



# National Fenestration Rating Council Incorporated

NFRC 2010 Technical Interpretations Manual E0A8

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## ***FOREWORD***

The NFRC Technical Committee issues Technical Interpretations to NFRC 100: *Procedure for Determining Fenestration Product U-Factors*, NFRC 101: *Procedure for Determining Thermo-Physical Properties of Materials for Use in NFRC-Approved Software Programs*, NFRC 102: *Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems*, NFRC 200: *Procedure for Determining Solar Heat Gain Coefficients and Visible Transmittance at Normal Incidence*, NFRC 201: *Procedure for Interim Standard Test Method for Measuring the Solar Heat Gain Coefficient of Fenestration Systems Using Calorimetry Hot Box Methods*, NFRC 300: *Procedure for Determining Solar Optical Properties for Simple Fenestration Products*, NFRC 301: *Standard Test Method for Emittance of Specular Surfaces Using Spectrometric Measurements*, NFRC 400: *Procedure for Determining Fenestration Product Air Leakage*, NFRC 500: *Procedure for Determining Fenestration Product Condensation Resistance Values and NFRC Simulation Manual*. These *NFRC Technical Interpretations* examine questions put forth by NFRC members and those entities involved in the NFRC rating system and certification and labeling program.

This document is published annually, but maybe published more frequently if the need arises. Please contact NFRC to assure that you are reading from the most recent edition of *NFRC Technical Interpretations*. *These NFRC Technical Interpretations, where applicable, will be incorporated into future editions of their respective program and technical documents.*

Questions on the use of this procedure should be addressed to:

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\* Technical Interpretations indicated by the asterisk were brought forward from the 2001/2004 TI Manual but were re-analyzed, revised where applicable, and re-numbered. The previous TI number is noted in (parenthesis) for reference only.

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TI-2010-01 03/03/2010
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## ***NFRC Technical Interpretation – 2010***

<b><i>Interpretation Requested:</i></b>
When revising a report to add a new glass option to an existing matrix and the new glass option has a better center-of-glass U-factor, is it required to report using an additional SHGC / VT 0.0 and 1.0 table for the new options?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
1/18/2010	2/8/2010	3/3/2010

<b><i>Pertinent Document:</i></b>	
NFRC 200 - 2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
4.5.B	Page 10

<b><i>Interpretation:</i></b>
No. The initial SHGC / VT 0.00 and 1.00 table shall be used for the entire certification cycle and will be modified upon recertification.

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>



TI-2010-03  
06/09/2010

## ***NFRC Technical Interpretation – 2010***

### ***Interpretation Requested:***

How should a door which is designed to be installed in a variety of curtain wall / storefront systems be rated?

Background: NFRC 100 discusses wood, fiberglass, and steel doors and provides default framing systems for use in rating. Storefront doors are typically aluminum systems which are designed to interface with a wide variety of storefront / curtain wall systems.

Example drawings included.

<b><i>Date Requested</i></b>	<b><i>Initial Interpretation Date</i></b>	<b><i>Final TIPC Approval Date</i></b>
5/03/2010	05/12/2010	05/12/2010

### ***Pertinent Document:***

NFRC 100-2010

### ***Referenced Sections:***

Section 5.2 of NFRC 100

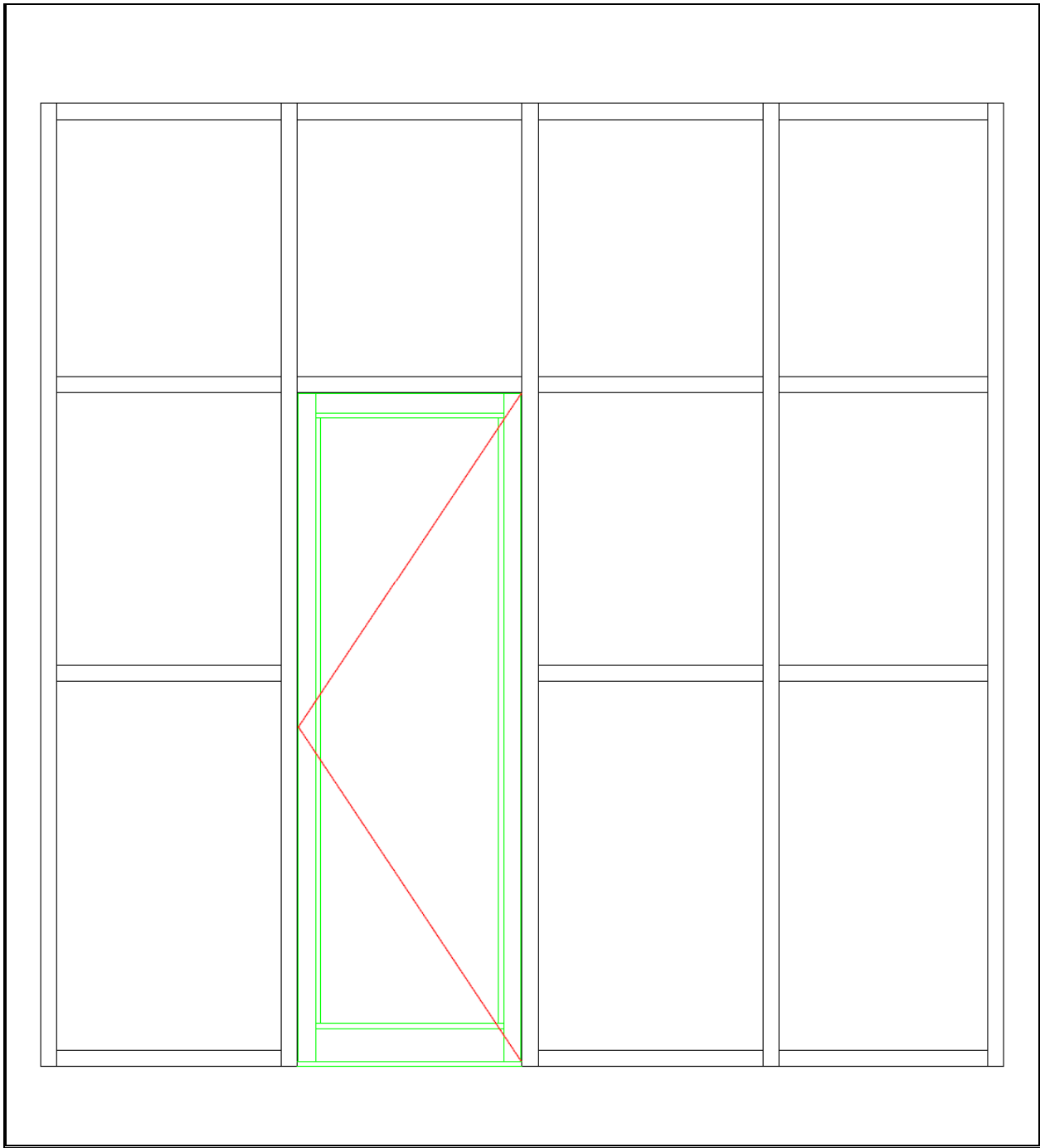
### ***Referenced Pages:***

Page 37

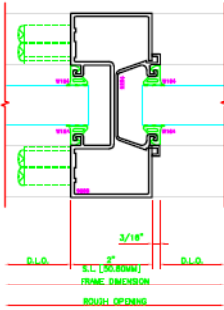
### ***Interpretation:***

The door shall be rated in the curtain wall/storefront system framing it is installed.

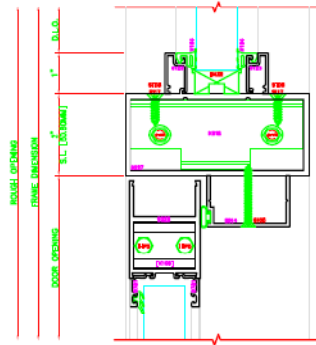
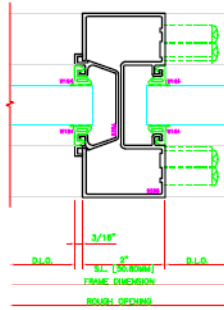
See examples on following pages.



