

## USING WOOD IN HOMES AND GARDENS : 1 - THE BASICS

### THE BENEFITS OF WOOD

- Wood is a natural and beautiful construction material
- Wood grown in well-managed forests is an environmentally acceptable material and unique as the only renewable construction material available. It is also recyclable.
- Because of its excellent thermal insulation properties, its use reduces home heating costs, and thus contributes to reducing the effects of global warming.
- It can be used as a bio-fuel for energy recovery at the end of its service life.



### WOOD IS STRONG AND SAFE

- It has a high strength to weight ratio. It is 16 times lighter than steel and 5 times lighter than concrete on strength for strength basis.
- When it burns it produces a charred outer layer that insulates the remaining un-burnt core, thus reducing the rate of spread of the flames.
- Its mechanical properties (including low coefficient of expansion) give it residual strength when it burns, and when compared with steel, it will not buckle and collapse as easily.

### NATURAL DURABILITY

Many hardwood timber species have a high level of natural durability, particularly tropical

hardwood species. Care should be taken if using such timber to ensure it is from legal and sustainable sources. Ask for information from your supplier.

Some softwood species, e.g. larch and western red cedar, are said to be naturally durable. Often statements made about natural durability are based on tests where small stakes made from the inner zone of a tree trunk, called heartwood, are placed in the ground and their length of life monitored. The outer zone, or sapwood, of most timber species is perishable with little natural resistance to decay. Most commercial timbers available in the UK contain significant proportions of sapwood and have low natural durability, especially when used in ground contact. However, industrial pre-treatment of wood can protect against these hazards and produce a material, which will give many years of sound performance. Such pre-treatment can also enhance the appearance of wood used in homes and gardens.

### Sapwood is less durable than heartwood

The living tree stores its food reserves, sugars and starches, in the sapwood and these remain after the logs are sawn into timber. Many species of fungi, insects, and microbes feed on the tree's food even after it is dead. The heartwood of some species contains naturally occurring chemicals that make it relatively durable. Timber from trees that have a relatively high proportion of sapwood is more vulnerable to biological degradation and attack than timbers used 50 - 100 years ago.

### THE CAUSES OF DECAY AND INSECT ATTACK

The risk of fungal decay occurs, and the potential for insect infestation increases, when the moisture content of timber rises above 20%. For timbers used in construction, this often arises as a result of bad building practices, poor maintenance of pointing in brickwork, faulty gutters and down pipes, and as a result of lost roof tiles and leaking water supply pipes. Blocked up air-bricks, poor ventilation and rising damp are also common causes for the moisture content of the timber to rise to the

threshold above which decay can occur. Property owners and managers should introduce maintenance programmes that avoid the potential for timber to become and remain wet.

- **Fungal decay**

Dry rot is normally restricted to interior timbers, while wet rot occurs both inside and out, both types requiring the wood to become and remain wet. Wood exposed to the weather or in the ground is at constant risk of decay by these fungi.

Mould and stain fungi may also grow on damp or wet timber, and sap staining fungi develop within the sapwood (often showing as dark sectors across the grain) when logs are stored for a long time before being sawn up. Mould and stain fungi do not affect the strength of wood but can indicate that it has become wet enough for decay fungi to start growing.

- **Insect damage**

Disfigurement of timber and, in severe cases, structural failure of building timbers and furniture can be caused by insects, even in dry conditions. Decaying material is even more susceptible to insect attack.

In the UK a number of damaging insect species are economically important. They include the House Longhorn beetle, Common Furniture Beetle, Powder Post and Death Watch beetles. Weevils are often found in association with decaying timber and can bring forward structural failure.

Typically, timber damage is caused by the larvae (immature stage of beetle species) when they tunnel through the wood and eat it. After the larvae mature the adult beetle will eat its way out of the wood leaving characteristic flight holes and piles of fine sawdust, known as frass, are often found beneath the holes.

