Radiance modeling of translucent glazings, a practical approach

• What we get from radiance modeling
• Why translucent glazings? – a solution to daylighting
• How I measure and model diffusing materials
• My deliverables: quick turnaround reasonable quality renderings.
• Cool time lapse rendering comparisons
Radiance Modelling

We use Radiance as both:

• **Selling Tool** – for both ourselves and for building design professionals, who have to justify the decision to use Solera in their project.

• **Design Tool** – With Radiance we can determine the appropriate light transmittance to use, and what changes will be had from different configurations.
Design example:
Why Translucents?

• A different way to introduce natural light
Daylighting: renewed importance

- With current energy concerns daylighting is receiving renewed attention
- LEED program and the daylighting requirements it puts forward are forcing building design professionals to incorporate natural lighting in their projects.
Problem with LEED

• LEED is creating awareness and activity with respect to daylighting, but…

• LEED requirements only stipulate a quantity of daylight. And to meet the requirement a space need not be functional and well lit.
‘Traditional’ Daylighting Approaches: both good and bad

- East-west orientation
- Northern glass is ok
- Use overhangs on south
- Skylights with deep light-colored wells
- Minimal glazing on east and west
- Reflectives, dark tints, shades, frit simply block light
Where are all the daylit buildings?

- Victims of project realities
  - Budget
  - Site Considerations
  - Style
Typical Occupant Solution
“NO BLINDS!!!!”
The reality of ignoring daylight

- NRC Canada studies:
  - 65% of window area studied ‘permanently occluded by blinds’
  - Blinds cited as largest reason for failure of projected energy savings
Simple and Cost-Effective Daylighting through Translucence

- Controlled daylight
- Consistent direction / distribution
- Reduced glare
- Improved penetration
45°
Incident Light

Solera™ L sample

Detector
this is moved through angles from +90 to -90
Acid Etched - 45° incidence
First step: get drawings of the space (typically CAD).
Next we Create a 3D model in Autocad
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