

Chapter 1

Introduction

The Australian Fenestration Rating Council (AFRC) was established to provide an energy rating system for windows and doors that is fair, accurate and credible in application. The AFRC is the Australian operator of the NFRC.

The establishment of the AFRC is an attempt by the fenestration industry to take control of its own future.

The Government is interested in the development of a comprehensive and credible system to fairly evaluate fenestration products for more efficient energy performance. Insulation has been a primary energy saving component improved energy efficiency for some years but now other building components (such as windows) are seen as having a role to play in energy conservation and CO₂ emission reductions.

It is not within the AFRC remit to establish 'performance targets', that is the responsibility of the appropriate authorities. The role of the AFRC is to make sure that uniform methods of independently evaluating fenestration performance are available and employed so that any manufacturer's products can be compared and contrasted.

NFRC Process Background

The National Fenestration Rating Council Incorporated (NFRC) operates a uniform national rating system for energy performance of fenestration products. The Rating System determines the U-value (this is synonymous with U-factor), Solar Heat Gain Coefficient (SHGC) and Visible Transmittance (VT) of a product, and is supplemented by procedures for the ratings of products for Air Leakage (AL) and Condensation Resistance (CR). Together, these rating procedures, as set forth in documents published by NFRC, are known as the NFRC Rating System. The Rating System is expected to be supplemented by additional procedures for rating energy performance characteristics including annual energy performance, long term energy performance, ultra-violet (UV) and comfort.

The Rating System employs computer simulation and physical testing by NFRC-accredited laboratories to establish energy performance ratings for fenestration product types.

NFRC ensures the integrity and uniformity of NFRC ratings, certification and labeling by ensuring that responsible parties, testing and simulation laboratories and Independent Auditors (IAs) adhere to strict NFRC requirements.

In order to participate in the Certification Program, a responsible party shall rate a product to be certified for mandatory NFRC rating procedures. At present, a responsible party may elect to rate products for U-factor, solar heat gain coefficient, visible transmittance, air leakage, condensation resistance, or any other procedure adopted by NFRC, and to include those ratings on a label affixed to its products (or Certificate for site-built products).

U-factor, SHGC and VT, AL, and CR rating reports shall be obtained from a laboratory, which has been accredited by NFRC in accordance with the requirements of the Laboratory Accreditation Program (LAP).

NFRC maintains a Certified Products Directory, listing product lines and individual products selected by the responsible party for which product certification authorisation has been granted and listing all NFRC-licensed IAs and NFRC-accredited testing simulation laboratories.

NFRC manages the Rating System and regulates the Product Certification Program (PCP) , Laboratory Accreditation Program (LAP) and Certification Agency Program (CAP) in accordance with the PCP, the LAP and the CAP procedures, and conducts compliance activities under all these programs as well as the Compliance and Monitoring Program. NFRC continues to develop the Rating System and each of the programs.

NFRC owns all rights in and to each of the PCP, LAP, CAP, Compliance and Monitoring Program, and each procedure, which is a component of the Rating System, as well as each of its certification marks, trade names, and other intellectual property.

AFRC Process Background

AFRC is the custodian of protocols and procedures for the energy rating of all fenestration products in Australia. AFRC is an international partner of NFRC and therefore adopts the NFRC Rating System with exceptions such as the Air Leakage (AL) procedure. Procedure for the ratings of products for Air Leakage (AL) in Australia can be found in the AS2047 standard. AFRC develops, administers, and approves methods and systems unique to Australia and ensures a uniform rating and labeling system for energy performance for windows, glazed doors, skylights, Louvre windows as well as attached products such as film and secondary glazing.

The AFRC Rating System employs computer simulation (only) by AFRC-accredited laboratories to establish energy performance ratings for fenestration product types. AFRC ensures the integrity and uniformity of AFRC ratings, certification and labeling by ensuring that responsible parties, simulation laboratories, Independent Auditors (IAs) and Independent Audit Houses adhere to strict AFRC requirements.

In order to participate in the Certification Program, a responsible party shall rate a product to be certified for mandatory AFRC rating procedures. At present, a responsible party may elect to rate products for U-Value, solar heat gain coefficient, visible transmittance, condensation resistance, or any other procedure adopted by AFRC, and to include those ratings on a label affixed to its products or Certificate.

U-Value, SHGC and VT, and CR rating reports shall be obtained from a laboratory or an independent audit house, which has been accredited by AFRC in accordance with the requirements of the Laboratory Accreditation Program (LAP)-NFRC 701. Air leakage shall be given to the AFRC accredited simulation laboratory before commencing any simulation. AFRC maintains a Certified Product Directory (CPD) listing individual products certified and accredited by AFRC certified IAs and AFRC accredited simulators. Please note AFRC certified IA's may maintain a CPD, listing individual products certified by the specific IA and simulated by an AFRC accredited simulator.

