



PROGRAM BOOKLET

(Agendas, Draft Minutes, & Committee Rosters enclosed)

NFRC Spring Committee Meeting

Baltimore, Maryland

March 25-27, 2019



National Fenestration Rating Council

6305 Ivy Lane, Suite 140

Greenbelt, MD 20770

301/589-1776

www.nfrc.org



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

Program Booklet

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NFRC 2019 Spring Committee Meeting

Baltimore, MD

Meeting Schedule*

Monday, March 25, 2019		
9:00am – 1:00pm	Volunteer Leader Network (additional fee required) **	Westminster Room
12:00pm	Registration Table Opens	Outside Whitehall Ballroom
1:00pm – 2:00pm	LAP / CAP Workshop	Ravenhurst Room
3:00pm – 3:30pm	Opening General Session	Whitehall Ballroom
3:30pm – 4:30pm	Tubular Daylighting Device TG	Whitehall Ballroom
4:30pm – 5:30pm	Window / Therm Approval TG	Whitehall Ballroom
6:00pm – 8:00pm	Member Reception (onsite)	Hamptons Room
Tuesday, March 26, 2019		
7:00am – 8:00am	Breakfast	Hamptons Room
8:00am – 9:00am	Diffuse Glazing TG	Whitehall Ballroom
9:00am – 10:00am	Solar Non-Planar TG	Whitehall Ballroom
10:00am – 11:00am	Daylighting Potential Rating TG	Whitehall Ballroom
11:00am – 12:00pm	Spandrel Validation TG	Whitehall Ballroom
12:00pm – 1:15pm	Networking Lunch	Hamptons Room
1:15pm – 2:00pm	Warm-Edge Spacer TG	Whitehall Ballroom
2:00pm – 3:00pm	NFRC 700 Certification Process Streamline TG	Whitehall Ballroom
3:00pm – 4:00pm	Future of IGDB Presenter: Lawrence Berkeley National Labs	Whitehall Ballroom
Convenes at 4:00pm	Research and Technology Committee Block Chair: Bipin Shah; Staff Liaison: Scott Hanlon Roll call taken prior to convening of Subcommittees <ul style="list-style-type: none"> • Thermophysical Properties SC • Optical Properties SC • Research SC 	Whitehall Ballroom

Wednesday, March 27, 2019

7:00am – 8:00am	Breakfast	Hamptons Room
Convenes at 8:00am	<p>Technical Committee Block Chair: Michael Thoman; Staff Liaison: Scott Hanlon Roll call taken prior to convening of Subcommittees</p> <ul style="list-style-type: none"> • Software SC • CMA SC • Daylighting SC • Condensation Resistance SC • U-factor SC • Solar Heat Gain SC • Ventilation Rating SC 	Whitehall Ballroom
12:00pm – 1:30pm	Lunch – On Your Own	
1:30pm	<p>Technical Committee Block Reconvenes if necessary</p>	Whitehall Ballroom
Convenes after Technical Block	<p>Ratings Committee Block Convenes following Technical Committee Block Chair: Sue Schreiber; Staff Liaison: Scott Hanlon Roll call taken prior to convening of Subcommittees</p> <ul style="list-style-type: none"> • NFRC 700 PCP Certification SC • NFRC 705 CMA-PCP SC 	Whitehall Ballroom
Convenes 30 mins after Ratings Block	<p>Closing Session Convenes no later than 5:00 pm Scheduled for 60 mins</p>	Whitehall Ballroom

NOTE: Committees blocks will run consecutively as time allows. Committees listed will go in order, subcommittee order is subject to change and time/date is not guaranteed.

* Schedule subject to change.

** For information on the Volunteer Leaders Network optional session, click [here](#).



Dear NFRC Members and Guests,

Welcome to our annual Spring Committee meeting in Baltimore. It's not quite baseball season yet, but there is plenty to do in Charm City including exploring the beautiful Inner Harbor, the National Aquarium and Maryland Science Center.

In some ways, this city reflects the evolution of our organization. Using its proximity to the water, sports fanbase and other natural advantages, Baltimore has pursued an economic development strategy that helped the city adapt to the 21st century. It found ways to improve and evolve while keeping its true identity, which is something we can relate to as we celebrate NFRC's 30th anniversary.

At NFRC we're facing similar challenges head-on in a collaborative manner. As part of our mission, we must serve our members the best way possible. We also need to maintain a development plan that incorporates how the economy is changing; how the needs of consumers are evolving. One of the more rewarding parts of chairing is seeing our great staff and members take on this challenge and continue supporting the NFRC brand and the benefits it provides. That collaboration is why we're proud to highlight "30 Voices for 30 Years" as we reach our 30th anniversary. Our members got us to this point, and it's wonderful to hear them share their stories and how NFRC supports them.

As we know, the built environment is about far more now than just the design and function of a home or office. People are keenly aware of the emerging role of technology, sustainability, and resiliency in construction and energy efficiency. Thanks to NFRC and its members, the fenestration industry has established itself in this space and highlighted where windows, doors and skylights contribute to the built environment's sustainability movement. The right fenestration products help businesses and households get the best possible energy performance, indoor air quality and daylighting from their offices and homes.

Nevertheless, taking a moment to celebrate our achievements is also a good time to reflect on what's to come. Transformative changes in our industry offer many new opportunities and challenges.

The marketplace is evolving. New technologies are redefining how we interact and do business. The workforce is also different as employers embrace new hiring and training strategies. To continue making NFRC's work meaningful even after three decades, we'll need to continue looking for new, innovative solutions that expand our reach and strengthen our relevance – even as we continue providing the fair, accurate, and credible ratings that got us where we are.

Our success is contingent upon our stakeholders' trust in our ratings and the value of our brand. If we work together to face new challenges, NFRC and its members will continue to grow and thrive and reach greater heights than ever before. Together in Baltimore, let's celebrate 30 years of success and many more years ahead.

Sincerely,

Paul Bush
NFRC Board Chair



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NFRC's Spring Meeting: SPECIAL NOTES

Meeting Hotel

[Royal Sonesta Harbor Court Hotel](#)

550 Light Street
Baltimore, MD
Royal Sonesta Harbor Court Baltimore
410-234-0550

NFRC Program Booklet

NFRC is once again going **green** and will not have printed copies of this program book available onsite nor will we be providing USB flash drives. All items can be accessed online via the [NFRC Meeting Resources Page](#) prior to the conference. If you need hard copies, please print before coming to the meeting or use the hotel's business center.

Monday, March 25, 2019

Volunteer Leaders Network 9:00 am – 1:00 pm in the *Westminster Room* (additional fee)

The sessions will include Lessons in Leadership and Difficult Conversations, using Kim Scott's groundbreaking text "Radical Candor".

Opening General Session 3:00 p.m. – 3:30 p.m. in the *Whitehall Ballroom*

The meeting will kick off on Monday afternoon with the Opening General Session.

Member Networking Reception 6:00 p.m. – 8:00 p.m. in the *Hamptons Room*

Join fellow members for conversation, cocktails, and hors d'oeuvres.

Tuesday, March 26, 2019

Breakfast 7:00 a.m., Meetings Start 8:00 a.m. We will begin with task group meetings, The Future of IGDB, and the Research and Technology Committee Block. All registered attendees are invited to a networking lunch from 12:00 p.m. – 1:15 p.m. in the Hamptons Room.

Wednesday, March 27, 2019

Breakfast 7:00 a.m., Meetings Start at 8:00 a.m. We will begin with the Technical Committee Block followed by the Ratings Committee Block (2:00 p.m. – 4:00 p.m.). All subcommittee meetings will run in scheduled order within the Committee Block in the Whitehall Ballroom.

Closing Session 30 minutes after conclusion of Ratings Committee, approximately 5:00 p.m.

The Board of Directors will meet in a closing session on Wednesday afternoon in the Whitehall Ballroom. All registered attendees are welcome to observe the meeting and take advantage of a period for questions and comments for Board consideration.



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Voting at the Committee Meeting

- ✓ Voting cards will be distributed onsite at registration to member companies (one per member company) and those holding proxies*.
- ✓ Members will be responsible for obtaining their voting cards from the NFRC registration staff prior to voting.
- ✓ Members will be responsible for ensuring the appropriate representative of the Member Company is in possession of the voting card prior to the need to vote.
- ✓ After each motion, voting members will be asked to hold up the appropriate card to vote on all motions up for vote at the meeting.
- ✓ NFRC staff will count visible cards to obtain voting results.
- ✓ **Voting Card Polling will be used Tuesday and Wednesday at the Committee and Subcommittee Meetings.**

*[*Proxies must be received prior to the start of the NFRC Meeting.](#) They must be filled out and signed by a member representative from the absent organization.*

Upcoming Meetings and Reminders

NFRC 2019 Fall Membership Meeting
September 23-25, 2019
Location TBD

NFRC 2020 Spring Committee Meeting
March 16-18, 2020
Location TBD

NFRC 2020 Fall Membership Meeting
October 26-28, 2020
Location TBD

NFRC 2021 Spring Committee Meeting
March 29-31, 2021
Location TBD

NFRC 2021 Fall Membership Meeting
October 25-27, 2021
Location TBD



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Reminder: Your Feedback is Valued!

We look for our stakeholders' feedback to help us improve the meeting experience and ask that you complete the brief online meeting evaluation survey. The link will be sent via email shortly after the conclusion of the meeting.

Presentations from the meeting will be posted in the NFRC Member Community a few weeks after the meeting.

Thank you for your continued participation in the NFRC programs. We look forward to seeing you at future NFRC meetings.

Questions? Contact [Kristin Pate](#) prior to the meeting or onsite.





NFRC 2019 Spring Committee Meeting
March 24-27, 2019, Baltimore, MD
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Meeting Notes:

Use box below to type any meeting notes you would like to capture



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AGENDA

Opening General Session

Monday, March 25, 2019

3:00 p.m. – 3:30 p.m.

Chair: *Paul Bush, Vitro Architectural Glass*

1. **Welcome to Baltimore and Review of Schedule and Logistics – K. Pate**
2. **NFRC Update – D. Callahan (CEO)**
3. **NFRC Chairperson's Welcoming Remarks – P. Bush**
4. **Adjourn**



NFRC 2019 Spring Committee Meeting
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AGENDA

Tubular Daylighting Devices Task Group

Monday, March 25, 2019

3:30 p.m. - 4:30 p.m.

Chair: Neall Digert, *Solatube*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines

2. Appoint Recording Secretary (staff if available)

3. Review and Approve Agenda

4. Unfinished Business

- a. None

5. New Business

- a. Review how N. Digert has implemented NFRC 203 ratings into CA T-24, Washington State, ASHRAE 90.1, and the ICC IECC code language.
- b. Introduce proposal for how we could augment NFRC 203 to provide Diffuse Sky product ratings (N. Digert).

6. Adjourn

SCOPE

The Tubular Task Group mission is to do what is required, using recognized science and NFRC published procedures to accurately define, rate and label thermal performance characteristics of tubular daylighting devices.



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AGENDA

Window/Therm Approval Task Group

Monday, March 25, 2019

4:30-5:30

Chair: Joe Hayden, Pella Corporation

1. **Call to Order**
 - a. Welcome to All AttendeesCell phones & laptops to silent mode
 - b. Antitrust Reminder
 - c. NFRC Meeting Guidelines
 2. **Appoint Recording Secretary ([TASK GROUP PARTICIPANT NAME])**
 3. **Review and Approve Agenda**
 4. **Unfinished Business**
 - a. Review/Refine Task List
 - b. Assignments/Next Steps
 - c. Schedule Next Call
 5. **Adjourn**
-

SCOPE

The Window / Therm Approval Task Group shall be responsible for:

- *Managing the process of obtaining NFRC approval of WINDOW and THERM, as defined by the NFRC Software Approval Guidelines.*
- *Proposing all necessary document revisions associated with implementation of WINDOW and THERM.*
- *Proposing a schedule for implementation of WINDOW and THERM, and subsequent sun-setting of previous versions.*
- *Reviewing the NFRC Software Approval Guidelines and recommending revisions if deemed appropriate.*

This task group shall report to the Software Subcommittee.



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AGENDA

Diffuse Glazing Task Group

Tuesday, March 26, 2018

8:00AM – 9:00AM EDT

Chair: Jacob C. Jonsson, LBNL

1. **Call to Order**
 - a. Welcome to All AttendeesCell phones & laptops to silent mode
 - b. Antitrust Reminder
 - c. NFRC Meeting Guidelines
 2. **Appoint Recording Secretary ([TASK GROUP PARTICIPANT NAME])**
 3. **Review and Approve Agenda**
 4. **Unfinished Business**
 - a. Review ballot comments
 - b. Review research project and comments
 5. **New Business**
 - a. None
 6. **Adjourn**
-

SCOPE

Find a way to obtain spectral data for diffuse glazing in a manner that would allow WINDOW calculations of IGUs. Determine best practice how to obtain data and verify the accuracy of these practices.



