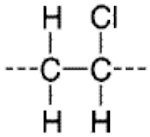
What is PVC?

Polyvinyl chloride (PVC) is a major thermoplastic material finding use in a very wide variety of applications and products.

The essential raw materials for PVC are derived from salt and oil. The electrolysis of saltwater produces chlorine, which is combined with ethylene, obtained from oil, to form vinyl chloride monomer (VCM). Molecules of VCM are polymerised to form PVC resin, to which appropriate additives are incorporated to make a customised PVC compound.



The working life of a PVC-U Window

PVC-U has been used for fabricating window frames since the 1960s. The use of PVC-U windows has grown dramatically and now over 90% of new and replacement window projects use PVC-U, usually to replace timber-framed windows.

There are many reasons for this success, but the main one is the quality of the product. PVC-U is a very durable and lightweight material that lends itself perfectly for use in fenestration products:

Life expectancy

PVC-U windows have an expected service life of over 40 years. EU standards (under the auspices of the British Standards Institution - BSI) are available governing various aspects of the technical performance of PVC-U window frames. BS 7412 states that: "PVC-U windows manufactured in accordance with this standard should provide a long life with only an occasional wipe down for appearance purposes".

One important factor leading to the now well-established position of PVC-U in construction applications is its durability. This has led to its use in long-life applications such as pipes and window profiles - the two biggest applications for PVC-U in Western Europe, accounting for over a third of total consumption.

The first commercially available windows were installed in Germany in 1959. While the technology for producing these windows has naturally advanced over the years with, for example, the introduction of better performing acrylic-based impact modifiers, some of these earlier PVC-U windows are actually still in use. The main reasons why PVC-U windows would be replaced over time are:

- Renovation/redesign/demolition of the whole building
- Upgrading to improve security
- Upgrading to improve insulation properties

Modern stabiliser systems allow a service life of over 40 years to be given to the PVC-U material component of replacement and new-build window systems. As windows are intended to be exposed to the elements, including wind, rain, and UV light; some limited, superficial, changes can occur. However, the only effect this could have would be a loss of gloss on the surface finish of the frame. Impact strength, structural integrity, and colourfastness will continue to meet requirements for the lifetime of the window.

Window maintenance

We recommend regular cleaning with appropriate detergents and warm water, and the checking of certain hardware components such as gaskets and hinges, which may need lubrication from time to time. This would hold true for all materials, however, and is not unique to PVC-U.

Since the PVC window frames do not have to be painted with fungicides or protective coatings, no maintenance of the frame is required apart from cleaning.

PVC-U can be successfully maintained by following the guidance provided by the British Plastics Federation's Windows Group. It is important to remember that timber window frames are also subject to weathering, and they will require cleaning just the same as PVC-U. PVC-U windows, however, do not rot, warp, peel, or chip.

Cost comparison

Whilst it is very difficult to generalise about costs which will vary for all materials in terms of product quality and market conditions, the Northern Consortium of Housing Authorities in the UK has carried out a regular survey of costs of window systems. The Consortium has accumulated a considerable amount of data for the in-use cost of window frames made from different materials. Their data shows that over a 30-year period, the total capital and maintenance costs for a softwood window will be 33% more than for a window in PVC-U

Aesthetics

PVC-U now accounts for some 90% of the replacement window market in the UK. Windows obviously play an important part in the expression of period, image, and regional building traditions.

What's in a name?

PVC-U used to be called uPVC (for unplasticised PVC) but in 1990 the name was changed to conform to the international naming conventions for polymers. The standard international name of any plastic is now in two parts: the basic material name is given first and any special properties are given after a hyphen, with all the letters in capitals. The correct name is therefore PVC-U where PVC is the base polymer and the U refers to the unplasticised version of PVC.