

# How NFRC Product / Project Certification will Impact Contract Glazing in the Next Few Years

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# Who has heard of NFRC?

## National Fenestration Rating Council

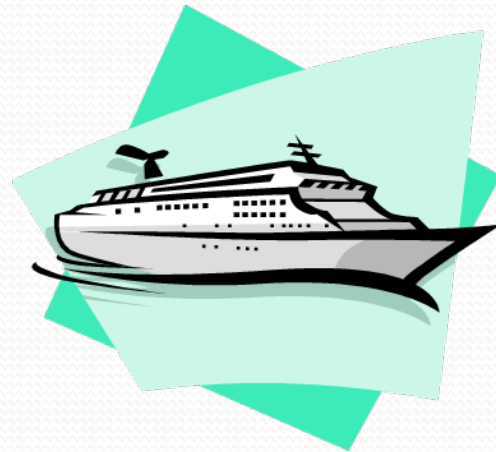


Who has been asked for NFRC  
certification as part of a job?

# Who has heard of the CMA Rating Program from NFRC?



OR



?



Who has attended a  
NFRC meeting?

# Questions we'll answer about CMA

- **Why** should you care?
- **How** does the program work?
- **When** will it start?
- **How long** does it take to get a certificate?
- **How much** does it cost?

# Why should you care?

- NFRC is referenced in the energy codes for U-factor and SHGC:
  - ASHRAE 90.1 since 2001
  - IECC since 2000
- Fenestration properties must be determined in accordance with NFRC technical procedures by an independent lab,
  - or -
  - use punitive default values.
- Full NFRC certification is also required in a few places like California and Seattle.
- In real life, enforcement is currently low. However, enforcement will increase with recent concerns about energy efficiency.
- NFRC also being pushed for tax credits, above-code programs.



What does this really mean?

**You will start seeing NFRC ratings in more specifications.**

**It's important that you account for that **COST** and **TIME** when bidding a job.**

# History of NFRC Ratings

- NFRC is a non-profit organization founded in 1989 to develop a uniform rating system for thermal performance of windows, doors, and skylights.
- First developed ratings for U-factor in 1991, followed by SHGC and VT in 1993.
- These are *whole-product ratings*, including frame and glazing, not just center-of-glass.
- Founded by the residential industry, and that was initial NFRC focus.
- Far less commercial representation to this day.



# Previous NFRC “Site-Built” Ratings

- Developed procedure for site-built products in 2000.
- Program mostly ignored due to cost, complexity, use of defaults, and lack of enforcement.
- Put almost all the responsibility on the **glazing contractor**.
- Estimated use has been less than 0.1% !

# Component Modeling Approach (CMA)

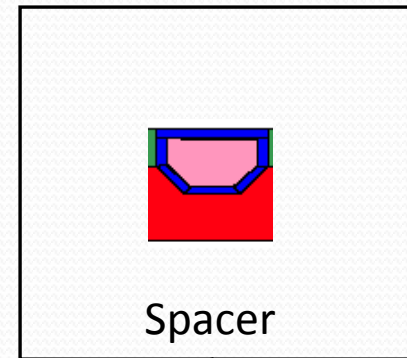
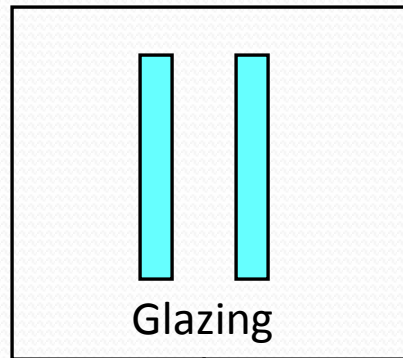
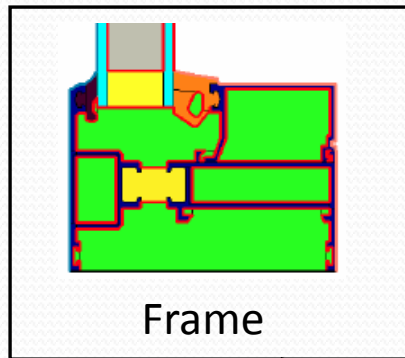
- In 2003, NFRC started working on a new rating program for commercial fenestration in response to these problems.

