

Guide to the

Choice, use and application of wood preservatives

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The Wood Preservation Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

- British far Industry Association*
- British Wood Preserving Association*
- British Woodwork Manufacturers' Association
- Chemical Industries Association*
- Department of the Environment (Building Research Establishment, Princes Risborough Laboratory)*
- Department of Industry — Chemicals and Textiles
- Electricity Supply Industry in England and Wales*
- Fencing Contractors' Association
- Greater London Council
- Ministry of Agriculture, Fisheries and Food
- National Coal Board*
- Post Office*
- Timber Research and Development Association*
- Timber Trade Federation of the United Kingdom*

The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

- British Pest Control Association
- Commonwealth Institute of Entomology
- Department of Energy — Electricity
- Institution of Municipal Engineers
- Ministry of Defence
- Tin Research Institute

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Foreword

In this revision of the 1959 edition, emphasis has been placed on guiding the user on the proper choice of wood preservatives and appropriate methods of application to meet the different situations in which the use of preserved wood is advisable. Attention is drawn to the related British Standards which specify the preservatives, their methods of application and the requirements for the treated products. This revision supersedes the 1959 edition of BS 1282 which is withdrawn.

NOTE As this British Standard is not a specification and only lays down guidelines, the words “complying with BS 1282” or similar expressions should not be used.

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 and ii, pages 1 to 12, an inside back cover and a back cover.

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

1 Scope

This British Standard gives guidance on the selection of preservative treatments for timber. It describes the conditions under which timber in use is liable to be damaged by wood-destroying organisms. It defines and describes the various types of wood preservatives and lists the existing specifications for them. It defines and describes the processes available for applying them. Finally it indicates the factors which control the effectiveness of preservative treatments and gives guidance on how to select the best treatment for a particular purpose. It does not, however, give detailed advice on the treatment of timber for specific uses, such as window frames or plywood, but recommends certain other codes and specifications in which such information can be found.

This guide does not cover in situ remedial treatment of timber already attacked but deals only with preservative treatment. It does not deal with short term preventive treatment against staining fungi or attack by forest insects of newly felled timber in the forest or of freshly sawn timber at the mill.

This standard deals with treatment carried out in the United Kingdom on timber intended for use either there or abroad. It includes also treatment carried out abroad on timber to be imported into the United Kingdom but does not cover treatments carried out abroad on timber for use outside the United Kingdom.

2 References

The titles of the British Standards and Code of Practice referred to in this standard are listed on the inside back cover.

3 General

Wood does not deteriorate of its own accord and, under favourable conditions, it can last almost indefinitely. In many environments, however, it is subject to attack by one or more wood-destroying organisms, namely fungi, insects, marine borers and, to a limited extent, bacteria. These are described in clauses 4 and 5. The various timbers are not all equally liable to attack, some being highly susceptible and others naturally resistant. A convenient way of avoiding damage by any of these organisms is therefore to select a naturally durable species of wood, provided that one can be found with the other properties required and at an economic price. It is sometimes difficult to find a timber that has sufficient natural resistance to give the life required in an aggressive environment such as a tropical sea. However, it is generally cheaper, more reliable and more effective to use preservative treatments. Treatments are now available which are known to give protection for a very long time in almost any environment, and timber can be kept in a sound condition throughout the design life of any structure in which it is used by the application of an appropriate preservative treatment. Treatments vary very widely in their effectiveness and so it is essential to ensure that the treatment selected can give protection for the period required and that it is applied early enough. In many cases, once the timber is in position, it is impossible to treat it as effectively or economically.

In choosing a preservative treatment there are, to begin with, two equally important aspects to be considered: the properties and potential effectiveness of the preservative, and the process by which it is applied. The first of these is dealt with in clauses 6 to 8 and the second in clauses 11 and 12. The principles on which to base the selection of a treatment and a table of codes and specifications covering the preservation of different timber products which the user can be recommended to follow are given in clause 12.

4 Wood-destroying organisms in the United Kingdom

4.1 Wood-rotting fungi. Wood-rotting fungi can develop only if the moisture content of the wood is above about 22 %. Under normal atmospheric conditions, however, timber will tend to dry to below this critical value and so it is not liable to attack unless it is continually or intermittently wetted in some way. This can happen, for example, by contact with the ground or some other damp material, by exposure to rain or condensation or to very high relative humidities, over about 90 %. It can happen also in less obvious ways, for example through internal condensation within the wood, which can occur if timber is part of the wall (or roof or floor) of a building or container, such as a cold store, through which moisture vapour is diffusing along a negative temperature gradient.

The decay rate of timber under any of these damp conditions depends very much on its natural resistance to fungal attack or, in the more commonly used term, on its natural durability. Some timbers, such as beech, and the sapwood of most timbers, have virtually no resistance to attack and will decay very rapidly if they are allowed to become wet. Others, for example oak, teak and western red cedar, are resistant and will remain in a sound condition for a very long time under these conditions. The natural durability of most of the commercial timbers is now known and can be found in the literature¹⁾. The length of service that a timber of given durability is likely to provide will of course depend also to a very great extent on the actual environment in which it is used. All the various damp and wet situations are not equally conducive to decay. In some, for example in the soil, infection is virtually continuous and other conditions are favourable for rapid development of decay. But in others, for example in the open air above ground, conditions are usually only marginally and intermittently favourable to infection and development of decay. This means that a timber classed as durable, e.g. oak, and of a certain thickness could last for only 20 years in ground contact, but for several centuries on the exterior wall of a building.

The first step, therefore, towards assessing the need for preservative treatment is to establish the natural durability of the timber to be used and to obtain an estimate of its likely performance in service under the conditions to which it will be exposed.

4.2 Wood-boring insects. In the United Kingdom the only widespread wood-boring insect likely to cause significant damage to timber structures is the common furniture beetle, *Anobium punctatum*. This attacks only the sapwood part of the timber and not the heartwood. There are one or two exceptions to this in that, with certain light coloured timbers the heartwood is liable to be attacked also. These timbers are all species of low natural durability such as beech, poplar and spruce.

Wood-boring insects other than *Anobium punctatum* may be encountered in the United Kingdom and although of less importance, they can be equally damaging in particular circumstances. *Lyctus brunneus*, the powder post beetle, confines its activity to the sapwood of hardwoods, although beech and birch are immune. Control is usually effected by good timber yard practice and, if necessary, among others, treatment of suspect timber by kiln sterilization or methyl bromide fumigation. If *Lyctus* attack does occur in buildings it can usually be traced to the inadvertent use of actively infested timber. Certain insects, such as the death watch beetle and wood-boring weevils, only attack wood once it has started to decay.

Although *Anobium punctatum* prefers damp timber it will tolerate much drier conditions than wood-rotting fungi. This is important because it means that, although it is possible, and normal good practice, to eliminate risk of fungal decay in buildings by designing out any access of water to or condensation in the timber, it is not practicable to avoid the risk of insect attack in the same way.

Economically significant damage by *Anobium punctatum* is, to all intents and purposes, confined to timber in buildings and the like. Although the natural habitat of Anobiids is out of doors, they are rarely responsible for any significant damage to timber structures in the open because, if these are susceptible, they will normally also be of low natural durability and be destroyed more rapidly by fungal decay. Attack by *Anobium punctatum* builds up only slowly over several years and can die out at any time of its own accord. But when it continues the whole of the sapwood can eventually be destroyed and, if this constitutes a large proportion of the wood, as is often the case with the common building timber, European redwood, the timber will ultimately be seriously weakened.

¹⁾ PRL Technical Note No. 40, "The natural durability classification of timbers", published by HMSO for the Building Research Establishment.