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AGENDA

Solar Optical Perf. Non-Planar Trans. Task Group

Tuesday, March 26, 2018

9:00AM – 10:00AM EDT

Chair: Charlie Curcija, LBNL

Co-Chair: Michael Fischer, Kellen

1. **Call to Order**
 - a. Welcome to All AttendeesCell phones & laptops to silent mode
 - b. Antitrust Reminder
 - c. NFRC Meeting Guidelines
 2. **Appoint Recording Secretary ([TASK GROUP PARTICIPANT NAME])**
 3. **Review and Approve Agenda**
 4. **Unfinished Business**
 - a. Review and develop the Draft RFP
 5. **New Business**
 - a. None
 6. **Adjourn**
-

SCOPE

To develop a rating procedure for non-planar products using computer simulation software such as WINDOW/THERM.



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AGENDA

Daylighting Potential Rating Task Group

Tuesday March 26, 2019

10:00am – 11:00am

Chair: Ray Garries, MI Windows and Doors, Inc.

Vice Chair: Neall Digert, Solatube International, Inc.

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines

2. Appoint Recording Secretary (NFRC Staff)

3. Review and Approve Agenda

4. Unfinished Business

- a. Review Status of LBNL Simulation Activities
- b. Review Findings from LBNL Data
- c. Identify next steps in determining a viable Daylight Potential Rating System

5. New Business

6. Adjourn

SCOPE

To create a rating system for daylighting potential utilizing the existing NFRC VT rating combined with known, bright day incident illuminance values.

Committee Chain: Technical Committee; Daylighting Subcommittee; Daylighting Potential Rating Task Group
NFRC Staff Liaison: Una Moneypeny, Sr. Manager, Product Development; umoneypeny@nfr.org



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AGENDA

Spandrel Validation Task Group

March 26, 2019

11:00am – 12:00pm

Chair: Anthony Cinnamon, *Wiss, Janney, Elstner Associates, Inc.*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines

2. Appoint Recording Secretary ([TASK GROUP PARTICIPANT NAME])

3. Review and Approve Agenda

4. New Business

- a. Present research
- b. Next steps
- c. Discuss scope update

5. Schedule next call

6. Adjourn

SCOPE

To provide a definition for spandrels so that they may be rated, in accordance with NFRC approved methods, for U-factor, solar heat gain coefficient (SHGC), visible transmittance (VT), and condensation resistance (CR).

Committee Chain: Technical Committee * U-factor Subcommittee * Spandrel Validation Task Group
NFRC Staff Liaison: Scott R. Hanlon, Director, Program Operations * shanlon@nfr.org



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AGENDA

Warm-Edge Spacer Task Group

March 26, 2019

1:15pm – 2:00pm

Chair: Tom Culp, *Birch Point Consulting LLC*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines

2. Appoint Recording Secretary ([TASK GROUP PARTICIPANT NAME])

3. Review and Approve Agenda

4. New Business

- a. Summarize TG direction
- b. Review submitted materials
- c. NFRC documents impacted
- d. Implementation plan

5. Adjourn

SCOPE

Clarify the use of the term 'warm edge spacer system' through use of standardized definitions and calculation method.

Committee Chain: Technical Committee * Warm-Edge Spacer Task Group
NFRC Staff Liaison: Scott R. Hanlon, Director, Program Operations * shanlon@nfcc.org



NFRC 2019 Spring Committee Meeting
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AGENDA

NFRC 700 Certification Process - Streamline Task Group

Tuesday, March 26, 2019

2:00pm – 3:00pm

Co-Chairs: Steve Strawn, JELD-WEN

Jason Seals, AAMA

1. **Call to Order**
 - a. Welcome to All AttendeesCell phones & laptops to silent mode
 - b. Antitrust Reminder
 - c. NFRC Meeting Guidelines
 2. **Appoint Recording Secretary (NFRC Staff)**
 3. **Review and Approve Agenda**
 4. **Unfinished Business**
 - a. VSIM Workgroup Report
 - b. Presentation on status updates for all kaizen-related projects
 5. **New Business**
 6. **Adjourn**
-

SCOPE

Review all requirements of NFRC Product Certification Procedures with the goal of removing non-value-added steps to streamline the whole certification process.

Committee Chain: Ratings Committee; NFRC 700 PCP Certification Subcommittee; NFRC 700 PCP Certification Process – Streamline Task Group

NFRC Staff Liaison: Una Money Penny, Sr. Manager, Product Development, umoneypenny@nfr.org



NFRC 2018 Spring Membership Meeting
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AGENDA

Thermophysical Properties Subcommittee

Tuesday March 26, 2019

R&T Block Period: 4:00 PM

Chair: *Charlie Curcija, LBNL*

Vice Chair: *Peter Lyons, Peter Lyons & Associates*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Subcommittee Voting Requirements: one vote per member company

2. Appoint Recording Secretary (STAFF)

3. Approve Minutes from October, 2018 meeting in Albuquerque, NM

4. Review and Approve Agenda

5. Reports

- a. NFRC 101 TG – J. Hayden, Pella, Inc.

6. New Business

- a. NFRC 101 Appendices Ballot

7. Adjourn

SCOPE

The Thermophysical Properties Subcommittee is responsible for developing and maintaining NFRC 101. It is also responsible for the review and approval of the submitted data in accordance with these documents. This subcommittee reports to the Research and Technology Committee.

Committee Chain: *Research & Technology Committee * Thermophysical Properties Subcommittee
NFRC Staff Liaison: Steve Urich, Director, Programs* surich@nfr.org



NFRC 2018 Spring Committee Meeting
March 19-21, 2018, St. Louis, MO

Minutes

NFRC Thermophysical Properties Subcommittee

Tuesday, March 20, 2018

Under Research & Technology Committee Block: 02:30 p.m. – 4:30 p.m.

Chair: Dr. Charlie Curcija, Lawrence Berkeley National Laboratory

Vice Chair: Peter Lyons, Peter Lyons & Associates

1. C. Curcija called the meeting to order at 03:18 p.m.
2. J. Padgett was appointed recording secretary.
3. Minutes from September 2017 (San Diego) were approved as presented.
4. The agenda was reviewed and approved as modified.
5. Reports
 - a. NFRC 101 TG – (J. Hayden)
 - i. J. Hayden reported the TG hopes to have a ballot for the fall. There will be a webinar to explain the changes. The TG has found that the generic values in appendix A for wood were possibly incorrect. The difference being .14 to .17 mostly on those that are less likely to be used. Suggestion was to do an ILC for the most commonly used woods from the wood manufactures to try and support and be able to keep .14.
 - b. NFRC 101 generic material electronic database development – (C. Curcija)
 - i. C. Curcija proposes we remove this item from the reporting list because of software changes making the list obsolete.
6. Unfinished Business
 - i. None
7. New Business
 - a. NFRC 101 Section 5.1.7.1 Ballot

MOTION: J. Hayden / J. Baker - move to forward the ballot to the Research and Technology Committee to approve and forward to the Board for approval and implementation upon publication. Passes with UVV
8. The meeting was adjourned at 3:37 p.m.



NFRC 2019 Spring Committee Meeting
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AGENDA

Optical Properties Subcommittee

Tuesday March 26, 2019

R&T Block Period: 4:00 PM

Chair: Jacob Jonsson, Lawrence Berkley National Lab

Vice Chair: David Cooper, Guardian Industries

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Subcommittee Voting Requirements: one vote per member company

2. Appoint Recording Secretary

3. Approve Minutes from Fall 2019 meeting in Albuquerque, NM

4. Review and Approve Agenda

5. Reports

- a. VIG Task Group Report (D. Cooper)
- b. Diffuse Glazing (J. Jonsson)
- c. Solar Optical Perf. Non-Planar Trans. Systems Task Group (C. Curicja / M. Fischer)

6. Unfinished Business

7. New Business

- a. NFRC 301 Ballot
- b. NFRC 302 Ballot

8. Adjourn

SCOPE

The Optical Properties Subcommittee shall be responsible for determining, reviewing, and maintaining solar optical properties data for glazing materials and systems for use in NFRC procedures. The Optical Properties Subcommittee shall report to the Research and Technology Committee.



NFRC 2018 Fall Membership Meeting
October 8-10, 2018, Albuquerque, NM

Minutes

Optical Properties Subcommittee

Tuesday, October 9, 2018

Research and Technology Committee Block: 03:30 p.m. – 06:00 p.m.

Chair: Jacob Jonsson, Lawrence Berkley National Lab

Vice Chair: David Cooper, Guardian Industries

1. J. Jonsson called the meeting to order at 03:30 p.m.
2. S. Hanlon was appointed recording secretary.
3. Minutes from March 2018 (St. Louis) were approved as presented/modified.
4. The agenda was reviewed and approved as presented/modified.
5. Reports
 - a. VIG Task Group Report (D. Cooper)
 - i. D. Cooper reported that the bids have been reviewed and a recommendation will be presented to the research subcommittee.
 - b. Diffuse Glazing Task Group (J. Jonsson)
 - i. J. Jonsson reported .
 - c. Solar Optical Perf. Non-Planar Trans. Systems Task Group (C. Curicja / M. Fischer)
 - i. M. Fischer reported .
6. New Business
 - a. NFRC 301 Ballot
 - i. Andersen Corporation: M. Mikkelson (General) – NEG
MOTION: M. Mikkelson / S. econd move to find this negative substantive and persuasive. Motion passes by UVV.
 - ii. Birch Point Consulting, LLC: T. Culp (General) – NEG
MOTION: T. Culp / S. econd move to find this negative editorial and persuasive. Motion passes by UVV.
 - iii. Vitro Architectural Glass: M. Buchanan (Section 1, 5.1, 8.2) – NEG
MOTION: M. Buchanan / S. econd move to find this negative substantive and persuasive. Motion passes by UVV.
 - iv. WESTLab: J. Baker (General) – NEG
MOTION: J. Baker / S. econd move to find this negative substantive and persuasive. Motion passes by UVV.
 - b. NFRC 302 Ballot
 - i. Andersen Corporation: M. Mikkelson (General) – NEG

MOTION: M. Mikkelson / S. econd move to find this negative substantive and persuasive. Motion passes by UVV.

- ii. Cardinal Glass Industries, Inc.: J. Larsen (Section 3.7.F) – NEG

MOTION: J. Larsen / S. econd move to find this negative substantive and persuasive. Motion passes by UVV.

- iii. California Energy Commission: P. Bozorgchami (General) – NEG

MOTION: P. Bozorgchami / S. econd move to find this negative editorial and persuasive. Motion passes by UVV.

- iv. WESTLab: J. Baker (General) – NEG

MOTION: J. Baker / S. econd move to find this negative substantive and persuasive. Motion passes by UVV.

- v. Velux: R. Lebrun (Section 1 and 3.4) – NEG

MOTION: R. Lebrun / S. econd move to find this negative editorial and persuasive. Motion passes by UVV.

- c. Deconstruction of electrochromic products

- 7. The meeting was adjourned at 4:15 p.m.



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AGENDA

Research Subcommittee

Tuesday March 26, 2019

R&T Block Period: 4:00 PM

Chair: *Bipin Shah, WinBuild, Inc.*

Vice Chair: *Peter Lyons, Peter Lyons & Associates*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Subcommittee Voting Requirements: one vote per member company

2. Appoint Recording Secretary

3. Approve Minutes from Fall 2019 meeting in Albuquerque, NM

4. Review and Approve Agenda

5. Reports

- a. VIG Task Group Report (D. Cooper)
- b. Diffuse Glazing (J. Jonsson)
- c. Solar Optical Perf. Non-Planar Trans. Systems Task Group (M. Fischer /C. Curicja)

6. Unfinished Business

- a. Fritted Glass RFP

7. New Business

8. Adjourn

SCOPE

The Research Subcommittee is to act as a repository for research requests. These requests will be prioritized and recommendations passed to the Research and Technology Committee. The Research Subcommittee is to function as an intermediary for the collection, coordination, and publication of research and test data pertinent to the NFRC organization and its membership. The purpose of this coordinated effort is to provide concise, useful information such as reports of tests in progress and accumulated test results.



NFRC 2018 Fall Membership Meeting
October 8-10, 2018, Albuquerque, NM

Minutes

Research Subcommittee

Tuesday, October 9, 2018

Chair: Bipin Shah, WinBuild, Inc.

Vice Chair: Peter Lyons, Peter Lyons & Associates

1. B. Shah called the meeting to order at 4:21pm MDT
2. K. Louder was appointed recording secretary.
3. Minutes from March 2018 (St. Louis) were approved as presented.
4. The agenda was reviewed and approved as presented.
5. Reports
 - a. VIG Task Group Report – D. Cooper reported the BRTG reviewed four bids and they covered the scope of the RFP. The BRTG recommends approval of one bid to the Research SC.
 - b. Diffuse Glazing Task Group - J. Jonsson reported that based on the 301 and 302 ballot comments additional work is required by the TG.
 - c. Solar Optical Perf. Non-Planar Trans. Systems Task Group – M. Fischer reported on the one pager and to move this forward to R&T for approval.
6. New Business
 - a. VIG RFP – BRTG Summary
 - i. Recommendation on bid award to Veridis Solutions
MOTION: D. Cooper / J. Hayden move the BRTG recommendations forward to R&T for approval. Motion passes 29-2-13
 - b. Diffuse Glazing RFP
 - i. The Diffuse Glazing RFP was presented to move this forward
MOTION: J. Jonsson / K. Haglund move the Diffuse Glazing RFP forward R&T for approval. Motion passes 16-4-22
 - c. Non-Planar TG – One pager
 - i. **MOTION:** M. Fischer / C. Curcija move to forward the one pager to R&T for approval. Motion passes UVV
7. The meeting was adjourned at 5:03pm MDT



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

AGENDA

Research and Technology Committee

Tuesday, March 26, 2019 – Convenes at 4:00pm

Chair: *Bipin Shah, WinBuild, Inc.*

Vice Chair: *Lisa Winkler, Eastman, Performance Films Division*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Committee Voting Requirements: one vote per member company listed on the roster.

