

PVC-U (unplasticised polyvinyl chloride)

About 20% of plastics processed in New Zealand are for construction purposes. PVC-U is typically used for window frames, pipework, cladding, guttering and downpipes.

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Extraction and manufacture	
Impact of extraction	PVC-U is a product of the petro-chemical industries. Some PVC-U may incorporate recycled materials.
Energy use	Embodied energy is quoted as 60.9 MJ/kg for PVC-U.
By-products/emissions	PVC-U manufacture utilises fossil reserves. Toxic substances are used during manufacturing, but modern plants release very little of these compounds. PVC-U does not contain plasticisers. The potential exposure of manufacturing operators to vinyl chloride monomer (VCM) in the working atmosphere is a health concern.
Sourcing	
Material sources	PVC-U windows are assembled in New Zealand from imported components or imported as a manufactured unit. PVC-U claddings and accessories are manufactured in New Zealand from imported raw materials.
Availability	Plastic components are readily available throughout New Zealand.
Cost	PVC-U is one of the cheapest polymers to make and has a large range of properties so can be used to make hundreds of products. PVC-U cladding and windows tend to be more expensive than other comparable components but long-term costs are lower because they require little maintenance.
Transport to site	PVC-U components are typically light to transport.
Construction/installation	
Health and safety during construction/installation	Waste must not be burnt on site as toxic substances can be produced.
Ease of construction/installation	PVC-U components are light and easy to handle.
Adaptability	PVC-U claddings are moderately difficult to remove/replace.
Performance	
Health and safety during life of building	Manufacturers claim that PVC-U components are non-toxic and chemically stable in its manufactured form. PVC-U is suitable for roof water catchment.
Structural capability	Generally nil.
Expected durability (assuming correct installation and maintenance)	15-20+ years for external use. Plastics are suitable for use in aggressive environments.
Maintenance rating	Low

Moisture resistance	PVC-U is impermeable to moisture.
Rot, mould and corrosion	Lichen will grow on damp un-cleaned surfaces.
Thermal performance	PVC-U cladding provides negligible thermal insulation unless the profile incorporates a still air space. No thermal mass benefit is provided. PVC-U window sections have less thermal conductivity than aluminium.
Sound insulation	PVC-U cladding provides negligible sound insulation – thin material can vibrate and assist sound transfer.
Fire performance	PVC-U is ignition-resistant. Depending on the formulation and the fire, it may melt and give off toxic fumes.
Waste disposal/recycling/re-use	
Re-use	PVC-U windows and cladding can be re-used.
Recycling	PVC-U can be recycled.
Waste disposal	Decomposition of plastics is very slow – controlled landfill is not thought to cause significant risk to the environment. Burning of PVC-U can produce toxic gases.