836 DOOR JAMB  
S433

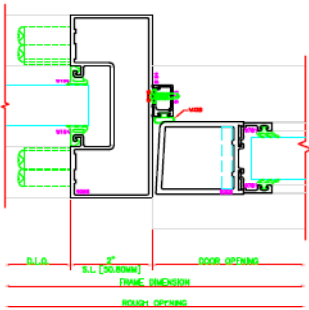


835 DOOR JAMB  
S433

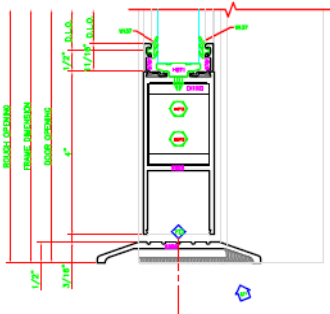
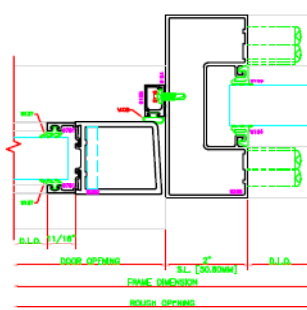


810 DOOR HEADER  
S433

811 DOOR JAMB  
S433

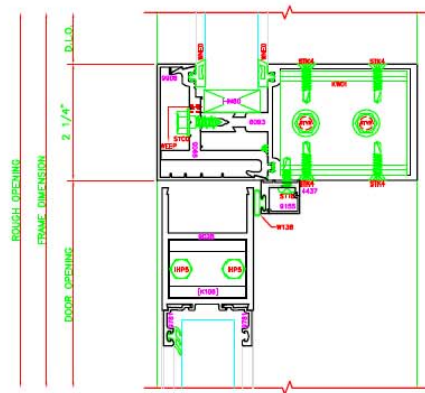


812 DOOR JAMB  
S433



200 BOTTOM RAIL  
S7A 0200

D200 Door Inside Storefront Framing System

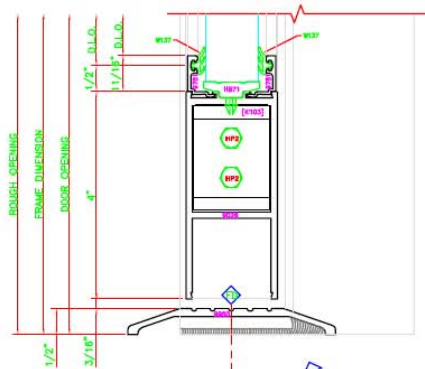
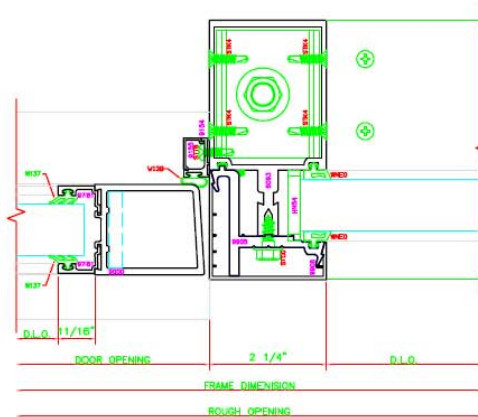
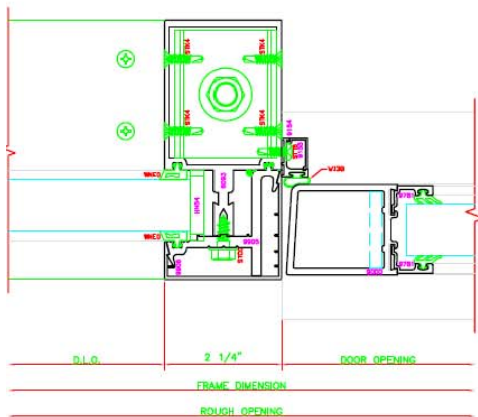


8137	HEADER
	5600 5"

100	TOP RAIL
	S/A D200

8138	O.G. VERT.
	5600 5"

8139	O.G. VERT.
	5600 5"



200	BOTTOM RAIL
	S/A D200

D200 Door Inside Curtain Wall System

**Technical Committee Revisions to Initial Interpretation:**



TI-2010-04 06/21/2010
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## ***NFRC Technical Interpretation – 2010***

### ***Interpretation Requested:***

Concealed vents are a type of 4-sided structurally glazed window that are commonly used in commercial fenestration. Since there is no exposed framing on the exterior of the window, the window obtains its strength by attaching directly to a curtain wall. For validation testing purposes it is necessary to include the support framing in the test. However, since concealed vents are never installed as single openings but are part of a larger glazed wall system, it should be permitted that the simulations are done to the centerline of the support framing system into which they are installed. This is consistent with footnote 4 of table 4-3 which allows simulations to be done to the centerline of the verticals and horizontals. The validation test size would continue to be based on the size for the operator size in table 4-3 including the full frame of the glazed wall system. Simulating the full frame penalizes the product since half of the frame is already being included in the glazed wall simulations. See example of a concealed vent installed into a curtain wall system below. Requested interpretation on the following two questions is requested:

- How are concealed vents to be tested?
- How are concealed vents to be simulated and rated?

<b><i>Date Requested</i></b>	<b><i>Initial Interpretation Date</i></b>	<b><i>Final TIPC Approval Date</i></b>
5/07/2010	6/21/2010	6/21/2010

### ***Pertinent Document:***

NFRC 100 - 2010

### ***Referenced Sections:***

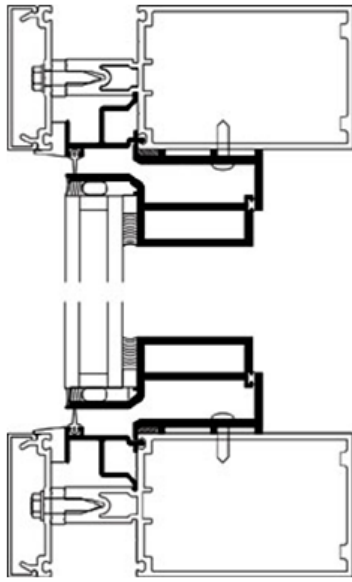
Table 4-3

### ***Referenced Pages:***

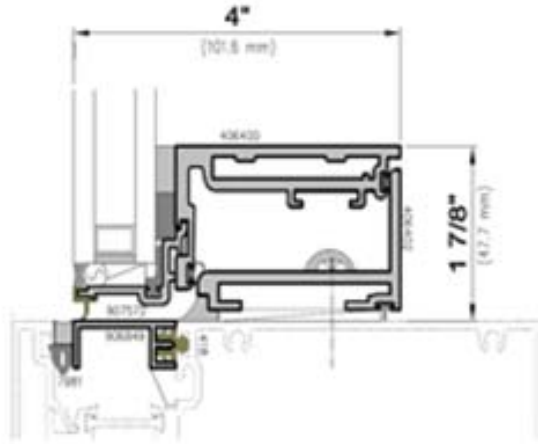
Page 25

### ***Interpretation:***

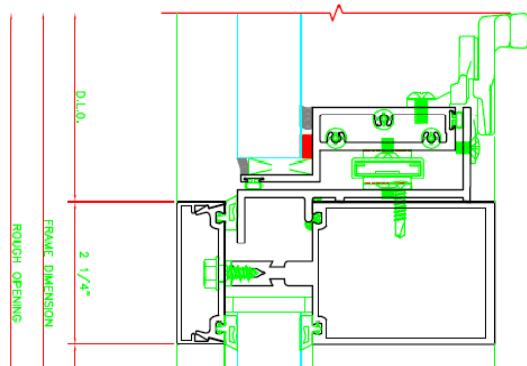
All vents designed to go into glazed walls shall be tested and rated as a stand-alone product, using the appropriate operator type from Table 4-3 of NFRC 100.



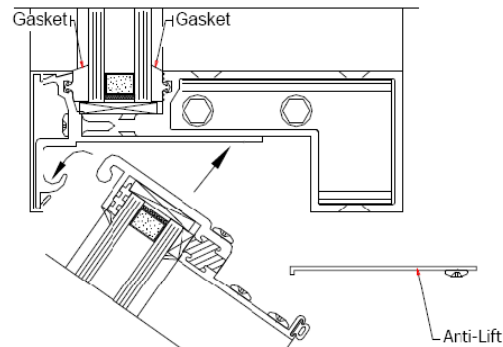
Example 1



Example 2



Example 3 – Jamb



Example 3 – Head/Sill

***Technical Committee Revisions to Initial Interpretation:***



TI-2010-05 07/23/2010 11/01/2010 Revised
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# **NFRC Technical Interpretation – 2010**

***Interpretation Requested:***

Can a manufacturer obtain U-factor, SHGC and VT ratings for exterior bi-fold doors (a.k.a. folding walls) using NFRC’s current technical procedures (NFRC 100 and 200)? If so, how?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
6/23/10	7/15/2010	7/15/2010

***Pertinent Document:***

NFRC 100-2010, NFRC 200-2010

<i>Referenced Sections:</i>	<i>Referenced Pages:</i>
NFRC 100, Section 5.2	Page 36
NFRC 200, Section 2.1	Page 2

***Interpretation:***

Yes, exterior bi-fold doors (folding walls) shall be rated and tested as a single or double swinging door.

