



Service life, Whole Life Cost,
maintenance and durability

The **Wood Window** Alliance



**WOOD. AT THE HEART
OF A GOOD WINDOW**



Service life, Whole Life Cost, maintenance and durability

Specifying or using Wood Window Alliance windows will give an expected service life of at least 60 years. By following manufacturers' recommendations, you can extend this to 80 years or more.

Effective maintenance of a window will extend its service life and:

- Reduce Whole Life Costs
- Reduce the environmental impacts associated with replacement and disposal costs
- Prolong the carbon store effect.

Simple rules apply:

- Check handles are working correctly and lubricate or adjust where necessary
- Check locks and latches are functional
- Check that seals around glazing units are undamaged and replace if necessary
- Check seals round opening casements and sashes are undamaged and replace if necessary
- Ensure external frames are cleaned regularly and re-decorated within the manufacturer's recommended schedule
- Check external frames for damage and repair if necessary.

60 year minimum service life

- We commissioned new service life research by Imperial College London
- They used ISO 15686-8 (2006) methodology to build a model based on the latest design and paint finishing technology used in Wood Window Alliance windows
- These factors were applied to Imperial's own existing service life data, as well as BRE's
- The results show that windows manufactured to Wood Window Alliance standards have a minimum service life of 60 years, even under a low maintenance regime
- And a service life of 80 years or beyond in more sheltered conditions.

'This research implies there is no reason why today's Wood Window Alliance windows shouldn't last as long as Edwardian and Victorian wood windows – a lifetime or beyond.'

Dr R Murphy, Imperial College London



Service Life of Wood Window Alliance windows compared to generic wood and PVC-U



Source: Imperial College, 2010

*Service Life - BRE Green Guide **Service Life - ISO 15686-8:2008, Imperial College London



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How manufacturing standards influence service life

The following measures, undertaken by members of the Wood Window Alliance, improve service life to a minimum 60 years.

- Improvements to the timber used in the windows
 - Using specially selected slow-growth timber grown in cold climates
 - Using a higher proportion of heartwood
 - Using engineered sections, such as laminated or finger-jointed timber, increasing stability and reducing knots and resin exudation
 - Improved machining processes result in a smoother timber surface and a better paint surface
- Improved component design, using a slight slope - especially to the horizontal sections of the window – to prevent standing rainwater, water ingress and rot in vulnerable areas
- Rounded corners, rather than sharp edges, to improve paint adhesion
- End-grain sealants, to prevent water ingress to vulnerable sections
- Better timber treatment systems, to extend durability
- Minimum paint or stain applications applied in the factory, providing better protection than paint-brush applied finishes
- Improved drained and vented glazing systems, increasing glazing unit service life.

How architects and clients can improve service life beyond 60 years

Each of the following factors can be undertaken by clients and will increase the service life of the window beyond 60 years

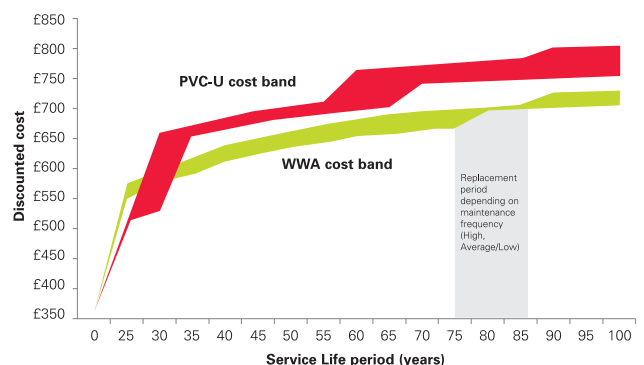
- Correct storage on-site
- The use of qualified contractors for the installation
- Shelter or partial shelter from driving rain or particulates
 - Some urban environments are defined as sheltered
 - Some suburban situations may be classed as sheltered or partially sheltered, depending on the proximity of other buildings
 - Providing some shelter to the window may simply involve recessing into the brickwork.

- Avoid the use of window cills over 70mm
- Position the window on stone, concrete or brick cills
- Follow the manufacturers' maintenance recommendations
 - Wash down / wipe the frames annually
 - Apply the following redecoration levels:
 - Every 3 to 5 years – **HIGH** – increases life significantly
 - Every 5 to 7 years – **EXPECTED** – increases life by 10%
 - Every 7 to 10 years – **LOW** – increases life to some degree.

Whole Life Cost

- With an expected service life which exceeds today's building service life expectancy, a Wood Window Alliance window is better long-term value, as it won't need to be replaced for over 60 years
- When taking maintenance into account, a Wood Window Alliance window has a lower Whole Life Cost over 60, 80 or 100 years, than a comparable PVC-U window
- Over an 80 year life, a Wood Window Alliance window will remain in service whereas a PVC-U window may have been replaced twice. No new window installation costs, no disposal costs.

