HNG Float Glass Ltd

Building Envelope

Warm and Humid climate

Building Envelope

Building Envelope = Exterior Façade

Well designed building Envelope

-Cost Savings

- **by taking advantage of daylight**
- **correct HVAC sizing**

-Adheres to ECBC

Building Envelope Efficiency

- Factors
  - Heat gain/loss
  - Wind that enters inside

- Key determinants
  - Walls
  - Window
  - Roof

Building Envelope
Walls

Thermal performance of walls can be improved

- **Increasing wall thickness (Thicker Glass)**
- **Providing air cavity (IGU)**
- **Applying insulation on the external surface (Ref/ LowE)**

Building Envelope
Window

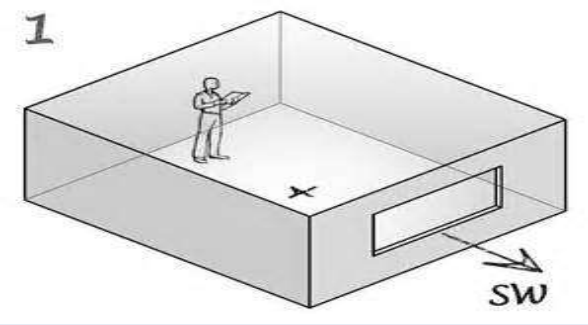
Important Components

- Window Size and Placement
- Glazing
- Frame
- Shading (external & internal)

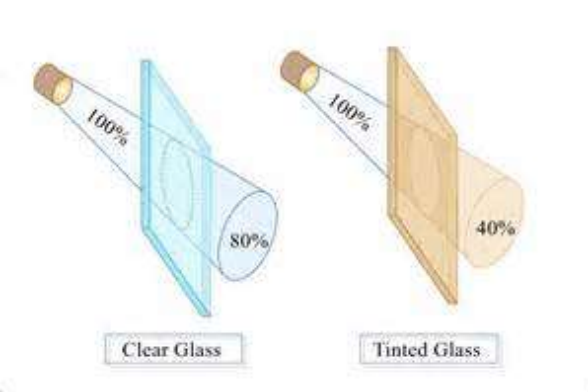
Building Envelope
Window-Components

Window Size and Placement-

- **Higher the window, deeper the daylight penetration**



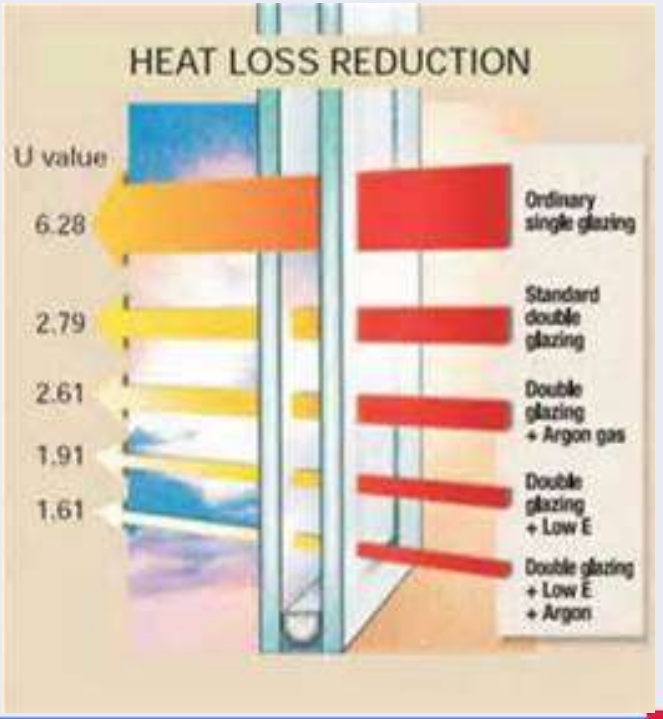
- **For good Lighting and glare control; separate view and light windows**
  - **Light -Clear Glass**
  - **Glare control-Tinted Glass**



Building Envelope
Window-Components

Glazing

- Most commonly used-Glass
- Primary properties of Glazing that impact energy-
  - ➢Reflectance
  - ➢Thermal Transmittance/ U value
  - ➢Solar heat gain
  - ➢Glazing colour



