BRITISH STANDARD

BS 5707 : 1997

Specification for

Preparations of wood preservatives in organic solvents

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ICS 71.100.50

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee B/515, Wood preservation, upon which the following bodies were represented:

British Telecommunications plc
British Wood Preserving and Damp-proofing Association
Chemical Industries Association
Creosote Council
Department of the Environment (Building Research Establishment)
Timber Research and Development Association
Timber Trade Federation
Wood Panel Industries Federation

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

Association of Consulting Scientists
ITRI Ltd.
Ministry of Defence

This British Standard, having been prepared under the direction of the Sector Board for Building and Civil Engineering, was published under the authority of the Standards Board and comes into effect on 15 May 1997

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Foreword

This revision of BS 5707 has been prepared by Technical Committee B/515. This standard supersedes BS 5707 : Parts 1, 2 and 3, which are withdrawn. This revision takes account of European Standards on wood preservation produced by CEN Technical Committee CEN/TC38 and is produced in a single part, combining the specifications for preservative solutions and providing guidance on suitable methods of treatment in annex A.

Consideration was given to the inclusion of a requirement for the compatibility with paint. However, it was not found possible to include a test suitable to represent the many different painting practices in use. Similarly, no test is available that gives generally useful information on the effectiveness of water repellents, which are often included in the solutions specified in this standard.

CAUTION. Attention is drawn to the Health and Safety at Work etc. Act 1974, and the need for ensuring that the methods specified in this British Standard are carried out with suitable precautions.

The procedures described in this British Standard are intended to be carried out by appropriately qualified and experienced persons or other suitably trained and/or supervised personnel. Normal safety precautions should be used throughout the use of the methods.

Materials conforming to this specification and used as a wood preservative require government approval under the Control of Pesticides Regulations 1986 (SI 1510) before they can be sold, supplied, stored, advertised or used in the United Kingdom.

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 and ii, pages 1 to 8, an inside back cover and a back cover.

1 Scope

This British Standard specifies requirements for preparations of chemicals in organic solvents intended for application to timber to preserve it against attack in service by wood-destroying fungi and/or insects. These preparations are not suitable for all purposes, and reference should be made to commodity standards or codes of practice for information about their suitability for any particular purpose.

NOTE. Coloured preparations, for example those containing dyes or pigments, may not be suitable for use with timber that is to be painted. Pentachlorophenol in heavy oil cannot be used with timber that is to be painted or used in domestic dwellings. Specific advice regarding suitability should be obtained from the product supplier.

This standard includes those formulations that are used generally for pretreatment or maintenance (preventative) procedures. It does not address formulations for use in remedial (curative) treatments.

2 References

2.1 Normative references

This British Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on the inside back cover. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the cited publication apply to this British Standard only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the publication referred to applies, together with any amendments.

2.2 Informative references

This British Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 Definitions

For the purposes of this British Standard the following definitions apply.

3.1 bloom

Crystals or other visible deposits from a preservative remaining on the surface of treated wood as a result of evaporation of solvent.

3.2 tack

Perceived stickiness on the surface of wood impregnated with a preservative following evaporation of solvent.

4 Active ingredients

NOTE. Methods of analysis for some of the active ingredients defined in clause **4** can be found in Parts of BS 5666.

4.1 *Acypetacs zinc*. The zinc salt of a mixture of C_8 to C_{10} linear and branched chain saturated aliphatic carboxylic acids; the branched chain acids predominating and consisting of equal parts by weight of:

a) acids in which the main chain is dialkyl-substituted on the second carbon atom; and

b) acids in which the second carbon atom is either unsubstituted or monoalkyl-substituted.

NOTE. Both acids may be further alkyl-substituted on the third or higher carbon atoms.

The molecular weight of the mixture of acids lies between 157 and 171. The total zinc content is a minimum of 20.0 % (*m/m*) and purity is a minimum of 99 % (*m/m*).

4.2 *Copper naphthenate*. A mixture of the copper salts of naturally-occurring naphthenic acids (naturally occurring carboxylic acids extracted from petroleum oils), conforming to BS 3769 : 1964.

NOTE. Commercial products are available with copper contents of 6 % (*m/m*) and 8 % (*m/m*).

