
20	8
30	12
40	16
50	20
60	24

Any sample providing a result significantly below the values given in Table 11 is unlikely to have been treated as recommended by this code of practice. For those few timber species with more resistant sapwood the retentions given in Table 11 apply to that portion of the sapwood which is fully penetrated by the preservative.

Appendix A Decision process for using preservative treatment and examples of the use of Table 4 and Table 5

A.1 Decision process

The general stages to be followed when deciding on whether to use preservative treatment and, if so, which type are given in Table 12.

Examples of the use of Table 4 and Table 5 are given in **A.2**.

A.2 Examples

A.2.1 *Example 1. Trussed rafters with punched metal plate connectors, European Whitewood, normal domestic pitched roof*

1) *Identify situation*

Timber in buildings: refer to Table 4.

2) *Identify component and subcomponent (or equivalent)*

Pitched roofs (dry): refer to Table 4, situations 1 and/or 2.

Rafters: refer to Table 4, situations 1 or 2 a).

(It is assumed that the roof is normally pitched, adequately ventilated, etc. and that no unusual feature which could lead to a decay hazard is present.)

3) *Consider species or species group and durability rating*

Refer to Table 4, column 4.

European whitewood is specified, sapwood will be present therefore natural durability classification is irrelevant.

4) *Consider use of treatment*

Refer to Table 4, column 3.

Do the "Hylotrupes" requirements of the England and Wales Building Regulations. Approved Document to support Regulation 7 apply?

If "yes", i.e. situation 1, then preservative treatment is essential.

If "no", then preservative protection against fungal decay is considered unnecessary but insecticidal treatment to protect from insect attack is considered optional and should be considered. Decide on whether to treat or not to treat with preservative.

5) *Consider type of treatment where necessary or decided upon*

a) Select type and level of preservative treatment in the light of the species/group involved. European whitewood is a commercial designation for European spruce, mixed with European silver fir when from Central European sources; sapwood and heartwood will be present and both are susceptible to Anobium attack. Heartwood therefore needs protection and its treatability will dictate the process parameters.

European whitewood: resistant (see Table 1).

Therefore treatment specification should be chosen from those under the R and ER heading. Refer to Table 4, columns 9 to 12.

b) Decide between the three recommended options, i.e. CCA, OS, boron, on the basis of cost, availability, convenience, ancillary properties, etc. and reference to clause **8**.

c) Specify minimum recommended treatments.

	"Hylotrupes" area	Other area
CCA in accordance with BS 4072	P3, 30 g/L	P2, 30 g/L
OS (Type N or F/N) in accordance with BS 5707	V/1 or M10	V/1 or M10
Boron in accordance with BWPA Manual	Diffusion treatment at source	

Table 12 — Decision process for using preservative treatment

Stage	Decision	Action
(1) Identify situation	Is the structural components in a building?	Yes. Refer to Table 4 No. Refer to Table 5.
(2) Identify component	Is the timber component listed in column 2 of Table 4 or in column 1 of Table 5, as appropriate.	Yes. Go to stage (3). No. Identify nearest equivalent component or subcomponent in terms of use and decay/insect attack hazard. Go to stage (3).
(3) Consider species	Will the use of a species with naturally durable hardwood provide adequate resistance to decay/insect attack hazard[a]?	Yes. Specify. No. Go to stage (4).
(4) Consider use of treatment	If an untreated species (or sapwood) of lower durability is used, will the risk of attack in the particular circumstances of use and the economic, disruptive and safety consequences be acceptable[a]?	Yes. Specify. No. Go to stage (5).
(5) Consider type of treatment	Which type of preservative is appropriate?	Specify type of treatment selected from Table 4 or Table 5, as appropriate referring to Table 1 for information on treatability.

[a] Column 3 of Table 4 and Table 5 gives broad guidance on the allocation of risk categories; specific circumstances may dictate otherwise.

A2.2 *Example 2. Substitution of hem-fir in example 1*

Stages (1) to (4) are identical with those of example 1.

(5) *Consider type of treatment*

Hem-fir is a commercial mixture of western hemlock and grand and amabilis firs; sapwood and heartwood will be present and both are susceptible to Anobium attack. Heartwood therefore needs protection and its treatability will dictate the process parameters.

Hem-fir: resistant (see Table 1).

Therefore treatment specification should be chosen from those under the R and ER heading. Refer to Table 4, columns 9 to 12, as in example 1.

A.2.3 *Example 3. Sole plate in external timber frame wall, above DPC, SPF (spruce-pine-fir) group timber, domestic building*

1) *Identify situation*

Timber in buildings: refer to Table 4.