***Technical Committee Revisions to Initial Interpretation:***

The revision to this TI was a decision by the Board of Directors Steering Committee to change the term bi-fold doors to exterior bi-fold doors (a.k.a. folding walls).



TI-2010-07 10/25/2010
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## ***NFRC Technical Interpretation – 2010***

<b><i>Interpretation Requested:</i></b>
How is an Entry Door product (with and/or without glass lites) rated when supplied with a pre-installed storm door from the manufacturer?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
9/31/2010	10/25/2010	10/25/2010

<b><i>Pertinent Document:</i></b>	
NFRC 100-2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
NFRC 100, Section 5.2	Page 38

<b><i>Interpretation:</i></b>
The product shall be rated with the storm door and associated parts removed from the assembly, or as Test Only for each configuration.

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>



TI-2010-08 12/08/2010
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## ***NFRC Technical Interpretation – 2010***

<b><i>Interpretation Requested:</i></b>
If a manufacturer has simulated a full lite door and wishes to add the option of substituting an opaque infill system which contains panels or a combination panels and glazing for the existing glazing. May the manufacturer simulate the infill system utilizing the simplifications described in NFRC 100 Section 5.2.4 to reduce the number of individual products required to represent the product line and include the results of this simulation with the results of the existing full lite simulation?

<b><i>Date Requested</i></b>	<b><i>Initial Interpretation Date</i></b>	<b><i>Final TIPC Approval Date</i></b>
10/25/2010	12/08/2010	12/08/2010

<b><i>Pertinent Document:</i></b>	
NFRC 100-2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
NFRC 100, Section 5.2 and 5.2.4	Pages 39-41

<b><i>Interpretation:</i></b>
Yes. The manufacturer may model and rate single swing doors using WINDOW to calculate the full lite door per the model size, but may also use the Entry Door Spreadsheet methodology to calculate the ¾, ½, and ¼ lite options.

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>



TI-2010-09 12/08/2010
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## ***NFRC Technical Interpretation – 2010***

<b><i>Interpretation Requested:</i></b>
Are embossed panel, or stile and rail panel, doors/sidelights ¼ lite, ½ lite, ¾ lite and full lite sizes defined by Table 5.1 or NFRC 100 Section 5.2.6 Figure 5-1?

<b><i>Date Requested</i></b>	<b><i>Initial Interpretation Date</i></b>	<b><i>Final TIPC Approval Date</i></b>
10/25/2010	12/08/2010	12/08/2010

<b><i>Pertinent Document:</i></b>	
NFRC 100-2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
NFRC 100 Section 5.2, Table 5.1 NFRC 100 Figure 5-1	Pages 39-43

<b><i>Interpretation:</i></b>
It is defined by Table 5-1 when using the simplification option per section 5.2.5.1. If the simplification is not used, then the actual configuration of panel and glazing sizes shall be rated.

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>



TI-2010-10 12/08/2010
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## ***NFRC Technical Interpretation – 2010***

<b><i>Interpretation Requested:</i></b>
How do we model the trapped air spaces within any spacer system?

<b><i>Date Requested</i></b>	<b><i>Initial Interpretation Date</i></b>	<b><i>Final TIPC Approval Date</i></b>
10/30/2003	12/08/2003	12/08/2003 Reapproved 12/08/2010

<b><i>Pertinent Document:</i></b>	
NFRC 100-2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
NFRC 100, Section 4.3.1	Page 22

<b><i>Interpretation:</i></b>
Create a new solid material called “still air cavity” with a conductivity of 0.024 W/m-K. Note: The 0.024 W/m-K is the same conductivity used in the 3-D modeling calculation for Bolts, etc.

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>



TI-2010-11 07/30/2004
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## **NFRC Technical Interpretation – 2010**

<b>Interpretation Requested:</b>
How are corrugated plastic panels that are manufactured and installed without frames rated for U-factor and SHGC?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
06/21/2004	07/30/2004	07/30/2004 Reapproved 12/08/10

<b>Pertinent Document:</b>	
NFRC 100-2010, NFRC 102-2010, NFRC 200-2010 and NFRC 201-2010	
<b>Referenced Sections:</b>	<b>Referenced Pages:</b>
NFRC 100-2010, Section 4.3.2.2 NFRC 200-2010, Section 2.1.1 & 4.6	Page 25 Pages 3 & 13

<b>Interpretation:</b>
<p><b>U-factor</b> – Section 4.3.2.2 of NFRC 100-2010 shall be adhered to.</p> <p><b>SHGC</b> – A specimen sized per 1000mm x 1000mm shall be tested per NFRC 201 as center-of-glazing. The SHGC of the product shall be the tested center-of-glazing.</p>

<b>Technical Committee Revisions to Initial Interpretation:</b>



TI-2010-12 08/11/2005
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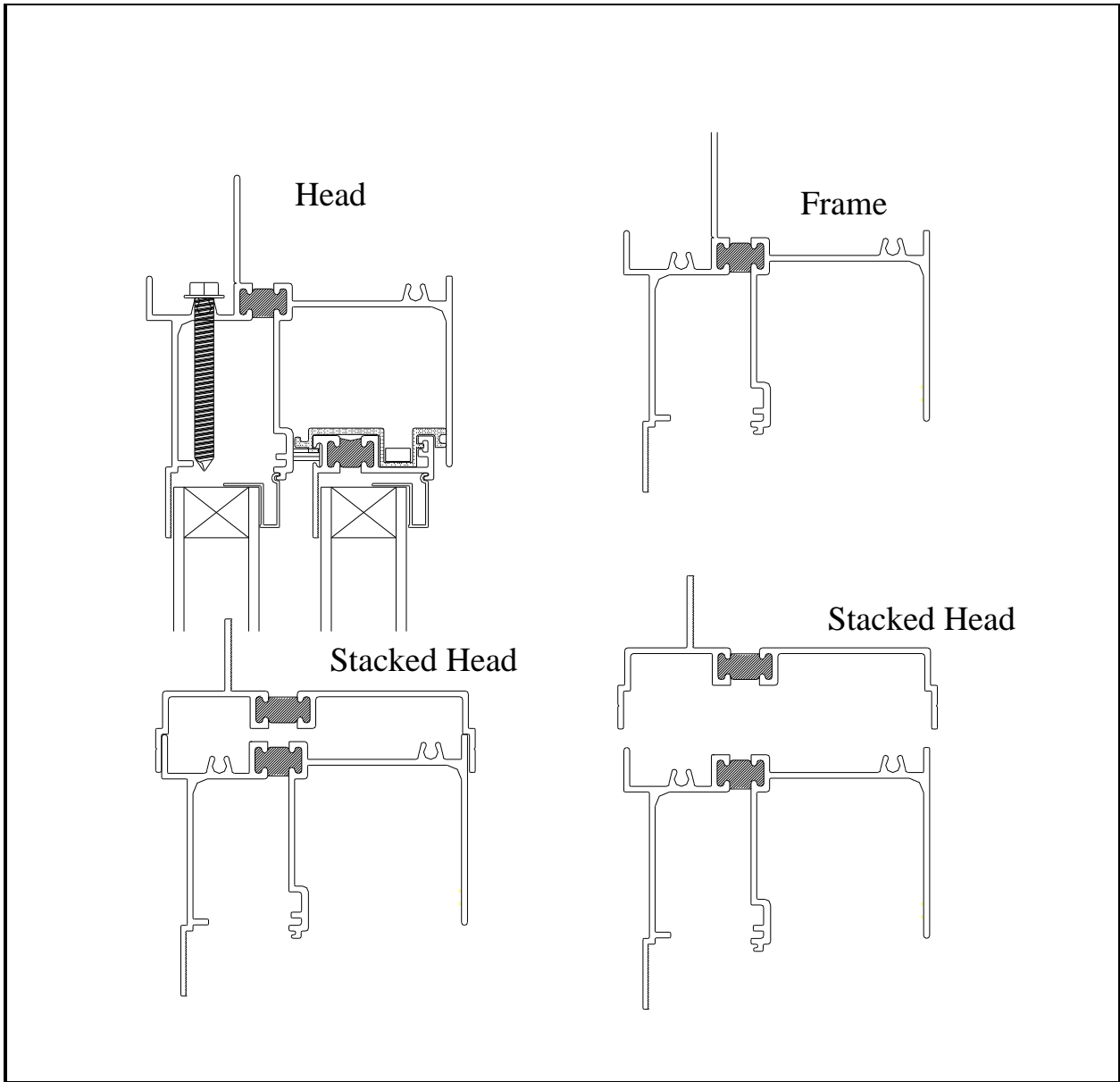
## ***NFRC Technical Interpretation – 2010***

<b><i>Interpretation Requested:</i></b>
Are additional profiles attached to the perimeter of a window frame to be modeled as part of the same product line? Is it an individual product within a product line?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
07/21/2005	07/25/2005	08/11/2005 Reapproved 12/08/2010

<b><i>Pertinent Document:</i></b>	
NFRC 100-2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
Section 4.2.5.B	Page 20

<b><i>Interpretation:</i></b>
No. The fenestration product with the additional attached profile is to be treated as a separate product line. (See the example below)



***Technical Committee Revisions to Initial Interpretation:***



TI-2010-13 03/15/2006
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## **NFRC Technical Interpretation – 2010**

<b>Interpretation Requested:</b>
What are the differences (if any) in the simulation procedure for Tubular Daylighting Devices which have a square bottom diffuser section? Is there any variation to account for the diffuser section being larger than the tube diameter?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
01/19/2006	03/15/2006	03/15/2006 Reapproved 12/08/2010

<b>Pertinent Document:</b>	
NFRC 100-2010 and NFRC 200-2010	
<b>Referenced Sections:</b>	<b>Referenced Pages:</b>
Table 4-3 Section 5.4	Page 26 Page 55

<b>Interpretation:</b>
For non circular diffuser, for simulation use the circular diffuser with surface area equal to actual non circular diffuser surface area.