4.3 *Cypermethrin* ($C_{22}H_{19}NCl_2O_3$). A yellow viscous liquid, essentially a mixture of the isomers of α-cyano-3-phenoxybenzyl-2,2-dimethyl-3-(2,2-dichlorovinyl)-cyclopropane carboxylate having an isomer mix of a minimum of 35 % (*m/m*) *cis* isomers and a maximum of 65 % (*m/m*) *trans* isomers with a total isomer content of not less than 90 % (*m/m*).

4.4 *Lindane* ($C_6H_6Cl_6$). A white crystalline solid containing not less than 99.5 % (*m/m*) of the γ-isomer of 1,2,3,4,5,6-hexachlorocyclohexane.

4.5 *Pentachlorophenol* (C_6Cl_5OH). Total chlorophenol content of not less than 96 % (*m/m*), expressed as pentachlorophenol, of which not less than 84 % (*m/m*) is pentachlorophenol and not more than 10 % (*m/m*) tetrachlorophenols, and free from 2,3,7,8-tetrachlorodibenzo-*p*-dioxin isomers to a detection limit of 10^{-7} % (*m/m*). The total content of hexachlorodibenzo-*p*-dioxins is less than 4×10^{-4} % (*m/m*). The product shall not contain more than 0.5 % (*m/m*) of material insoluble in a sodium hydroxide solution (5 g NaOH in 100 ml water) when tested according to the method in annex B of BS 3175 : 1959.

NOTE. For the analysis of dioxin concentrations, methods published by the USA Environmental Protection Agency can prove suitable. Refer to US EPA Method 1613 [1].

4.6 *Pentachlorophenyl laurate*. The ester of pentachlorophenol conforming to **4.5** and dodecanoic (lauric) acid ($C_{11}H_{23}COOH$). The dodecanoic acid can contain other fatty acids but shall have a mean molecular weight of 200 and shall be an oily liquid at room temperature. The final product shall conform to the dioxin impurity limits given in **4.5**.

4.7 *Permethrin* ($C_{21}H_{20}Cl_2O_3$). A colourless to pale brown viscous liquid or semi-solid, essentially a mixture of the isomers of methyl 3-phenoxyphenyl-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate. Acceptable isomer mixes are:

a) 25 %/75 % *cis/trans* (28 % max. *cis*, 65 % min. *trans*) with a total minimum isomer content of 93 % (*m/m*);

b) 40 %/60 % *cis/trans* (35 % to 45 % *cis*, 55 % to 65 % *trans*) with a total minimum isomer content of 92 % (*m/m*);

c) 50 %/50 % *cis/trans* (45 % min. *cis*, 55 % max. *trans*) with a total minimum isomer content of 90 % (*m/m*).

4.8 *Propiconazole* ($C_{15}H_{17}Cl_2N_3O_2$). 1-(2′,4′-dichlorophenyl)-4-propyl-1,3-(dioxolan-2-ylmethyl)-1*H*-1,2,4-triazole, a light to dark yellow, clear viscous liquid. Purity shall not be less than 90 % (*m/m*).

4.9 *Tebuconazole* ($C_{16}H_{22}ClN_3O$). *α*-[2-(4-chlorophenyl)ethyl]-*α*-(1,1-dimethylethyl)-1*H*-1,2,4-triazole-1-ethanol. A white to pale brown crystalline powder, melting point 103 °C approx., containing not less than 93 % (*m/m*) tebuconazole.

4.10 *TCMTB* ($C_9H_6N_2S_3$). 2-(thiocyanomethylthio)benzothiazole, usually available as a red/orange to dark brown liquid which can be very viscous and which crystallizes depending on the concentration.

NOTE. Commercial products are available at TCMTB concentrations of 60 % (*m/m*) and 80 % (*m/m*).

4.11 *Tri-n-butyltin oxide* ($[(C_4H_9)_3Sn]_2O$), containing a minimum of 95 % (*m/m*) bis(tri-*n*-butyltin) oxide and 38.2 % (*m/m*) tin.

4.12 *Tri-n-butyltin naphthenate*. The ester of bis(tri-*n*-butyltin) oxide and naturally-occurring naphthenic acids (naturally occurring carboxylic acids extracted from petroleum oils). The product shall contain a minimum of 92 % (*m/m*) tri-*n*-butyltin naphthenate and a minimum of 21.0 % (*m/m*) tin. The product shall not contain more than 0.1 % (*m/m*) free bis(tri-*n*-butyltin) oxide.

