August 06, 2009

Mr. Chuck Knickerbocker
Curtain Wall Manager
Technical Glass Products
8107 Bracken Place SE
Snoqualmie, WA 98065

Dear Mr. Knickerbocker:

Thank you for your letter dated July 27, 2009. I appreciate you sharing your concerns with us. We've received many similar queries from glaziers and glazing contractors and are aware of the impact building code requirements may have on this segment of the industry in particular.

Rest assured that you are not alone in your concerns. We understand that the full benefits of the Component Modeling Approach ("CMA") program will go unrealized unless we communicate effectively with the glaziers, glazing contractors, and others who are going to use the program for code compliance. Of course, communication is a two-way street so we are seeking feedback from industry during the pilot project phase of the program and will consider all recommendations for improvement.

For your convenience, I've broken down your questions into excerpts and provided our responses as appropriate (the excerpts are *italicized* for clarity).

You wrote:

1. *The NFRC size for modeling may or may not represent actual conditions on site. Certification of a window of an arbitrary size that doesn't duplicate the site built conditions may lead to:*
    a. *A unitized wall panel for example, with its varying framing methods, which cannot be accurately modeled in the CMAST program as demonstrated yesterday.*

We took this concern into account, and deliberately designed the Component Modeling Approach Software Tool ("CMAST") to be flexible. CMAST has the ability to model unitized curtain wall systems, and these systems can be modeled at the NFRC standard size (for code compliance) or, as an option, at user-defined sizes that correspond to the project.

    b. *Certifications of walls that may perform better or worse than the NFRC size expose the qualifying entity, most like the subcontractors to huge liability issues.*

NFRC constantly considered liability issues as we developed the CMA program. Keep in mind that NFRC makes no claim that the ratings represent anything other than calculated performance of a specific section of the fenestration system under a set of idealized standard conditions. CMAST is a *rating tool,* and as such will output values based on standardized assumptions cited in NFRC 100 such as outdoor and indoor temperature, wind speed, normal angle of incidence for solar radiation, etc. Of course, as with any comparison of a rating generated at standard conditions to a rating measured through field testing, it is expected that variations will occur; there should be no expectation that the values generated by CMAST will correspond to field performance.

> *c. As a result, NFRC certification may or may [not] indicate actual performance of a given wall product.*

As stated above, the NFRC certification will indicate performance of a system built to the NFRC standard size and evaluated at the NFRC standard conditions. The existing rating and labeling system for residential products operates in exactly the same way.

> *d. Is this a possibility, and what do we do if we encounter this? What is NFRC prepared to do to assist the glazing subcontractor if this occurs?*

We understand that this is a new program for many in the commercial fenestration industry, and that an important part of our job is to educate stakeholders on what the program *does* — and *does not* — provide. Here's the most important thing to remember:

> **CMAST-generated values (i.e., ratings reflected on the CMA Label Certificate), are intended for code compliance and for the comparison of various fenestration systems.**

Understanding this key point provides the insight to bypass potential conflicts based on actual versus rated performance.

The use of NFRC standard sizes provides a benchmark for determining code compliance. For example, if a jurisdiction references ASHRAE 90.7-2007 for commercial construction and the requirements are for a *U-factor* of 0.35 and a *Solar Heat Gain Coefficient* of 0.45, the code official can simply check the NFRC label certificate to see if the products comply.[1]

Though the CMA Label Certificate reflects certified ratings at the NFRC standard size, it can also provide, as an option, ratings at the actual size of the product as "supplemental information" as an addendum to the certificate (a sample label certificate is attached for illustrative purposes). In addition, CMAST can generate an electronic file that can be used in *EnergyPlus*® where building performance can be modeled. This feature of CMAST has generated considerable enthusiasm among designers and architects to whom we have demonstrated the software tool.

[1] Both ASHRAE and IECC reference NFRC rating methodologies.

2. *Fenestration Rating for curtain walls: does this just cover the glass industry? What about the other "curtain walls" (non-load bearing building skins) that are out there? Does NRFC have a say in rating precast concrete and window systems? How about Stucco? Masonry? GFRC? Stud-built systems with either terra cotta, stone, brick, or EIFS? How do we get those rated come 1 January 2010?*

NRC ratings are limited to *fenestration*—the glazing and associated framing portions of the building envelope as well as doors and skylights (we are also developing ratings for attachments to fenestration systems). Ratings for other building envelope requirements specified in California's building code are developed by other organizations. We're sure that these other organizations can answer these questions.

   a. *Should we just be concerned about the glazing portion of these walls?*

      What about other glazing materials that get mounted into any of the variety of steel or aluminum curtain walls? Composite metal panels for one, or granite? How do we get a California Building Inspector to accept a certification in January that NFRC is not presently prepared to offer? Architects aren't going to stop designing these systems with these components.

