



Lawrence Berkeley National Laboratory


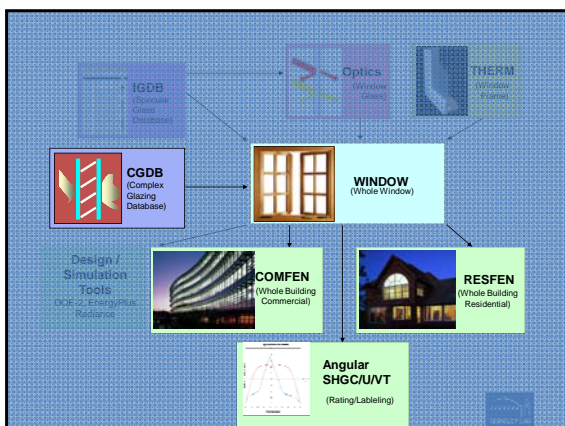
Complex Glazing DataBase update

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Windows and Daylighting Research Group
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GOALS

- To provide streamlined and documented procedure for **measuring** and **submitting** optical data for **scattering** materials and layers
- To develop next generation of modeling **tools** that will accurately calculate scattering layer and system **performance** indices in a user friendly environment
- To output **rating** data and **detailed** data for use in energy simulation tools


MEASUREMENT DEVICES

- Goniophotometer:
 - Detailed angular resolution
 - Slow/expensive and only available at LBNL and a few other places.
 - Limited number of wavelengths.
- Spectrophotometer:
 - Only normal incidence
 - Full spectral resolution
- Spectrophotometer + angle tubes:
 - Limited number of angles (9 currently)
 - Full spectral resolution
- Integrating sphere

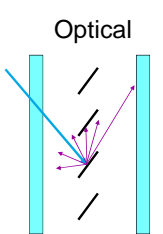


MEASUREMENT STRATEGIES

- Spectrophotometer
 - Venetian blind slats
 - Fritted glass
 - Diffusing laminates
- Angle Tubes
 - Woven shades / insect screens
- Goniophotometer
 - All Other Complex systems

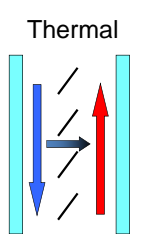


MODELING NEEDS




Optical

- Visible & Solar
- Far Infrared



Thermal

- Conduction
- Convection



COMPLEX GLAZING DATABASE (CGDB)

- Conceptually comparable to International Glazing Database (IGDB)
- Designed for optically complex materials and devices
 - Venetian Blind slats
 - Woven Shades
 - Scattering (Diffusing) Interlayers
 - Scattering glass
 - Fritted Glass
 - Cellular shades
 - Other scattering layers/systems

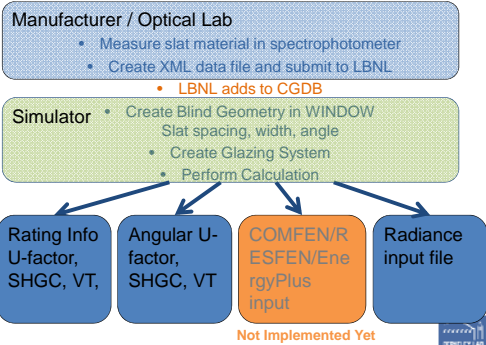


INITIAL CGDB CONTENT

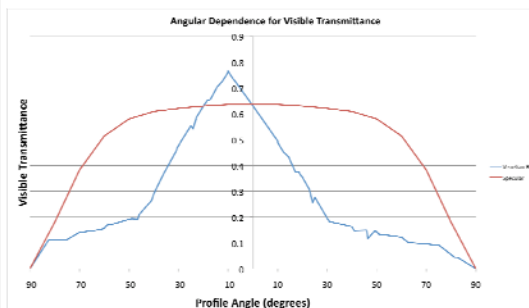
- Existing Product Measurements:
 - 100 Woven Shade screens
 - 14 Frits
 - 7 Venetian Blinds
 - 3 Diffusing Laminates
- Measured at LBNL



Example Work Flow for Venetian Blinds



ANGULAR SHGC AND VT OUTPUT



CURRENT AVAILABILITY

- WINDOW 6 / THERM 6 – version 6.3 available now
 - Incorporated selected scattering materials and layers
 - LBNL can add selected new materials & layers
 - Depending on the outcome of NFRC validation research project, selected scattering systems, such as in-between glazing venetian blinds, frits, etc. can be modeled for rating



NEXT STEPS FOR WINDOW / THERM

- Finalizing Measurement procedures
- Preparing CGDB ILC
- Finalizing XML format
- Developing Database Format



CURRENTLY UNDER DEVELOPMENT

- Vertical blinds analytical model
- Honeycomb/Cellular shades analytical model
- Perforated screens analytical model
- Application of University of Waterloo thermal models for indoor and outdoor venetian blinds



TIMELINE

- Sept 2011
 - CGDB Beta (W6 and W7beta)
 - WINDOW 7 / THERM7 Beta
- Jan 2012
 - CGDB Inter-laboratory comparison (ILC)
 - CGDB 1.0 Release
- September 2012
 - WINDOW 7 / THERM 7 Release



Thank you

Contact info

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