WOOD Protection Association

A Division of the BWPDA

PRESERVING CONFIDENCE IN TIMBER

This publication is produced by the Wood Protection Association to promote a greater understanding of timber pre-treatment and its economic and environmental benefits.

INDUSTRIAL TIMBER PRESERVATION

WOOD IS A SUPERB MATERIAL AND THE only truly sustainable resource for construction. Plantation grown softwoods from certified sources are most widely used in construction but such timber lacks sufficient natural durability for many situations. However, the correct treatment in conjunction with good design and maintenance will deliver exceptional performance for any application.

Industrial wood preservation technology is the process by which stable chemical solutions are safely introduced into the structure of the wood to prevent fungal decay and insect attack.

Treatment takes place in purpose designed plant under strictly controlled conditions and is a technology which permits selection of the pre-treatment process and preservative most appropriate to the timber component's end use.

TIMBER

Timber is the oldest and most attractive of man's building materials. Light yet strong and easily worked it is an infinitely versatile material with a natural beauty and warmth unmatched by any other construction product.

As a raw material, timber has the added advantage of being one of the few renewable resources and with proper forestry management the equilibrium between growth regrowth and commercial utilisation can be maintained. However, long term forestry strategies and world economic cycles rarely coincide, therefore any action that would lead demand to outstrip production and further deplete the world's forest resources must be avoided.

Timber preservation has major importance in contributing to the conservation of these resources, ensuring that wood is used sparingly and to its full potential and life span.

THE ADVANTAGES OF PRE-TREATMENT

Most of the timber species currently used in the UK are low in natural durability and vulnerable to attack by destructive biological organisms like wood destroying fungi and insects. Such organisms compromise the structural integrity of the component and subsequently lead to its premature failure. The consequences for safety and the cost of repair or replacement can be considerable.

Good building design and maintenance are essential but alone they cannot always protect untreated timber. To ensure a long, safe and useful life timber needs preservation and pre-treatment is the most effective and economical means of achieving it. This is because pre-treatment processes are carefully controlled impregnation techniques in which the amount of preservation required is tailored precisely to the components end use and the characteristics of the species from which it is made. The fact that large amounts of timber components can be treated at the same time also brings economies of scale to the process making it highly cost effective.

FIRE

As well as preventing biological degradation, pre-treatment technology is equally effective and economical in providing the means to improve the performance of timber in the event of fire. By making ignition more difficult and reducing the rate at which flame spreads across timber, fire retardants play an important role in the protection of human life. Specialist advice on fire retardant treatment is to be found in the Wood Protection Association Manual.

TYPES OF WOOD PRESERVATIVE AND METHODS OF APPLICATION

TIMBER PRE-TREATMENT IS CARRIED out in purpose designed industrial plants that impregnate the structure of the wood with a preservative solution using a carefully controlled process.

The type of preservative used together with its strength and method of application are determined by the type of component, its risk of exposure to biological attack during its desired service life and the characteristics of the species used. Besides its efficacy against organisms, a good industrial preservative must also possess other properties. It should penetrate the wood without causing damage and have an appropriate effective life without affecting the performance of appropriate metal Fittings and fixings. Above all it must not affect the health of anyone involved in its proper manufacture, transport and application or any user of the treated article.

The applications for pre-treated timber are almost endless but its principal uses are:

Constructional timbers and joinery
Timber frame buildings and roof trusses
Playground and landscaping timbers
Noise barriers, fencing and decking
Bridges, jetties and pontoons
Transmission poles and railway sleepers
Agricultural and horticultural applications

In fact anywhere that timber will be exposed to the weather, moisture or insects.

In order to achieve the correct level of treatment it is important to adhere to recognised official standards. These define the desired results of treatment and divide end uses of timber into classes according to the type of hazard they are likely to meet in service life.

Hazard Class

1	Internal, with no risk of wetting
2	Internal, with risk of wetting
3	External, above damp proof course
4	In permanent contact with the ground or fresh water
5	In permanent contact with sea water

The Wood Protection Association Manual provides detailed advice on the selection and specification of preservative treatment.

