

# LOOK OUT

**Your choice of window frames could seriously affect the health of our planet.**

## PVC-*u* or Timber. Which is best?

- The production and disposal of PVC-*u* windows leads to the release of highly poisonous chemicals which threaten the environment and human health. PVC-*u* production involves no less than six of the fifteen most hazardous chemicals listed by European governments for priority elimination.

- Timber is a sustainable resource. As long as the timber is sourced from properly managed forests and care is taken in the choice of preservatives, paints and stains, timber windows are by far the best environmental choice.

- Developments in timber window design and finishing products mean that modern, high performance timber windows need minimal maintenance and potentially have a significantly longer life than PVC-*u*.

- PVC-*u* windows do degrade, they are not maintenance-free and worst of all they cannot be repaired when necessary.

- High performance, double-glazed, timber windows need not cost more than PVC-*u* equivalents. In fact the National Housing Federation and some local authorities have found

PVC-*u* window frames to be more expensive in terms of initial capital cost and more expensive or equal to timber over the lifetime of the windows.



**Use cost effective, low maintenance alternatives to PVC-*u* and look out at a safer world...**

# The UK Government has agreed to eliminate hazardous substances by 2020. Let's start with PVC-u windows.

PVC-*u* stands for unplasticised polyvinyl chloride. (Soft PVC, often called vinyl, contains softeners or plasticisers. PVC-*u* does not contain these softeners and is hard and inflexible as a result). The production and disposal of all types of PVC release some of today's most damaging industrial pollutants.

Many of the chemicals used to make PVC-*u* are the subject of international conventions to ban them (*see below*). Fifteen European governments, including the UK, have started a program of elimination of what they consider to be the most serious industrial pollutants. Of the priority list of fifteen chemicals at least six (dioxins, furans, lead, cadmium, mercury and organic tin compounds) are used in the production of PVC-*u* or are released as by-products.

When PVC-*u* windows come to be disposed of, many of these chemicals are again released into the environment, either

through chemical reactions caused when PVC-*u* is incinerated or through depositing old PVC-*u* frames in landfill sites.

The good news is that there are alternatives to PVC for virtually every application. Where traditional materials (such as wood for windows or clay for underground pipes) are not suitable other, less harmful plastics are often as

good as or better than PVC. Polyolefin (polyethylene or polypropylene) based plastics are less polluting during production, are more easily recycled, and are replacing PVC in many areas. Austria's largest PVC window frame producer, Internorm, are among several European window frame manufacturers who will be marketing a range of PVC-free plastic window frames in 1999.



PVC-*u* incineration waste has to be landfilled



**The OSPAR Commission** consists of 15 European countries and the European Commission. Member states have signed a convention to eliminate discharges, emissions and losses of hazardous substances by the year 2020.

**The United Nations Environment Program (UNEP)** has begun negotiations to bring about an international agreement to minimise releases of persistent organic

pollutants (POPs) into the environment. UNEP considers POPs to be among the most dangerous pollutants released into the environment by human activity. PVC-*u* releases POPs, in the form of dioxins and furans, when it is made and when it is incinerated or burnt in open fires.

Another United Nations protocol includes measures to restrict or eliminate lead, cadmium and mercury.

# Timber windows better value, better for the environment.

## Maintenance: timber V PVC-u

*"It is sometimes said that wooden joinery requires more maintenance than aluminium or PVC. This prejudice has been superseded because of the developments in finishing products and the growing understanding that there is no such thing as a material which does not need any maintenance..."*

(Engels N.V, leading supplier of timber and PVC-u windows)

Developments in design techniques that minimise water retention and damp penetration, and in microporous paints and stains that allow wood to breathe, mean modern, high performance, double-glazed softwood windows need minimal maintenance. Peeling, blistering paint is a thing of the past. Modern finishes also minimise the preparation necessary when it comes to repainting or staining windows. A soap wash or very light sanding before a single coat of stain or paint is often all that is necessary.



**Housing Association owned retirement home in Brentford**

Factory-finished windows need not be repainted or re-stained for up to eight years. Thereafter five to eight year staining or painting cycles are the norm. Because it covers parts not traditionally touched by on-site

finishing, factory finishing can also increase the life of the frame. While it is true that timber windows need some maintenance, modern high performance windows make that maintenance exceptionally easy.

## PVC Disposal – A problem you can do without

- Old PVC-u windows are inevitably either landfilled or incinerated. Because burning PVC-u releases hydrochloric acid, neutralising salts must be added. This means that each tonne of PVC-u incinerated can produce over two tonnes of contaminated waste that must be landfilled!