Whole Life Cost of Wood Window Alliance windows vs PVC-U
High/average/low maintenance levels
Suburban conditions*



*Part sheltered
NPV cost discounted at 3.5% real
Base Service Life source: BRE Green Guide – 35 years

Source: Estimated Service Life - ISO 15686-8:2008, Imperial College London



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Typical warranties:

- 30 years on the frame
- 8 years on the paint finish
- 6 years on stain finish
- 10 years on seals and ironmongery
- 10 years on IGUs

Performance for higher quality

- Buy timber windows fully finished and glazed by the manufacturer
- Advances in factory-applied paint or stain finishing techniques provide finishing conditions which cannot be replicated by on-site painting
- Unlike on-site painting, factory-applied coatings provide a consistent coating to all areas of the window
- The manufacturer is able to offer service life, paint-life and glazing unit warranties if these are performed in a factory-controlled environment
- Buying unfinished or unglazed windows and painting on-site can invalidate preservative warranties, lead to moisture ingress, timber movement, premature breakdown of the glazing units, premature frame decay, and ruin the overall aesthetic qualities of the window.

Initial treatment of a quality wood window

- Coating manufacturers recommend that base stains and primers are applied by a method of saturation, whether dipping, saturate spraying or flow coating
- This provides better absorption, leading to superior adhesion of the first coating layer
- Cut outs, vents and v-joints are all reached by such coating methods, giving better overall protection.

Types of finish

- Coatings may be solvent or water-based. The latter are more commonly used by window manufacturers and have lower environmental impact
- Coatings are applied in controlled conditions indoors,

ensuring wet weather and high outdoor humidity do not lead to high moisture contents which hinder the absorption and adhesion of coatings

- Coatings are applied to all concealed surfaces, which cannot be achieved once windows are installed
- Coating operatives are easier to monitor and audit in factories than on-site
- Spray-applied factory finishes give smooth coatings with high film builds that are very difficult to replicate with site-applied finishes
- Higher build factory applied coatings offer better durability and a longer service life.

Opaque finishes (paints) give a solid colour.

- Some grain texture will show through, providing a natural wood character, unlike a plastic window
- The heavier pigmentation of opaque paints protects the surface from UV light damage and provides long lifespans
- White, or paler colours, provide the most effective UV protection
- The darker the finish, the greater the solar heat gain and risk of resin exudation and timber movement.

Translucent stains will show the grain structure of the timber underneath.

- Lighter shades will have a more pleasing, clear appearance but require more frequent re-coating because they are susceptible to damage from UV light
- Colourless coatings are very susceptible to damage from UV light and are not recommended.





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Designing for low maintenance

Building designers can extend maintenance intervals for wood windows by:

- Considering the aspect of the window in relation to the sun and prevailing weather
- Providing some protection, such as roof or other overhangs
- Setting the windows back into the window reveal

For upper storeys or less accessible windows, consider designs that allow cleaning and decoration from inside the building:

- Reversible windows
- Projecting hinge, or 'easy clean' casements.

Aluminium composites, or aluminium clad timber windows, are a good option for medium rise buildings, and offer longer paint service life and reduced maintenance periods.

Different aspects of the building will require differing maintenance schedules:

- North-facing windows will suffer less damage from UV light, and coatings can last more than twice as long as south-facing windows
- Coastal and high altitude climates are the most challenging because of prevailing winds and the impact of salt, sand, wind and rain
- Windows in inner cities will suffer from dirt and pollution and require more frequent cleaning to ensure a longer lifespan
- Good quality coating manufacturers will recommend different maintenance regimes depending on the aspect of the window and its environment.

Maintenance and repairs

Modern paint and stain systems do not need the same maintenance programmes and methods as older brush painted windows:

- Planned maintenance programmes are recommended as they reduce whole life costs and prolong the life of the windows
- 'Burning off' is a thing of the past; a simple rub-down and brush application is often all that is required
- Any knocks and abrasions can easily be repaired with fillers and coatings



- Hot waxes are quick to apply and can give near invisible repairs
- Coatings manufacturers can advise on which window manufacturers participate in planned maintenance schemes
- Refer to coatings manufacturers' advice sheets or websites.

Upgrading wood windows

It may often be better to retain the old wood windows within a building rather than replace them. In many cases, architectural or historic features may have to be retained and replacement windows may not be appropriate.

- Upgrading wood windows can be more cost-effective than replacement
- 'Repair and renew' is often a better environmental option than replacement and prolongs the carbon store effect
- Improvements to seals, ironmongery and other mechanisms will lead to improved weather performance
- Secondary glazing may be an alternative to double-glazing where this is not an acceptable option
- Wood is easily repairable. Sections of timber can be replaced and the window 'made good'.