<b>Technical Committee Revisions to Initial Interpretation:</b>



TI-2010-14 03/15/2006
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## **NFRC Technical Interpretation – 2010**

<b><i>Interpretation Requested:</i></b>
Can one group the test-only COG options including between-glass shades based on the known COG properties without between-glass shades?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
03/13/2006	03/15/2006	03/15/2006 Reapproved 12/08/2010

<b><i>Pertinent Document:</i></b>	
NFRC 100-2010 and NFRC 200-2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
Section 4.2.4.1 Section 4.2.3	Page 18 Page 8

<b><i>Interpretation:</i></b>
<p>Yes.</p> <p>U-Factor: For each group, the group leader shall be the tested COG option including the between-glass shade corresponding to the simulated COG option (without the between-glass shade) with the highest COG U-value in accordance with the section 4.2.4.1 in NFRC 100.</p> <p>SHGC: For each group, the group leader shall be the tested COG option including the between-glass shade corresponding to the simulated COG option (without the between-glass shade) in accordance with the Section 4.2.3 and rules of Table 4-1 in NFRC 200.</p>

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>



TI-2010-15 07/11/2006
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## **NFRC Technical Interpretation – 2010**

<b><i>Interpretation Requested:</i></b>
What is the size for the large Calibration Transfer Standards (CTS) if a lab has to test 2000mm by 2000mm size sample?

<b><i>Date Requested</i></b>	<b><i>Initial Interpretation Date</i></b>	<b><i>Final TIPC Approval Date</i></b>
05/23/2006	06/19/2006	07/10/2006 Reapproved 12/08/2010

<b><i>Pertinent Document:</i></b>	
NFRC 102-2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
5.1.3 (A)	8

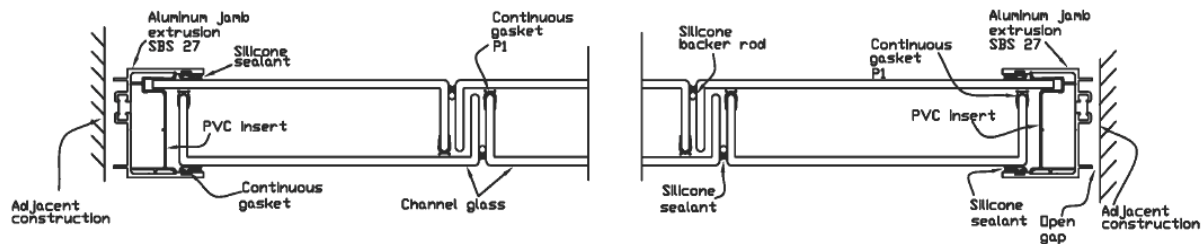
<b><i>Interpretation:</i></b>
For the largest CTS the minimum width shall be 72” and the minimum height shall be 80”. A laboratory is allowed to build a larger size CTS at their discretion.

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>

## NFRC Technical Interpretation – 2004

### **Interpretation Requested:**

Please provide a general clarification of how a glazed wall system must be simulated to rate a glazed wall system with a U-channel glazing system, which does not require intermediate vertical or horizontal framing members due to its unique U-channel glazing system construction?



<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
06/12/2006	07/24/2006	01/04/2007 Reapproved 12/08/2010

### **Pertinent Document:**

NFRC 100-2010

### **Referenced Sections:**

5.6

### **Referenced Pages:**

65 – 67

### **Interpretation:**

The NFRC standard configuration for glazed wall systems requires a two-lite system with an intermediate vertical mullion. If the manufacturer has a standard intermediate mullion available, it should be used. If an intermediate mullion is not available, the intermediate mullion should be created by using two frame jambs back-to-back. The center-of-glass U-factor is determined by ASTM C1363 testing.

### **Technical Committee Revisions to Initial Interpretation:**



TI-2010-17 01/04/2007
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## ***NFRC Technical Interpretation – 2010***

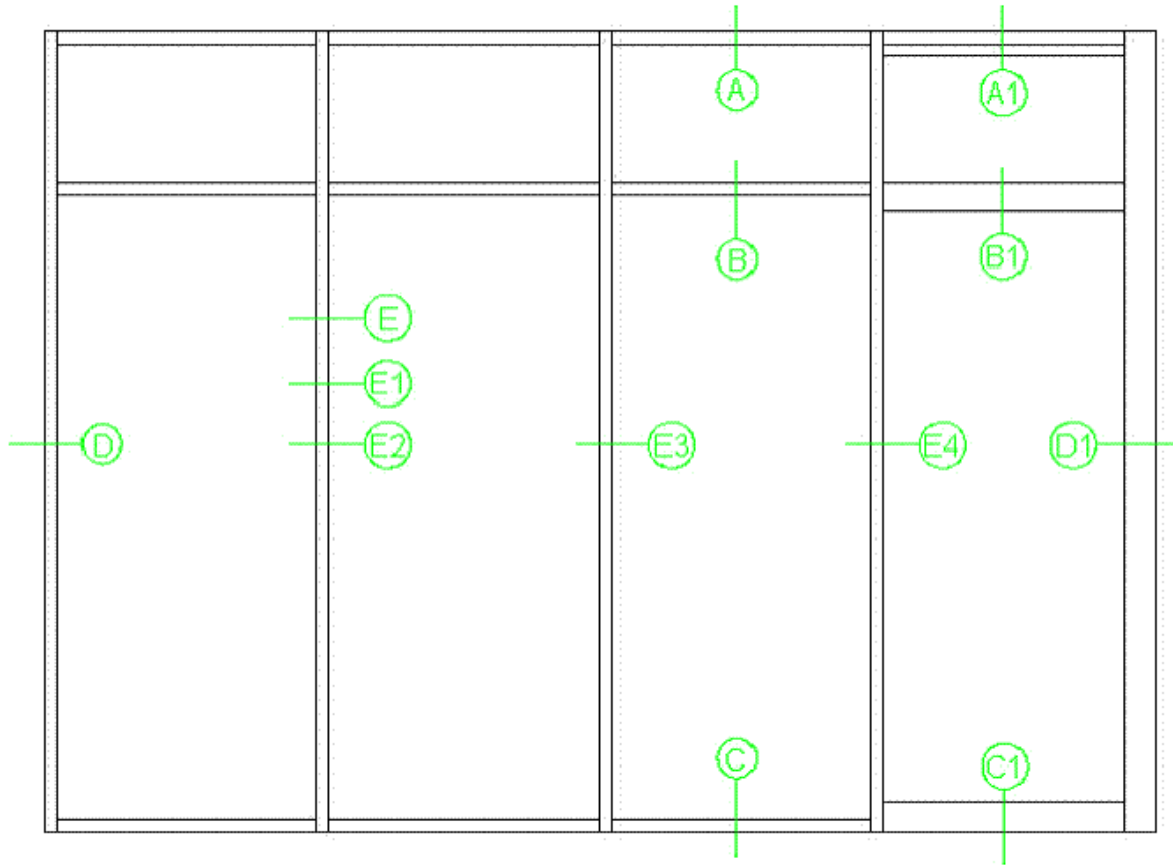
<b><i>Interpretation Requested:</i></b>
Please provide general clarification on modeling a store front system given in Figure 1 and how to select a typical cross section for modeling the intermediate verticals as jamb in a window wall system.