AFRC manages the Rating System and regulates the Product Certification Program (PCP) , Laboratory Accreditation Program (LAP) and Certification Agency Program (CAP) in accordance with the PCP, the LAP and the CAP procedures, and conducts compliance activities under all these programs as well as the Compliance and Monitoring Program. AFRC continues to develop the Rating System and each of the programs.

NFRC owns all rights in and to each of the PCP, LAP, CAP, Compliance and Monitoring Program, and each procedure, which is a component of the Rating System, as well as each of its certification marks, trade names, and other intellectual property. AFRC owns all rights in the procedures developed unique to Australia.

AFRC Labelling Process is currently being finalised and will be implemented in the near future.

AFRC does not adopt the NFRC 901-Guidelines to Estimate the Effects of Fenestration on Heating and Cooling Energy Consumption in Single Family Residence procedures in Australia. AFRC follows the guidelines set out by the Nationwide House Energy Rating Scheme (NatHERS) to rate the potential energy efficiency of Australian homes. For more information please visit the following website: <http://www.nathers.gov.au/> .

The reports generated by the computer simulation containing the energy performance details are utilised to generate data files that can be used in the software accredited by NatHERS. The accredited software are utilised to obtain Annual Energy Performance for Residential Buildings.

Approved Simulation Software

- Therm 6.3
- Window 6.3
- Optics 5.1.02
- Simulator shall use only current approved NFRC versions of above software tools. See windows.lbl.gov/software.

Approved Simulation Documentation

The following documents are to be used in conjunction with the exceptions in this manual:

- NFRC Simulation Manual
- Current Technical Interpretations (ie. NFRC TIPC Interpretations, AFRC Technical Interpretation Manual)
- Please visit the following website for more information : www.nfrc.org/resources.aspx and <http://www.afrc.org.au/TechDocs.htm>
- AFRC 300-01-1.0 Louvre Window System Simulation Manual or AFRC Louvre Window System Simulation Manual
- AFRC 200-01-1.3 Skylight Simulation Manual or AFRC Skylight Simulation Manual

Chapter 2

Scope

This AFRC User Manual provides guidelines and explains the procedure to AFRC-licensed users in Australia to obtain thermal performance ratings for fenestration products within product lines from AFRC-accredited simulation and testing laboratories, and obtain a certification authorisation report (CAR) for these ratings, and authorisation to label products from AFRC-licensed independent agencies (IAs).

This manual specifically documents the Australian variations and rules and should be read in conjunction with the PCP, the LAP, the CAP and the technical procedures of the NFRC.

Each participant of this program acts independently to report, authorise for certification, and certify a rating.

AFRC and NFRC do not certify a product and certification does not constitute a warranty of AFRC or NFRC regarding any characteristic of a fenestration product. Certification is not an endorsement of or recommendation for any fenestration product or product line or any attribute of a product or product line. AFRC and NFRC are not merchants in the business of selling fenestration products and therefore cannot warrant products as to their merchantability or fitness for a particular use.

AFRC and NFRC therefore disclaim any and all liability that may arise from or in connection with services provided by, decisions made by, or reports or certifications issued or granted by any NFRC-accredited laboratory, NFRC-licensed IA or any product manufacturer; reliance on any NFRC product description, specification, rating, test or certification, whether appearing in a report, a product certification authorisation or a printed or electronic directory, or on a label; or the sale or use of any NFRC-rated or certified fenestration product or product line; including but not limited to damages for personal or other injury, lost profits, lost savings or other consequential or incidental damages.

AFRC program participants are required to indemnify AFRC from and against such liability.

Chapter 3

Approved Glass Library

REFERENCES

NFRC Simulation Manual

Technical Interpretations (NFRC TIPC Interpretations, AFRC Technical Interpretation Manual)

3.1 GENERAL

The **only** sources of glass spectral data are:

- The International Glazing Database (IGDB) as issued by Lawrence Berkeley National Laboratory (LBNL). The current version of the IGDB is located at <http://windows.lbl.gov/materials/IGDB/default.htm>
- NFRC approved spectral data is identified by a # sign in the IGDB.
- Laminates constructed by an accredited simulator in accordance with NFRC procedure "Creating a Laminate in Optics for NFRC".

3.2 AUSTRALIAN EXCEPTION

Australia only permits the use of IGDB certified data including, but not limited to, NFRC data with the # sign and laminated glass constructions as defined above. To be classified as IGDB certified data, the data must have a valid IGDB version number. This number is found in the Source column of the Glass Library in Window 6.3.

3.2.1 Non-Valid IGDB Data

- Data with the Source 'User' with the exception of laminates as described above.
- Data with the Source 'Optics5 vx.x' where 'x' indicates the version number of Optics5 with the exception of laminates as described above.
- Data with the Source 'IGDB v12.2' with the exceptions of IGDB ID 1343 and 1344 with the exception of laminates as described above. (IGDB 1343 and 1344 are permitted because they are identified as NFRC approved (or #) products.)