## *“Component Modeling Approach” or CMA*

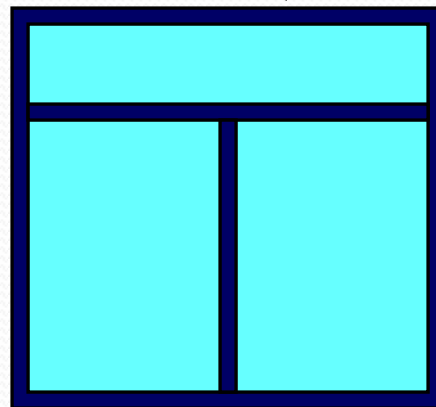
- Recognizes that these are not standardized whole products coming out a factory.
- Spreads out the responsibility from just the glazing contractor to include the key component manufacturers:
  - Frame
  - Glass
  - Spacer

# Component Modeling Approach (CMA)

Rather than simulating and testing the whole product assembly, simulate each component separately and enter it into a component “library”.



Final user selects components from libraries, and software performs simple calculation of combined assembly performance.



Frame, glass, and spacer manufacturers responsible for this part.

“Specifying authority” responsible for this part. Could be architect, **glazing contractor**, component manufacturer, whoever.

# Component Modeling Approach (CMA)

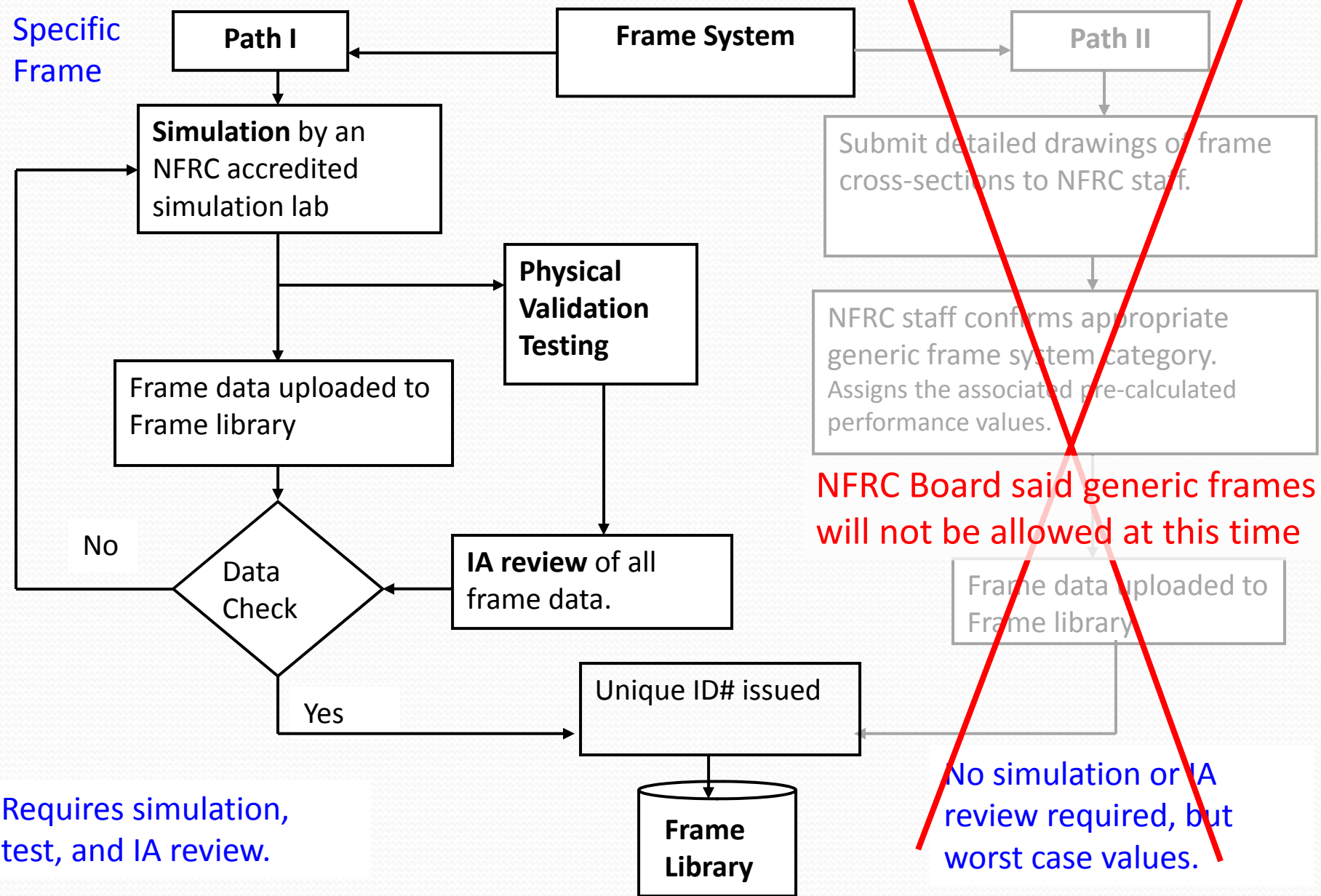
- In a sense, not too different from AAMA 507, another component-based rating system for commercial products.
- Both AAMA 507 and CMA are promising ***technical tools*** for determining energy performance.
- However ... the devil is in the details ... in this case, the main concerns are about the ***certification program***.
- Too much bureaucracy and complexity will add excessive cost and time delays for certification.
- Program must be streamlined and cost-effective, or it will again be ignored.