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
10/05/2006	10/25/2006	01/04/2007 Reapproved 12/08/2010

<b><i>Pertinent Document:</i></b>	
NFRC 100-2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
Table 4-3, Footnote #5 & Section 5.6	26; 65 – 67

<b><i>Interpretation:</i></b>
The store front system shall be simulated as a Glazed Window Walls System. As per footnote #5, Window Walls shall be simulated and tested with intermediate verticals as jamb (using half of jamb for U-factor tag) and standard head and sill members. If the intermediate verticals are not the same, then they can either be simulated as different product lines, or grouped, if applicable. The horizontals in the storefront system, other than the door transom, shall be ignored. The door and transom, if present shall be each simulated separately. For door and transom use standard jamb definition (i.e., full U-factor tag).

Figure 1



*Technical Committee Revisions to Initial Interpretation:*



TI-2010-18 01/04/2007
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## **NFRC Technical Interpretation – 2010**

<b><i>Interpretation Requested:</i></b>
For doors with integral shading devices, how do we rate the multiple sizes - ¼, ½, ¾, and full?

<b><i>Date Requested</i></b>	<b><i>Initial Interpretation Date</i></b>	<b><i>Final TIPC Approval Date</i></b>
12/01/2006	01/04/2007	01/04/2007 Reapproved 12/08/2010

<b><i>Pertinent Document:</i></b>	
NFRC 100-2010& NFRC 200-2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
NFRC 100, Sections 2.1.H & 4.2.2.D	3 & 16
NFRC 200, Section 2.1.1.A	3

<b><i>Interpretation:</i></b>
Determine the least deviation from 1 meter by 1 meter (39” by 39”) and the resultant conductance value can be used for all product types specified in Table 1 of NFRC 100.

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>



TI-2010-19 05/06/2008
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# NFRC Technical Interpretation – 2010

<b>Interpretation Requested:</b>
How can a non-standard size Tubular Daylighting Device be rated using the test-only methodology?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
03/14/2008	05/06/2008	05/06/2008 Reapproved 12/08/2010

<b>Pertinent Document:</b>	
NFRC 100-2004 and NFRC 200-2004	
<b>Referenced Sections:</b>	<b>Referenced Pages:</b>
NFRC 100, Section 4.1.2 NFRC 200, Section 4.1.2	12 7

<b>Interpretation:</b>
<p>The Tubular Daylight Device U-Factor at standard size shall be calculated using equation 4-1.</p> $U_{mod} = (U_{rep} A_{rep}) / A_{mod}$ <p>Where:</p> $U_{mod} = \text{U-Factor at model size}$ $U_{rep} = \text{U-Factor at representative size (test size)}$ $A_{rep} = \text{area at representative size}$ $A_{mod} = \text{area at model size}$ <p>The Tubular Daylight Device SHGC value at standard size shall be calculated using the following equation.</p> $SHGC_{mod} = (SHGC_{rep} A_{rep}) / A_{mod}$ <p>Where:</p> $SHGC_{mod} = \text{SHGC at model size}$ $SHGC_{rep} = \text{SHGC at representative size (test size)}$ $A_{rep} = \text{area at representative size}$ $A_{mod} = \text{area at model size}$

<b>Technical Committee Revisions to Initial Interpretation:</b>



TI-2010-20  
03/24/2003

## **NFRC Technical Interpretation – 2010**

**Interpretation Requested:**

If the sill of a sliding glass door is designed set into the building; installed so that it extends beyond the rough opening, is it considered an appendage and therefore not modeled?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
04/02/2008	04/10/2008	06/10/2008 Reapproved 12/08/2010

<b>Pertinent Document:</b>	
NFRC 100-2010	
<b>Referenced Sections:</b>	<b>Referenced Pages:</b>
Section 4.2.5.A, 4.2.5.B	Page 20

**Interpretation:**

No, although the integral framing member (in this case the sill) extends beyond the rough opening and is not exposed after installation, it shall be modeled in the following manner:

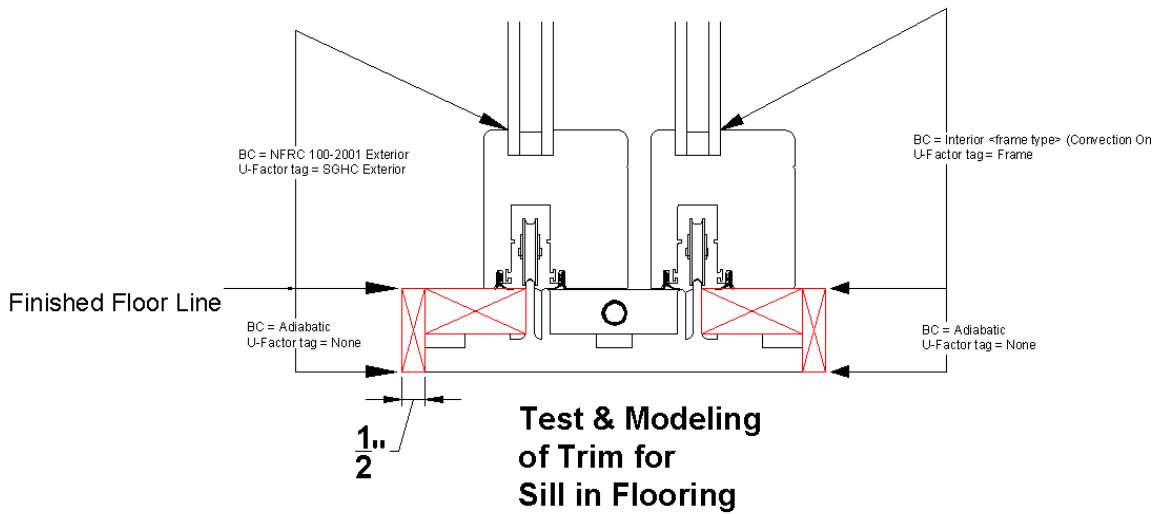
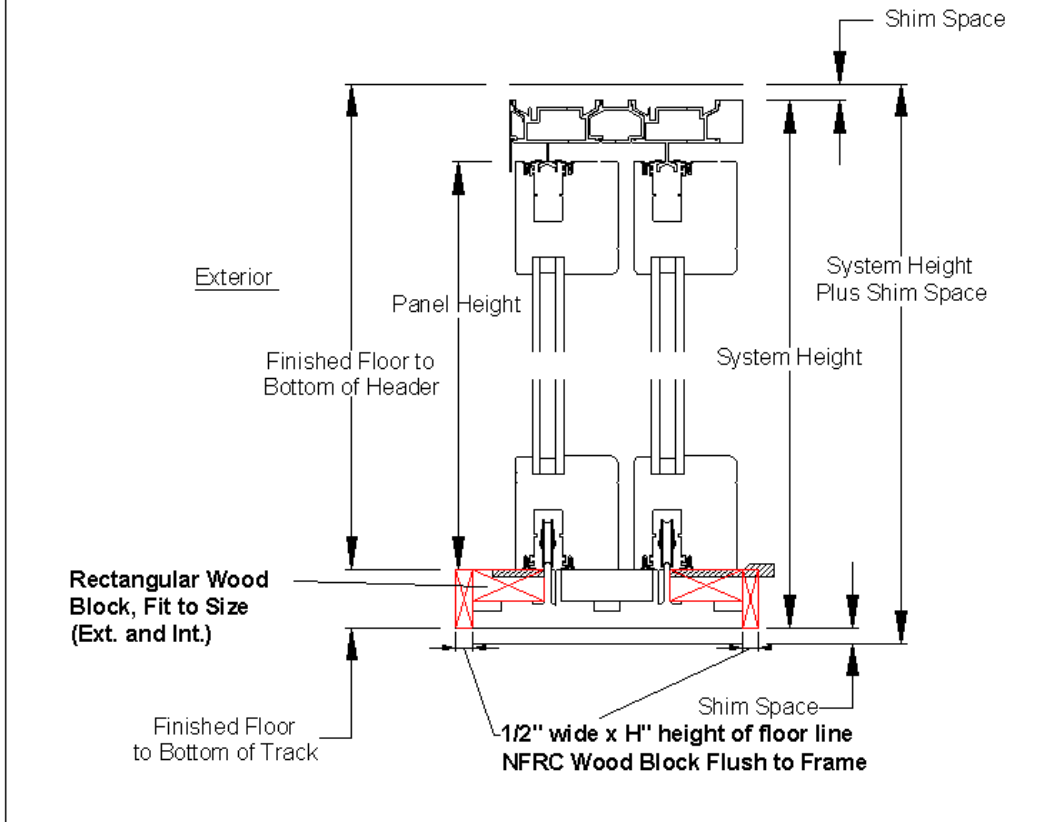
A rectangular wood block (pine or equivalent) ½” x H” (height from the bottom of the sill cavity to the finish floor line) shall be placed from at the edge of the frame on both the exterior and interior.