3.2.2 Additional Notes

- a. Glazing with an applied film is to be measured as a spectral data file on the appropriate substrate (3mm clear, 6mm clear and 6mm grey) and have an approved IGDB number.
- b. Obscure and patterned glass products are modelled as their base glass properties (refer TI-2004-13)
- c. Glass blocks and blinds are not currently included.
- d. The nominal glass thickness used in the IGDB and by the NFRC is based on imperial thicknesses found in ASTM C1036-97. Glass intended for use in the Australian market should be represented by metric nominal thickness as stated in AS 4667:2000 and AS2208:1996. If a product falls outside the metric nominal thickness range, only a thinner product may be substituted.

Chapter 4

Simulation Process

REFERENCES

AFRC Technical Interpretation Manual
NFRC 100
NFRC 200
NFRC 500
NFRC Simulation Manual
NFRC Approved Simulation Computer Programs
Technical Interpretations (NFRC TIPC Interpretations)
NFRC 700
AFRC Skylight Simulation Manual
AFRC Louvre Window System Simulation Manual

4.1 GENERAL

All simulations are to be performed using AFRC Approved Software, NFRC or AFRC Approved Simulation Documentation (see Chapter 1) and NFRC or AFRC technical documents (NFRC 100, NFRC 200, NFRC 500, AFRC 300-01-1.0, and AFRC 200-01-1.3, AFRC 300-01-1.0 Louvre Window System Simulation Manual).

4.1.1 Overview

Receive Manufacturer's Documentation

- a. Create Glazing Library with any Product Grouping using Approved Simulation Software (see Chapter 1) and the Approved Glass Library (see Chapter 3)
- b. Create frame component files using Approved Simulation Software (see Chapter 1)
- c. Create complete window file using the data from steps 1 and 2 and Approved Simulation Software (see Chapter 1)

4.2 ENVIRONMENTAL CONDITIONS

The glazing, frames and whole windows are modelled using NFRC 100-2001 environmental conditions.

4.3 SIMULATION SOFTWARE

Simulations are to be performed using Approved Software. For the current list of approved software see Chapter 1.

The following checkbox should be ticked under the preferences area in the WINDOW simulation software:

- Use Nominal Glass Thickness

The following checkbox should not be selected under the preferences area in the WINDOW simulation software:

- Use Nominal Heights

4.4 MANUFACTURER'S DOCUMENTATION

The minimum documentation that a manufacturer shall provide to the simulator is as follows:

- Manufacturer's Details (name, address, contact details)
- General Product Description (Series or model type, operator type, size, framing type, glazing type, spacer type)
- Accurate scale assembly drawings including frame component/part numbers
- Dimensioned frame component drawings (including material types)
- Glazing Material including:
 - thickness,
 - coatings and films (if present) with location identified (surface),
 - gap width (insulated glass units),
 - gas fill (type of gas and fill method)
 - spacers – materials, construction, drawings
- AS2047 report

4.5 CREATION OF GLAZING LIBRARY

The Glazing Library is created using Approved Simulation Software and the Approved Glass Library. Nominal glass thickness is to be used when modelling. After the creation of the Glazing Library, similar products can then be grouped, as per the NFRC product grouping rules, to minimise the total number of simulations to be performed.

4.6 PRODUCT GROUPING FOR GLAZING

The rules for product grouping by U-value are present in NFRC 100.

4.7 CREATION OF FRAME COMPONENT FILES

The frame component files are to be created using Approved Simulation Software following the guidelines of the NFRC Approved Simulation Manual. The Simulation Manual details how frame sections should be modelled including, but not limited to, frame cavities, boundary conditions, U-value tags. The default frame absorptance for residential products is 0.30. The default frame absorptance for commercial products is 0.50.

4.8 CREATION OF COMPLETE WINDOW FILE

To create a complete window file, the following is required:

- Glazing components (modelled using Approved Simulation Software)
- Frame components (modelled using Approved Simulation Software)
- Product Model Size
- An Approved Simulation software program

4.9 PRODUCT MODEL SIZE AND CONFIGURATIONS

The product model size and configurations used are given in NFRC 100 Table 4-3. It is recognised that the standard simulation configurations are not representative of the typical window configurations found in Australian housing. The Approved Simulation Software is currently only able to simulate one or two light windows. For a multi-light product, the product shall be modelled as a single or two light window following the notes accompanying table in Section 4.10 below. This rule is applicable because some studies have shown that it is valid to extrapolate the values calculated with one and two light windows to multi-light windows.