4.13 *Trihexylene glycol biborate* ($C_{18}H_{36}O_6B_2$). A clear, colourless to pale straw liquid, boiling point 314 °C to 326 °C, containing not less than 5.6 % (*m/m*) boron (equivalent to 32 % (*m/m*) boric acid).

4.14 *Zinc naphthenate*. A mixture of the zinc salts of naturally-occurring naphthenic acids (naturally occurring carboxylic acids extracted from petroleum oils). The product shall conform to BS 3770 : 1964.

NOTE. Commercial products are available with zinc contents of 6 % (*m/m*), 8 % (*m/m*) and 12 % (*m/m*).

4.15 *Zinc versatate*. The zinc salt of a mixture of saturated aliphatic carboxylic acids, of which 95 % is C_{10} branched acids. The acids shall be dialkyl substituted on the second carbon atom and can be further substituted on the third or higher carbon atoms. The molecular weight of the mixture of acids shall lie between 170 and 180.

NOTE. Commercial products are available with zinc concentrations ranging from 6 % (*m/m*) to 16 % (*m/m*).

5 Solutions for general purpose applications, including timber that is to be painted

5.1 Composition

NOTE. Co-solvents and other ingredients, for instance water repellents, pigments and dyes, can be added to the basic mixture of solvent and fungicide and/or insecticide providing that the resultant solution conforms to **5.2**.

5.1.1 *Fungicides and insecticides*

The fungicides and insecticides used in these formulations shall be as specified in tables 1 and 2. The solutions shall contain not less than the concentrations of the fungicides and/or insecticides included in tables 1 and 2.

5.1.2 *Solvent*

The solvent shall be a petroleum distillate or a coal tar distillate or a mixture of these. The distillation characteristics of the solvent, when determined as described in BS 7392, shall be as specified in table 3.

Table 1. Minimum concentration of fungicides and type designation

Type number	Fungicide(s)	Minimum concentration % (*m*/*m*)
F1	pentachlorophenol	5.0
F2	tri-*n*-butyltin oxide	1.0
F3	pentachlorophenol/ tri-*n*-butyltin oxide	1.75 pentachlorophenol/ 0.44 tri-*n*-butyltin oxide
F4	zinc naphthenate/ pentachlorophenol	1.8 zinc/ 2.0 pentachlorophenol
F5	zinc naphthenate/ pentachlorophenol	1.0 zinc/ 5.0 pentachlorophenol
F6	pentachlorophenyl laurate	6.25
F7	copper naphthenate	2.0 copper
F8	copper naphthenate	2.75 copper
F9	acypetacs zinc	14.5
F10	zinc versatate	2.9 zinc
F11	trihexylene glycol biborate	3.5
F12	tri-*n*-butyltin naphthenate	1.8
F13	tebuconazole	0.75
F14	TCMTB	2.25 TCMTB
F15	propiconazole	1.0

NOTE 1. The minimum concentrations listed in the table refer to the commercial product not to the pure active ingredient.

NOTE 2. Marketed products containing these minimum concentrations are not necessarily of equal effectiveness.

Table 2. Minimum concentration of insecticides and type designation

Type number	Insecticide	Minimum concentration % (*m*/*m*)
N1	lindane	0.5
N3	permethrin	0.1
N4	cypermethrin	0.05

NOTE 1. Type number N2 referred to dieldrin (which is now prohibited) in BS 5707 : Part 1 : 1979. To avoid confusion, this type number has not been used for the insecticides currently approved for use as wood preservatives.

NOTE 2. The minimum concentrations refer to the products, not the pure active ingredients, as defined in clause **4**.

NOTE 3. Marketed products containing these minimum concentrations are not necessarily of equal effectiveness.

Table 3. Distillation characteristics of clause 5 solvents

Property	Requirement
Initial boiling point	135 °C min.
Fraction recovered below 155 °C	10 % (*V*/*V*) max.
Fraction recovered below 250 °C	90 % (*V*/*V*) max.
Fraction recovered below 270 °C	98 % (*V*/*V*) max.

5.2 Requirements for the solution

NOTE. For certain uses, freedom from bloom and tack or a minimum level of bloom and tack can be specified. Annex B provides a test method whereby the amount of bloom and tack likely to develop from the use of a preservative preparation can be assessed.

