

**Update on NFRC's
The Component Modeling Approach
(CMA)
NFRC Membership Meeting
March 2008**



Topics

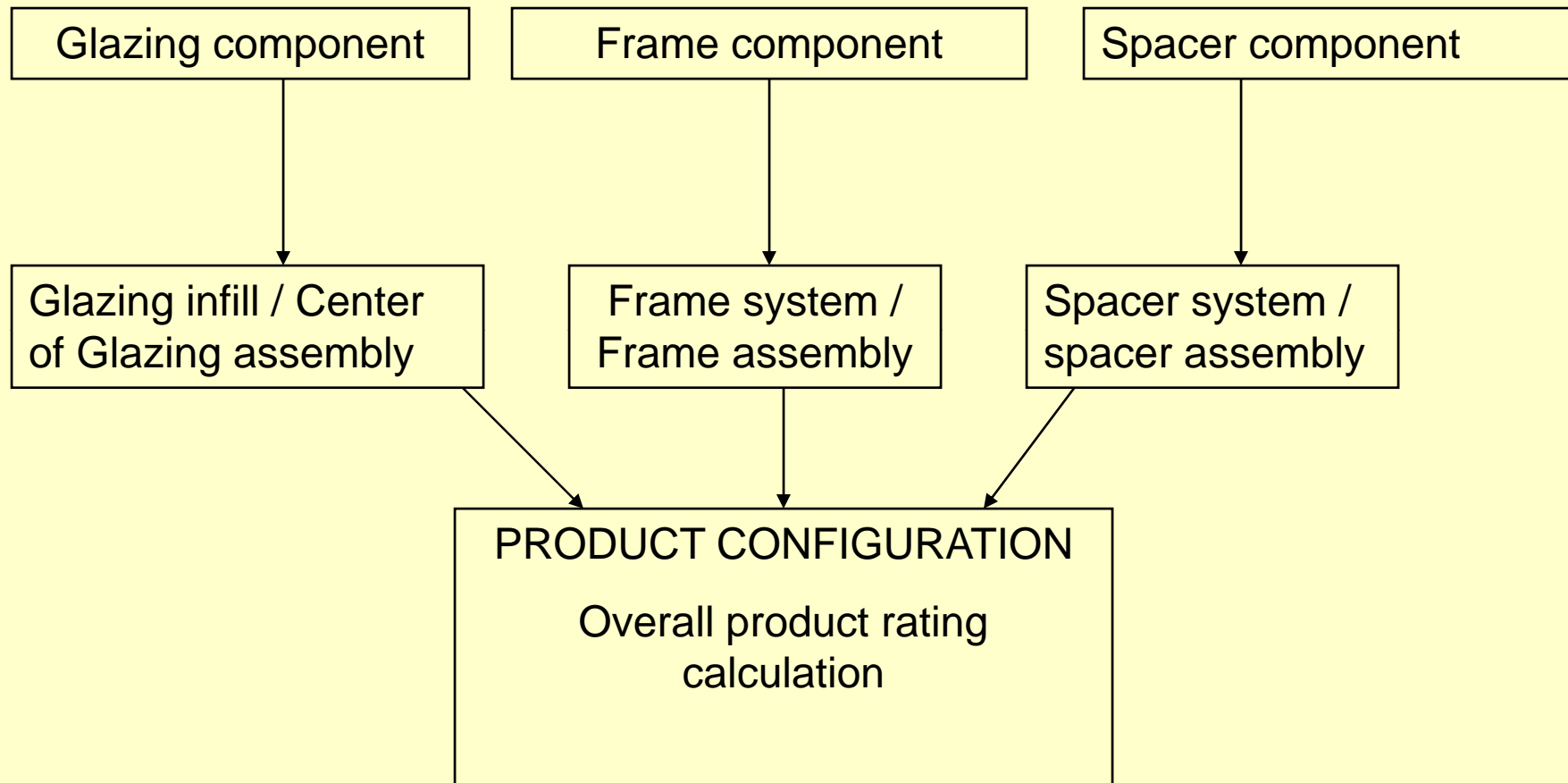
- Overview of the CMA Procedure
- Current Program Development Status
- CMA Software Development
- CMAST vs. FENSIZE
- CMA core functionality
- Questions



Overview

- Component performance data used for obtaining overall product performance.
 - Three primary components used:
 - **Glazing**: Glazing optical spectral and thermal data from the International Glazing Database (IGDB)
 - **Frame**: Thermal performance data of frame cross-sections
 - **Spacer**: K_{eff} of spacer component geometry and materials

Overview - CMA Procedure



Current Program Development

- CMA Technical Procedures have been established and approved.
 - Revisions to these procedures have been balloted for March.
- CMA Product Certification Program requirements have been developed but not yet approved.
 - These procedures have been balloted March. The document is approximately 95% completed.