4.10 EXTRACT FROM NFRC 100 Tables 4-3

(Using Australian nomenclature, with Model Size as height by width, SI units)

WINDOW PRODUCTS

Product Type	Opening (X) Non-operating (O)	Model Size (height by width) SI units
Awning, Single (Projecting)	X	600mm by 1500mm
Awning, Dual (Projecting)	XX	1200mm by 1500mm
Casement – Single	X	1500mm by 600mm
Casement – Double ¹	XX	1500mm by 1200mm
Double Hung (Vertical Slider)	XO or XX	1500mm by 1200mm
Fixed (incl. non-standard shapes)	O	1500mm by 1200mm
Folding Window	XX	1500mm by 1200mm
Horizontal Slider	XO or XX	1200mm by 1500mm
Pivoted	X	1500mm by 1200mm
Tilt'n'Turn	X	1500mm by 600mm
Louvre windows	X	1500mm by 600mm

DOOR PRODUCTS

Product Type	Opening (X) Non-operating (O)	Model Size (height by width) SI units
Door Transom	X	600mm by 2000mm
Folding Door ²	XX	2000mm by 2000mm
Garage Door Garage(Vehicular Access)/Rolling Door	X	2134 mm x 2134 mm
Sliding Patio Door with Frame ²	XO or XX	2000mm by 2000mm
Swinging Door with Frame ³	O, X, XO or XX	2000mm by 1000mm or 2000mm by 2000mm

OTHER FENESTRATION PRODUCTS

Product Type	Opening (X) Non-operating (O)	Model Size (height by width) SI units
Curtain Wall/Window Wall/Sloped Glazing	OO ⁴	2000mm by 2000mm
Sidelight	X	2000mm by 600mm
Roof Window	X	1200mm by 1200mm
Skylight	X	900mm by 900mm
Vertical Sashless	XX	1500mm by 1200mm
Horizontal Sashless	XO or XX	1200mm by 1500mm
Tubular Daylighting Device (TDD)	O	350mm diameter

Notes:

1. Double Casements are to be rated only in the case where a single casement is not manufactured.
2. The double door shall be used to represent all door assemblies (OXO, OXXO). Where a multi panel door is required to be modelled, it shall be modelled as a two light door using the head, sill, jamb and mullion cross sections with the most 'finning'.
3. The single door shall be used to represent all door assemblies (single, double, multiple) unless the manufacturer does not produce a single door. In that case, the double door shall be used to represent double and multiple door assemblies.
4. Two lights with one vertical mullion. A multi-story system shall be simulated as a curtain wall and a single-story system shall be simulated as a window wall. Curtain walls shall be simulated and tested with intermediate verticals as jambs and intermediate horizontal as head/sill frame members. Window walls shall be simulated and tested with intermediate verticals as jambs and standard head and sill members. For rating of curtain walls and window walls, area weight intermediate members based on centreline dimensions. Sloped glazing may also be rated based on the centreline dimensions if utilized like a curtain or window wall, except for solariums and sunrooms. Sloped glazing of solariums and sunrooms shall be simulated and tested with standard jamb, head, and sill members. Refer to NFRC 100-2010, Section 5.6.4.2.
5. Fits over an 1180 mm by 1180 mm opening.

4.11 EXCLUDED PRODUCTS

The following products cannot be calculated for SHGC using NFRC 200 simulation techniques:

- Tubular Daylighting Devices (TDD)
- Dome Skylights
- Prismatic diffusers
- Glass Blocks
- Translucent Glazings

4.12 SPECIFIC PRODUCT CONSIDERATIONS

4.12.1 What is Not Modelled

NFRC 100 specifically excludes certain details which are not modelled in Therm. These include:

- Screens
- Optional interior trim
- Colonial Bars which are applied to the surface of the glass. Internal dividers between glass layers must be modelled as per NFRC 100-2004.
- Optional jamb, head and sill extensions.
- Interior or exterior shading devices.
- Non-continuous components such as hinges, locks, balances, operators, setting blocks, shear blocks and corner stakes.
- Reveal linings. Frames with removable reveal fins shall be modelled with the fins removed. Permanent reveal fins shall be modelled as per NFRC Technical Interpretation TI-2005-08.

4.12.2 AFRC Additional Products

The following Products can be simulated following AFRC specific simulation methods

- Tubular Skylights, for SHGC
- Rectangular Skylights, with shaft for U value and SHGC
- Sashless Windows
- Louvre Windows
- Secondary Glazing

4.13 SOFTWARE BUGS

Current list of bugs in the simulation software can be found in the following pages:

- http://windows.lbl.gov/software/therm/FAQ/therm63_faq.htm
- http://windows.lbl.gov/software/window/6/W63_faq.html

4.14 MODELLING ISSUES

Please refer to the AFRC Technical Interpretation Manual for more information

Chapter 5

Reporting Formats

REFERENCE

NFRC 701, NFRC 701.03, NFRC 701.07

5.1 GENERAL

The simulator shall maintain a file for assessment by the auditor s that will allow for full traceability to the requirements required in this chapter.

The simulator may produce a full test report for the client on request or provide only part information as required.

Details are given below. All reported units to be SI (metric).