5.2.1 *Appearance*

The solution shall be free from visible extraneous matter.

5.2.2 *Flashpoint*

The flashpoint of the solution shall be not lower than 32 °C when determined as described in BS 2000 : Part 170 : 1995.

5.2.3 *Water content*

The water content of the solution as supplied shall be not greater than 0.25 % (*V*/*V*) when determined as described in BS 4385 : Part 1 : 1995.

5.2.4 *Solution stability*

The solution shall not show any trace of crystalline deposit or other precipitation after it has been maintained at (0 ± 1) °C for 24 h.

5.2.5 *Penetration factor*

The penetration factor for solutions intended for application by brushing, spraying or immersion shall be at least 70 % when determined by the method described in annex C.

5.2.6 *Designation of solutions*

Solutions containing only fungicides shall be designated as class F solutions; those containing only insecticides as class N solutions and those containing both fungicides and insecticides as class F/N solutions. Where reference to solutions containing a specific active ingredient is to be made, the appropriate type number shall also be included, for example BS 5707 : F4, BS 5707 : N2 or BS 5707 : F5/N3.

6 Pentachlorophenol in heavy oil for use on timber that is not to be painted

NOTE. The solution can contain a non-volatile solubilizing agent and other additives in addition to those specified in **6.1**.

6.1 Composition

6.1.1 *Pentachlorophenol*

The solution shall contain not less than 5.0 % (*m*/*m*) of pentachlorophenol (see **4.5**).

6.1.2 *Solvent*

The solvent shall be a petroleum distillate or a coal tar distillate or a mixture of these. The distillation characteristics of the solvent, when determined as described in BS 7392 : 1990, shall be as given in table 4.

Table 4. Distillation characteristics of clause 6 solvents

Property	Requirement
Initial boiling point	180 °C min.
Fraction recovered below 260 °C	50 % (*V*/*V*) max.
Fraction recovered below 360 °C	95 % (*V*/*V*) min.

6.2 Requirements for the solution

6.2.1 *Appearance*

The solution shall be a clear mobile liquid, free from visible extraneous material.

6.2.2 *Flashpoint*

The flashpoint of the solution shall be not lower than 70 °C when determined as described in BS 2000 : Part 170 : 1995.

6.2.3 *Water content*

The water content of the solution, as supplied, shall be not greater than 0.25 % (*V*/*V*) when determined as described in BS 4385 : 1991.

6.2.4 *Solution stability*

The solution shall not show any trace of crystalline deposit or other precipitation after it has been maintained at (0 ± 1) °C for 24 h.

6.2.5 *Viscosity*

The viscosity of the solution shall be not greater than 3.0 $m^2 \cdot s^{-1}$ at 38 °C when determined by the method described in BS 2000 : Part 71.1 : 1995.

Annexes

Annex A (informative)
Guidance on methods of treatment

A.1 Introduction

This informative annex gives guidance for the treatment of timber using organic solvent wood preservatives conforming to this standard. It includes those methods most commonly used in the UK for the treatment of timber components with organic solvent preservatives.

A.2 Preservative solutions

The type of preservative solution to be used should be chosen from among those specified in clauses **5** and **6**.

A.3 Treatment processes

A.3.1 *Double vacuum process*

A.3.1.1 *Principle of the process*

The double vacuum method of treatment depends primarily on creating a vacuum within the timber and using the pressure differential between this and atmospheric or increased pressure applied in the vessel after it is filled with preservative fluid to force the fluid into the timber. At the end of the pressure stage the vessel is emptied of fluid and a final vacuum applied to remove some of the absorbed fluid.

A.3.1.2 *Charging the vessel*

The timber should be stacked in the treatment vessel so that the preservative fluid will have free access to all faces of the timber. The vessel should then be sealed.

A.3.1.3 *Initial vacuum stage*

The pressure within the vessel should be reduced to the target value and maintained at this pressure for the prescribed time.

All the timber should be covered with preservative fluid either before or after establishment of the initial vacuum. In the latter case the reduced pressure should be maintained until all the timber is submerged.

The vessel should then be allowed to return to atmospheric conditions.

A.3.1.4 *Pressure stage*

The pressure within the vessel should be raised to the target value and maintained at this pressure for the prescribed time.