We're aware of concerns regarding curtain wall infills. Since NFRC administers a uniform and independent rating and labeling system for the energy performance of windows, doors, skylights, and attachment products, we do not have procedures for rating and labeling curtain walls with opaque infills[2]. Fortunately, Title 24 does not require NFRC certification for products not certified by NFRC. You would simply need to show compliance for these products with code requirements as you have in the past.

3. *Has the NFRC involved the one entity that has to pay for all of this, the building owners? This includes Federal, State, and local governments, who can fob it off to the taxpayers, but*

   a. *Time to schedules will be required to allow testing of custom curtain walls not previously built to be tested and certified. The response to this question in the webinar was it could happen in as little as two months. If it takes longer, then what?*

Yes, we have worked hard to engage with building owners and we intend to continue doing so:

- In March 2007, our Executive Director, James Benney, wrote a letter to the President of BOMA (Building Owners and Managers Association) International, introducing the

[2] Some interest has been shown in developing ratings for certain types of infill materials such as spandrel glazings, but rating such products today is beyond the scope of the NFRC program.

CMA Program, which was under development at the time. The certification document for the program, which was still in draft form, was forwarded to BOMA for review and feedback.

- In 2006, we published an article about the CMA program in *BOMA Magazine*.
- NFRC exhibited at the BOMA annual convention several years ago.

When it comes to cost of compliance, the NFRC Board of Directors has made cost control a top priority from the very beginning. The concept behind CMA is that frame members can be simulated and maintained indefinitely in an electronic library in CMAST for use in as many systems or projects as needed. Physical testing is required for validation, but once that is done, the frame member simulations validated by that test (which can be in the hundreds), can be populated into the CMAST library. Once approved, these components can be used for multiple systems in multiple projects. We encourage frame manufacturers to begin populating this library with their framing members now to further expedite the generation of a Label Certificate through the CMA process.

b. What happens if the designed custom wall the owner's architect has put in the drawings doesn't get rated or certified? Is that the glazing subcontractor's problem? The architect's?

Ultimately, everyone involved in the design and construction of a commercial building is responsible for making sure that the building complies with all relevant codes. That's what the CMA program is all about: providing a tool that will allow the commercial fenestration industry to comply with new code requirements in California and other states.

NFRC is making a concerted effort to reach out to all parties involved in specifying the window wall systems for a given building project, from architects to contractors to building owners, and to educate these stakeholders about NFRC's CMA Product Certification Program and the CMA Software Tool. Perhaps within the context of integrated project delivery, all players involved in a given project can collaborate and coordinate roles and responsibilities, such as fenestration product certification.

c. The owner's going to be impacted, that's for sure. Do the building owners realize that a HUGE cost impact to their projects just got dumped on them?

d. And do they know that a Certificate of Occupancy can hang in the balance should the certification not meet the Building Inspector's expectation?

The NFRC CMA program is a rating system developed with input from all interested parties, and as we indicated above we have reached out to building owners.

When it comes to a Certificate of Occupancy, building owners, like all disciplines involved in constructing a commercial building, should be aware of and comply with all code requirements, fenestration-related and otherwise. NFRC is providing a cost-effective tool that will allow them to comply with new requirements in California and other states.

4. *NFRC is out there trying to alert the one entity that will be charged with getting the certifications, that being the glazing subcontractors. They'll enlist the help of the glass or frame suppliers, but they have to include the cost and schedule impact into their estimates.*

    a. *Glass Association of North America (GANA) has been trying to clue the glass and glazing subcontractors in, but they haven't been made to understand the impact. They won't until they have to experience it firsthand.*

    b. *Jobs being bid right now for 2010 will miss a significant cost in their estimates. That's never good for owners or subcontractors. They'll be burned on the cost of the first one, and then the owners will feel the impact on the next job.*

    c. *Except there will be one glazing sub on the next project being bid that won't know what they are about to walk into, and their price won't include any of certification, and they get the job because they were the low bidder. The playing field will NOT be level at bid day. And delays will be incurred while they absorb the cost impact to get certification.*

    d. *All while at or near the end of the job, when the owner's trying to get the CO, the owner, architects, general contractors as well as the sub's bankers and bonding company will be breathing heavily on their necks to get the certification.*

As those in the industry realize, commercial construction is a very complicated process, and one of many considerations is *code compliance.* As the codes are continually evolving, it is incumbent upon the parties involved to understand the latest code requirements, and to ensure that the cost of compliance is factored in to the project. NFRC does not generate energy codes; we develop rating systems to facilitate compliance with such codes.