Don't worry - we won't go through the details of the next 3 slides. This is just to show the steps your metal and glass suppliers will have to go through, since the costs will ultimately be passed on.

# CMA Framing System Approval

Specific Frame

Generic Frame



Requires simulation, test, and IA review.

No simulation or IA review required, but worst case values.

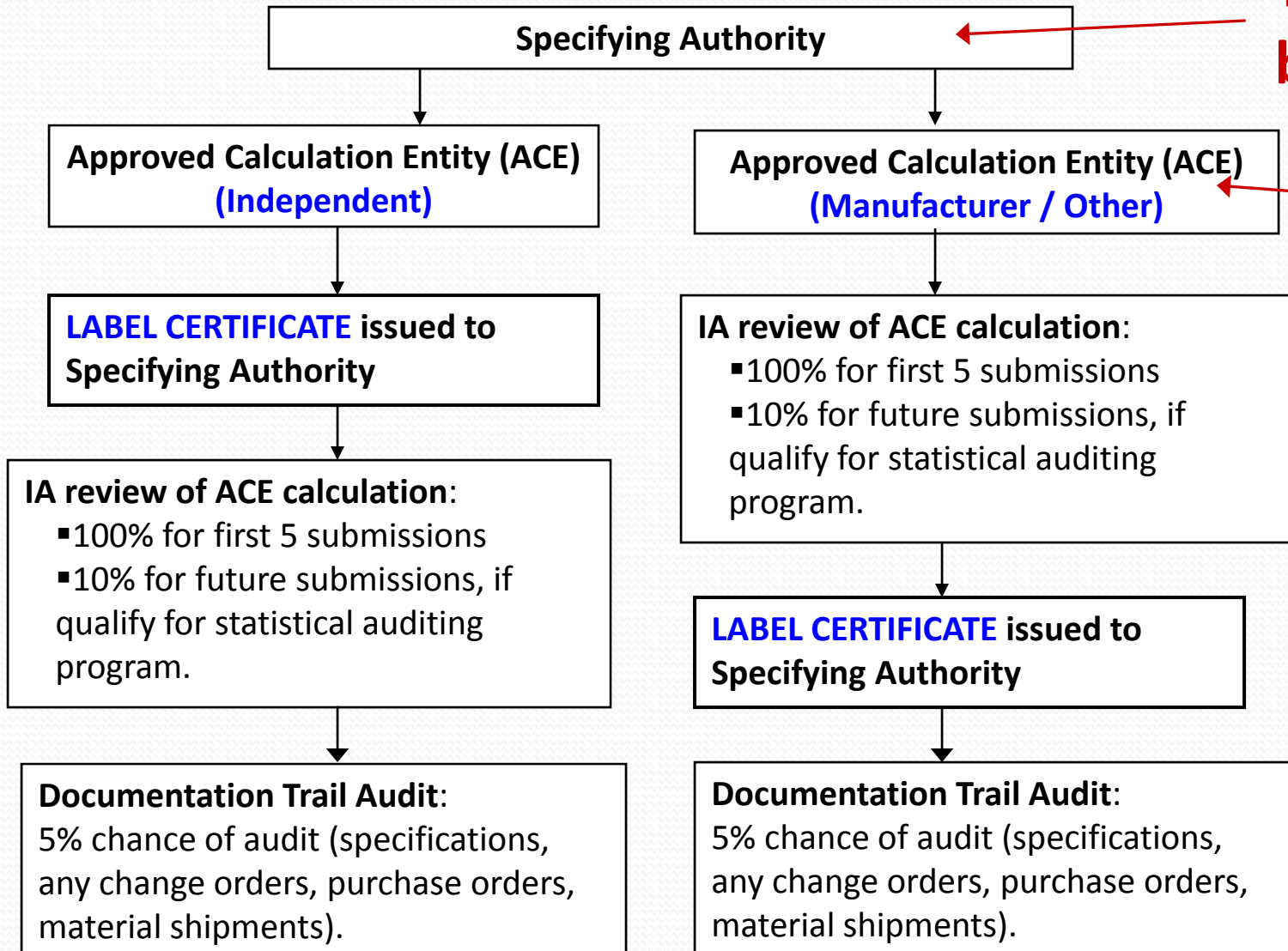
# CMA Glass Approval

- Glass manufacturer submits optical data to:
  - Lawrence Berkeley National Lab
  - Peer review group
- After review, data entered into glass library (same one used with WINDOW software now).
- A little more complicated for laminates.

# CMA Spacer System Approval

- Spacer approval is also complex with 3 paths:
  - Path I: Generic spacer with generic sealants
  - Path II: Specific spacer with generic sealants
  - Path III: Specific spacer with specific sealants
- Paths II and III require:
  - Simulation by independent sim lab
  - Review by independent Inspection Agency (IA)
- Path I does not require simulation or IA review, but uses worst case values.

# CMA Final Product Certification



**This may be you!**

**This could also be you, but only if you want to do it.**

# CMA Label Certificate

- Final label certificate is used for code compliance.
  - Project address information