2. Appoint Recording Secretary

3. Roll Call/Establish Quorum

4. Review and Approve Agenda

5. Approve Minutes from Fall 2019 meeting in Albuquerque, NM

6. Convene Subcommittees Meetings (Reference SC agendas)

- a. Optical Properties Subcommittee – (J. Jonsson, D. Cooper)
- b. Thermophysical Properties Subcommittee – (C. Curcija, P. Lyons)
- c. Research Subcommittee – (B. Shah, Peter Lyons)

7. Reports

- a. Remaining Subcommittee Items as needed

8. New Business

- a. TBD

9. Adjourn

SCOPE

The Research and Technology Committee is responsible for developing and maintaining accurate technical data used to support the NFRC rating procedures.

Committee Chain: Research & Technology Committee
NFRC Staff Liaison: Scott R. Hanlon, Director, Program Operations * shanlon@nfr.org



NFRC 2018 Fall Membership Meeting
October 8-10, 2018, Albuquerque, NM

Minutes

Research and Technology Committee

Tuesday, October 9, 2018

Chair: Bipin Shah, WinBuild

Vice Chair: Lisa Winkler, Eastman, Performance Films Division

1. B. Shah called the meeting to order at 5:08pm MDT
2. A quorum was established
3. K. Louder was appointed recording secretary
4. Minutes from March 2018 (St. Louis) were approved as presented
5. The agenda was reviewed and approved as presented
6. Reports
 - a. Optical Properties Subcommittee – J. Jonsson reported that the VIG TG, Diffuse Glazing TG and Solar Non-Planar TG are all doing work.
 - b. Thermophysical Properties Subcommittee – C. Curcija reported the NFRC 101 TG is working on finding sources for materials in Appendix A and Appendix B.
 - c. Research Subcommittee (B. Shah, Peter Lyons)
 - i. **MOTION:** P. Bush / S. Harp move to forward the BRTG recommendation to the board for bid award approval. Motion passes 29-1-9
 - ii. **MOTION:** D. Cooper / M. Buchanan move to forward Diffuse Glazing RFP to the board for approval. Motion fails: 11-13-16

Staff shall reissue the Diffuse Glazing RFP to membership for additional review after the Diffuse Glazing TG updates to address obscure glazing
 - iii. **MOTION:** M. Thoman / J. Baker move to forward the one pager to the board for approval. Motion passes UVV
7. New Business
 - a. None
8. The meeting was adjourned at 5:30pm MDT



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

Program Booklet

Research & Technology Committee Roster (as of March 11, 2019)

AGC Glass Company North America	National Certified Testing Laboratories
American Architectural Manufacturers Association	Oak Ridge National Laboratory
Andersen Corporation	ODL Inc
Apogee Enterprises	Oldcastle Building Envelope
Associated Laboratories, Inc.	Pella Windows and Doors
Associated Materials, Inc.	PGT Industries
Benson Industries	Pilkington North America, Inc.
Birch Point Consulting, LLC	Pleotint
California Energy Commission	PlyGem Windows
Cardinal Glass Industries, Inc.	Quast Consulting and Testing, Inc
Chelsea Building Products	Roetzel & Address
Door and Access Systems Manufacturers Assoc	SaintGobain Solar Gard, LLC
Eastman Chemical Company	Solatube International, Inc.
Efficient Windows Collaborative	Sunrise Windows, Ltd.
Element Materials Technology	Technoform
Global GreenTag Americas	Therma-Tru
Guardian Fabrication Central	Tremco, Inc.
Insulating Glass Certification Council (IGCC)	UL, LLC
Insulating Glass Manufacturers Alliance (IGMA)	VEKA Inc.
International Window Film Association	VELUX America LLC
Intertek-ATI	Vitro Architectural Glass
Intigral	Western Window Systems
JELD-WEN, inc.	WESTLab
Kawneer	WinBuild, Inc.
Keystone Certifications, Inc.	Window and Door Manufacturers Assoc (WDMA)
Kolbe & Kolbe Millwork Co., Inc.	Windsor Windows and Doors
Lawrence Berkley National Laboratory	Wiss, Janney, Elstner Associates
Madico, Inc.	World Millwork Alliance
Manko Window Systems, Inc.	WSP
Marvin Windows and Doors	
Masonite International Corporation	
Mathews Brothers Company	
MI Windows and Doors	
Milgard Manufacturing, Inc.	

**Committee Membership requires members to sign up onsite at meeting (or by [sending an email](#) while attending meeting) for inclusion on roster/voting rights. Please note, if two consecutive meetings are missed without a voting representative being at the meeting (checked via meeting registration) the company will be dropped and interested parties must sign up once again.*

Only those organizations that have paid NFRC membership dues as of March 11, 2019, will be eligible to vote at the meeting.

*If you notice a problem, PLEASE contact the staff of NFRC as soon as possible. **Discrepancies cannot be addressed after March 22, 2019:** jfinn@nfr.org*



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

AGENDA

Software Subcommittee

Wednesday, March 27, 2019

Chair: *Catherine Best, RWDI*

Vice Chair: *Ryan Harnden, Matthews Brothers*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Subcommittee Voting Requirements: one vote per member company

2. Appoint Recording Secretary ([NFRC STAFF NAME])

3. Approve Minutes from October 2019 meeting in Albuquerque, NM

4. Review and Approve Agenda

5. Reports

- a. *WINDOW / THERM Approval TG – J. Hayden*
- b. *CMAST Advisory TG – J. Winters*
- c. *CPD Advisory TG – J. Gordon*

6. New Business

- a. Approval of LBNL Window/Therm 7.7

7. Adjourn

SCOPE

The scope of the Software Subcommittee is to:

- *Develop guidelines for the development of software tools and their documentation as used in NFRC ratings;*
- *Review and prioritize software development requests;*
- *Provide oversight for software development efforts; and*
- *Develop and maintain software acceptance criteria.*

The purpose of this effort is streamlined, robust, accurate and well documented software that fulfills NFRC core mission.



NFRC 2018 Fall Membership Meeting
October 8-10, 2018, Albuquerque, NM

Minutes

NFRC Software Subcommittee

Wednesday, October 10, 2018

Technical Committee Block: 8:00 a.m. – 12:00 p.m.

Chair: Catherine Best, Benson Industries, Inc.

Vice Chair: Ryan Harnden, Matthews Brothers

1. M. Thoman called the meeting to order at 08:00 a.m.
2. A. Rawson was appointed recording secretary.
3. Minutes from March 2018 (St. Louis) were approved as presented.
4. The agenda was reviewed and approved as modified.
5. Reports
 - a. WINDOW / THERM Approval TG – J. Hayden
 - i. J. Hayden reported in process working to approve Window / Therm 7.6. Proposing to compensate a few simulators to review software. Working on RFP. Anticipated completion spring / summer 2019.
 - b. CMAST Advisory TG – J. Winters
 - i. J. Winters reported working on CMAST user manual. Looking to revise scope and asking for feedback.
 - c. CPD Advisory TG – J. Gordon
 - i. J. Gordon reported no activity.
6. Unfinished Business
 - a. None
7. New Business
 - a. Request for new chair. Contact S. Nicholas if interested. C Benson resigned. Vice Chair remains.
8. The meeting was adjourned at 8:11 a.m.



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

AGENDA

NFRC CMA Technical Subcommittee

Wednesday, March 27, 2019

Technical Committee Block

Chair: *Mason Fritz, EFCO Corp*

Vice Chair: *Mahabir Bhandari, ORNL*

1. **Call to Order**

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Subcommittee Voting Requirements: one vote per member company

2. **Appoint Recording Secretary (STAFF)**

3. **Approve Minutes** from Fall 2018 meeting in Albuquerque, NM

4. **Review and Approve Agenda**

5. **Reports**

- a. CMA Technical TG – M. Fritz, EFCO

6. **New Business**

7. **Adjourn**

SCOPE

To maintain a component based nonresidential procedure for fenestration products that will yield accurate energy performance data for use in code compliance and for meaningful building energy analysis.

Committee Chain: *Technical Committee * CMA Technical Subcommittee

NFRC Staff Liaison: Steve Urich, Director, Programs surich@nfr.org



NFRC 2018 Fall Membership Meeting
October 8-10, 2018, Albuquerque, NM

Minutes

NFRC CMA (Technical) Subcommittee

Wednesday, October 10, 2018

Technical Committee Block: 8:00 a.m. – 12:00 p.m.

Chair: Mason Fritz, EFCO Corp.

Vice Chair: Mahabir Bhandari, Oak Ridge National Laboratory

1. M Fritz called the meeting to order at 08:11 a.m.
2. A. Rawson was appointed recording secretary.
3. Minutes from March 2018 (St. Louis) were approved as presented.
4. The agenda was reviewed and approved as presented.
5. Reports
 - a. CMA Technical TG – Mason Fritz, EFCO Corp.
 - i. M. Fritz reported working on CMA 705 TG Ballot. Revisiting grouping rules for CMA. Forming a WG for a specifying authority manual. Looking to develop project sized specific calculation.
6. Unfinished Business
 - a. None
7. New Business
 - a. None
8. The meeting was adjourned at 8:14 a.m.



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

AGENDA

Daylighting Subcommittee

Wednesday, March 27, 2019

Technical Block convenes at 8am

Chair: Ray Garries, MI Windows and Doors, Inc.

Vice Chair: Neall Digert, Solatube International, Inc.

1. **Call to Order**

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Subcommittee Voting Requirements: one vote per member company

2. **Appoint Recording Secretary (NFRC STAFF)**

3. **Approve Minutes** from October 2018 meeting in Albuquerque, NM

4. **Review and Approve Agenda**

5. **Reports**

- a. Actions taken during conference calls or via ballots between October 2018 and March 2019

6. **Unfinished Business**

7. **New Business**

8. **Adjourn**

SCOPE

To create a rating system for daylighting potential utilizing the existing NFRC VT rating combined with known, bright day incident illuminance values.

Committee Chain: Technical Committee; Daylighting Subcommittee

NFRC Staff Liaison: Una Moneyppenny, Sr. Manager, Product Development, umoneyppenny@nfr.org



NFRC 2018 Fall Membership Meeting
October 8-10, 2018, Albuquerque, NM

Minutes

NFRC Daylighting Subcommittee

Wednesday, October 10, 2018

Technical Committee Block: 8:00 a.m. – 12:00 p.m.

Chair: Ray Garries, MI Windows and Doors

Vice Chair: Roger LeBrun, VELUX-America

1. R. Garries called the meeting to order at 08:17 a.m.
2. A. Rawson was appointed recording secretary.
3. Minutes from March 2018 (St. Louis) were approved as presented.
4. The agenda was reviewed and approved as presented.
5. Reports
 - a. Review of Concept
 - i. R Garries reported with a presentation on Daylighting Potential Rating.
 - ii. K Haglund asked to have participation in WELL Building version 2.
 - iii. M. Buchanan asked for clarification on reporting method.
 - R Garries - Label would show lumens for standard sized products.
 - iv. M. Thoman requests additional NFRC 203 evaluation.
 - v. S. Fronck 3D and 2D plots not consumer friendly. Need better graphic.
 - R Garries – We should include this in survey.
 - vi. S Fronck should we consider UV rating to accompany daylighting potential?
 - b. Initial consumer information plan
 - i. See R. Garries presentation.
 - c. Concept proposal update
 - i. See R. Garries presentation
 - d. Next steps
 - i. See R. Garries presentation.
6. Unfinished Business
 - a. None
7. New Business
 - a. R LeBrun will be retiring soon. N. Digert will be the new Vice Chair.
8. The meeting was adjourned at 8:48 AM



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

AGENDA

Condensation Resistance Subcommittee

March 2019

Chair: Kevin Vilhauer, *Milgard Manufacturing, Inc.*

Vice Chair: Steve Harp, *Associated Materials*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Subcommittee Voting Requirements: one vote per member company

2. Appoint Recording Secretary (NFRC STAFF)

3. Approve Minutes from Fall 2018 meeting in Albuquerque, NM

4. Review and Approve Agenda

5. Reports

- a. Condensation Resistance Task Group (D. Anderson)

6. New Business

- a. NFRC 500 Condensation Resistance Ballot
- b. NFRC 501 Condensation Resistance Ballot
- c. Harmonization Efforts with AAMA, CSA, ASTM

7. Adjourn

SCOPE

The Condensation Resistance Subcommittee is responsible for developing and coordinating NFRC 500: Procedure for Determining Fenestration Product Condensation Resistance Values and NFRC 501: User Guide to the Procedure for Determining Fenestration Product Condensation Resistance Rating Values.

