

Glass R&D Themes

Reduce the cost of commodity glass

- Energy efficiency and cost Alternative fuels
Re-use of 'waste' heat
More efficient heating
- Raw Materials and composition Lower melting point compositions
- Labour Automation

Value-added Products

- Energy-saving windows Coatings, vacuum glazing
- Switchable, smart windows Whole system
- Self-cleaning Interior applications (bacteria-eating)
- Safety and Security Interlayer films
Fire-resistant products

ALL ARE CLOSELY LINKED TO MATERIAL ISSUES

Reduced Energy Loss Through Windows

U-values (W/m^2K):

Single Glazing 5.4

Double Glazing (IGU) 2.8

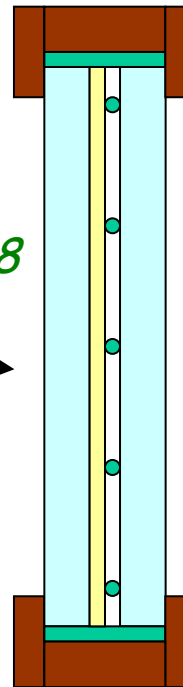
IGU with Low-E and Ar 1.1

Triple Glazing with Low-E and Ar 0.8

Vacuum Glazing 0.3-0.4

Also need to include solar heat gain

Same basic points for other leading edge window technologies:
eg Switchable, Self-Cleaning, etc.
And probably in the rest of the industry



All about Materials Issues

- Spacer material
- Surface condition
- Low-E coating
- Sealing
- Framing

Numerous process issues

- Not the glass it's the additional materials
- Hybrid systems
- Joining technologies