In addition PVC is the major contributor to chlorine in incinerators, which leads to the production of dioxin – the most toxic synthetic chemical known to science.

- Landfilling is not a sustainable option. Moreover, the long-term behaviour of PVC in landfill is not known. Lead, cadmium, organotins and other additives may leach out of PVC and contaminate underground water tables.

- Recycling of PVC-u windows is not viable:

Because PVC-u degrades when recycled, a product like a window can only contain a small percentage of recycled material.

All materials, PVC-*u* included, degrade over time. If PVC-*u* window frames are not cleaned they quickly become discoloured by dirt retention. They cannot then be restored to a nearly-new condition. Sunlight causes PVC to go brittle, turn yellow and it can develop hairline cracks. Window frames contain chemical additives to slow down this process but they cannot eliminate it entirely. PVC-*u* windows are also much more susceptible than timber windows to impact damage, especially in cold weather. They can, like timber windows, be installed and never touched again but just as with timber frames, the consequences of no-maintenance will soon become apparent.

Housing Association Property Mutual (often known as HAPM), the major defect insurer for housing associations, states that PVC-*u* window frames must be cleaned every six months, lubricated and adjusted annually and have



#### High performance timber windows need minimal maintenance

weather stripping and gaskets renewed every 10 years. Of course a similar regime should be applied to timber windows – the point is that PVC-*u* also needs maintenance if windows are to remain in good condition.

So, contrary to what PVC-*u* advertising campaigns often suggest, timber windows require little more maintenance than PVC-*u*. However, one of the great benefits of timber windows is that they

can be maintained and repaired. If necessary, sections can be chopped out and replaced. PVC-*u* on the other hand is like a car with the bonnet welded shut. Almost nothing can be done to prevent deterioration of the PVC itself or the metal supports inside.

In the event of misuse (drilling of holes for TV aerials is not uncommon), vandalism, forced entry or general deterioration, repair is difficult, expensive and sometimes impossible. Some local authorities have reported problems obtaining replacement hardware and other spare parts. Temporary boarding up of windows is also difficult with PVC-*u* frames.

**PVC-*u* recyclate is of a lower quality but more expensive than virgin PVC.**

This is why, despite 10 years of PVC-*u* industry attempts to “green” the image of its product by showing it can be recycled, only a tiny fraction of used PVC-*u* windows get anywhere near a recycling plant.



Old PVC window frames

**Life expectancy: timber V PVC-u**

How long a window frame will last depends on many factors, so it is difficult to provide accurate figures. However the National Building Federation's "Standards and Quality in Development" gives PVC-u window frames a life expectancy of 20 to 25 years, and vacuum-treated softwood frames 25 to 35 years. According to the Green Building Digest, "well designed

and well maintained timber windows can and do last the lifetime of the building in which they are installed."

Good design is the key to the durability of a timber window. For example it is important that drained and vented glazing rebates are used to prevent deterioration of the timber and premature failure of glazing unit seals from trapped water. Dual-seals and factory glazing will also help maximise the life of glazing units.

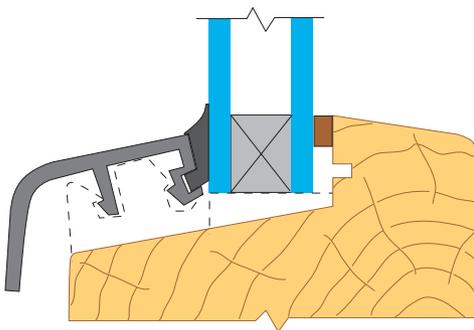
**Cost: timber V PVC-u**

Price comparisons are extremely difficult to make because of the enormous variations in quality of both timber and PVC-u frames. Discounts and incentives complicate the picture further. However the widely held assumption that PVC-u provides the cheapest option is often wrong, both in terms of initial capital costs and total costs over the lifetime of the window.

The National Housing Federation finds softwood considerably cheaper both in terms of initial capital costs and life cycle costs over a period of 30 years. Figures from its June 1998 report, "Standards in Quality and Development", put the cost of buying, fitting and maintaining a softwood window frame at between £149.90 and £199.94 over 30 years.\* In contrast, a PVC-u frame will cost between £257.91 and £274.30.

In April 1998, Carlisle City Council did a cost comparison between PVC-u and high performance, softwood double-glazed units. It found that PVC-u windows were 25% more expensive initially, with negligible difference in costs over a 30-year period. The cost for timber

\* Prices are for solvent-treated timber. Water-based Borate treatment is less harmful to the environment but slightly more expensive. Durable heartwood or FSC hardwood cost more than softwood but do not need any preservative treatment. Laminated oak should also need no preservatives and is cheaper than solid hardwood.