A rectangular wood block shall be sized to fit the exterior and interior area void created between the ½” block and the sill roller track.

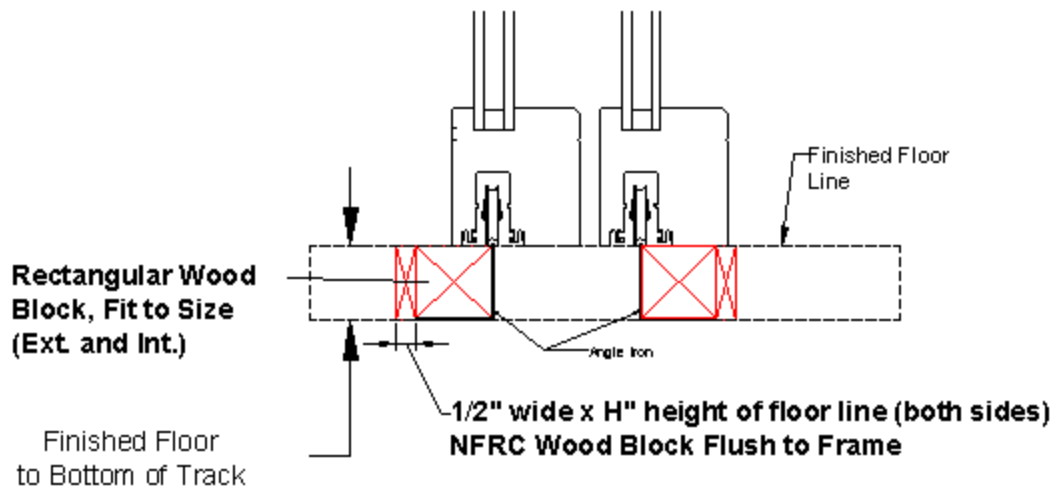
If applicable, any remaining center void that is intended to be filled with material (i.e., concrete) when the unit is installed, a rectangular wood block shall be sized to fit the area.

See accompanying drawings:

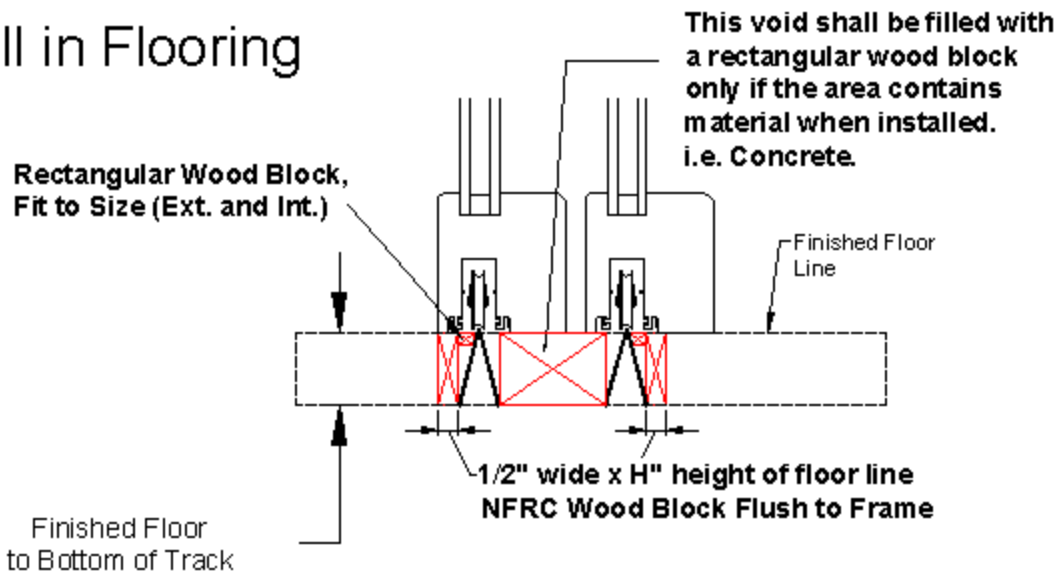
# Sill in Flooring



## Sill in Flooring



## Sill in Flooring



*Technical Committee Revisions to Initial Interpretation:*



TI-2010-21 06/10/2008
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## **NFRC Technical Interpretation – 2010**

<b>Interpretation Requested:</b>
May a non-operable version of an operable product type (X) as listed in Table 4-3 be included in the simulation of the operable product?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
04/17/2008	06/10/2008	06/10/2008 Reapproved 12/08/2010

<b>Pertinent Document:</b>	
NFRC 100-2010	
<b>Referenced Sections:</b>	<b>Referenced Pages:</b>
Section 4.4 and Table 4-3	Pages 25 and 26

<b>Interpretation:</b>
<p>Yes.</p> <p>Any changes to render the product non-operable must comply with section 4.2.</p> <p>For example, this allows a Fixed Casement (O) to be included within the same product line as a Casement (X).</p>

<b>Technical Committee Revisions to Initial Interpretation:</b>



TI-2010-22 10/15/2008
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## **NFRC Technical Interpretation – 2010**

**Interpretation Requested:**

The Dynamic Attachments for Swinging Doors methodology in NFRC 100 and 200 requires rating of the Reference Door with the blinds up and the blinds down and closed. The blinds up case can be simulated. The blinds down and closed case cannot currently be simulated.

Is it acceptable to perform whole product (reference door + attachment) testing to determine these ratings (NFRC 102 for U-Factor and NFRC 201 for SHGC)?

Is it acceptable to use a single U-Factor test to represent both reference products?

Is it acceptable to use a single SHGC test to represent both reference products?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
08/05/2008	10/15/2008	10/15/2008 Reapproved 12/08/2010

<b>Pertinent Document:</b>	
NFRC 100-2010 and NFRC 200-2010	
<i>Referenced Sections:</i>	<i>Referenced Pages:</i>
NFRC 100, Section 5.7	68
NFRC 200, Section 5.8	27

**Interpretation:**

Yes. Current language requires to test glazing system with in-between shading device in closed position and to use tested conductance to simulate whole product performance; however, significant frame portions are required to mount the glazing system, so it is deemed acceptable to test the whole product (reference door + attachment).

No.

No.

**Technical Committee Revisions to Initial Interpretation:**



TI-2010-23 06/16/2009
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## *NFRC Technical Interpretation – 2010*

<b><i>Interpretation Requested:</i></b>
Can ASTM C518 be used to measure the effective thermal conductivity of non-homogeneous specimens, such as composite spacer products or materials that cannot be extruded in sufficient thickness, which cannot otherwise be simulated due to material component construction and limitations of the NFRC software?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
04/24/2009	06/16/2009	06/16/2009 Reapproved 12/08/2010

<b><i>Pertinent Document:</i></b>	
NFRC 100-2010 NFRC 101-2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
NFRC 100, Section 4.3.1.B	22
NFRC 101, Section 5	8

<b><i>Interpretation:</i></b>
<p>Yes, ASTM C-518 testing is acceptable for obtaining effective thermal conductivity values for materials and components that <b>cannot be simulated and/or provided as a homogeneous specimen</b> for testing. Limitations to this allowance are:</p> <p>As stated in NFRC 101, three (3) samples shall be tested and the tested values shall be within 10%.</p> <p>The test specimen must be assembled of parallel lengths of the sample material having thickness no less than 12.7 mm (1/2”) and that no gaps exist between the lengths of material that may allow for air within the test specimen assembly. In cases where the chamber needs to be protected or the specimen cannot be properly sealed, the specimen shall be prepared sandwiched between two pieces of 1/4” thick glass.</p> <p>Orientation of the test specimen material is such that the heat flux in the test assembly is in the same direction across the test specimen assembly as when the component is installed in an</p>

insulating glass unit.

The test specimen assembly construction is such that the heat flux is predominantly uniform across the test area and that areas of localized heat flux variation is minimized.

***Technical Committee Revisions to Initial Interpretation:***



TI-2010-24  
08/18/2009

## **NFRC Technical Interpretation – 2010**

### **Interpretation Requested:**

Can a total product test be used to determine a center-of-glass SHGC ( $SHGC_{cog}$ )?  
When a total product is tested for SHGC with an integral blind or solar screen, can we calculate the  $SHGC_{cog}$ ?

Can the calculated  $SHGC_{cog}$  be used for other product lines with the same glazing and integral blind or solar screen?