## **DESIGNING TO PREVENT DECAY**

Inspection of historical wooden buildings reveals a number of techniques that were employed in the design and building of timber structures in the past. These techniques are still suitable for many applications of wood, both inside the home and in the garden. Examples include:

- The use of overhangs, cappings, pieces of flashing and detailing to provide weather protection to prevent conditions arising where the moisture

content of the timber reaches the threshold where decay could occur.

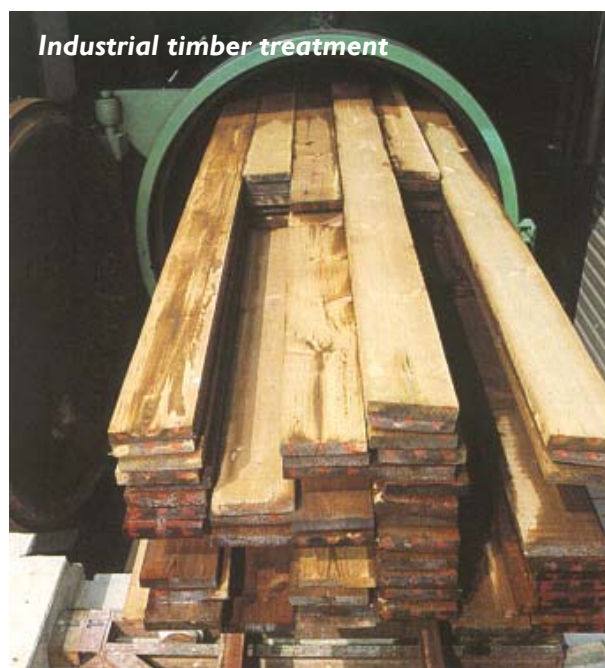
- The sloping and chamfering of top surfaces to promote the shedding of water.
- The use of stanchions, shoes and other devices to minimise the contact of timber with the ground.

## **EXTENDING TIMBER'S NATURAL DURABILITY**

Wood preservatives are used to extend the natural durability of timber.

Wood preservatives can be applied to timber in a number of ways:

- Industrial treatment of timber, e.g. pressure-treated wood (preventative treatment). Pre-treatment in industrial, impregnation plant ensures good preservative penetration and long service life (for further details see leaflet 2 in this series)



- Brush, spray or dip application of the product, either before the timber article is used (preventative), or applied to timber that is being subjected to biological deterioration (curative). These methods are suitable for shorter term protection (see leaflet 3 in this series for details).

## SOURCES OF INFORMATION

### GENERAL

- The Wood Protection Association (a division of The British Wood Preserving and Damp-proofing Association) [www.wood-protection.org](http://www.wood-protection.org)
- Wood For Good, [www.woodforgood.org](http://www.woodforgood.org)

### PRESERVATIVES

- Suppliers of wood preservative products.  
Details can be found on the WPA and Wood For Good websites.

### TREATED TIMBER

- Suppliers of treated timber and products made from treated timber.
- WPA [www.wood-protection.org](http://www.wood-protection.org)
- UK Forest Products Association, [www.ukfpa.co.uk](http://www.ukfpa.co.uk)
- Timber Trades Federation, [www.ttf.co.uk](http://www.ttf.co.uk)
- Timber Decking Association, [www.tda.org.uk](http://www.tda.org.uk)

### REGULATORY BODIES

- Health and Safety Executive, [www.hse.gov.uk/hthdir/noframes/bpau.htm](http://www.hse.gov.uk/hthdir/noframes/bpau.htm)
- Department of Environment, Food and Rural Affairs, [www.defra.gov.uk/environment/waste/index.htm](http://www.defra.gov.uk/environment/waste/index.htm)
- Environment Agency, [www.environment-agency.gov.uk/subjects/waste](http://www.environment-agency.gov.uk/subjects/waste)
- Scottish Environment Protection Agency, [www.sepa.org.uk/guidance/index.htm](http://www.sepa.org.uk/guidance/index.htm)

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