  - Contact information for specifying authority, frame supplier, and glazing supplier
  - Product performance (U, SHGC, VT) at NFRC standard size
    - These are **certified** whole-product values.
  - Optional product performance (U, SHGC, VT) at actual size
    - However, these are **not certified** values.



NFRC LABEL CERTIFICATE - PRODUCT LISTING:

LABEL CERTIFICATE ID: XYZ-001

NFRC CERTIFIED PRODUCT RATING INFORMATION:\*

PRODUCT LISTING:

CPD ID	Name	Framing Ref	Glazing Ref	Spacer Ref	CERTIFIED Performance Rating at NFRC Standard Size		
					U <sup>***</sup>	SHGC <sup>**</sup>	VT <sup>**</sup>
P-PL-010	PL-2200 / PL-2210	FA-PL2210	GA-TT-001	SA-AM-001	3.01	0.58	0.66
P-PL-005	PL-3400 / PL-3401	FA-PL3401	GA-TT-001	SA-AM-002	3.18	0.57	0.65
P-PL-012	PL-5700 / PL-5720	FA-PL5720	GA-TO-002	SA-AM-001	2.95	0.21	0.30
P-PL-002	PL-1100 / PL-1152	FA-PL1152	GA-TT-001	SA-AM-001	2.38	0.51	0.62
P-PL-022	PL-9900 / PL-9915	FA-PL9915	GA-TO-003	SA-AM-002	2.56	0.15	0.19

FRAME, GLAZING and SPACER ASSEMBLIES:

FRAMING LISTING:

FRAMING REF	SUPPLIER ID	DESCRIPTION
FA-PL2210		Single Casement Thermally Broken Aluminum
FA-PL3401		Projecting (Awning) Thermally Broken Aluminum
FA-PL5720		Vertical Slider PVC reinforced with Steel
FA-PL1152		Vertical Slider Thermally Broken Aluminum
FA-PL9915		Fixed Thermally Broken Aluminum

GLAZING LISTING:

