



Vinyl framed window after a brief hail storm.

*Who says that vinyl windows can warp, twist, bow, crack, turn brittle, fade and discolor under sunlight?*

## Government

**U.S. Dept. of Energy** - Four times since 1994, the U.S. Dept. of Energy, Energy Efficiency and Renewable Energy consumer fact sheet on windows, stated that vinyl windows can warp, twist, bow, fade and crack.

**2002** - "Vinyl frames are not very rigid. Vinyl windows with large openings usually require an internal metal extrusion to make the frame stiffer. This can lower the frames R-Value significantly. Vinyl window frames can also soften, warp and twist if heat builds up within the frame. In hot sunny climates, direct exposure to sunlight is not recommended."

**Canadian Dept. of Natural Resources Consumer Guide 2005** - "The disadvantages of vinyl framing material is that vinyl expands and contracts with temperature. Opening up cracks for air leakage."

**Canadian Centre for Energy Technology 2005** - "Unreinforced PVC window profiles have a lack of rigidity and a high coefficient of expansion. PVC profiles are subject to distortion."

**National Research Council Canada website 2006** - "Because of the plastics high coefficient of expansion, dark colors may cause excessive distortion. The high coefficient of thermal expansion has to be taken into account in the decision of the window. In cold climate, contraction of the window frame will enlarge the width of the joint with the wall."

**Germany EPA 2003** - "The average lifetime of a PVC window is 15 years."

**North-rthn.org Canadian Research and Technology in Housing 2005** - "PVC is too brittle in cold conditions and breaks easily. PVC is not as stiff as wood. It is recommended that PVC frames have metal reinforcements provided. PVC can also experience significant dimensional changes under temperature differentials."

**Canadian Institute of Research in Construction Website 2006** - "To increase the rigidity of a large PVC window sash, a steel reinforcement is inserted. In cold climates, the coefficient of thermal expansion has to be taken into account. Contraction of the window frame will enlarge the width of the joint with the wall."