Building Envelope
Window-Components

Glazing-Latest Trends

Switchable Glass-

- To change optical and thermal properties of sealed glazed units
- Material change their reflectivity and absorptivity
- Chromogenic phenomenon

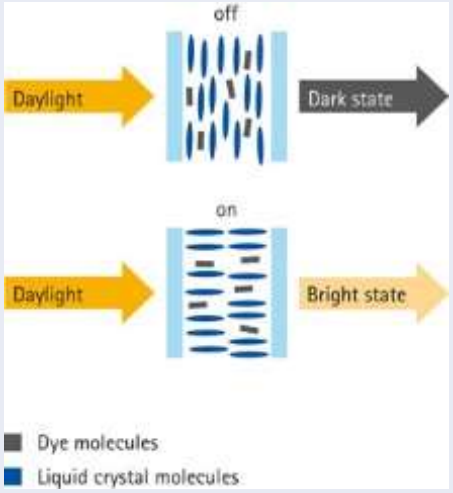
Chromogenic

- Thermochromatic
- Electrochromatic
- Photochromatic

Building Envelopes
Window-Components

Thermochromatic

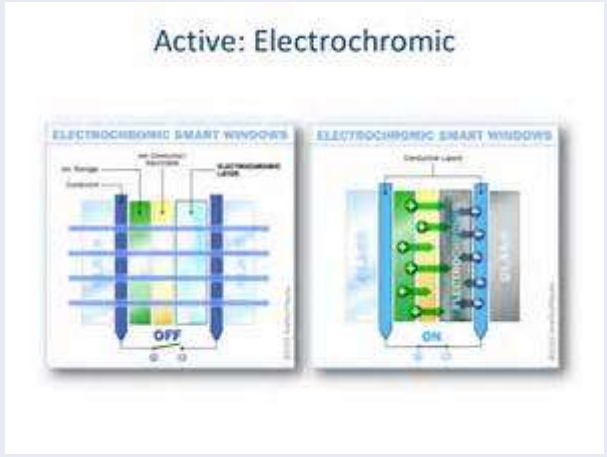
- Changes optical properties in response to temperature
- Liquids/ gels sandwiched
- Block solar radiation
- Reduce VLT



Building Envelopes
Window-Components

Electrochromatic

- Changes optical properties when electric current runs
- Thin metallic film- similar to LowE
- Liquid quartz film between glass layers



Building Envelopes
Window-Components

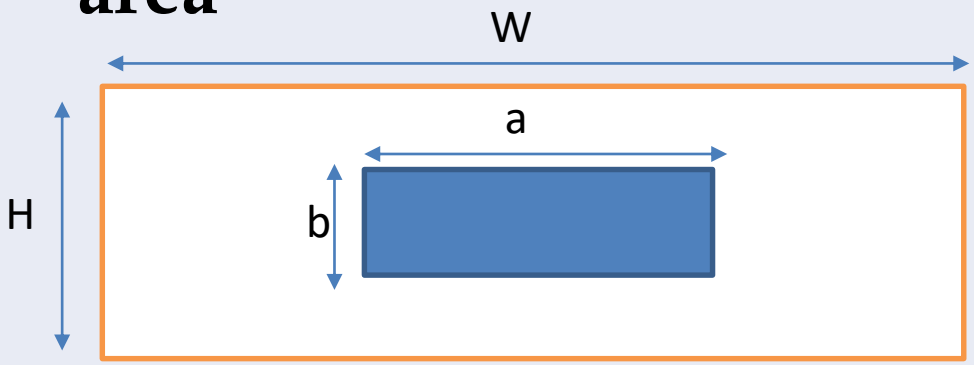
Photochromatic

- Changes optical properties in response to sunlight
- When Photochromatic material change their transmittance, Glass absorbs more heat

Building Envelope

WWR

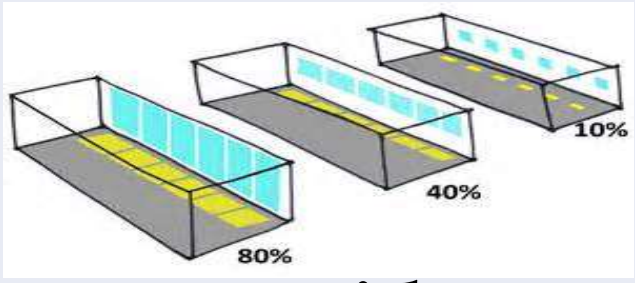
- "Window Wall Ratio" is the ratio of the window area to the gross exterior wall area