5. *TGP's in a unique position: what has priority, fire rated partitions or the energy requirements both of which by code are required? The issue comes down to public safety or energy code compliance? Who gets to decide the fate of that issue if a fire rated fenestration product can't get certified as being compliant with the energy code? I don't think I'm overstating the case as it presently stands. And NFRC may have plans to implement and eventually deal with the contingencies. But what do we do in the meantime? Seems the only resort is to plead our case for the Building Inspectors of the world to grant us an exemption. That's a risk, too. It can be naïve to think they may approve the exception, and worse, the consequences when they won't. It's also naïve to think the NFRC CMA certification will cover all conditions after 1 January 2010.*

Your questions are valid, but as these are code-related questions, they are really beyond the scope of NFRC's influence. As specific examples of issues with NFRC rating or certification

programs are made known to us, we will review and, through the consensus process, address the problem. It is critically important to receive input from impacted stakeholders when revising and modifying our ratings and processes. If you have further questions along these lines, we recommend that you direct them to the various code-making bodies.

> *There appear to be too many loopholes. How we can work within what appears to be a very difficult situation is of extreme interest to us. I'd be curious as to NFRC's reaction to all this. It may help us plan and implement TGP's approach a little better.*

The CMA Software Tool has been designed to allow for NFRC ratings to be generated at the bid and design level by any user of the software, before certification is required. This functionality will allow for energy performance requirements to be generated and analyzed for a specified system that may also have safety requirements to meet. Any discrepancies can be identified at the design phase and possible solutions addressed at that time.

The NFRC CMA Program has been developed to address the time and cost issues that you and others have raised. NFRC knows that the full benefits of the CMA program will go unrealized unless we can make it work in the "real world". The CMA pilot project is the testing or proving ground for the certification program and the software application. Before we release the program to the world, we hope that the industry will participate in this most critical phase and assist us in "making it work." We need your input; we're open to any suggestions as to how we can do a better of job of communicating with you and your counterparts in the glass industry.

At this time we are developing informational materials on the CMA program and will be offering ongoing webinars as well that will focus on the latest developments and issues and questions that those involved in the pilot project and other interested parties may have. We are also presenting the CMA program and software at conferences and continuing education seminars, as often as we can. NFRC's John Lewis will be presenting a demonstration of CMAST and an overview of the CMA Program at the upcoming GANA conference on September 3rd in Kansas City, MO.

I hope that we have been able to address your questions and concerns. Please feel free to contact me at 301-589-1776, extension 204, with any follow-up questions you might have or further clarifications you might require. We are planning another webinar session on CMA in early September and hope you can participate in this session as well.

Sincerely,

Jessica Ferris
CMA Program Manager
National Fenestration Rating Council

cc: Ashley Charest ~ *Glass Association of North America*

Greg Carney ~ *Glass Association of North America*
Max Perilstein ~ *Arch Aluminum*
Megan Headley ~ *USGlass Magazine*
Jenni Chase ~ *Glass Magazine*
Marc LaFrance ~ *U.S. Department of Energy*
John Lewis ~ *National Fenestration Rating Council*
Jim Benney ~ *National Fenestration Rating Council*

NATIONAL FENESTRATION RATING COUNCIL
LABEL CERTIFICATE
PROJECT INFORMATION

LABEL CERTIFICATE ID: *XYZ-001* **Issuance Date:** mm/dd/yyyy

This is to be completed by an NFRC Approved Calculation Entity (ACE), based on information provided by the Specifying Authority and calculated in accordance with NFRC procedures.

PROJECT LOCATION:

Address: _____,

City: _____, **State,** _____, **Zip code:** _____,

Contact person:_____, **Title:** _____,

Phone: _____, **Facsimile:** _____, **Email:** _____,

Project name (optional): _____, **Designer (optional):** _____.

IDENTIFICATION OF SPECIFYING AUTHORITY:

Company name: _____, **ID:** _____,

Address: _____,

City: _____, **State,** _____, **Zip code:** _____,

Contact person:_____, **Title:** _____,

Phone: _____, **Facsimile:** _____, **Email:** _____,

FRAMING SUPPLIER:

Company name: _____, **ID:** _____,

Address: _____,

City: _____, **State,** _____, **Zip code:** _____,

Contact person:_____, **Title:** _____,

Phone: _____, **Facsimile:** _____, **Email:** _____,

GLAZING SUPPLIER:

Company name: _____, **ID:** _____,

Address: _____,

City: _____, **State,** _____, **Zip code:** _____,

Contact person:_____, **Title:** _____,

Phone: _____, **Facsimile:** _____, **Email:** _____,

IDENTIFICATION NAME OF APPROVED CALCULATION ENTITY (ACE):

_____, **ID:**_____,

IDENTIFICATION NAME OF INSPECTION AGENCY (IA):

_____, **ID:**_____,

Number of individual products listed on this label certificate: **5**

NATIONAL FENESTRATION RATING COUNCIL
LABEL CERTIFICATE

PRODUCT LISTING

FOR CODE COMPLIANCE

LABEL CERTIFICATE ID: ***XYZ-001*** **Issuance Date:** mm/dd/yyyy

NFRC CERTIFIED PRODUCT RATING INFORMATION:*

The NFRC Certified Product Rating Information listed here is to be used to verify that the ratings meet applicable energy code requirements.