5.2 UNITS

Data reporting in the public domain shall be to one decimal place for U-value and to two decimal places for SHGC and VT, with a leading zero in the case of SHGC and VT. All results shall be reported in SI units. U-value shall be reported in W/m^2K .

(Example of Results: U-value = 5.6W/m²K, SHGC = 0.39, VT = 0.56)

5.3 SIMULATION AND TEST REPORT CONTENTS

5.3.1 Administration

- a. Name, address, telephone number and email address of simulation/test laboratory
- b. Simulation date
- c. Name, address and all contact details of the client
- d. Unique report number for each product/product line
- e. Simulation/test methods employed (eg; NFRC 100)
- f. A statement that the simulations/tests were conducted in full compliance with the applicable requirements
- g. Rating size [height (mm) x width (mm)]
- h. A statement that the report relates only to the fenestration products simulated/ tested
- i. Name and signature of the Simulator-in-responsible-charge.
- j. Date of audit finalization

5.3.2 Product Description

A detailed written description and/or drawing(s) of the specimen including, where applicable:

- Manufacturer and model number
- General description of product (i.e. operator type, frame type)
- A window elevation identifying frame cross sections
- Dimensioned drawings (or reference to dimensioned drawings) of cross-sections of the window system (keyed to the window elevation) identifying weather-stripping locations

- A bill of materials if full material descriptions are not included on the cross sectional drawings or technical data manual or sheets.
- Individual product glazing characteristics, including IGDB numbers and IGDB version, local identification name, thickness, coatings and/or films and their location (surface number, starting from the outside)
- Gap characteristics including width, gas fill, type and design concentration
- Spacer drawing(s) identifying profiles and materials (spacer, sealants and desiccants)
- All continuous hardware
- Solar absorptance of frames and dividers if other than the default values

5.3.3 Simulation Results

- Total Product Area Weighted U-value (U), Solar Heat Gain Coefficient (SHGC) and Visible Transmittance (VT). Optional: CR if required by Client.
- Centre of Glass U-value (Ucog), Solar Heat Gain Coefficient (SHGCCog) and Visible Transmittance (VTcog)
- A table of the 0 and 1 Solar Heat Gain Coefficient and Visible Transmission SHGC/VT 0 & 1 values for no dividers and, if the manufacturer specifies that the product may have dividers, values with the standard default dividers
- ISO Damage Weighted Transmittance TdwISO
- Identification of each individual product within the product line simulated, if using grouping.
- For Roof windows, Luminous Efficacy (VT/SHGC) (optional for other products)
- For commercial applications only, the following additional properties for both frame and edge-of-glazing are required: average and individual U-values, SHGCs and areas.

Chapter 6

Australian Variation – Physical Testing

REFERENCES

NFRC 100
NFRC 102
NFRC 200
NFRC 201
Memorandum of Understanding

6.1 GENERAL

Testing is not currently required for U-value and Solar Heat Gain Coefficient except for products where these properties cannot be simulated. In such circumstances the following test procedures shall be adopted.

6.2 U-VALUE

NFRC 100 Section 4.3.2 procedures shall be followed using relevant Australian model sizes. (Refer to Chapter 4.10) Physical Testing procedures are specified in NFRC 102.

6.3 SHGC

The product shall be tested in accordance with NFRC 201 to the standard conditions specified in NFRC 200 Section 4.3. Relevant Australian model sizes shall be used. (Refer to Chapter 4.10)

Chapter 7

Simulator Training & Accreditation

REFERENCES

NFRC 701
NFRC 700
AFRC Simulator Code of Conduct
AFRC Simulator Procedures

7.1 GENERAL

The AFRC administer and provide the training and accreditation for all simulation and test laboratories. . The NFRC 701 details the requirements of simulation and test laboratories. The AFRC Simulator Procedures document defines procedures for all simulators engaged in any type of fenestration simulation accredited by the AFRC. The AFRC Simulator Code of Conduct defines the principles and standards of conduct that AFRC Accredited Simulators must maintain. AFRC training and accreditation procedures are based on the NFRC procedures and protocols with Australian variations.

7.2 AUSTRALIAN EXCEPTION

All simulators are to be trained in the use of the currently AFRC approved simulation software programs and technical procedures. An individual may have both trainer and simulator status if all accreditation requirements are met for each category.

