

High R-Value Windows

What is this Technology?

The Department of Energy (DOE) defines high-performance glazing as having a heat transfer coefficient (U-value) around 0.2 (R-5). By comparison, ENERGY STAR windows are R-3, while commercial double plane glazing is R-2. High-performance glazing also often includes spectrally selective coatings, which filter out from 40% to 70% of the heat normally transmitted through clear glass while allowing the full amount of light to be transmitted.

Why is GSA Interested?



ENERGY EFFICIENCY Moving from R-3 (ENERGY STAR) glazing to R-5 high performance glazing reduces the average heat loss by 30%. The result is lower load on the heating, ventilating, and air-conditioning (HVAC) system. Reducing the solar heat gain through spectrally selected coatings further reduces the load on the space cooling system.



COST EFFECTIVENESS At a price premium of up to \$4 / square foot, high-performance glazing proves cost-effective in several climate zones on the basis of energy savings alone. However, not only do high-performance windows save HVAC energy, but because of the potential to downsize HVAC capacity, they can also result in lower HVAC equipment costs for new construction and major renovations.



OCCUPANT SATISFACTION The technology also offers building occupants comfort benefits. A number of studies show a significant component of comfort / discomfort is due to the radiant heat exchange between our bodies and surrounding interior surfaces; high-performance windows improve comfort by reducing this radiant heat exchange.



APPLICABILITY The technology is particularly applicable to commercial new construction and major reconstruction that have high window-to-wall area ratios that are fully conditioned and where the capital cost can be offset by the downsized HVAC equipment cost.

Measurement & Verification

The Green Proving Ground program has commissioned the Lawrence Berkeley National Laboratory to perform measurement and verification (M&V) on high R-value windows at the Federal Center in Provo, Utah. Findings from that investigation will be available in September 2012.