Drained and vented rebates will maximise the life of glazing units

**Preservatives, paints and stains**

The type of preservative treatment used will affect the environmental impact of a window.

The ideal is to avoid the use of preservatives altogether by using FSC certified hardwood. Good quality, locally grown, durable heartwood such as oak, chestnut or larch, should need no preservative treatment if used in a well designed window. However beware. If not FSC certified, locally grown timbers are not always from sustainable sources. They may be felled from hedgerows for

example. Always insist on verification of sustainable practice.

When preservative treatments are felt to be necessary, the environmental impact can be minimised by using water-borne preservatives instead of solvent-borne formulations. Active ingredients such as lindane, pentachlorophenol, tributyl-tin or other synthetic organic compounds should also be avoided as these hazardous chemicals may be released when the preservative is applied or when the window is eventually disposed of. Water-borne

preservatives that use less harmful active ingredients, such as borate, are preferable. According to the Green Building Handbook, preservatives based on boron, soda, potash, beeswax or linseed oil are safe and effective when used in conjunction with good design.

Choice of paints or stains will also affect environmental impact. As a general rule of thumb, plant-based finishes are the least harmful while solvent-borne synthetic finishes should be avoided.



was based on Carlisle's five-year maintenance cycle of water-based staining and the figure for PVC-*u* included an allowance for some maintenance.

#### **Aesthetic quality: timber V PVC-*u***

Planning controls often restrict the use of PVC-*u* windows in conservation areas and in buildings of historical interest. With good reason. PVC-*u* cannot match the detailing of traditional windows. In contrast, timber has a variable and natural beauty and enormous flexibility for design options.

## LOOK OUT FOR TIMBER

Timber is repairable, adaptable and durable. From well managed sources it is a sustainable, environmentally friendly resource. Independent certification by the Forestry Stewardship Council (FSC) should be sought as proof of acceptable forestry practices.

FSC-certified timber is becoming increasingly available in the UK. However if FSC-certified windows cannot be sourced, window frames made from timber which does not originate in old growth or ancient forests should be used. Most Scandinavian and UK grown timber would conform to this minimum requirement, but proof should be requested from the supplier before ordering.



#### **How green can you get?**

The UK-based company Construction Resources supplies slow grown Scandinavian pine windows which carry a 25-year guarantee against rot and fungal growth without the need for chemical impregnation. Another UK company, Environmental Construction Products, supplies a choice of timbers, including untreated larch heartwood or Scandinavian redwood treated with inorganic borates – probably the least harmful chemical preservative currently available.

If using preservatives, paints or stains choose those which minimise environmental impact.



Timber windows: Adaptable, durable and low maintenance

### Information

For more details of issues covered in this pamphlet:  
Greenpeace 0171 865 8183.

PVC-free plastic windows:  
Internorm 00 43 7229 770 355; fax 00 43 7229 71293.

Repair and aesthetics of timber windows:  
English Heritage 0171 973 3000.

Details of window suppliers and manufacturers using sustainably produced wood:

**The British Woodworking Federation**  
0171 608 5050; fax 0171 608 5051; (<http://www.bwf.org.uk>)

**The Association of Environment Conscious Builders**  
01559 370908

**Coed Cymru**  
01686 650777; fax 01686 650696: (for Welsh grown, FSC certified window frames and other timber products).

Preservatives, paints and stains :  
**Construction Resources**

0171 450 221

**The Association of Environment Conscious Builders**  
01559 370908

**Green Building Digest at The Queens University of Belfast**  
01232 335466

The Forestry Stewardship Council has a website at:  
[www.fscoax.org/frameneg.html](http://www.fscoax.org/frameneg.html)

### Timber suppliers

FSC-certified timber is available from **F.W. Mason & Sons** 0115 911 3500 or contact the **Forestry Stewardship Council** on 01686 412176

### Window suppliers

High performance timber windows are available from the following suppliers (Greenpeace does not endorse or recommend any supplier, nor is this list exhaustive. Before ordering, buyers should request proof that timber is not from old growth forests):

**Construction Resources** 0171 450 2211

**Crickhowell Joinery** 01873 810156

**ELAM** 01691 648495

**Environmental Construction Products** 01484 854898

**O. Windows (UK) Ltd.** 01263 735 454

**Swedish Window Co. Ltd.** 01787 223931

**Scandinavian Window Systems Ltd.** 01777 248227

**Rugby Joinery (for Bolton & Paul and John Carr)** 01302 394000

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