7.3 TRAINER REQUIREMENTS & ACCREDITATION

The individual shall have successfully attended and completed all the necessary examinations of the AFRC Simulator Accreditation Workshop and shall meet the following requirements:

- Participate in annual round robins as required (national basis through the AFRC)
- Participate in annual workshops or training
- Participate in random checks of other accredited trainers and be randomly checked by other accredited trainers
- Actively participate in the training of simulators to maintain status
- An active member of the AFRC Technical Protocols Committee
- Participate in the development of training procedures
- Participate in the evaluation of Simulator's examinations
- Meet the minimum simulation equipment requirements (refer to NFRC 701 for details)
- Meet the minimum operations manual requirements (refer to NFRC 701 for details)
- Meet the minimum record keeping requirements (refer to NFRC 701 for details)

7.4 SIMULATOR REQUIREMENTS & ACCREDITATION

The individual shall have successfully attended and completed all the necessary examinations of the AFRC Simulator Training Course and shall meet the following requirements:

- Meet the independence criteria
- Participate in national annual round robins
- Participate in any annual workshop/training and successfully complete any examination resulting from this workshop.
- Participate in random checks of other simulators and be randomly checked by other accredited simulators
- Participate in annual reviews
- Meet the minimum simulation equipment requirements (refer to NFRC 701 for details)
- Meet the minimum operations manual requirements (refer to NFRC 701 for details)
- Meet the minimum record keeping requirements (refer to NFRC 701 for details)

7.5 AUSTRALIAN ACCREDITED TRAINING COURSE

This training course involves learning how to perform simulations using the currently AFRC approved simulation software programs and technical procedures including the current Australia variations. The training course was developed by the AFRC TAC. The course involves the successful completion of two test problems within a given time period (30 days). Marking criteria can be found on the AFRC Simulator Training manual. The examination is assessed by an Australian trainer and may be cross-checked by another accredited trainer or simulator. The successful completion of this examination is required as part of the process to be successfully accredited as a simulator in Australia.

7.6 INDEPENDENCE CRITERIA

In order for a simulator/simulation laboratory to become or remain accredited the laboratory shall meet the laboratory independence requirements set out in this section, so that services are rendered objectively and without bias.

1. No accredited simulator, laboratory, owner, owners, officers, directors, managers or employees or any affiliated person may:
 - a. Have any financial interest in any fenestration product or component manufacturer, supplier or vendor,
 - b. Recommend the use of any product (or product component) for which the accredited simulator/laboratory provides simulation services,
 - c. Recommend the use of a particular thermal performance certification agency,
 - d. Be involved in the commercial design or fabrication of fenestration products or components.
2. No accredited laboratory shall accept any payment or consideration of any kind, from any person, in exchange for the laboratory's reporting a rating or simulation result that appears to meet or comply with the requirements of the Australian Supplement AFRC documents when the testing or simulation was in fact not conducted and reported in compliance with those requirements.
3. Each accredited simulator/laboratory shall keep confidential all product information, test data and other proprietary information developed for or acquired from the simulator/laboratory's clients to the extent required by such clients, except as may be expressly required by auditors or through the simulator and trainer cross checking process (for simulator and trainer reviews).

Chapter 8

Independent Auditor (IA)

REFERENCES

NFRC 702

NFRC 700

NFRC Certification and Inspection Agency (IA) Operations Manual.

AFRC Auditor Code of Conduct

AFRC Auditor Procedures

8.1 GENERAL

An AFRC-licensed Independent Auditor (IA) is responsible for reviewing simulation laboratory reports and data files and certifying their validity. The IA shall comply with the requirements of the NFRC 702 with the following Australian exceptions.

8.2 ANNUAL IN-PLANT INSPECTIONS

Where a manufacturer participates in an independent certified Inspection Accreditation Program there is no requirement for such inspections by an IA. In such circumstances their role shall be limited to certification of simulation data. Otherwise, inspections shall be carried out as specified in the NFRC 702

8.3 TECHNICAL AUDITING OF SIMULATIONS

In order to manage a system without auditing of all products, products shall be randomly selected and auditing shall be subcontracted out by the Gatekeeper. The Gatekeeper data upload fee shall contain an audit provision to allow for auditing of 30% of product lines on average across the industry, comprising a mix of random audits for practicing simulators and mandatory audits for new simulators

For a new accredited simulator the first 20 product lines simulated shall be audited. Where more than 5 glazing systems or glazing product groups are simulated within a product line, only 5 glazing systems or glazing product groups (if product grouping has been used) need to be audited per product line if no errors are found. If the first 20 product lines are found to be without error, the frequency of audit shall reduce to nominally 20% of product lines selected at random by the Gatekeeper.

In the event of a subsequent failed audit, the frequency shall increase to all product lines until 5 consecutive error-free ratings are generated. The simulator shall also review all intervening ratings since the last audit for the same type of error and submit a written report to the IA outlining the findings and any necessary remediation. The IA shall forward this report to the AFRC Board for their action.

In the event of an audit failure rate of 1 in 3 audits or greater, the AFRC Board shall review the accreditation status of the simulator. If any remedial action is not undertaken or is unsatisfactory or ineffective the Board reserves the right to suspend accreditation.

8.3.1 Auditing Checklist

The following is an overview of the items to be checked when auditing simulations. An exhaustive checklist is contained in the NFRC Certification and Inspection Agency (IA) Operations Manual.

