

**uPVC (unplasticised polyvinyl chloride)**

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

© BRANZ 2007

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

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