Committee Chain: Technical Committee * Condensation Resistance Subcommittee
*NFRC Staff Liaison: Scott R. Hanlon, Director, Program Operations * shanlon@nfr.org*



NFRC 2018 Fall Membership Meeting
October 8-10, 2018, Albuquerque, NM

Minutes

NFRC Condensation Resistance Subcommittee

Wednesday, October 10, 2018

Chair: Kevin Vilhauer, Milgard Manufacturing, Inc.

Vice Chair: Steve Harp, Associated Materials

1. K. Vilhauer called the meeting to order at 9:04am MDT
2. A. Rawson was appointed recording secretary.
3. Minutes from March 2018 (St. Louis) were approved as presented.
4. The agenda was reviewed and approved presented.
5. Reports
 - a. Condensation Resistance Task Group - D. Anderson reported 2 ballots will be under new business.
6. New Business
 - a. NFRC 500 Condensation Resistance Ballot
 - i. Cardinal: J. Larson (Section 4.3.2.3) – NEG
MOTION: J. Larson / S. Strawn move to find this negative Persuasive and substantive with recommendation to use the 1/2" location. Motion passes by UVV.
 - ii. Quast Consulting and Testing, Inc.: S. Skoglund (Section: Instructions) - NEG
MOTION: S. Skoglund / D Anderson move to find this negative Persuasive and Editorial. Motion passes by UVV
 - iii. WESTLab: J. Baker (General) - NEG
Withdrawn
 - iv. Roetzel & Andress: T. Zaremba (General) - NEG
MOTION: D Anderson / T. Culp move to find this negative Persuasive and Substantive. Motion passes by UVV.
 - v. JELD-WEN Inc.: S. Strawn (General) - NEG
Withdrawn
 - vi. VELUX AMERICA: R. LeBrun (General) - NEG
Withdrawn
 - b. NFRC 501 Condensation Resistance Ballot
 - i. Cardinal: J. Larson (Section: Table 7-1) - NEG
MOTION: J. Larson / S Harp move to find this negative Persuasive and Substantive. Motion passes by UVV.
 - ii. WESTLab: J. Baker (General) - NEG

Withdrawn

- iii. Roetzel & Andress: T. Zaremba (General) - NEG

MOTION: J Hayden / M Fritz move to find this negative Persuasive and substantive. Motion passes by UVV.

- iv. JELD-WEN Inc.: S. Strawn (General) - NEG

Withdrawn

- v. Milgard Manufacturing: K. Vilhauer (General) - NEG

MOTION: S Harp / S Strawn move to find this negative Persuasive and Editorial. Motion passes by UVV.

- vi. Madico, Inc.: J. Manship (General) - NEG

MOTION: J. Manship / J. Hayden move to find this negative Persuasive and Editorial. Motion passes by UVV.

- vii. VELUX AMERICA: R. LeBrun (General) - NEG

Withdrawn

- c. Harmonization Efforts with AAMA, CSA, ASTM – D. Anderson reported on the collaboration efforts that are occurring during the task and work group.

- 7. The meeting was adjourned at 9:35am MDT



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

AGENDA

U-factor Subcommittee

March 2019

Chair: Anthony Cinnamon, *Wiss, Janney, Elstner Associates, Inc.*

Vice Chair: *Bipin Shah, WinBuild, Inc.*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Subcommittee Voting Requirements: one vote per member company

2. Appoint Recording Secretary (NFRC STAFF)

3. Approve Minutes from Fall 2018 meeting in Albuquerque, NM

4. Review and Approve Agenda

5. Reports

- a. Door Task Group (S. Jaspersen)
- b. NFRC 100 Product Line Updating TG (M. Fritz)
- c. Skylight Task Group (R. LeBrun)
- d. Simulators Task Group (S. Coble)
- e. Spandrel Validation Task Group (A. Cinnamon)
- f. TDD Task Group (N. Digert)
- g. Testing Laboratory Task Group (M. Thoman)

6. New Business

- a. ANSI / NFRC 100 Diffused Glazing Ballot
- b. ANSI / NFRC 100 Obscure Glazing Ballot
- c. ANSI / NFRC 100 "OO" Ballot
- d. Grid Add-on concept (RCBC TG)

7. Adjourn

SCOPE

The U-factor Subcommittee is responsible for developing and coordinating NFRC 100: The Technical Procedures for Determining Fenestration Product U-Factors.



NFRC 2018 Fall Membership Meeting
October 8-10, 2018, Albuquerque, NM

Minutes

U-Factor Subcommittee

Wednesday, October 10, 2018

Chair: Anthony Cinnamon, Wiss, Janney, Elstner Associates, Inc.

Vice Chair: Bipin Shah, WinBuild, Inc.

1. A. Cinnamon called the meeting to order at 9:36am MDT
2. S. Urich was appointed recording secretary.
3. Minutes from March 2018 (St. Louis) were approved as presented
4. The agenda was reviewed and approved as modified
5. Reports
 - a. Door Task Group – S. Jaspersen reported there is no action
 - b. NFRC 100 Product Line Updating TG – M. Fritz reported task group is continuing with review of the products in Table 4-3 for updating. Looking at moving the footnotes into the body of the document.
 - c. Skylight Task Group – R. LeBrun reported no meetings/no action
 - d. Simulators Task Group – K. Louder (staff) reported no meetings/no action. Will meet post ILC for actions. Floor comment by member: Looking for a new chair for the TG.
 - e. Spandrel Validation Task Group – A. Cinnamon reported still working on physical testing. Hoping to bring more information forward Spring 2019.
 - f. TDD Task Group – N. Digert reported no action. Looking at computational fluid dynamics for calculating ratings.
 - g. Testing Laboratory Task Group – M. Thoman reported no meetings. Presented data on 4th surface low e data showing tests validate with simulations at one laboratory. Results may not apply at other laboratories. Potential issues with higher U-factors and/or 4th surface ONLY low-e.
6. New Business
 - a. ANSI / NFRC 100 Grid / 3mm / 6mm Ballot
 - i. WESTLab: J. Baker (General) – NEG

MOTION: J. Baker / M. Mikkelson move to find this negative substantive and persuasive and terminate the concept of using only 3mm and 6mm glass for U-factor ratings. Motion passes by VV.

MOTION: J. Baker / S. Strawn move to find this negative substantive and persuasive and request the RCBC TG to revisit the concept for an add-on value for grids. Motion passes by UVV.
 - ii. Marvin Windows: D. McDonald (General) – NEG

Withdrawn based on previous action
 - iii. Kolbe & Kolbe Millwork Co., Inc.: S. Schreiber (General) – NEG

- Withdrawn based on previous action
- iv. Vitro Architectural Glass: M. Buchanan (General) – NEG
Withdrawn
 - v. Quast Consulting and Testing: S. Skoglund (General) – NEG
Withdrawn
 - vi. Andersen Corporation: M. Mikkelson (General) – NEG
Withdrawn based on previous action
 - vii. Intertek-ATI: M. Thoman (General) – NEG
Withdrawn
 - viii. Masonite International Corporation: T. Reid (General) – NEG
Withdrawn
 - ix. UL, LLC.: D. Anderson (General) – NEG
Withdrawn
 - x. PGT Industries: E. Koss (General) – NEG
Withdrawn based on previous action
 - xi. WSP: C. Hernandez (General) – NEG
Withdrawn
 - xii. Milgard: K. Vilhauer (General) – NEG
Withdrawn
 - xiii. California Energy Commission: P. Bozorgchami (General) – NEG
Withdrawn
 - xiv. Keystone Certifications, Inc.: J. Hill (Section 5.9.3.1.1.H) – NEG
MOTION: J. Hayden / J. Baker move to find this non-persuasive based on previous action. Motion passes by UVV.
 - xv. Windsor Windows: P. Weber (Section 5.9.3.1.1.H) – APC
Withdrawn
- b. ANSI / NFRC 100 Table 4-3 Ballot
- i. UL, LLC: D. Anderson (Table 4-3 including notes) – NEG
Withdrawn
 - ii. NCTL: J. Gordon (Table 4-3) – NEG
Withdrawn
 - iii. WESTLab: J. Baker (Table 4-3) – NEG
Withdrawn
 - iv. Intertek-ATI: M. Thoman (Table 4-3) – NEG
Withdrawn with commitment to fix the table.
 - v. Quast Consulting & Testing: S. Skoglund (Table 4-3) – NEG

MOTION: S. Skoglund withdrawn with commitment to fix the table.

MOTION: M. Fritz / J. Hayden move to send the ballot to the Technical Committee for approval and to forward to the Board for approval with implementation upon publication and completion of any required changes to the CPD. Motion passes by UVV with 2 abstentions.

- c. ANSI / NFRC 100 Diffused Glazing Ballot
 - i. Andersen Corporation: M. Mikkelson (General) – NEG

MOTION: M. Mikkelson / S. Strawn move to find this negative substantive and persuasive and send back to Diffused Glazing TG. Motion passes by UVV.
 - ii. Pella Windows and Doors: J. Hayden (Section 4.3.1.D) – NEG

Withdrawn based on previous action
 - iii. AAMA: J. Seals (General) – NEG

Withdrawn based on previous action
 - iv. JELD-WEN, Inc.: S. Strawn (General) – NEG

Withdrawn based on previous action
 - v. WESTLab: J. Baker (General) – NEG

Withdrawn based on previous action
 - d. ANSI / NFRC 100 Trendline Ballot
 - i. California Energy Commission: P. Bozorgchami (Section 5.11.2) – NEG

Withdrawn
 - ii. UL, LLC: D. Anderson (Section 5.11.4.1.2) – NEG

MOTION: D. Anderson / S. Strawn move to find this negative persuasive and editorial as modified “shall use methodology per Section 4”. Motion passes by UVV.
 - iii. Keystone Certifications, Inc.: J. Hill (Section 5.11.7.B) – NEG

MOTION: S. Strawn / J. Hayden move to find this negative persuasive and editorial. Motion passes by UVV.

MOTION: S. Strawn / J. Baker move to send the ballot to the Technical Committee for approval and to forward to the Board for approval with implementation upon publication and completion of other documents associated with the RCBC methodology are ready for implementation. Motion passes by UVV.
 - e. Scenic Doors TG – B. Fevold to report back to the U-factor SC on the task group work at the CSA A440 group. Any other NFRC members that wish to join that CSA TG are welcome to join.
 - f. New chair for Simulators TG – S. Coble, WESTLab volunteered and was appointed as TG chair by the U-factor SC chair.
7. The meeting was adjourned at 10:55am MDT



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

AGENDA

Solar Heat Gain Coefficient Subcommittee

March 2019

Chair: Lisa Winckler, *Eastman, Performance Films Division*

Vice Chair: *Brad Schultz, ALI*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Subcommittee Voting Requirements: one vote per member company

2. Appoint Recording Secretary (NFRC STAFF)

3. Approve Minutes from Fall 2018 meeting in Albuquerque, NM

4. Review and Approve Agenda

5. Reports

- a. TDD Task Group (N. Digert)

6. New Business

- a. ANSI / NFRC 200 Diffused Glazing Ballot
- b. ANSI / NFRC 200 Obscure Glazing Ballot

7. Adjourn

SCOPE

The Solar Heat Gain Subcommittee is responsible for developing and coordinating NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Transmittance at Normal Incidence.

Committee Chain: Technical Committee * Solar Heat Gain Coefficient Subcommittee
NFRC Staff Liaison: Scott R. Hanlon, Director, Program Operations * shanlon@nfr.org



NFRC 2018 Fall Membership Meeting
October 8-10, 2018, Albuquerque, NM

Minutes

Solar Heat Gain Coefficient Subcommittee

Wednesday, October 10, 2018

Chair: Lisa Winckler, Eastman, Performance Films Division

Vice Chair: Brad Schultz, ALI

1. L. Winckler called the meeting to order at 10:55am MDT
2. S. Urich was appointed recording secretary.
3. Minutes from March 2018 (St. Louis) were approved as presented.
4. The agenda was reviewed and approved as presented.
5. Reports
 - a. TDD Task Group – N. Digert reported the TG will be meeting to review research on future changes to NFRC 203.
6. New Business
 - a. ANSI / NFRC 200 Grid / 3mm / 6mm Ballot
 - i. WESTLab: J. Baker (General) – NEG

MOTION: J. Baker / M. Mikkelson move to find the motion persuasive and substantive and terminate the balloted concept of using only 3mm and 6mm glass for SHGC/VT ratings and request the RCBC TG to revisit the concept for an add-on value for grids. Motion passes by VV.
 - ii. Marvin Windows: D. McDonald (General) – NEG
Withdrawn
 - iii. Kolbe & Kolbe Millwork Co., Inc.: S. Schreiber (General) – NEG
Withdrawn
 - iv. Vitro Architectural Glass: M. Buchanan (General) – NEG
Withdrawn
 - v. Quast Consulting & Testing: S. Skoglund (General) – NEG
Withdrawn
 - vi. Andersen Corporation: M. Mikkelson (General) – NEG
Withdrawn
 - vii. Intertek-ATI: M. Thoman (General) – NEG
Withdrawn
 - viii. Masonite International Corporation: T. Reid (General) – NEG
Withdrawn
 - ix. UL, LLC: D. Anderson (General) – NEG

Withdrawn

- x. PGT Industries: E. Koss (General) – NEG

Withdrawn

- xi. WSP: C. Hernandez (General) – NEG

Withdrawn

- xii. Associated Labs: B. Schultz (General) – NEG

Withdrawn

- xiii. California Energy Commission: P. Bozorgchami (General) – NEG

Withdrawn

- b. ANSI / NFRC 200 Diffused Glazing Ballot

- i. Andersen Corporation: M. Mikkelson (General) – NEG

MOTION: M. Mikkelson / J. Hayden move to find this negative substantive and send back to Diffused Glazing TG. Motion passes by UVV.