GLAZING REF	SUPPLIER ID	DESCRIPTION
GA-TT-001		1" Double Glazed, 1/4" HC Low-e, 1/4" Clear, Argon (90%), 1/2" gap
GA-TT-002		1" Triple Glazed, 1/8" Clear, Coated film, 1/8" SC, Argon (90%), 3/8" gap
GA-TT-003		1" Double Glazed, 1/4" Bronze, 1/4" SC Low-e, Argon (90%), 1/2" gap

SPACER LISTING:

SPACER REF	SUPPLIER ID	DESCRIPTION
SA-AM-001		250P Mill Finish Aluminum Low profile (1/2")
SA-AM-002		15A Polymer Spacer (3/8")

Note: For NFRC approved frame, glazing and spacer component performance information see the NFRC Approved Component Library Database: [www.nfrc.org/CMAST](http://www.nfrc.org/CMAST)

\*Certification information provided is for those fenestration systems listed and does not necessarily encompass all systems for the project.

\*\* Each individual product certified performance rating is based on NFRC standard size in accordance with NFRC procedures.

# When will this new program start?

- 6 month pilot program starting in March, focused on California.



- Full implementation planned to start **October 2009**.
- When you will see it depends on code enforcement in your area.

# The Big Questions



How long will certification take?



How much will it cost?

# How long to get a label certificate?

- It depends – from 1 to 100 days!
- **Are the component products (frame, glass, spacer) already in the library?**
- If so, it is very quick.
  - A non-official bid report can be generated in < 1 hour.
  - Label certificate can probably be obtained within 1-7 days, depending on the schedules of the ACE and IA.

*ACE = Approved Calculation Entity*  
*IA = Inspection Agency*

**Total: 1-7 days**

# How long to get a label certificate?

- **What if the framing system is not in the library (either a new or custom product)?** The process can be much longer.
- Can the new frame can be “grouped” with a previously approved frame?

- *If so*, no new validation test is required.

The new frame can be simulated and added in 1-2 weeks, depending on the schedules of the sim lab and IA.

Then, ACE can provide label certificate in 1-7 days, depending on the schedules of the ACE and IA.

**Total: 1-3 weeks**

- *If not*, a validation test is required first, which can take up to 3 months (push extrusions, build mock-up, shipping, test lab schedule, etc.)

While waiting, can at least do simulations and get an unofficial bid report in a few weeks.

**Total: 60-100 days?**

# How much will CMA certification cost?

- Fee schedule announced by NFRC:

**CMAST User Fees** (CMA software tool, can be used to generate bid reports)

One-time User Fees	\$20
Annual use fee (unlimited use)	\$3500

## Spacers

Annual Participation Fee	\$1000
Per Product (annual fee)	\$50
CAP (annual fee)	\$6000

## Frames

Annual Participation Fee	\$1000
Per product (annual fee)	\$20
CAP(annual fee)	\$20,000

**Glass** (note - same as NFRC IGDB fees)

Annual Participation Fee	\$1000 (member)
Per product (annual fee)	\$137.50
CAP (annual fee)	\$13,750

## Label (project) Certificate Fee

Project Size	Fees
<1000 sf	\$20
1001 – 10,000 sf	\$100
10,001 – 50,000 sf	\$500
50,001 – 100,000 sf	\$1000
>100,000 sf	\$1500

Also,

- Free 30 day trial for software. Free annual use if pay more than \$3500 in component fees).
- 33% early adopter discount for frame and spacers added to the library in the first year.
- Overall cap of \$45,000 per year for all certification costs.
- Does not include simulation, testing, IA, or ACE costs.

# CMA Certification Cost - Who pays what?

## ● **Frame Manufacturer:**

- Frame simulation
  - Frame validation testing
  - Frame IA review
- } Could range from \$200-\$9,000 per product, depending on how custom it is.
- Frame annual participation and database fees ← \$10,000-\$21,000 per year
  - If act as specifying authority, also include those costs. ← See later slide

## ● **Spacer Manufacturer:**

- Spacer simulation
  - Spacer IA review
- } Perhaps \$50-200 per product
- Spacer annual participation and database fees ← \$2,000-\$7,000 per year

# CMA Certification Cost - Who pays what?

- **Primary Glass Manufacturer:**

- Glass annual participation and database fees

← \$14,750 per year

- **Glass Fabricator:**

- Some database fees, but only for their own custom glazing products not already entered by primary glass or interlayer manufacturers

← \$1,000 annual fee  
+ \$137.50 per product per year

(e.g. custom laminates)

- If act as specifying authority, also include those costs.