Current Program Development

- CMA requirements for the Laboratory Accreditation Program are currently under development by the APC.
- CMA requirements for the Certification Agency Program anticipated to begin development in March under CPC.

CMA Software Development

- CMA Software development project began in May 2007.
- Fensize, the precursor of the CMA software was designed in 2002 by current CMA software contractor, D. Charlie Curcija.
- A prototype of the CMA Software Tool (CMAST) will be ready for testing in May/June 2008.



CMA Software Development

- CMAST Prototype Testing (client based) – May 2008
- Alpha testing (network/synchronization) - October 2008
- CMAST deployment - January 2009
- Six-month Pilot Project to conclude August 2009
- Full implementation - August 2009



FENSIZE and CMAST

- Similarities

- Both use three primary components for whole product assembly
- Both provide energy performance ratings at NFRC standard size and actual size
- Both define commercial projects in relation to products configured
- Both allow for the saving and storage of data:
 - Frame and glazing assemblies
 - Spacer K_{eff}
 - Fenestration systems
 - Project information



CMA Software vs. FENSIZE

- Differences

- CMA software will have client-based and web-based functionalities; FENSIZE is client-based only (local desktop application)
- CMA software can access frame cross-sections to configure frame system; FENSIZE must import the systems from W5
- CMA software can create IG assemblies; FENSIZE must import these assemblies from W5



CMA Software vs. FENSIZE

Differences continued...

- CMA software can calculate spacer K_{eff} on demand; FENSIZE allows for only manual input of K_{eff} modeled in THERM.
- CMA software will have access to a central database of NFRC-approved components maintained on a central server; FENSIZE does not.



CMAST– Core functions

- CMA software tool will be able to
 - Maintain libraries of component data
 - Define projects
 - Assemble components, and
 - Calculate whole product ratings
- Assemblies generated in the software prior to whole product calculation:
 - Center of Glazing assembly
 - Spacer and edge seal assembly
 - Frame assembly

CMAST-Component Assemblies

- **Center of glazing assembly** is generated from glazing components data, geometry (i.e., gap width) and gap fill (U_C , $SHGC_C$, VT_C are calculated)
- **Spacer assembly** is generated from spacer components and any applicable sealants/desiccants (k_{eff} is calculated)
- **Frame assembly** is generated from frame components (product layout and associated areas are generated)

CMAST – Whole Product Calculation

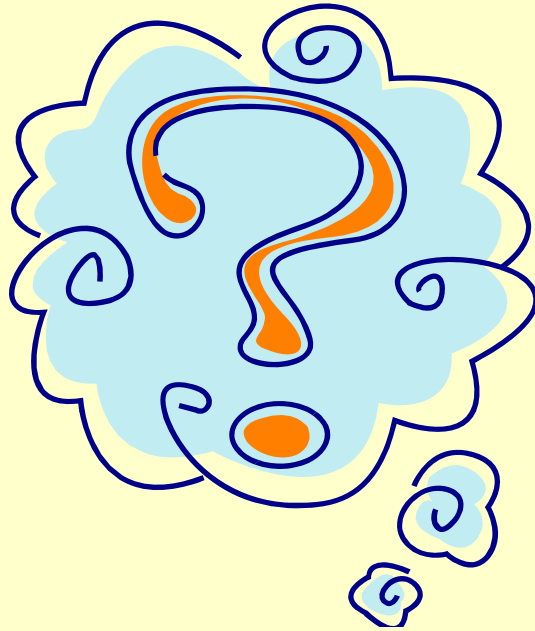
- Whole products are then calculated from the assemblies:
 - Frame assembly is selected first
 - Glazing infill (center of glazing assembly) is selected and placed in frame assembly openings (glazing infill locations)
 - Spacer system (spacer and edge seal assembly) is then selected and placed in glazing infill
 - Whole product performance is calculated after all three assemblies are specified



CMAST Output

- Project data and fenestration system performance data for a project can be exported for use in bidding, energy analysis, determining specifications, etc.
- Product Certification and issuance of NFRC Label Certificate for code compliance.
- Public directory of approved components, certified products, and other label certificate information.





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Questions...**



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