- ii. Pella Windows and Doors: J. Hayden (Section 2.1.E) – NEG

Withdrawn based on previous action

- iii. AAMA: J. Seals (General) – NEG

Withdrawn based on previous action

- iv. JELD-WEN, Inc.: S. Strawn (General) – NEG

Withdrawn based on previous action

- v. WESTLab: J. Baker (General) – NEG

Withdrawn based on previous action

- c. CSA TG – B. Fevold to report back to the U-factor SC on the task group work at the CSA A440 group. Any other NFRC members that wish to join that CSA TG are welcome to join.

7. The meeting was adjourned at 11:05 a.m.

8. M. Thoman reconvened the meeting at 12:22 p.m.

9. S. Urich was appointed recording secretary.

10. New Business

- a. **MOTION:** J. Baker / B. Shah move to send the ANSI/NFRC 200 ballot to the Technical Committee for approval and to forward to the Board for approval with implementation upon publication and completion of other documents associated with the RCBC methodology are ready for implementation. Motion passes UVV.

11. The meeting was adjourned at 12:27 p.m.



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

AGENDA

Ventilation Subcommittee

Wednesday, Marcy 27, 2019

Block Period: 8:00 a.m. – 12:00 p.m.

Chair: *Ray Garries, MI Window*

Vice Chair: *TBD*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Subcommittee Voting Requirements: one vote per member company

2. Appoint Recording Secretary (NFRC STAFF)

3. Approve Minutes from Fall 2018 meeting in Albuquerque, NM

4. Review and Approve Agenda

5. Reports

- a. Venilation Rating Task Group (R. Garries)

6. New Business

- a. None.

7. Adjourn

SCOPE

To create a NFRC Ventilation rating system utilizing net clear opening less a screen factor.

Committee Chain: Technical Committee * Ventilation Subcommittee
NFRC Staff Liaison: Michelle Scism mscism@nfr.org



NFRC 2018 Fall Membership Meeting
October 8-10, 2018, Albuquerque, NM

Minutes

Ventilation Subcommittee

Wednesday, October 10, 2018

Technical Committee Block: 08:00 a.m. – 02:30 p.m.

Chair: Ray Garries, MI Windows and doors

Vice Chair: NA

1. R. Garries called the meeting to order at 11:08 a.m.
2. S. Urich was appointed recording secretary.
3. Minutes from March 2018 (St. Louis) were approved as presented.
4. The agenda was reviewed and approved as presented.
5. Reports
 - a. Ventilation Ratings Task Group – (R. Garries)
 - i. Review of Andersen concerns
 - ii. Review of response plan and physical testing
 - iii. Latest physical testing results
 - iv. Screen effect and partial opening effect discussion
 - v. Next Steps

R. Garries presented an update on the latest test results, calculations, and screen effect. The test results show a possible need to revise the VA calculation in the standard. The change to the calculation needs to go to the TG for review.

TG will review latest findings and create a ballot for the 401.

Request to review aspect ratio, inflow vs. outflow, screen factor.

MOTION: M. Mikkelson / J. Hayden move to accept the motion of the task group to forward on to the Technical Committee. Motion passes 26-5-15.
6. New Business
7. The meeting was adjourned at 12:24 p.m.



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

AGENDA

Technical Committee

March 2019

Chair: Michael Thoman, *Intertek, Inc.*

Vice Chair: Lisa Winkler, *Eastman, Performance Films Division*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Committee Voting Requirements: one vote per member company listed on the roster.

2. Appoint Recording Secretary

3. Roll Call/Establish Quorum

4. Review and Approve Agenda

5. Approve Minutes from Fall 2019 meeting in Albuquerque, NM

6. Convene Subcommittees Meetings (Reference SC agendas)

- a. Software Subcommittee (C. Best, R. Harnden)
- b. Component Modeling Approach Subcommittee (M. Fritz, M. Bhandari)
- c. Daylighting Subcommittee (R. Garries, N. Digert)
- d. Ventilation Subcommittee (R. Garries, TBD)
- e. Condensation Resistance Subcommittee (K. Vilhauer, S. Harp)
- f. U-factor Subcommittee (A. Cinnamon, B. Shah)
- g. Solar Heat Gain Subcommittee (L. Winckler, B. Schultz)

7. Reports

- a. Remaining Subcommittee Items as needed
- b. Residential Component Based Calculation Task Group (S. Strawn, M. Webb)
- c. Warm Edge Spacer Task Group – (T. Culp)

8. Future Document Cycle – ANSI

9. New Business

- a. Task group reporting concept – M. Thoman / Staff

10. Adjourn

SCOPE

The Technical Committee is responsible for developing rating system tools and procedures necessary to ensure the technical accuracy of the rating system.

Committee Chain: Technical Committee

NFRC Staff Liaison: Scott R. Hanlon, Director, Program Operations * shanlon@nfr.org



NFRC 2018 Fall Membership Meeting
October 8-10, 2018, Albuquerque, NM

Minutes

Technical Committee

Wednesday, October 10, 2018

Chair: Michael Thoman, Intertek-ATI

Vice Chair: Lisa Winckler, Eastman, Performance Films Division

1. M. Thoman called the meeting to order at 12:29pm MDT
2. S. Urich was appointed recording secretary
3. Roll call was taken a quorum was established
4. Minutes from March 2018 (St. Louis) were approved as presented
5. The agenda was reviewed and approved as presented
6. Reports
 - a. Daylighting Subcommittee – R. Garries reported no new action from SC meeting
 - b. Ventilation Subcommittee
 - i. **MOTION:** J. Baker / J. Hayden move to accept the motion of the Ventilation Subcommittee to forward on to the board. Motion passes by UVV.
 - c. Component Modeling Approach Subcommittee – M. Fritz reported no new action from SC meeting
 - d. Condensation Resistance Subcommittee – K. Vilhauer reported two ballots are going back to TG
 - e. U-factor Subcommittee
 - i. **MOTION:** A. Cinnamon / B. Shah move to send the ANSI/NFRC 100 OO ballot to the Board for approval with implementation upon publication and completion of any required changes to the CPD. Motion passes by UVV.
 - ii. **MOTION:** A. Cinnamon / S. Strawn move to send the NFRC 100 Trendline ballot to the Board for approval with implementation upon publication when completion of the other documents associated with the RCBC methodology are ready for implementation. Motion passes by UVV.
 - f. Solar Heat Gain Subcommittee
 - i. **MOTION:** L. Winckler / S. Strawn move to send the ANSI/NFRC 200 Trendline ballot from Spring 2018 meeting to the Board for approval with implementation upon publication when completion of other documents associated with the RCBC methodology are ready for implementation. Motion passes by UVV.
 - g. Software Subcommittee – M. Thoman reported the SC is currently looking for a new chair
 - h. Residential Component Based Calculation Task Group (S. Strawn, M. Webb)
 - i. S. Strawn reported no new action from the SC meeting.

7. Future ANSI Document Cycle – J. Hayden reported the next cycle will start 1 year from now.
8. New Business
 - a. Task Group reporting concept – M. Thoman / Staff – Would like to implement the concept of having TGs report to whichever SC/Committee makes the most sense. Looking to eliminate redundancy of TGs reporting to multiple SCs/Committees.
 - b. Warm Edge Spacer Task Group – T. Culp – create a TG to “Clarify the use of the term ‘warm edge spacer system’ through use of standardized definitions and calculation method.” T. Culp to chair. D. Hauck, T. Cinnamon, M. Fritz, B. Hensley, B. Shah
9. The meeting was adjourned at 12:47pm MDT



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

Program Booklet

Technical Committee Roster (as of March 11, 2019)

AGC Glass Company North America	National Certified Testing Laboratories
American Architectural Manufacturers Association	Natural Light Energy Systems DBA Kennedy Skylights
Andersen Corporation	Oak Ridge National Laboratory
Apogee Enterprises	ODL Inc
Associated Laboratories, Inc.	Oldcastle Building Envelope
Associated Materials, Inc.	Pella Windows and Doors
Benson Industries	PGT Industries
Birch Point Consulting, LLC	Pilkington North America, Inc.
California Energy Commission	Pleotint
Cardinal Glass Industries, Inc.	Ply Gem Window Group
Chelsea Building Products	PlyGem Windows
Door and Access Systems Manufacturers Assoc	Quanex
Eastman Chemical Company	Quast Consulting and Testing, Inc
Efficient Windows Collaborative	Roetzel & Andress
Element Materials Technology	SaintGobain Solar Gard, LLC
Energi Fenestration Solutions	Solatube International, Inc.
Guardian Fabrication Central	Sunrise Windows, Ltd.
Insulating Glass Certification Council (IGCC)	Technoform
Insulating Glass Manufacturers Alliance (IGMA)	Therma-Tru
International Window Film Association	Tremco, Inc.
Intertek-ATI	Turner Engineering & Consulting, Inc.
Intigral	UL, LLC
JELD-WEN, inc.	VEKA Inc.
Kawneer	VELUX America LLC
Keystone Certifications, Inc.	Vitro Architectural Glass
Kolbe & Kolbe Millwork Co., Inc.	Western Window Systems
Lawrence Berkeley National Laboratory (LBNL)	WESTLab
Madico, Inc.	WinBuild, Inc.
Manko Window Systems, Inc.	Window and Door Manufacturers Association (WDMA)
Marvin Windows and Doors	Windsor Windows and Doors
Masonite International Corporation	Wiss, Janney, Elstner Associates
Mathews Brothers Company	World Millwork Alliance
MI Windows and Doors	WSP
Milgard Manufacturing, Inc.	

**Committee Membership requires members to sign up onsite at meeting (or by [sending an email](#) while attending meeting) for inclusion on roster/voting rights. Please note, if two consecutive meetings are missed without a voting representative being at the meeting (checked via meeting registration) the company will be dropped and interested parties must sign up once again.*

Only those organizations that have paid NFRC membership dues as of March 11, 2019, will be eligible to vote at the meeting.

*If you notice a problem, PLEASE contact the staff of NFRC as soon as possible. **Discrepancies cannot be addressed after March 22, 2019:** jfinn@nfr.org*



NFRC 2019 Spring Membership Meeting
March 25th – 27th, 2019, Baltimore, MD

AGENDA

NFRC 700 PCP Certification Subcommittee

Wednesday, March 27, 2019

Ratings Committee Block: #:## pm - #:## pm

Chair: *Jason Seals, AAMA*

Vice Chair: *Brad Schultz, ALI*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Subcommittee Voting Requirements: one vote per member company

2. Appoint Recording Secretary (STAFF)

3. Approve Minutes from October 2018 meeting in Albuquerque, NM

4. Review and Approve Agenda

5. Reports

- a. NFRC 700 PCP Review TG – J. McFee, WDMA
- b. Certification Process Streamline Task Group – S. Strawn, JELD-WEN
- c. Ventilation Rating Task Group – R. Garries

6. New Business

- a. NFRC 700 SDR Ballot
- b. NFRC 700 Component Test Report Ballot
- c. NFRC 700 Label Size Ballot

7. Adjourn

SCOPE

To create and maintain Product Certification Program (PCP) document and procedures.

Committee Chain: *Ratings Committee * NFRC 700 PCP Certification Subcommittee
NFRC Staff Liaison: Steven Urich, Director, Programs * surich@nfr.org



NFRC 2018 Fall Membership Meeting
October 8-10, 2018, Albuquerque, NM

Minutes

NFRC 700 PCP Certification Subcommittee

Wednesday, October 10, 2018

Ratings Committee Block: 2:30 pm -4:30 pm

Chair: Jason Seals, AAMA

Vice Chair: Brad Schultz, ALI

1. J. Seals called the meeting to order at 2:31 p.m.
2. S. McDowell was appointed recording secretary.
3. Minutes from March 2018 (St. Louis) were approved as presented.
4. The agenda was reviewed and approved as presented.
5. Reports
 - a. NFRC 700 PCP Review TG – J. McFee, WDMA
 - i. J. McFee reported brought four ballots forward
 - b. Certification Process Streamline Task Group – S. Strawn, JELD-WEN
 - i. S. Strawn reported staff is moving forward with activities
 - c. Ventilation Rating Task Group – R. Garries
 - i. No Report
6. New Business
 - a. **NFRC 700 Grids and 3, 6mm Glass Ballot**
 - i. WESTLab: J. Baker (General) – NEG Persuasive and Substantive
MOTION: J. Baker / M. Mikkelson Find the persuasive and substantive and move to abandon the 3mm and 6mm concept and send the grid simplification back to the RCBC for further study. Motion passes by UVV.
 - ii. Marvin Windows: D. McDonald (General) – NEG Persuasive and Substantive
Withdrawn
 - iii. Kolbe & Kolbe Millwork Co.: S. Schreiber (General) – NEG Persuasive and Substantive
Withdrawn
 - iv. Vitro Architectural Glass: M. Buchanan (General) – NEG Persuasive and Substantive
Withdrawn
 - v. Quast Consulting and Testing, Inc: S. Skoglund (General) – NEG Persuasive and Substantive
Withdrawn
 - vi. Andersen Corporation: M. Mikkelson (General) – NEG Persuasive and Substantive
Withdrawn based on previous action
 - vii. Intertek-ATI: M. Tohman (General) – NEG Persuasive and Substantive

MOTION: J. Baker / M Fritz move to find this negative non-persuasive based on previous action. Motion passes by UVV.