Manufacturers Documentation

- Check documentation for completeness: manufacturers' details / product description.
- Check Assembly drawings: scale / frame, component part numbers.
- Check frame component drawings.
- Check glazing matrix: thickness, coatings & films, gas, spacers etc.

Glazing Library

- Check IGDB ID number, thickness, coatings & films (surface), gap width, gas fill.
- Check groupings (if used).

Frame Component Files

- Check Therm file properties: ID / cross section type.
- Check gravity vector.
- Check frame component materials against drawings.
- Check frame cavities: Nu number, slightly ventilated exterior cavities, taped edge cavities, frame cavity surface emissivity (hollow aluminium sections).
- Check Glazing library / ID / CR cavity height / options.
- Check Glazing Sight line / spacer height / edge of glass dimension / glazing system height.
- Check boundary conditions / tags.
- Check U-value is set to 'projected Y'

Complete Window File

- Check window type / mode / conditions.
- Check glazing system.
- Check frame elements.

Simulation Report

- Check manufacturer's details.
- Check client details
- Check window type / mode / conditions.
- Check results / units.
- Check window report file.

8.4 INDEPENDENCE CRITERIA

An IA shall satisfy the independence criteria stipulated for simulators. An IA may also perform the role of simulator provided they do not act as Simulator and IA on any given simulation.

8.5 IA TRAINING AND ACCREDITATION

IA's must meet the training and accreditation requirements of a Simulator. In particular they must participate in annual round robins and annual workshops and any related examinations. In addition an IA must submit to an initial inspection by two members of the NFRC Technical Committee to verify compliance with the requirements of the NFRC 702.

CHAPTER 9

Technical Interpretations Policy Committee (TIPC)

REFERENCE

Technical Interpretations Manual (NFRC TIPC Interpretations, AFRC Technical Interpretation Manual)

9.1 GENERAL

Technical Interpretations Policy Committee (TIPC) is a standing NFRC committee that provides supplementary technical advice and rulings to NFRC participants. It was created because existing NFRC technical procedures and documents do not always provide clear guidance, especially regarding modelling procedures. The NFRC Simulation Manual is replete with worked examples and TIPC complements that document. NFRC TIPC rulings are contained in *the NFRC Technical Interpretation Manual*. The benefits of TIPC are i) a quicker turnaround on questions requiring interpretation, and ii) more time available during regular committee and membership meetings for the development of new procedures.

TIPC meets once a month by teleconference. Because most TI requests are from highly experienced simulators, TIPC requires that a request be accompanied by a suggested answer. If TIPC members agree with the proposed answer the committee will simply answer 'yes'. If they do not agree, the committee will provide a workaround or a solution.

Totally new language issued by TIPC is not automatically added to the relevant technical procedure(s). That action occurs during the normal cycle of document revision which is normally four years but can be shorter in the case of urgent issues. For this reason, NFRC and AFRC simulators and test labs are expected to be familiar with and to refer to the latest version of the TIPC document when carrying out ratings.

9.2 AusTIPC

For practical reasons, it is recommended that the AFRC Technical Advisory Committee function as a local TIPC ('AusTIPC'). Rulings shall be considered by that committee and finalised by consensus. The current AFRC Technical request form ('TIR') shall be used and forwarded to the AFRC Board. Once an AusTIPC ruling has been issued, if it is related to current NFRC procedures it shall be forwarded to NFRC TIPC for peer review and approval. If the AusTIPC request relates to non-NFRC (i.e. Australia-only) provisions, the AusTIPC ruling may be optionally forwarded to AFRC Board, depending on the judgment of AusTIPC. AFRC TIPC rulings are contained in the AFRC Technical Interpretation Manual.



ATIR-2012-01

ATIR-2012-01 00/00/2012

AFRC Technical Interpretation Request Form

Please complete the highlighted fields and return to the AFRC.

Mail: AFRC, 71 Ridge St, GORDON NSW 2072

Fax: 02 9498 3816

Email: info@afrc.org.au

<i>Interpretation Requested:</i>

<i>Date Requested:</i>	<i>Initial Interpretation Date:</i>	<i>Final TAC Approval Date:</i>

<i>Pertinent Document:</i>	
<i>Referenced Sections:</i>	<i>Referenced Pages:</i>

<i>Interpretation :</i>

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

Chapter 10

Software Validation

REFERENCE

NFRC Software Approval Guidelines

10.1 GENERAL

The NFRC Software Approval Guidelines document sets out the procedure for the approval of software by the NFRC. The process involves the formation of a task group to review the software. The task group consists of a minimum of three NFRC members and one NFRC Staff member. This group reviews and evaluates the software and any additional manuals and validation data provided by the software author/vendor. The task group then forms a report based on the NFRC Software Approval Guidelines document for discussion and review by the Software Review Subcommittee.

The NFRC Software Approval Guidelines document shall be followed for Software Validation in Australia with the following exceptions.