PRODUCT LISTING:

						CERTIFIED Performance Rating at NFRC Standard Size		
CPD ID	Total Area	Name	Framing Ref	Glazing Ref	Spacer Ref	U-factor**	SHGC**	VT**
	ft^2					Btu/ $hr \cdot ft^2 \cdot {}^oF$	-	-
P-PL-010	88.89	PL-2200 / PL-2210	FA-PL2210	GA-TT-001	SA-AM-001	**0.53**	**0.58**	**0.66**
P-PL-005	192.67	PL-3400 / PL-3401	FA-PL3401	GA-TT-001	SA-AM-002	**0.56**	**0.57**	**0.65**
P-PL-012	382.22	PL-5700 / PL-5720	FA-PL5720	GA-TO-002	SA-AM-001	**0.52**	**0.21**	**0.30**
P-PL-002	60.00	PL-1100 / PL-1152	FA-PL1152	GA-TT-001	SA-AM-001	**0.42**	**0.51**	**0.62**
P-PL-022	525.00	PL-9900 / PL-9915	FA-PL9915	GA-TO-003	SA-AM-002	**0.45**	**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”)

NATIONAL FENESTRATION RATING COUNCIL
LABEL CERTIFICATE

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

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

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

FOR CODE COMPLIANCE

NATIONAL FENESTRATION RATING COUNCIL LABEL CERTIFICATE

SUPPLEMENTAL PRODUCT INFORMATION

For Informational Purposes Only

Non-Certified Product Information at Actual Product Size

Reference NFRC Label Certificate ID: *XYZ-001* for Certified Ratings for Code Compliance:

Individual product performance at actual size is listed in the table below and has been determined in accordance with NFRC technical procedures; however, these are not certified ratings. Certified ratings are determined at NFRC model sizes for comparative purposes and are listed on the actual Label Certificate referenced above. The actual size performance calculations below are for information purposes and use in calculations and energy simulation programs to estimate energy use, and are not intended for use in code compliance.

PRODUCT LISTING:

					NON-CERTIFIED Performance at Actual Size				
CPD ID	**Qty**	**Total Area**	**Name**	**EnergyPlus Report File**	**Width**	**Height**	**U-factor**	**SHGC**	**VT**
		ft^2			**in.**	**in.**	**Btu/ $hr \cdot ft^2 \cdot {}^oF$**	**-**	**-**
P-PL-010	2	48.00	PL-2200 / PL-2210	www.nfrc.org/CMAST/pl2200-2210.txt	48.00	72.00	**0.48**	**0.59**	**0.66**
P-PL-010	5	88.89	PL-2200 / PL-2210	www.nfrc.org/CMAST/pl2200-2210.txt	40.00	64.00	**0.50**	**0.56**	**0.64**
P-PL-005	6	192.67	PL-3400 / PL-3401	www.nfrc.org/CMAST/pl3400-3401.txt	68.00	68.00	**0.49**	**0.58**	**0.65**
P-PL-005	3	54.00	PL-3400 / PL-3401	www.nfrc.org/CMAST/pl3400-3401.txt	72.00	36.00	**0.51**	**0.55**	**0.62**
P-PL-005	5	167.22	PL-3400 / PL-3401	www.nfrc.org/CMAST/pl3400-3401.txt	86.00	56.00	**0.48**	**0.59**	**0.67**
P-PL-012	10	382.22	PL-5700 / PL-5720	www.nfrc.org/CMAST/pl5700-5720.txt	64.00	86.00	**0.33**	**0.22**	**0.30**
P-PL-002	3	60.00	PL-1100 / PL-1152	www.nfrc.org/CMAST/pl1100-1152.txt	48.00	60.00	**0.52**	**0.53**	**0.60**
P-PL-022*	21	525.00	PL-9900 / PL-9915	N/A	N/A	N/A	N/A	N/A	N/A

** This product and/or its glazing system is a test-only specimen, and fenestration performance is only available at the NFRC standard test size and not actual size. Therefore, EnergyPlus report files are not available for test-only specimens.*