At the end of the pressure stage, the pressure in the vessel should be allowed to achieve atmospheric conditions and the preservative fluid should be discharged.

A.3.1.5 *Final vacuum stage*

The pressure within the vessel should be reduced to the target value and maintained at this pressure for the prescribed time.

The pressure in the vessel should be allowed to achieve atmospheric conditions; the vessel should then be opened and the treated timber should be removed.

A.3.1.6 *Selection of treatment schedule*

Choice of a suitable treatment schedule for a particular end use depends on a number of factors, e.g. the type of preservative, the species of timber and the performance required in service from the treated component.

NOTE. This annex does not discuss in detail the suitability of the different processes for various uses.

Guidance on the selection of an appropriate schedule may be found in the relevant commodity standard or obtained by contacting the manufacturer of the formulation being used.

A.3.1.7 *Example of double vacuum treatment*

For permeable and moderately resistant timber (of treatability classes 1 and 2 of BS EN 350-2 : 1994), to be treated with preservative solutions conforming to clause **5**, a widely used double vacuum treatment schedule consists of an initial vacuum stage of -0.33 bar for 3 min, a pressure stage of 0 bar for 3 min and a final vacuum stage of -0.67 bar for 20 min. Several variants of this schedule are possible depending on the treatability of the timber and the preservative solution being used.

A.3.2 *Immersion process*

A.3.2.1 *Principle of the process*

Complete immersion of the timber in the preservative solution at atmospheric pressure ensuring that all surfaces of the wood are in free contact with the solution.

In general, penetration and loading are less than those obtained by double vacuum treatment. Better treatment can be achieved by immersion for long periods (hours or even days) but this is usually not practicable.

A.3.2.2 *Operation*

The timber should be immersed completely in the solution for a suitable period of time depending on the type of wood and envisaged end use. The periods of immersion normally specified range from 3 min to 60 min.

A.3.3 *Brushing and spraying*

A.3.3.1 *Principle of process*

Application of the preservative solution by means of a brush to ensure that all exposed surfaces are thoroughly treated. Use of a hand held spray is a similar process.

A.3.3.2 *Application*

This method is usually used to treat surfaces of treated timber exposed by subsequent wood-working or for maintenance purposes. At least two coats should be applied. Unless carried out thoroughly, these methods are likely to be much less effective than the other methods described in this standard because of the risks of incomplete coverage and of not allowing absorbent areas of the timber, such as sapwood, the chance to absorb as much preservative as they would do in other treatments.

A.3.4 ***Post treatment operations***

For timber treated with these preparations, time should be allowed for the solvent to evaporate before further processing or installation.

Annex B (informative)

Determination of freedom from bloom and tack

B.1 Principle

Samples of redwood (*Pinus sylvestris*) are treated with the preservative solution by immersion for 3 min. After drying the treated wood for 24 h, the freedom from bloom and tack is determined by a visual assessment for bloom and a tactile assessment for tack.

B.2 Materials

B.2.1 *Wood.* Redwood (*Pinus sylvestris*) containing not less than 30 % but not more than 60 % by volume of sapwood, straight grained and free from knots, staining fungi and other defects.

B.3 Preparation of test pieces

Three test samples of the wood should be prepared, each approximately 25 mm × 25 mm in cross section and at least 150 mm in length with planed lateral surfaces. The test samples should be conditioned by standing them, for at least 7 days, in a position where each sample is exposed to free circulation of air at a relative humidity of (65 ± 5) % and a temperature of (20 ± 2) °C.

B.4 Procedure

The conditioned test samples should be immersed completely in the preservative solution for 3 min, then removed and allowed to dry in the air by standing them on end for 24 h.

All lateral surfaces of all the dried test samples should be examined for bloom. If any surface of any test sample has crystalline or other visible deposits deriving from the preservative solution it should be regarded as indicating that the test samples are not free from bloom.

All lateral surfaces of the test samples should be touched repeatedly with the end of an index finger. If stickiness or resistance to the finger leaving the surface is experienced, it should be regarded as indicating that the test samples are not free from tack.

NOTE. For safety reasons, it may be appropriate to wear a fine rubber glove when carrying out the test for tack.