- viii. Masonite International Corporation: T. Reid (General) – NEG Persuasive and Substantive

Withdrawn

- ix. UL, LLC: D. Anderson (General) – NEG Persuasive and Substantive

Withdrawn

- x. PGT Industries: E. Koss (General) – NEG Persuasive and Substantive

Withdrawn

- xi. WSP: C. Hernandez (General) – NEG Persuasive and Substantive

MOTION: J. Baker / S. Strawn move to find this negative non-persuasive based on previous action. Motion passes by UVV.

- xii. Associated Labs: B. Shultz (General) – NEG Persuasive and Substantive

Withdrawn

- xiii. California Energy Commission: P. Bozorgchami (General) – NEG Persuasive and Substantive

Withdrawn

b. NFRC 700 Retesting Fees Ballot

- i. Intertek-ATI: M. Thoman (8.6.1.5.D) – NEG Substantive

MOTION: M. Fritz / J. Baker move to find this negative non-persuasive. Motion passes by UVV.

- ii. WinTech: M. Castleberry (8.6.1.5) – NEG Substantive

MOTION: J. Hayden / S. Strawn move to find this negative non-persuasive. Motion passes by UVV.

MOTION: S. Strawn / B. Sitlinger move to forward to Ratings Committee for approval and to forward to the board for approval and implementation upon publication. Motion passes by UVV.

c. NFRC 700 Test Only Product Lines Ballot

- i. Intertek-ATI: M. Thoman (General) – NEG Substantive

MOTION: D. Anderson / S. Strawn move to find this negative non-persuasive. Motion passes by UVV.

MOTION: K. Seiling / B. Sitlinger move to forward to Ratings Committee for approval and to forward to the board for approval and implementation upon publication. Motion passes by UVV.

d. NFRC 700 SDR Ballot

- i. UL, LLC: D. Anderson (General) – NEG Persuasive and Substantive

MOTION: D. Anderson / S. Harp move to find this negative persuasive and substantive send back to task group to revise the flow chart. Motion passes by UVV.

- ii. AAMA: S. Strawn – NEG Persuasive and Editorial

MOTION: S. Strawn / J. Hayden move to find this negative persuasive and editorial. Motion passes by UVV.

- iii. Jeld-Wen: S. Strawn (General) – NEG Editorial

Withdrawn based on previous action.

7. New Business
8. The meeting was adjourned at 2:58 p.m.



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

AGENDA

NFRC 705 CMA-PCP Certification Subcommittee

Wednesday, March 27, 2019

Ratings Committee Block

Chair: *Catherine Best, RWDI*

Vice Chair: *Mason Fritz, EFCO Corp*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Subcommittee Voting Requirements: one vote per member company

2. Appoint Recording Secretary (STAFF)

3. Approve Minutes from Fall 2018 meeting in Albuquerque, NM

4. Review and Approve Agenda

5. Reports

- a. NFRC 705 CMA PCP TG – M. Fritz, EFCO

6. New Business

7. Adjourn

SCOPE

To maintain a component-based certification and rating procedure for fenestration products that will yield accurate energy performance data for use in code compliance and for meaningful building energy analysis. The certification and rating program shall be credible, simple, cost-effective, fair, uniform, and useful.

Committee Chain: *Ratings Committee * NFRC 705 CMA PCP Certification Subcommittee
NFRC Staff Liaison: April Rawson, Commercial Program Manager arawson@nfr.org



NFRC 2018 Fall Membership Meeting
October 8-10, 2018, Albuquerque, NM

Minutes

NFRC 705 CMA Certification Subcommittee

Wednesday, October 10, 2018

Ratings Committee Block: 2:30 pm -4:30 pm

Chair: Mason Fritz, EFCO Corp (Acting)

Vice Chair: Mason Fritz, EFCO Corp

1. M. Fritz called the meeting to order at 2:57 p.m.
2. S. McDowell was appointed recording secretary.
3. Minutes from March 2018 (St. Louis) were approved as presented.
4. The agenda was reviewed and approved as presented.
5. Reports
 - a. NFRC 705 CMA PCP TG – M. Fritz, EFCO
 - i. M. Fritz reported have one ballot under new business
6. New Business
 - a. **NFRC 705 Grids and 3, 6mm Glass Ballot**
 - i. WESTLab: J. Baker (General) – NEG Persuasive and Substantive
MOTION: J. Baker / M. Mikkelson move to find this negative substantive and to abandon 3mm and 6mm concept.
Motion passes by UVV.
 - ii. Marvin Windows: D. McDonald (General) – NEG Persuasive and Substantive
Withdrawn based on previous action
 - iii. Kolbe & Kolbe Millwork Co.: S. Schreiber (General) – NEG Persuasive and Substantive
Withdrawn based on previous action
 - iv. Quast Consulting and Testing, Inc: S. Skoglund (General) – NEG Persuasive and Substantive
Withdrawn based on previous action
 - v. Andersen Corporation: D. Anderson (General) – NEG Persuasive and Substantive
Withdrawn based on previous action
 - vi. Intertek-ATI: M. Tohman (General) – NEG Persuasive and Substantive
MOTION: J Baker. / E. Koss move to find this negative non persuasive based on previous action.
Motion passes by UVV.
 - vii. Masonite International Corporation: T. Reid (General) – NEG Persuasive and Substantive
Withdrawn based on previous action
 - viii. PGT Industries: E. Koss (General) – NEG Persuasive and Substantive

Withdrawn based on previous action

- ix. WSP: C. Hernandez (General) – NEG Persuasive and Substantive

MOTION: J Baker / E. Koss move to find this negative non persuasive based on previous action.

Motion passes by UVV.

- x. California Energy Commission: P. Bozorgchami (General) – NEG Persuasive and Substantive

Withdrawn based on previous action

- xi. Madico, Inc. J. Manship (4.1.3) – NEG Persuasive and Editorial

MOTION: D. Anderson / B. Sitlinger move to find this negative non-germane. Motion passes by UVV.

b. NFRC 705 Product Configuration Ballot

- i. Intertek-ATI: M. Thoman (4.2.C) – NEG Persuasive and Substantive

MOTION: G McKenna / B. Shah move to find this negative non persuasive but ask the technical committee to review NFRC 100.

Motion passes by UVV.

- ii. UL, LLC: D. Anderson (4.2.C) – NEG Persuasive and Substantive

Withdrawn based on the understanding that CMAST will be corrected.

MOTION: M. Bhandari / J. Baker move to send ballot to the Ratings Committee for approval and to send to the board for approval with implementation held in abeyance until CMAST can be updated.

Motion passes UVV

c. New Chair for Subcommittee

- i. Request for volunteers to be chair issued

d. New Chair for Task Group

- i. Request for volunteers to be chair issued

- 7. The meeting was adjourned at 3:26 p.m.



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

AGENDA

Ratings Committee

March 2019

Chair: *Sue Schreiber, Kolbe and Kolbe Millwork*

Vice Chair: *Sherri Wendt, Quast Consulting*

1. Call to Order

- a. Welcome to All AttendeesCell phones & laptops to silent mode
- b. Antitrust Reminder
- c. NFRC Meeting Guidelines
- d. Review Committee Voting Requirements: one vote per member company listed on the roster.

2. Appoint Recording Secretary

3. Roll Call/Establish Quorum

4. Review and Approve Agenda

5. Approve Minutes from Fall 2019 meeting in Albuquerque, NM

6. Convene Subcommittees Meetings (Reference SC agendas)

- a. NFRC 700 PCP Certification Subcommittee (J. Seals, B. Schultz)
- b. NFRC 705 CMA-PCP Certification Subcommittee (C. Best, M. Fritz)

7. Reports

- a. Remaining Subcommittee Items as needed
- b. Alternate Terminology Exploration Task Group (J. Seals)

8. New Business

- a. TBD

9. Adjourn

SCOPE

The Ratings Committee is responsible for developing programs to assure the uniform application of ratings including the NFRC Label for NFRC technical procedures.

Committee Chain: Ratings Committee

NFRC Staff Liaison: Scott R. Hanlon, Director, Program Operations * shanlon@nfr.org



NFRC 2018 Fall Membership Meeting
October 8-10, 2018, Albuquerque, NM

Minutes

NFRC Ratings Committee

Wednesday, October 10, 2018

Chair: John McFee, WDMA

Vice Chair: TBD

1. J. McFee called the meeting to order at 3:35pm MDT
2. A quorum was established
3. S. McDowell was appointed recording secretary.
4. Minutes from March 2018 (St. Louis) were approved as presented.
5. The agenda was reviewed and approved as presented.
6. Reports
 - a. NFRC 700 PCP Certification Subcommittee – J. Seals, AAMA
 - i. **Motion:** J. Seals / M. Fritz: move to forward the NFRC 700 Retesting Fees Ballot to the Board of Directors for approval and implementation upon publication. Motion passes by UVV
 - ii. **Motion:** J. Seals / M. Fritz: move to forward the NFRC 700 Test Only Product Line Expiration Dates Ballot to the Board of Directors for approval and implementation upon publication. Motion passes by UVV
 - b. NFRC 705 CMA-PCP Certification Subcommittee – M. Fritz, EFCO Corp
 - i. **Motion:** M. Fritz / J. Baker: move to forward the NFRC 705 Product Configuration Ballot to the Board of Directors for approval and implementation upon publication and held in abeyance until CMAST can be updated. Motion passes by UVV
 - c. Alternate Terminology Exploration Task Group – J. Seals reported no action to present.
7. New Business

Ratings Chair Transition: J. McFee reported that Sue Schreiber, Kolbe & Kolbe Millwork, Inc will become the Vice-Chair and in 2019 become the chair
8. The meeting was adjourned at 3:49pm MDT



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

Program Booklet

Ratings Committee Roster (as of March 11, 2019)

AGC Glass Company North America	Oak Ridge National Laboratory
American Architectural Manufacturers Association	ODL Inc
Andersen Corporation	Oldcastle Building Envelope
Apogee Enterprises	Pella Windows and Doors
Associated Laboratories, Inc.	PGT Industries
Associated Materials, Inc.	Pilkington North America, Inc.
Benson Industries	PlyGem Windows
Birch Point Consulting, LLC	Quanex
California Energy Commission	Quast Consulting and Testing, Inc
Cardinal Glass Industries, Inc.	Roetzel & Andress
Chelsea Building Products	SaintGobain Solar Gard, LLC
Door and Access Systems Manufacturers Association	Solatube International, Inc.
Eastman Chemical Company	Sunrise Windows, Ltd.
Efficient Windows Collaborative	Technoform
Element Materials Technology	Therma-Tru
Energi Fenestration Solutions	Tremco, Inc.
Guardian Fabrication Central	UL, LLC
Insulating Glass Certification Council (IGCC)	VEKA Inc.
Insulating Glass Manufacturers Alliance (IGMA)	VELUX America LLC
International Window Film Association	Vitro Architectural Glass
Intertek-ATI	Western Window Systems
Intigral	WESTLab
JELD-WEN, inc.	WinBuild, Inc.
Kawneer	Window and Door Manufacturers Association (WDMA)
Keystone Certifications, Inc.	Windsor Windows and Doors
Kolbe & Kolbe Millwork Co., Inc.	World Millwork Alliance
Lawrence Berkeley National Laboratory (LBNL)	WSP
Madico, Inc.	
Manko Window Systems, Inc.	
Marvin Windows and Doors	
Masonite International Corporation	
Mathews Brothers Company	
MI Windows and Doors	
Milgard Manufacturing, Inc.	
National Certified Testing Laboratories	

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Only those organizations that have paid NFRC membership dues as of March 11, 2019, will be eligible to vote at the meeting.