2) *Identify component and sub-component (or equivalent)*

External walls: refer to Table 4, situation 6.
Sole plate above dpc: refer to Table 4, situation 6(c).

3) *Consider species or species group and durability rating*

Refer to Table 4, column 4.

SPF (spruce-pine-fir) is specified, sapwood will be present therefore natural durability classification is irrelevant to the decision of whether or not to treat with preservative.

4) *Consider use of treatment*

Refer to Table 4, column 3.

Sole plates of timbers less than moderately durable are regarded as at risk from decay (due to high moisture contents resulting from poor workmanship, perforation of dpc, leaks etc.) to an extent that preservative protection is desirable to avoid the consequences of reinstatement should decay occur. It is considered unwise to dispense with preservative treatment of susceptible timbers unless special circumstances prevail.

5) *Consider type of treatment where decided upon*

a) Select type and level of preservative treatment in the light of the species/group involved. SPF is a commercial mixture of Western white spruce, Engelmann spruce, lodgepole pine and alpine fir amongst others; sapwood and heartwood will be present. Both the natural durability and treatability of the heartwood are relevant to the decision as to the type and intensity of treatment.

SPF: non-durable, resistant (see Table 1).

Refer to Table 4, columns 9 to 12 for R and ER group.

b) Decide between the four recommended options, i.e. CCA, OS, boron, creosote, on the basis of cost, availability, convenience, ancillary properties etc. and reference to clause **8**.

c) Specify minimum recommended treatments.

CCA in accordance with BS 4072	P7, 30 g/L
OS (Type F or F/N) in accordance with BS 5707	V/4 or V/3
Boron in accordance with BWPA manual	Diffusion treatment at source
Creosote	80 kg/m^3

Publications referred to

BS 144:1973, *Specification for coal tar creosote for the preservation of timber.*
BS 144, *Wood preservation by means of coal tar creosotes.*
BS 144-1, *Preservative specification**.
BS 144-2, *Method for timber treatment**.
BS 589, *Nomenclature of softwoods.*
BS 881, *Nomenclature of commercial timbers, including sources of supply.*
BS 913, *Specification for wood preservation by means of pressure creosoting.*
BS 1203, *Specification for synthetic resin adhesives (phenolic and aminoplastic) for plywood.*
BS 1282, *Guide to the choice, use and application of wood preservatives.*
BS 1990, *Wood poles for overhead power and telecommunication lines.*
BS 1990-1, *Specification for softwood poles.*
BS 3051, *Specification for coal tar creosotes for wood preservation (other than creosotes to BS 144).*
BS 4072, *Wood preservation by means of copper/chromium/arsenic compositions.*
BS 4072-1, *Specification for preservatives.*
BS 4072-2, *Wood preservation by means of copper/chromium/arsenic compositions.*
BS 4261, *Glossary of terms relating to timber preservation.*
BS 5250, *Code of basic data for the design of buildings: the control of condensation in dwellings.*
BS 5268, *Structural use of timber.*
BS 5268-2, *Code of practice for permissible stress design, materials and workmanship.*
BS 5589, *Code of practice for preservation of timber*[6)].
BS 5666, *Methods of analysis of wood preservatives and treated timber.*
BS 5666-2, *Qualitative analysis.*
BS 5707, *Solutions of wood preservatives in organic solvents.*
BS 5707-1, *Specification for solutions for general purpose applications, including timber that is to be painted.*
BS 5707-2, *Specification for pentachlorophenol wood preservative solution for use on timber that is not required to be painted.*
BS 5707-3, *Methods of treatment.*
BS 5750, *Quality systems.*
BS 6100, *Glossary of building and civil engineering terms.*
BS 6100-4, *Forest products.*
BS 6566, *Plywood.*
BS 6566-7, *Specification for classification of resistance to fungal decay and wood borer attack.*
BRE Digest 296 *Timbers: their natural durability and resistance to preservative treatment 1985* [7)].
BWPA Manual 1986[8)].
PRL Technical Note No. 59: *Marine borers and method of preserving timber against their attack*[7)].
EHC Reference Document 1988[9)].

[6)] 1989 revision in preparation.
[7)] Obtainable from the Building Research Station, Bucknalls Lane, Garston, Watford, Herts WD2 7JR
[8)] Obtainable from the British Wood Preserving Association, 6 The Office Village, 4 Romford Road, Stratford London E15 4EA.
[9)] Obtainable from the European Harmonization Committee for wood preservatives and treated wood, Bundesanstalt für Materialforschung und-Prüfung (BAM), Unter den Eichen 87, D-1000 Berlin 45

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