<b>Date Requested</b>	<b>Initial Interpretation Date</b>	<b>Final TIPC Approval Date</b>
08/10/2009	08/18/2009	08/18/2009 Reapproved 12/08/2010

### **Pertinent Document:**

NFRC 200-2010

### **Referenced Sections:**

Sections 4.5 & 4.7

### **Referenced Pages:**

Pages 10 & 13

### **Interpretation:**

Yes, only in the case that a COG test cannot be performed and the sample size shall include a 1m x 1m glass area, as required per TI-2004-07. The center-of-glass SHGC shall be calculated as follows:

$SHGC_{cog} = (SHGC_{total} - SHGC_0) / (SHGC_1 - SHGC_0)$ , where:

$SHGC_{total}$  will be from the NFRC 201 test, and the  $SHGC_0$  and  $SHGC_1$  will be from Window 5.2 for the product with custom size (same size as the NFRC 201 test sample).

Yes, this only applies when the integral blind or solar screen is between the panes of glass as defined in NFRC 100, Section 2.1.H.

Yes. As long as interpretations in #1 and #2 are applied.

### **Technical Committee Revisions to Initial Interpretation:**



TI-2010-25 12/10/2009 03/03/2010 Revised
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# ***NFRC Technical Interpretation – 2010***

***Interpretation Requested:***

Clarification of Dual Seal (D) vs. Single Seal (S) for reporting of spacer codes.

The NFRC now requires that the simulation and thermal test labs upload report summaries to the NFRC website. If the simulation and test lab validations do not match exactly, the uploads are rejected by the IA and a new corrected upload is required from each lab.

Recently, there have been rejections of uploads from IA's due to non-matching spacer codes between simulation and validation labs, specifically with the use of (S) vs. (D). Thus, it is requested that there be a clear definition made by the NFRC.

(1) When there is only one material type of sealant on both the sides and bottom of the spacer, would the simulation and test lab report a single sealed or dual sealed spacer system?

(2) When there are two different material types of sealant applied to a spacer would the simulation and test lab report this as a dual seal spacer system?

<b><i>Date Requested</i></b>	<b><i>Initial Interpretation Date</i></b>	<b><i>Final TIPC Approval Date</i></b>
11/17/2009	12/07/2009	12/07/2009 Revised 03/03/2010 Reapproved 12/08/2010

<b><i>Pertinent Document:</i></b>	
Simulation Manual (November 2010) & Certified Products Director 2.0 Simulation Lab User's Manual	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
Simulation Manual, Section 2.7	Page 2-14
Simulation Lab User's Manual, Section 3.3	Page 7

***Interpretation:***

(1) In the simulation manual, section 2.7, it states that there is a primary seal (edge of spacer to glass) that helps to hold the unit together and to prevent moisture intrusion and that a secondary seal (below spacer) is used to provide structural strength. It does not state that the sealant needs to be two different materials in order to be considered a dual sealed spacer.

Thus, if a spacer is sealed both on the sides and below the spacer, it should be reported as a dual sealed spacer.

(2) If a spacer has more than one type of sealant material it will automatically be considered a dual sealed spacer.

***Technical Committee Revisions to Initial Interpretation:***

The revision to this TI was to add question #2, with corresponding answer.



TI-2010-26 03/31/2004 03/15/2011 Revised
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## **NFRC Technical Interpretation – 2010**

<b><i>Interpretation Requested:</i></b>
If a manufacturer does not build an embossed sidelight or raised panel sidelight product in a size near the NFRC Table 4-3 size how does the simulator determine the daylight opening/panel width and height dimensions for the standard NFRC size?

<b><i>Date Requested</i></b>	<b><i>Initial Interpretation Date</i></b>	<b><i>Final TIPC Approval Date</i></b>
02/23/2004	03/29/2004	03/29/2004 Reapproved 03/15/2011

<b><i>Pertinent Document:</i></b>	
NFRC 100-2010 and NFRC 200-2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
NFRC 100 Table 4-3	Page 26
NFRC 100 Figures 5-2a, 5-2b, 5-3	Pages 4-46

<b><i>Interpretation:</i></b>
The stile and rail (PFD) dimensions are held constant and the panel (PFD) dimensions are equally adjusted to account for the difference between the as built and as rated sizes.

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>



TI-2011-01 02/15/2011
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## **NFRC Technical Interpretation – 2011**

<b><i>Interpretation Requested:</i></b>
<p>Grouping a frame component in CMA states that change in frame length perpendicular to the fenestration plane is allowed. Table 5.9.3 for aluminum products states that the maximum length is the group leader. When an aluminum unit is being lengthened solely by increasing the length of the thermal break, (see diagram below) should the group leader be determined by the component with the highest heat loss?</p>

<b><i>Date Requested</i></b>	<b><i>Initial Interpretation Date</i></b>	<b><i>Final TIPC Approval Date</i></b>
01/27/2011	02/15/2011	02/15/2011

<b><i>Pertinent Document:</i></b>	
NFRC 100-2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
NFRC 100, Section 5.9.2	85
NFRC 100, Table 5.9.3	86

<b><i>Interpretation:</i></b>
<p>Frame grouping in NFRC 100 Section 5.9.5.2 for metallic frames shall only apply when the width and material of any thermal break (if present) does not change.</p>

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>



TI-2011-02 03/15/2011
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## **NFRC Technical Interpretation – 2011**

<b>Interpretation Requested:</b>
According to the NFRC Simulation Manual when modeling a skylight, the Jamb members are to be assigned a cross section type of “Sill” and the gravity vector set to “Right”. In CMAST, the cross section type must be compatible with the location of the frame member, so a member with a cross-section type of Sill cannot be used as a Jamb when building a frame assembly in CMAST. What is the proper way to model these members in Therm, or import them to CMAST so they can be used correctly?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
03/09/2011	03/15/2011	03/15/2011

<b>Pertinent Document:</b>	
CMAST Manual and Simulation Manual 6.3	
<b>Referenced Sections:</b>	<b>Referenced Pages:</b>
CMAST Manual, Section 3.6.2.1	Page 61
Simulation Manual, Section 8.5.3	Page 8-64

<b>Interpretation:</b>
For products simulated at a slope, model the Jambs as Jamb and Vertical Intermediates as Vertical Meeting Rail so that the components can be used in CMAST. Set the gravity vector to the right.

<b>Technical Committee Revisions to Initial Interpretation:</b>



TI-2011-03 04/21/2011
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## *NFRC Technical Interpretation – 2011*

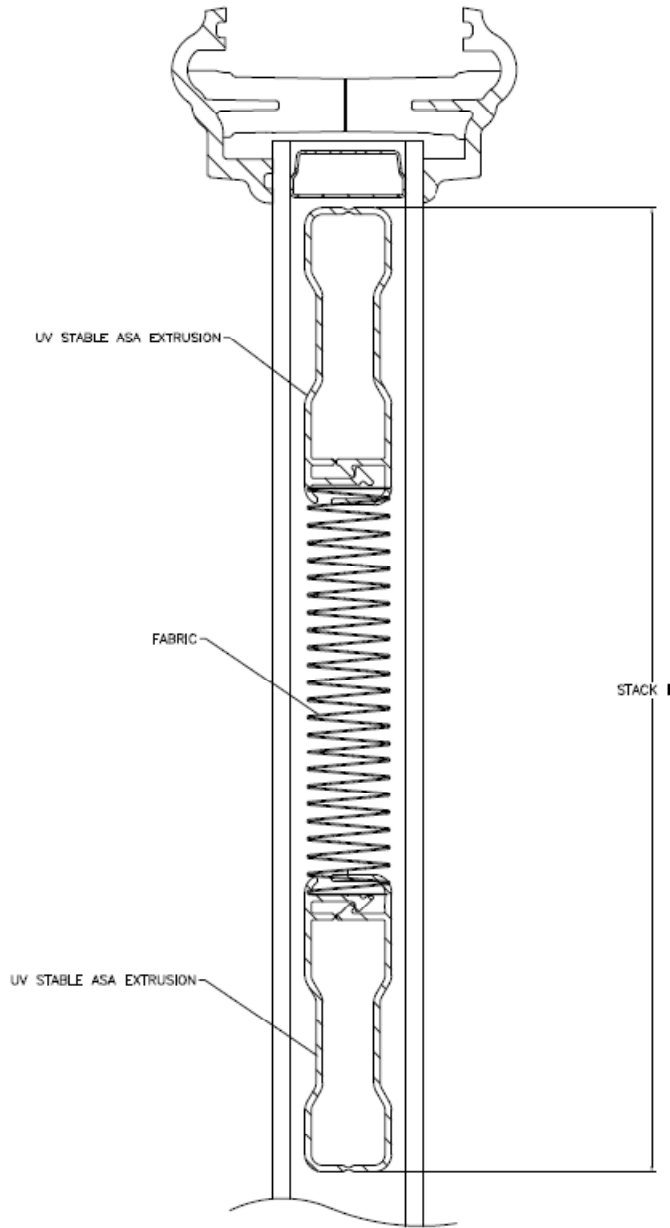
<b><i>Interpretation Requested:</i></b>
Can a fabric shade between the glass be simulated and rated in the fully retracted position?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
04/04/2011	04/21/2011	04/21/2011