*If you notice a problem, PLEASE contact the staff of NFRC as soon as possible. **Discrepancies cannot be addressed after March 22, 2019:** jfynn@nfr.org*



NFRC 2019 Spring Committee Meeting
March 25-27, 2019, Baltimore, MD

AGENDA

Board of Directors Meeting

Wednesday, March 27, 2019

Chair: *Paul Bush, Vitro Architectural Glass*

Vice Chair: *Daniel Huard, Global GreenTag Americas*

1. **Call to Order**
 - a. Roll Call/Establish Quorum
 - b. Welcome to All Attendees ... Cell phones & laptops to silent mode
2. **Review and Approve Agenda**
3. **Appoint Recording Secretary (NFRC Staff)**
4. **NFRC Meeting Action Items**
 - a. Research and Technology Committee - B. Shah
 - b. Technical Committee - M. Thoman
 - c. Ratings Committee – S. Schreiber
5. **Board Action Items**
6. **New Business**
 - a. Regulatory Affairs Update – D. Huard
7. **Adjourn**

Board of Directors

NFRC Staff Liaison: Deborah Callahan, Chief Executive Officer * dcallahan@nfr.org



NFRC Staff Directory 2019

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dcallahan@nfr.org

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Scott Hanlon
Director, Program Operations *Staff
Liaison – Accreditation Policy Committee;
Research & Technology, Technical, &
Ratings Committees; Solar Heat Gain
SC, Condensation Resistance TG;
Spandrel Validation TG; Residential
Component Based Calculation TG,
Environmentally Controlled Dynamic
Glazing TG; Door TG*
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shanlon@nfr.org

Steve Urich, PE
Director, Programs
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NFRC 2018 Fall Committee Meeting
October 8-10, 2018, Albuquerque, NM
Program Booklet

Guidelines for Orderly Conduct of NFRC Meetings

The following general guidelines apply to meetings of NFRC Committees and Subcommittees. As guidelines, committee/subcommittee chairs have the discretion in how rigidly to enforce these requirements (subject to being overruled by the members on a specific issue pursuant to a 2/3 majority). The intent is that committee/subcommittee chairs will use their good judgment in applying these rules to assist NFRC in conducting its meetings in an orderly fashion, while giving interested parties a reasonable opportunity to present their views. However, nothing in these guidelines, nor any flaw in committee and/or subcommittee conduct or procedure, will be construed to prohibit the NFRC Board from taking action on any matter if it deems it necessary in the best interests of the organization.

1. All material to be presented or discussed at an NFRC scheduled meeting shall be published as a listed item of the NFRC meeting agenda. The initial agenda shall be published 30 calendar days in advance of the meeting. All significant written or electronic presentations or documents to be handed out during the NFRC meeting shall be submitted to the committee chair and NFRC staff for review and determination of compliance with any applicable NFRC requirements. The presentations shall be submitted to the respective chair, who in turn would provide a copy to NFRC staff, no later than 15 calendar days before the NFRC meeting date. Any revisions to a published agenda shall be made by the chair no later than 12 calendar days before the NFRC scheduled meeting. The final meeting agenda shall be published by NFRC staff no later than 10 calendar days before a scheduled NFRC meeting. Issues not included on the published agenda can be brought up as announcements or for preliminary discussion only. No final action is to be taken on any item not specifically listed on the published agenda.
2. At a scheduled NFRC meeting, no person shall present his/her view until the chair recognizes the person to do so.
3. Minutes shall reflect all written ballot responses that are declared to be negatives and/or approved with comments and shall also reflect how each was addressed.



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4. All motions put forth in an NFRC meeting **MUST** be typed or written down on a designated Motion Form to be formally presented to the group and incorporated into the meeting minutes. Chairs shall provide enough time for the NFRC staff to type or collect any written motions and register them in the meeting minutes. The chair shall not proceed to a vote on an issue or to the next issue or agenda item until minute taker advises the chair that the needed action item has been duly registered, the motion form has been received, and the motion has been read to the group.

5. The minute taker shall register all action items in the meeting minutes. The minutes should try to contain a short summary of the proponent's reason for making the motion, so as to provide background for the intent. If modifications are made to the motion, there should also be a short summary of the intent for the modification. Unless recognized by the chair, minute taker shall not list any issues/notes other than the action items and short summary in meeting minutes.

6. Rules of common courtesy and Roberts Rules of Order generally apply to the conduct of NFRC meetings.

You have a VOICE - The NFRC Document Ballot Cycle – Details

NFRC - What is a Document Ballot?

The NFRC is grateful for its diverse community of volunteers who stand committed to keeping the NFRC's programs relevant and work diligently through task groups and subcommittees under the Research and Technology Committee, Technical Committee, and Ratings Committee. Much of the work concentrates on putting forth updates/changes to the NFRC's programs and technical documents as well as proposals for future research and research-related items.

The NFRC's document balloting process occurs two times per year--prior to the NFRC's Annual (Fall) and Committee Week meetings (Spring). This consensus-based process works to ensure that every company that participates through membership has an opportunity to share their expertise in the development and future success of the NFRC's varied programs.

- As ballots are reviewed, members are asked to vote one of three ways for each document up for review: Approve, Do Not Approve (Negative), or Abstain. Once the ballot cycle concludes (deadline for this cycle was February 23, 2018) all responses will be organized and a summary will be available for review approximately one week prior to the meeting.

These responses will then be discussed, reviewed, and voted on at the subcommittee meeting (upcoming meeting in St. Louis, MO, March 19-21, 2018).

Please note, below is a full description on the processing/categorization of these responses as well as the corresponding action as it will relate to the future of the ballot. [Review ballot summaries from current meeting \(also located on flash drive given to each registered attendee at registration\).](#)

✓ **Approve & Abstain Responses**

These responses are tallied and require no action by the subcommittee.

✓ **Processing of Negative Votes (Do Not Approve) on Written Ballots**

Subcommittees shall resolve negative votes on a subcommittee ballot at the next meeting. All negative votes must be submitted with specific written explanation for the basis or rationale for the negative vote and/or recommended alternative language. Important Note -

In the event that a negative vote is filed without a specific written explanation for the basis or rationale for the negative vote and/or recommended alternative language, the committee or subcommittee chair, and/or NFRC's staff, shall make a reasonable effort to contact the voter to request the voter to provide to the chair and NFRC staff in writing the required explanation and/or recommended alternative language. If NFRC staff or the chair is unable to reach the voter or if the voter declines to provide the required information within the required time-frame set by the chair or NFRC staff, the negative vote shall be ruled non-germane (see description below, under categorization of Negative Votes).

Categorization of Negative Votes

Based on the content of the negative vote, the negative votes shall be classified by the committee or subcommittee chair in the following categories:

Negative Categorized as Substantive

Substantive is defined as a proposal or comment that materially changes the general intent, technical content, or substantive meaning of the applicable language in the ballot.

Result of approving a substantive motion

Substantive motions shall result in the ballot being referred back to the subcommittee, task group, or submitter. **NOTE:** Unless otherwise determined by the subcommittee chair, only the language subject to the substantive negative shall be rebalotted.

Negative Categorized as Editorial

Editorial is defined as a comment that seeks to clarify, but does not change, the general intent, technical content, or substantive meaning of a rating procedure or program document, and includes correction of typographical errors, change of non-technical information, or elimination of ambiguous or redundant language.

Result of approving an editorial motion

Editorial motions shall result in NFRC staff making modifications to address negatives categorized as editorial. If necessary a task or work group may be formed to provide staff with recommended editorial language, or the committee or subcommittee may elect at that meeting to make the modification.

Negative Categorized as Non-Germane

Non-Germane is defined as comments that are deemed unrelated to the balloted issue or a negative vote submitted without required information.

Result of identifying a non-germane motion

Non-Germane motions shall require no further action by the subcommittee.

Negatives Withdrawn

Negative votes withdrawn by the voter shall require no additional action by the subcommittee or committee.

NFRC Antitrust Compliance Procedures

NFRC is committed to requiring the organization and its members and representatives to be in full compliance with all federal and state antitrust laws, rules and regulations. NFRC recognizes that some of its members and participants may be potential competitors and NFRC wishes to scrupulously avoid any discussion or activity that could lead to, or be reasonably perceived as leading to, improper restraints on competition. NFRC's Board of Directors has adopted the following procedures to assist the organization and its constituents to maintain full compliance with these antitrust laws. These procedures apply to all NFRC members, directors on NFRC Board of Directors, officers, NFRC staff, and all participants in NFRC sponsored meetings and task groups and to all other meetings attended by individuals as representatives of NFRC.

Avoiding Improper Agreements and Discussions Among Competitors

1. Express of implicit agreements or discussions among competitors as to prices or price levels relating to their products and services is expressly prohibited. In addition, no discussion is permitted of any elements of a company's operations which might influence pricing such as:
 - a. how prices are determined and when they are issued;
 - b. costs of operations, supplies, labor or services;
 - c. allowances for discounts and rebates;
 - d. raw materials and costs and production and inventory matters;
 - e. terms of sale or products, including credit arrangements; or
 - f. profit margins and mark ups.
2. Competitors may not discuss or reach agreements not to compete with each other in any form. The following are examples of improper anti-competitive conduct prohibited by federal and state antitrust laws:
 - a. division of geographic market territories;
 - b. limitations on the nature of business to be carried on or the products to be sold; or
 - c. agreements to sell products for a specific market only.
3. Discussions or agreements to boycott or refrain from doing business with other commercial entity are also expressly prohibited in any form. Examples of these illegal boycotts include the following:
 - a. agreements not to pursue a new technology;
 - b. agreements about blacklisting or unfavorable reports about particular companies including their financial situation; or
 - c. agreements not to do business with identified vendors, customers and others.

Compliance Education and Monitoring

1. It is NFRC's policy to periodically acquaint NFRC members, members of NFRC's Board of Directors, staff and other participants in the organization with the policies and procedures set forth in the Antitrust Compliance Procedures. As part of that compliance effort, NFRC will take the following steps to better ensure that NFRC meets these legal requirements:
 - a. Legal counsel for NFRC will brief NFRC Board and staff from time to time as to the requirements of the antitrust laws and the application of those laws to the activities of the organization;
 - b. NFRC Board and Chief Executive Officer will keep NFRC legal counsel informed of current and projected activities of NFRC and, as appropriate, request an antitrust review of those activities which will be shared with the Board.
 - c. NFRC legal counsel will be consulted on the agendas for NFRC meetings and the purpose of those meetings. Minutes of all NFRC sponsored meetings will be maintained and submitted to legal counsel for review for anti-trust implications;
 - d. At any meetings attended by persons who are acting on behalf of NFRC where discussion relates to matters with antitrust implications, the NFRC representative shall request that the discussion be stopped and ask that the request be made a part of the minutes of the meeting. If others continue such discussion, the NFRC representative shall leave the meeting and request that the minutes show that s/he left the meeting at that point and why s/he left. The NFRC representative shall immediately report the incident to NFRC's Chief Executive Officer who shall promptly inform the Board of the incident.
 - e. It is NFRC's policy that a copy of these Antitrust Compliance Procedures be given to each officer, director, committee member, official representative of member companies and NFRC employees at least annually and that the same be read, and/or disseminated, at all NFRC sponsored meetings.

Adopted by the NFRC Board of Directors - January 30, 2003

Duties of Meeting Chairpersons

The chairperson of each committee is responsible for well-planned and fair meetings. Since many interests are generally present at NFRC meetings, it is the duty of the chairperson that all interests be heard and fairly dealt with. The chairperson of each committee, subcommittee and task groups shall use the most recent edition of *Robert's Rules of Order*. The chairperson is also responsible for the management of the work of the group. It is up to the chair to assure that the work of the group is proceeding as scheduled and to oversee the work of the group during periods between meetings.

The following are some suggestions for the chair.

- Members should understand why the group exists and what are the expected goals.
- At the beginning of each meeting, determine quorum and identify voting members (one vote per voting member for subcommittees or one vote per voting member listed on the roster). For each task group, determine a well represented group of industry professionals.
- Review past minutes and recommendations and, if appropriate, make them part of the agenda.
- Distribute an agenda in time for the group Members to prepare themselves. One of the first items on the agenda should be approval of the minutes from the last meeting, if not already approved by letter ballot or other means.
- Determine if any items are to be added to the agenda.
- Follow up with Members who have been assigned tasks to assure they are completed.
- During the meeting, follow the agenda. Make sure items are covered, and if action is to be taken, it should be completed prior to moving on to the next agenda item.
- If the discussion is not related to the agenda item under consideration, ask that it be held until the proper time on the agenda.
- Make sure all assenting and dissenting views are heard before taking any action.
- After any action or vote is taken, repeat the decision and announce the vote for, against, and abstentions ensuring that the group understands. Do not move on to another agenda item until this is done.
- Only enter into discussions to expedite the business of the group, such as keeping the discussion on the appropriate topic.
- Before adjourning the meeting, review all votes taken, recommendations made or assignments given. Group participants should leave a meeting knowing what was decided and who is responsible for tasks prior to the next meeting.
- Make all assignments clear and concise and give a time when they should be completed.
- Be aware of the general principles regarding antitrust and tax exemption compliance provided by NFRC and remind your members of those principles from time to time. If you are concerned about the legal implications of any of the committee's actions or deliberations, contact NFRC's Chief Executive Officer and ask for input from NFRC's legal counsel, as appropriate.

Duties of Members Attending NFRC Meetings

- Be prepared to complete any assignments given within the time scheduled.
- Review agendas and be prepared to address the appropriate items.
- Speak only to the agenda items under consideration.
- Know the functions of the group.
- Be able to support views with facts or reasonable conclusions.
- Be a positive influence on all group actions.
- Respect other views.
- Make sure that actions to be taken, assignments given, or activities to be continued are understood.
- Read all materials provided prior to the meeting.
- Committee Membership Responsibilities:
 - To become a committee member, the designated member representative shall attend a meeting of the Committee and sign the appropriate Committee sign-up sheet. A Committee member may vote at the first Committee meeting the organization is included on the roster.
 - Committee members are expected to be experts on, or representatives of an organization directly involved in, the issues to be considered by the Committee.
 - Committee members shall be designated voting representatives, or designated alternate, of NFRC Members.
 - Acceptance of a position on a committee implies an agreement to participate constructively and consistently in committee proceedings.
 - After establishing committee membership, failure to attend two consecutive meetings without the approval of the chairperson will result in the removal of the committee member from the committee roster. Exercising of a proxy for more than two consecutive meetings does not constitute attendance.