← See next slide

# CMA Certification Cost - Who pays what?

- **Specifying Authority** – the person getting the label certificate (could be **Glazing Contractor**, unless they convince the metal or glass supplier to do it):
  - ACE calculation costs ← perhaps \$300-\$600 per project
  - IA review fees ← perhaps \$200-\$1000 per project
  - Bid report / software fees ← perhaps \$20-\$500 per project
  - Label Certificate fees ← \$20-\$1,500 per project
  - Documentation trail audit costs ← ??? Could be \$1,000-2,000 not including internal time, but only 5% chance of audit, and limited to 2 audits per year.

# CMA Costs

- **Frame validation testing** is one of the largest costs when consider testing fees, labor and materials, shipping, etc.
  - Amount of validation testing is still uncertain.
  - We estimate there are 200,000-250,000 different frame cross-sections in the market.
  - Big questions: How many will be entered in the database, and how many need to be tested?
- Grouping rules allows multiple frames to be combined, reducing the number of simulations and tests.
- New and expanded **frame grouping rules** just recently approved.
- This will help tremendously, although exact number of tests for each system is still uncertain.

# Estimate of Total Costs



- When try to include all certification costs (not just NFRC fees), estimate depends on whether framing system is custom or more standard.
- Custom framing system used only once:
  - As high as ~ \$0.70 per square foot of glazing.
- More standard framing system reused on multiple projects:
  - \$0.05 - \$0.25 per ft<sup>2</sup>, depending on how many times system is reused.
- Frame supplier pays 70-90% of all costs.
- Specifying Authority pays 5-20% of all costs.
- Of course, all costs will be passed on to some degree.

# What do you need to do?

- Understand what the system will require.
- Develop a strategy:
  - How will you handle certification requests?
  - Consider splitting out NFRC certification costs as a separate line item on bids.
  - Plan for the time to get a label certificate.
    - short for standard products
    - long for custom or new products that require a validation test
  - Talk about it with your metal and glass suppliers.
- Support your associations ...

**Be Prepared!**

# GANA & NFRC

- Glass Association of North America Involvement with the National Fenestration Rating Council
- History
- Objectives
- Challenges
- Accomplishments
- Future

# GANA & NFRC - History

- May 2000 – Hershey, PA & Site-Built Program
- Dallas Commercial Construction Market Meetings
- Site-Built Program Introduced – Not Used
- Reengagement 2004 – “Non-Residential Product Certification Program”

# GANA & NFRC - History

- March 2005 – NFRC Spring Meeting in Hawaii
- Non-Residential Products Task Group (Ratings)
- Three, Four – Day Meetings per Year 2005 – 2007; Two Four – Day Meetings in 2008; Task Group Meetings & Conference Calls, conference calls and more conference calls!

# GANA & NFRC - Objectives

- Be a Voice for The Commercial Construction Industry
- Bring Commercial Construction Industry Knowledge
- Question the Need for NFRC in The Commercial Construction Market
- Development of a “Simple, Cost Effective” Program for Commercial Fenestration

# GANA & NFRC - Challenges

- Existing NFRC Residential Window Program
- Having Our Voices Heard – Commercial Industry Involvement
- Lack of Commercial Industry Knowledge & Outreach
- Board of Directors Overturning Membership Votes

# GANA & NFRC - Accomplishments

- “Specifying Authority” in Lieu of “Responsible Party”
- Documentation-Trail Audit in Lieu of Construction Site Inspections
- Component Modeling Databases – Reduction in Testing

# GANA & NFRC – Future

- Is There a Need for NFRC in the Commercial Construction Market?
- Will Spacer and Framing System Manufacturers Enter Data?
- Will There Be Code Enforcement?
- What Level of Industry Involvement?

# GANA & NFRC

- John Lewis – American Architectural Manufacturers Association (AAMA)
- Tom Culp – Aluminum Extruders Council (AEC)
- Margaret Webb – Insulating Glass Manufacturers Alliance (IGMA)

# NFRC & Component Modeling Approach for Commercial Fenestration

- **Benefit > Cost = Success**
- **Is NFRC – CMA There Yet?**



# Questions?