

Methods of analysis of

Wood preservatives and treated timber —

Part 2: Qualitative analysis

NOTE It is essential that this Part is read in conjunction with Part 1 “General considerations and sampling and preparation of materials for analysis”.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, 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 and field of application

This Part of this British Standard details procedures for the detection of preservative materials commonly found in organic solvent type and water-borne type preservative solutions and in preservative-treated wood. The complex nature of the tar oil type preservatives precludes the use of a specific qualitative test for this group, although some indication of their presence may be provided by odour and appearance characteristics.

The procedures described in this Part will frequently be applied before carrying out quantitative analyses using methods described in other Parts of this standard. Two types of qualitative test are described, those carried out directly on timber sections and those requiring prior preparation of an extract from the timber sample. Some preservative materials can be detected by either type of method, others by only one of them. In addition to the detection of preservative materials, the spray tests described may be used to estimate the penetration of the preservatives.

Although these tests have been validated for the types of preservative in current use, the introduction of new materials could give rise to difficulties and analysts should be alert to this possibility.

2 References

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

3 Preliminary inspection of the sample

3.1 General. Much information can be gained from a careful inspection of the sample. Aged or partially decayed samples may have a misleading appearance and should be examined thoroughly.

3.2 Visual examination. A wide variety of colouring materials may be present in preservative formulations, so colour can only be considered as a guide.

Note the colour of the sample; the following inferences may be drawn.

a) *Green colouration.* The presence of copper naphthenate (see 3.3), copper/chromium/arsenic, or fluorine/chromium/arsenic preservative should be suspected. Copper naphthenate gives a bright blue-green coloration, copper/chromium/arsenic salts give a dark green or brown coloration. Fluorine/chromium/arsenic salts give a yellow-green coloration.

b) *Brown colouration.* This may indicate the presence of creosote or occasionally of zinc naphthenate. Care should be taken to differentiate between a brown colouration and general staining or accumulated dirt.

c) *Natural wood colour.* With the exception of zinc naphthenate, the materials mentioned in items a) and b) are almost certainly absent.

3.3 Odour. The sense of smell varies considerably with the individual, but it is generally possible to detect the presence of certain preservatives by their odour.

Smell the sample and, if appropriate, compare its odour with that of dilute solutions of appropriate preservative.

Creosote, naphthenic acids (present as the copper or zinc compounds) and tri-*n*-butyltin oxide all have characteristic odours. In addition, a "solvent smell" may indicate treatment with an organic solvent type preservative.

3.4 Differentiation of heartwood and sapwood in *Pinus* species. This is sometimes useful in the interpretation of the qualitative tests, for instance some specifications require the whole of the sapwood zone to be penetrated by preservative solution following treatment. The differentiation of the heartwood and sapwood of most *Pinus* species can be achieved by a simple colour change reaction, details of which are given in Appendix A.

4 Qualitative tests on timber sections

4.1 Principle. Copper, chromium, boron, fluoride, tin, zinc and pentachlorophenol are detected by spray or brush application of an appropriate chromogenic material to the timber surface.

NOTE 1 Preservative solutions may also be tested by absorbing them on to an ashless or chromatographic grade filter paper.

NOTE 2 The tests described are not always ideal but are the best available at the present time. In particular, it should be noted that the presence of other compounds may interfere with or mask the development of the distinguishing colour (positive response) and that treated wood may give a negative response because the level of preservative is below the detection limit of the reagent.

4.2 Reagents. All reagents shall be of recognized analytical reagent quality and water complying with the requirements of BS 3978 shall be used throughout.

Ethanol (absolute) complying with the requirements of BS 507 or industrial methylated spirits¹⁾ 99 % (V/V) (74 degrees O.P.) complying with the requirements of BS 3591 shall be used to make up the reagents where ethanol is specified.

4.2.1 Dithio-oxamide solution, 5 g/l. Dissolve 0.5 g of dithio-oxamide in 100 ml of ethanol.