Getting Involved with NFRC

Guide to the different levels of participation

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SUBCOMMITTEES

NFRC Definition & Purpose: Subcommittees are formed from the membership at the discretion of the appropriate Committee Chair and with the approval of the Board of Directors. They are responsible for tasks given to them by the Committee as they relate to the development of specific programs or procedures. Subcommittee findings and recommendations are reported to the Committee responsible for its formation.

Current Listing Available under “Groups”: <https://nfrccommunity.site-ym.com/>

Requirements and Details:

- NFRC Membership qualifies for one vote per Subcommittee - *Membership Listing can be found at <https://nfrccommunity.site-ym.com/?page=MemberList>.*
- ALL voting members of the NFRC are automatically subcommittee members and are allowed ONE VOTE per company at the subcommittee level.
- Ballots are issued via the NFRC website (<https://nfrccommunity.site-ym.com/?page=Ballots>) and voted on prior to NFRC Membership meetings – subcommittee membership qualifies one to vote on these ballots. (*One vote per member company*)
- Subcommittee meetings held at the NFRC Membership Meetings often hold final votes for balloted items. ***All voting members present are qualified to vote regardless of previous meeting attendance. One vote per Member Company.***
- Information on becoming an NFRC Member can be found at <https://nfrccommunity.site-ym.com/?page=MembershipApp> or by emailing membership@nfrc.org.

COMMITTEES

NFRC Definition & Purpose: Committees are mandated by the Bylaws or formed at the direction of the Board of Directors from the membership. They are generally responsible for the establishment of NFRC procedures and programs which are presented to the Board of Directors for final approval before implementation.

Current Listing Available under “Groups”: <http://nfrccommunity.site-ym.com/>

- Members Appointed by Board:
 - [Accreditation Policy Committee](#)
 - [Certification Policy Committee](#)
 - [Technical Interpretations Policy Committee](#)
 - [Verification Policy Committee](#)

- NFRC Member Supported (see below for details):
 - [Regulatory Affairs Committee](#)
 - [Ratings Committee](#)
 - [Research and Technology Committee](#)
 - [Technical Committee](#)

- Open Committee: (see below for details):
 - [ANS Standards Committee](#)

Requirements and Details:

- NFRC Committee Rosters (aka Committee Membership) are either BOARD appointed or are made up of interested member companies (Companies paying dues for NFRC Membership).
- To JOIN Member Supported COMMITTEE – Member must attend one meeting - signing the roster being sure to mark interest in having name added to the roster (becoming a voting member of the committee).
- Only one vote is allowed per NFRC dues paying Member Company.
- Member Name/Company Name will be added to the Committee Roster at the next meeting.
- Member Name/Company Name will be DROPPED from Roster if Representative misses TWO CONSECUTIVE COMMITTEE MEETINGS (absent for Roll Call)
- All current committee rosters are posted on the NFRC website prior to committee meetings for membership review or by contacting the Committee Chair or the NFRC's membership department at membership@nfrc.org.

ACRONYMS/TERMINOLOGY*

NFRC – *National Fenestration Rating Council – a nonprofit research/educational organization (501(c) 3) that develops and administer energy-related rating and certification programs that serve the public by providing fair, accurate, and credible information on fenestration performance.*

ACE – Approved Calculation Entity: An individual, who has attended an NFRC Calculation Training Workshop, completed and passed all necessary examinations, and has obtained a Certificate of Approval which qualifies him or her to carry out performance calculations of fenestration products for certification using the Component Modeling Approach.

AM – Air Mass: The ratio of the mass of atmosphere along the actual observer-to-sun line to the mass that would exist if the observer was at sea level, at standard barometric pressure, and if the sun was directly overhead (at the zenith).

AMC – Attachment Manufacturer's Certificate.

APC - Accreditation Policy Committee: A standing committee whose members are appointed by the NFRC Board of Directors to manage the NFRC Laboratory Accreditation Program (LAP). See the NFRC 710: Operating Policies Manual for further details.

APD – [Applied Films Product Directory](#)

ASL/ATL – Accredited Simulation/Testing Laboratory: Computer simulation or testing laboratory that has met NFRC Laboratory Accreditation Program (LAP) requirements, has entered into a NFRC laboratory License Agreement, and received a NFRC Certificate of Accreditation, none of which has been revoked.

CAMP – Compliance and Monitoring Program: NFRC administers this program that monitors program activity and assists and educates architects, builders, code officials and other regulatory agencies. The governing document for this program is the NFRC 707.

CAP – Certification Agency Program: NFRC administers this program which includes a set of rules and procedures by which an independent certification and inspection agency becomes licensed and operates. The governing document for this program is the NFRC 702.

CEAP – Calculation Entity Approval Program: NFRC administers this program that contains the rules and requirements for becoming an Approved Calculation Entity (ACE) and ACE Organization in the CMA Program. The governing document for this program is the NFRC 708.

CMA – Component Modeling Approach: A new rating methodology being developed by NFRC to address fenestration in commercial buildings.

CMA PCP – Component Modeling Approach Product Certification Program: NFRC administers this program which contains the rules and requirements for component manufacturers/participants seeking spacer and frame component approval and Specifying Authorities seeking product certification by requesting a CMA Label Certificate. The governing document for this program is the NFRC 705.

CMAST CPD – [Component Modeling Approach Software Tool Certified Products Directory](#): A freely accessible, web-based directory administered by NFRC that provides energy rating information for non-residential fenestration products as well as NFRC-approved components, and a listing of all CMA Label Certificates

CPC – Certification Policy Committee: A standing committee whose members are appointed by the NFRC Board of Directors to manage the NFRC Certification Agency Program (CAP) and to provide interpretations for the NFRC Product Certification Program (PCP). See the NFRC 710: Operating Policies Manual for further details.

CPD – [Certified Products Directory](#): A directory of fenestration products in electronic form, listing fenestration products and their performance ratings, for which product certification authorization has been granted by a licensed IA (inspection agency), and can be searched by the public.

CPD Number – Certified Products Directory Number: A unique identification number assigned by NFRC via the CPD to an authorized product.

CTS – Calibration Transfer Standard: An insulation board that is faced with glazing, instrumented with temperature sensors between the glazing and the insulation board core, which is used to calibrate the surface heat transfer coefficients and the surround panel.

*Additional terminology can be found in [NFRC 600: Glossary and Terminology](#).

FMC – Fenestration Manufacturer’s Certificate: An FMC may be used by a manufacturer under specific conditions in the event that a properly applied NFRC temporary label has been removed, or at the manufacturer’s discretion upon request from a responsible party (i.e., building code official, builder, homeowner, etc.)

Fenestration – Products that fill openings in a building envelope, such as windows, doors, skylights, curtain walls, etc., designed to permit or limit the passage of air, light, vehicles, or people.

Fenestration Attachment – A device (such as, but not limited to, shades, films, or blinds) designed to be physically attached to, incorporated with or covering a fenestration product.

Film: Fenestration attachment products which consist of a flexible adhesive-backed polymer film which may be applied to the interior or exterior surface of an existing glazing system. See Fenestration Attachment.

HTDD – Hybrid Tubular Daylighting Device: A tubular daylighting device (TDD) whose light transmitting tube consists of more than one material and/or has more than one geometry throughout its length. Typically used with suspended ceilings or to illuminate spaces without ceilings.

IA - Independent Certification and Inspection Agency: An organization or person authorized by license to conduct specified services for the Certification Program.

IAC – Inter-Agency Comparison: Organization, performance, and evaluation of certification authorization processes by two or more certification agencies in accordance with predetermined results and/or submissions.

IG/IGU – Insulating Glass Unit: A preassembled unit comprising lites of glass, which are sealed at the edges and separated by dehydrated space(s). The unit is normally used for windows, window walls, picture windows, sliding doors, patio doors, or other types of fenestration. (**SIG** – Sealed Insulating Glass Unit)

ILC – Interlaboratory Comparison: Organization, performance, and evaluation of the same test sample or simulation by two or more laboratories in accordance with predetermined conditions.

IRC – Individual-in-responsible-charge: The individual(s) responsible for assuring that the quality of services offered and provided by an Licensed Certification Program are in full compliance with the NFRC 700, NFRC 702, and NFRC 705. An IRC shall participate in any workshops associated with the NFRC 702.

IVP – The Independent Verification Program: A requirement because of NFRC’s status as an approved Certification Body (CB) for the EnergyStar® Windows Program. This is a program that will verify the performance ratings of EnergyStar® qualified and NFRC certified and labeled fenestration products sold in the market that agrees with the performance ratings listed in the NFRC Certified Products Directory. This program will use procedures that complement the inspection and validation testing requirements of the NFRC 700. A pilot program is scheduled for implementation in late 2011 and to continue through 2012. Full implementation is anticipated during 2013 upon the approval of the Board.

KD – Knocked Down Product: A fenestration product supplied by a licensed manufacturer/responsible party in an unassembled or partially assembled state, which requires further assembly at the jobsite.

LAP – Laboratory Accreditation Program: NFRC administers this program which contains the rules and requirements for licensed, accrediting thermal test and computer simulation laboratories. The governing document for this program is the NFRC 701.

OAVA – Outdoor Air Ventilator Assembly: An apparatus independent from but installed into a fenestration product for controlling the transfer of air through the product.

OWL – Outdoor Wetted Length: Measured from the interface between frame and glazing to the first adiabatic boundary on the outdoor side.

PCP – Product Certification Program: NFRC administers this program which contains the rules and requirements for licensed manufacturers/participants to label windows (and responsible parties to produce Label Certificates). The governing document for this program is the NFRC 700.

RH – Relative Humidity: The ratio of the amount of water vapor in the air compared to the maximum amount of water vapor that the air could hold at a particular temperature and pressure.

SIRC – Simulator-In-Responsible-Charge: The individual(s) responsible for assuring that the quality of services offered and provided by an Accredited Simulation Laboratory are in full compliance with the LAP. An SIRC shall have successfully completed an NFRC Simulation Accreditation Workshop, passed an NFRC Simulation Accreditation Examination, attended an NFRC Annual Accreditation Workshop, and participate in any ILC evaluations in accordance with the LAP.

Site-Built Program – A rating program developed in 1999 by NFRC to rate non-residential fenestration products.

TB - Thermally Broken Members: System members with a minimum of 5.30 mm (0.210 in) separation provided by a thermal break.

TI - Thermally Improved Members: System members with a separation \geq 1.60 mm (0.062 in) provided by either a thermal break or open air space that may be interrupted by short thermal bridges between the interior and exterior surfaces.

TDD - Tubular Daylighting Device): A non-operable device primarily designed to transmit daylight from a roof surface to an interior ceiling surface via a tubular conduit. The device consists of an exterior glazed weathering surface, a light transmitting tube with a reflective inside surface and an interior sealing device, such as a translucent ceiling panel. See also "Hybrid Tubular Daylighting Device."

NFRC Energy Performance Ratings

AL- Air Leakage: The volume of air flowing per unit time per unit area through a fenestration system due to air pressure or temperature difference between the outdoor and indoor environment. (NFRC 400).

Condensation Resistance – A relative indicator of a fenestration product's ability to resist the formation of condensation at a specific set of environmental conditions. The higher the Condensation Resistance value the greater the resistance to the formation of condensation. (NFRC 500).

SHGC – Solar Heat Gain Coefficient: A rating that expresses the percentage of incident solar heat transmitted through a fenestration product; the lower the SHGC, the less solar heat gain (NFRC 200 and NFRC 201).

U-factor – Thermal Transmittance: A rating that expresses the rate of heat flow through the fenestration product. The lower the U-factor, the less heat is allowed to transfer through the fenestration product (NFRC 100 and NFRC 102).

VT – Visible Transmittance: A rating that expresses the percentage of visible light transmitted through a fenestration product (NFRC 200).

Other Important Acronyms:

AAMA – American Architectural Manufacturers Association

AEC – Aluminum Extruders Council

AFRC – Australian Fenestration Rating Council

ANSI – American National Standards Institute

ASE – Alliance to Save Energy

ASHRAE – American Society of Heating, Refrigeration and Air-conditioning Engineers

ASTM International – *formerly known as ASTM*, The American Society of Testing and Materials

BIM – Building Information Modeling

CEC – California Energy Commission

CSA – Canadian Standards Association

DASMA – Door and Access System Manufacturers Association

EWC – Efficient Windows Collaborative

GANA – Glass Association of North America

NGA – National Glass Association

Title 24 – Building Energy Standard for California

WDMA – Window and Door Manufacturers Association

ICC – International Code Council

-IECC – *International Energy Conservation Code*

-IBC – *International Building Code*

-IRC – *International Residential Code*

IGCC – International Glass Certification Council

IGMA – Insulating Glass Manufacturers Alliance

ISO – International Organization of Standardization

IWFA – International Window Film Association

LBNL – Lawrence Berkeley National Laboratories

LEED – Leadership in Energy and Environmental Design