Annex C (normative)

Determination of the penetration factor

C.1 Principle

Sapwood samples of redwood (*Pinus sylvestris*) are placed standing on end in the preservative solution and the resultant longitudinal penetration achieved over a set period is measured and compared with the penetration achieved over the same period using a reference liquid.

C.2 Materials

C.2.1 *Wood.* Sapwood of redwood (*Pinus sylvestris*), straight grained and free from knots, staining fungi and other visible defects.

C.2.2 *Reference liquid*, decahydronaphthalene (dekalin, $C_{10}H_{18}$), containing a suitable oil-soluble dye.

NOTE. Waxoline blue, at a concentration of 0.5 % (*m/m*), is a suitable oil-soluble dye.

C.3 Preparation of test samples

Prepare five pieces of redwood, approximately 25 mm × 25 mm in cross section and at least 300 mm long, with planed lateral surfaces.

The moisture content at the time of cutting shall be below 20 %. Cross-cut each piece into two test pieces 150 mm long. Mark the end-grain surfaces that were adjacent to each other in the original pieces. Thus obtain five matched pairs of test samples.

Store the test samples at (20 ± 2) °C and at a relative humidity of (65 ± 5) % for at least one week before testing.

C.4 Procedure

If the preservative solution is not distinctly coloured, it shall be coloured with the same concentration of dye used in the reference liquid.

Treat each pair of test pieces as follows.

Fill a flat-bottomed glass dish to a depth greater than 5 mm with the preservative solution at a temperature of (20 ± 2) °C. Fill a second dish in the same way with the reference liquid.

Lower one of each pair of test samples vertically into the solution with the marked end-grain surface immersed to a depth of 5 mm. Similarly, lower each of the other matched test samples into the flat-bottomed dish containing the reference liquid. Remove the test samples after 3 min immersion. Drain the test samples by holding them vertically for 5 min with the immersed ends at the bottom. Store the test samples on their sides under ambient room conditions for 1 week; ensure that the test samples do not touch each other.

Saw each test sample longitudinally, the cut being made across the growth rings of the wood, from the untreated end towards the wood penetrated by the preservative solution or reference liquid.

NOTE. The exposed face may be planed in the same direction, if desired.

Measure the longitudinal penetration of the preservative solution or reference liquid from the immersed end in the central core of the test sample, the central core extending 7.5 mm on each side of the central line drawn along the axis of the sample. Record the minimum and maximum penetration of the preservative solution or reference liquid, as indicated by the colour of the solution or presence of the dye, within the central core zone.

C.5 Calculation of the penetration factor

Calculate the average of the five measurements made on the test samples immersed in the preservative solution; similarly determine the average of the corresponding test samples immersed in the reference liquid.

Calculate the penetration factor, expressed as a percentage, from the following formula:

$$P = (D_{\mathrm{P}} \div D_{\mathrm{X}}) \times 100$$

where

P is the penetration factor for the preservative (%);

D_{P} is the average penetration of preservative solution;

D_{X} is the average penetration of reference liquid.

blank

List of references (see clause **2**)

Normative references

BSI publications

BRITISH STANDARDS INSTITUTION, London

BS 2000 :	*Methods of test for petroleum and its products*
BS 2000 : Part 71 :	*Kinematic viscosity*
BS 2000 : Part 71.1 :1995	*Petroleum products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity*
BS 2000 : Part 170 : 1995	*Petroleum products — Determination of flash point — Abel closed cup method*
BS 3175 : 1959	*Specification for pentachlorophenol*
BS 3769 : 1964	*Specification for copper naphthenate and copper naphthenate concentrates*
BS 3770 : 1964	*Specification for zinc naphthenate and zinc naphthenate concentrates*
BS 7392 : 1990	*Method for determination of distillation characteristics of petroleum products*
BS EN ISO 9029 : 1995	*Crude petroleum — Determination of water — Distillation method*

Informative references

BSI publications

BRITISH STANDARDS INSTITUTION, London

BS EN 350 :	*Durability of wood and wood-based products — Natural durability of solid wood*
BS EN 350-2 : 1994	*Guide to natural durability and treatability of selected wood species of importance in Europe*
BS 5666 :	*Methods of analysis of wood preservatives and treated timber*

Other references

[1] UNITED STATES OF AMERICA. US EPA Method 1613, *Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HGRC/HRMS*, 1990. Washington DC: US EPA

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BSI
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W4 4AL