There are four main types of wood preservative used for industrial pre-treatment in Britain today:

Organic Solvent
Waterborne — Low pressure
Waterborne— High pressure
Creosote

WATERBORNE (Low pressure)

This type of preservative contains small quantities of fungicide and/or insecticide dissolved in water. This forms the bulk of the product. Dyes may be added to the preservative if so desired. The treatment is quick-drying and is typically used for general construction purposes falling into Hazard Classes 1, 2 and 3.
These preservatives are applied to timber components in an enclosed treatment vessel using either double vacuum process cycles or a vacuum/low pressure process to achieve the required absorption and depth of penetration. The treated wood can be glued, overpainted or stained.

ORGANIC SOLVENT

Similar in application to low pressure waterborne types but use white spirit instead of water as a carrier. Most often used in the treatment of timbers covered by Hazard Classes 1, 2, & 3.

Because organic solvent preservatives are readily absorbed and do not affect the surface character-istics of a component, they are highly suitable for the treatment of machined joinery products installed above d.p.c level where there is low to medium risk of decay.

WATERBORNE (High pressure)

Waterborne formulations are the most widely used wood preservatives in the world today. They provide protection against wood-attacking organisms in all situations and are applied using vacuum and high pressure process cycles to maximise penetration of the timber. They are odourless and after impregnation combine with the wood becoming resistant to leaching. It is possible to add dyes or water repellents during the treatment process and once dry, timber can be glued, painted or stained. Suitable for all situations but generally found meeting the requirements of Hazard Classes 3, 4 & 5.

CREOSOTE

This type of preservative is obtained by the distillation of coal tar and is impregnated into timber under vacuum and pressure using either a full or empty cell process. In full cell treatment the aim is to retain the largest possible amount of creosote in the wood. The empty cell process leaves the cell walls coated as opposed to filling the entire cell space. Creosoted timber components have been examined after 100 years service life. The timber was sound and the efficiency of the creosote when extracted and tested was found to be excellent. This high degree of permanence, even in salt water, makes creosote ideal for treating external structures, transmission poles, railway sleepers and timbers categorised as Hazard Class 4 & 5.

There are many applications where preservatives are interchangeable and a choice can be made. A number of variable factors can influence this choice and the Wood Protection Association is able to offer free and impartial advice on the most suitable form of treatment for any situation.

PRE-TREATED TIMBER AND THE ENVIRONMENT

For safety, value and versatility, pre-treated timber is the ideal construction material. Yet, along with its practical benefits, its use also has considerable environmental importance making possible the continued utilisation of timber with the lasting care of the world's forest resources.

By making wood last longer in service, pre-treatment effectively reduces the total number of trees that need to be felled to meet demand. It also enables the use of many species of timber which might otherwise be considered unsuitable thus taking the pressure off more valuable and ecologically important resources. For example, inexpensive pre-treated softwoods from the sustainable forests of temperate latitudes can be used where previously only a particularly durable hardwood or more expensive non-timber alternative would have been acceptable.

Moreover, the conversion of timber into a readily useable and durable pre-treated commodity makes far fewer demands upon the environment than man-made materials like steel, aluminium, concrete and pvc which consume finite raw materials and precious energy in their production.

It should also be added that timber components treated with an approved wood preservative to regulated procedures do not in themselves constitute a danger to man, plants or animals.

From the economic, technical and environmental perspective, pre-treated timber has much to commend it.

SETTING STANDARDS

The Wood Protection Association and its members recognise the importance of safety and that the use of wood preservatives needs to be regulated and carried out in well designed plant by properly trained operatives who have responsible and environmentally aware attitudes.

In support of these principles all wood preservatives in the UK must be approved under the Control of Pesticides Regulations; timber treatment plants should conform with the WPA Code of Practice for safe design and operation; plant operators should receive formal training and be assessed to ensure their competence in handling process equipment, chemicals and treated timber. The WPA and its members take a responsible stance in addressing the requirements of new legislation and regulatory bodies.

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The Wood Protection Association (*a Division of BWPDA*)

The Wood Protection Association encompasses BWPDA members who treat timber in industrial treatment plants, manufacturers and suppliers of preservatives and fire retardants and Associate members including universities, colleges, research organisations, other associations and trade bodies in the UK and worldwide.

Members' products are manufactured under Quality Assurance procedures, typically BS EN ISO 9000, and treatment of wood is carried out by companies who meet the association's Approved Treater criteria for quality assurance, trained and competent plant operators and health, safety and environmental protection.

The association publishes Codes of Practice, specifications for preservation and fire protection in The WPA Manual, and advice on all aspects of wood preservation and fire protection.

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