- WWR=(a*b)/(H*W)

Building Envelope

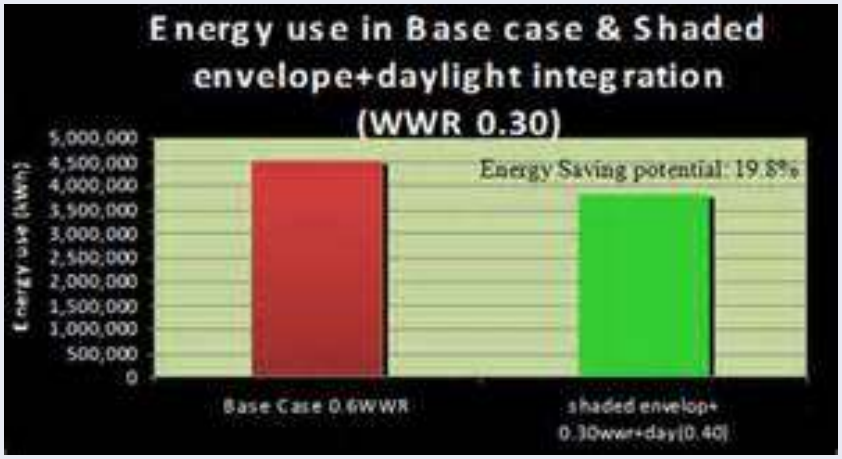
WWR

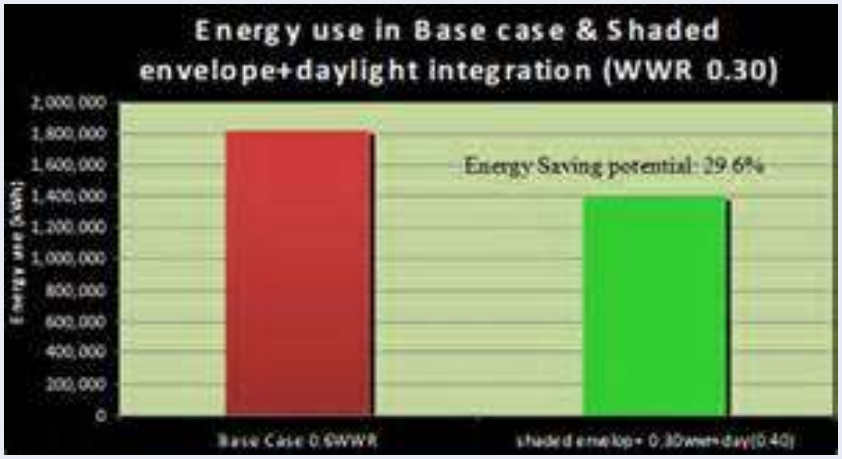


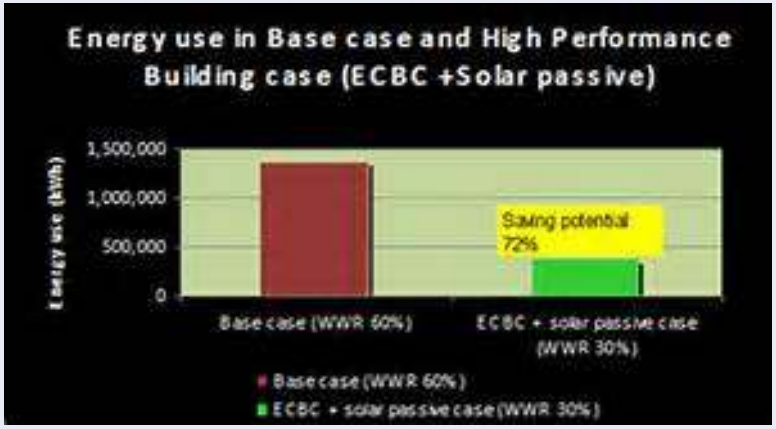
- **Cooling energy demand increases with increase in WWR**
- **ECBC made glass selection more stringent with increased WWR**
- **WWR with 10% has higher energy consumption, due need of artificial lighting**
- **Optimum WWR recommended-30%**

Building Envelope

Comparison at WWR 30%







Thank You