<b><i>Pertinent Document:</i></b>	
THERM 6.3 / WINDOW 6.3 NFRC Simulation Manual	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
Section 8.11	Pages 8-119 through 8-129

<b><i>Interpretation:</i></b>
Yes. The technique shown in Section 8.11 of the Simulation Manual shall be used, provided the shade system is designed to be stacked in the retracted position, with a solid block of “Cellulosic Fiber, Cotton Fiber” as the shade material in the model (See Model on next page)

***Interpretation (Continued):***



***Technical Committee Revisions to Initial Interpretation:***



TI-2011-04 04/21/2011
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# *NFRC Technical Interpretation – 2011*

<b><i>Interpretation Requested:</i></b>
If an ACE needs to generate a certificate for a product using a Frame Assembly (FA), is the ACE limited to using Approved Frame Components from a single Framing Product Line (FPL)?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
04/20/2011	04/21/2011	04/21/2011

<b><i>Pertinent Document:</i></b>	
CMAST Manual	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
Appendix C	Pages 144-146

<b><i>Interpretation:</i></b>
No, the CMAST Manual, Section 3.5.2.1, allows assembly of an FA using any approved frame component.

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>



TI-2011-05 05/31/2011
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## **NFRC Technical Interpretation – 2011**

<b>Interpretation Requested:</b>
NFRC 200 4.7.A.iii requires that the Frame and Divider SHGC to be calculated with default absorptance values. Is it required to simulate all frame and divider products for U-factor using the same default absorptance values?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
05/02/2011	05/31/2011	05/31/2011

<b>Pertinent Document:</b>	
NFRC 200	
<b>Referenced Sections:</b>	<b>Referenced Pages:</b>
Section 4.7.a.iii	Pages 14

<b>Interpretation:</b>
No, since U-factor is not affected by absorptance, only the individual products used to generate the Zero and One values called for in section 4.5 need to be calculated using the default absorptance values.

<b>Technical Committee Revisions to Initial Interpretation:</b>



TI-2011-06 05/31/2011
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# *NFRC Technical Interpretation – 2011*

<b><i>Interpretation Requested:</i></b>
Clarify the ambient test temperature conditions required for conducting an NFRC 102 test?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
05/09/2011	05/31/2011	05/31/2011

<b><i>Pertinent Document:</i></b>	
NFRC 102-2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
Section 7	Page 6

<b><i>Interpretation:</i></b>
<p>The following temperature conditions shall be used:</p> <p>Interior Temperature: 21.0 C (69.8 F) +/- 0.3C (+/- 0.5 F)</p> <p>Exterior Temperature: -18.0 C (-0.4 F) +/- 0.3C (+/- 0.5 F)</p> <p>The conditions above were published in NFRC 102-2004 and were inadvertently not included in NFRC 102-2010.</p>

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>

# *NFRC Technical Interpretation – 2011*

***Interpretation Requested:***

When simulating the default steel frame for doors, what sill should be used?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
05/12/2011	06/02/2011	06/02/2011

***Pertinent Document:***

NFRC 100-2010

***Referenced Sections:***

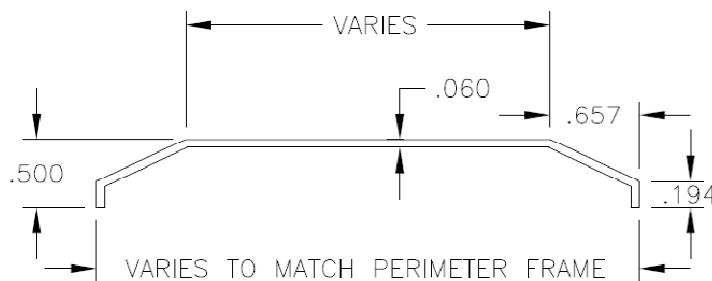
Section 5.2.4.B

***Referenced Pages:***

Page 40

***Interpretation:***

An aluminum non-thermally broken sill with a sill wall thickness of 1.4 mm to 1.6 mm (0.055 in to 0.065 in) and no substrate, as indicated in Section 5.2.4.B of NFRC 100-2010. (The attached drawing may be used.)



DEFAULT NON-THERMALLY BROKEN SILL  
ALUMINUM, MILL FINISH

***Technical Committee Revisions to Initial Interpretation:***



TI-2011-08 08/25/2011
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## ***NFRC Technical Interpretation – 2011***

<b><i>Interpretation Requested:</i></b>
Can a door with two slabs, one in front of the other, be rated by simulation assuming that the projected dimensions of the lite cutouts are the same for 1/4, 1/2, 3/4 and full lites and assuming the product is sold as a system?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
03/01/2011	03/15/2011	08/25/2011

<b><i>Pertinent Document:</i></b>	
NFRC100-2010, NFRC 200-2010, TI-2010-07	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
NFRC 100-2010 (Section 5.2)	37-49
NFRC 200-2010 (Section 5.2)	18

<b><i>Interpretation:</i></b>
Yes, so long as there is not a significant overlap (equal to or less than 25.4mm (1") between the vision area of one door and the opaque area of the other.

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>



TI-2011-09 09/29/2011
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## ***NFRC Technical Interpretation – 2011***

<b><i>Interpretation Requested:</i></b>
How does a simulator represent a very thin metal foil that is less than 0.005” thick?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
07/12/2011	08/25/2011	09/29/2011 Revised 10/25/2011

<b><i>Pertinent Document:</i></b>	
NFRC Simulation Manual	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
Section 6	6-1

<b><i>Interpretation:</i></b>
To simulate a very thin metal foil, increase the thickness by a multiple and divide its conductivity by the same multiple. Draw the foil at x times the thickness and use a conductivity equivalent to 1/x of the conductivity found in NFRC101. The modified thickness shall not exceed 0.005".

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>
TIPC approved a revision on October 25, 2011 to allow the multiplier of the metal thickness to be any value rather than limiting it to an integer, as was initially interpreted.



TI-2011-10 09/29/2011
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## ***NFRC Technical Interpretation – 2011***

<b><i>Interpretation Requested:</i></b>
NFRC 100 Section 5 for Swing Doors makes multiple references to using default assemblies (frames, sills, door lite frames, etc). Are these considered component changes as defined in NFRC 100 Section 4.2.1.F even though the physical shapes may be different?

<b><i>Date Requested</i></b>	<b><i>Initial Interpretation Date</i></b>	<b><i>Final TIPC Approval Date</i></b>
08/18/2011	09/25/2011	09/25/2011

<b><i>Pertinent Document:</i></b>	
NFRC 100	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
Section 5 and 4.2.1	13, 36-50

<b><i>Interpretation:</i></b>
Yes

<b><i>Technical Committee Revisions to Initial Interpretation:</i></b>



TI-2011-11 10/25/2011
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# *NFRC Technical Interpretation – 2011*

***Interpretation Requested:***

Clarify what value shall be entered for the variable,  $e_1$ , for fenestration product testing conducted in accordance with NFRC 102?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
10/11/2011	10/25/2011	10/25/2011

***Pertinent Document:***

NFRC 102

<i>Referenced Sections:</i>	<i>Referenced Pages:</i>
Section 7	6

***Interpretation:***

The surface emissivity of the Calibration Transfer Standard (CTS) shall be used for the variable  $e_1$  in all formulas where that variable is referenced.

***Technical Committee Revisions to Initial Interpretation:***



TI-2011-12 11/29/2011
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# *NFRC Technical Interpretation – 2011*

***Interpretation Requested:***

When simulating a product with a metallic frame, what interior boundary conditions and surface emissivities shall be applied?

<i>Date Requested</i>	<i>Initial Interpretation Date</i>	<i>Final TIPC Approval Date</i>
11/17/2011	11/29/2011	11/29/2011

<b><i>Pertinent Document:</i></b>	
NFRC 100-2010 NFRC 101-2010	
<b><i>Referenced Sections:</i></b>	<b><i>Referenced Pages:</i></b>
Table 4-2 of NFRC 100 Appendix A, B, and C of NFRC 101	Page 24 Pages 18-26

***Interpretation:***

Non-thermally broken metallic frames shall use Aluminum, thermally improved metallic frames shall use Thermally Improved Aluminum; and, and thermally-broken metallic frames shall be use Thermally Broken Aluminum Boundary Conditions.

Metallic surfaces shall be assigned the emissivity per NFRC 101 for exposed, painted, or anodized as appropriate. Surfaces to be considered exposed shall follow the same rules as aluminum frames but with the emissivity appropriate for that material.

***Technical Committee Revisions to Initial Interpretation:***