10.2 AUSTRALIAN EXCEPTION

An Australian Software Approval Task Group consisting of a minimum of three members will be appointed by the AFRC Board to evaluate new software. The members of this task group shall be independent of the Software author/vendor and consist of at least two AFRC-accredited simulators and an auditor engaged to assess the software. The validation input data should be based on recommendations from NFRC but shall also include data for products considered typical of Australian manufacture.

The Software author/vendor is required to present documentation and supporting evidence to meet the requirements set out in the NFRC Software Approval Guidelines including all algorithms used for calculations.

A report on the accuracy and stability of the software and any other pertinent observations shall be provided to the Board for evaluation with a copy returned to the developer. This report may be forwarded to the NFRC Software Approval Task Group for their recommendations at the discretion of the Board.

Upon Board approval, the software will be added to the list of Australian Approved Software Programs for subsequent inclusion into AFRC Protocols.

Chapter 11

Dispute Resolution

REFERENCES

AS 4608-2004 Dispute Management Systems
AS ISO 10002-2006 Customer Satisfaction-Complaints Handling Guidelines
NFRC 702

11.1 AFRC COMPLAINTS PROCEDURE GUIDELINES

11.1.1 *General*

Adherence to the guiding principles set out in 11.1.2 to 11.1.6 is recommended for effective handling of complaints or challenges.

11.1.2 *Visibility*

Information about how and where to complain should be well publicised to customers, personnel and other interested parties.

11.1.3 *Accessibility*

Information should be made available on the details of making and resolving complaints. The complaints-handling process and supporting information should be easy to understand and use. The information should be in clear language. For information and assistance in making a complaint refer 11.2.1

11.1.4 *Responsiveness*

Receipt of each complaint should be acknowledged to the complainant immediately. Complaints should be addressed promptly in accordance with their urgency.

11.1.5 *Objectivity*

Each complaint should be addressed in an equitable, objective and unbiased manner through the complaints-handling process referred to in 11.2.2.

11.1.6 *Charges*

Access to the complaints-handling process should be free of charge to the complainant.

11.2 AFRC COMPLAINTS PROCEDURES

11.2.1 *Making a Complaint*

A complaint shall be noticed in writing and shall be sent by a method which provides evidence of delivery to the Secretary of the AFRC and shall specify the basis for the complaint. Complaints shall be specific and include supporting documentation, contact details and the resolution being sought.

Upon receipt of the complaint the Secretary shall log the correspondence and forward the details, including action to be considered, to the appropriate party and advise the complainant of the course of action to be taken and an approximate time for redress:

- a. The chair of the TAC will be responsible for processing technical issues
- b. The board of the AFRC will be responsible for all other issues

11.2.2 Handling a Complaint

In the event of a complaint being received by the Secretary of the AFRC, the following process shall be followed:

- a. Details of the complaint entered into complaints register
- b. Notification of receipt sent to complainant
- c. Complaint and request for action forwarded to the appropriate AFRC committee
- d. Resolution, including recommended actions, returned to the Secretary. This must include supporting documentation for the committee's decision.
- e. Approval from the AFRC board.
- f. Recommendations actioned and recorded
- g. Notify complainant in writing

11.3 AFRC LICENSING AND APPEALS PROCEDURE

11.3.1 Grounds for Suspension of Licensing

An IA's license may be suspended by the AFRC Board pursuant to the express provisions of the AFRC.

11.3.2 Grounds for Revocation of Licensing

An IA's license shall be revoked by AFRC in any of the following circumstances:

- a. Pursuant to the non-fulfillment of the provisions contained in the CAP within the required time period;
- b. Upon the expiration of an IA's right to appeal a suspension of licensing;
- c. Upon a determination by the AFRC Board that an IA has acted in such a manner as to
 - Impair the objectivity or integrity of the Certification Agency Program or harm the reputation of AFRC, including, but not limited to, submission of false information to AFRC, or failure to submit to AFRC any material information required to be submitted, in connection with obtaining or maintaining licensing;
 - Knowingly or negligently issue reports that fail to meet all of the requirements of applicable testing or simulation methods; or
 - Make misrepresentations in advertising or promotional materials of its license status in general or with respect to any service that the IA offers.

11.3.3 Appeals Procedure

- a. In the event that AFRC licensing has been denied, suspended or revoked the IA shall have the right to appeal to the AFRC under the rules detailed in NFRC CAP-2005.
- b. An appeal shall be noticed in writing and shall be sent by a method which provides evidence of delivery to the Chair of the AFRC or the Board of Directors, as the case may be, with a copy to the AFRC Inspector, and shall specify the basis for the appeal.
- c. An IA may also appeal a suspension of the IA License Agreement pursuant to this section.
- d. An applicant for IA licensing may also appeal a denial of licensing to the AFRC Board of Directors pursuant to this section.

Chapter 12

Non-Residential Glazing

REFERENCE

NFRC 100

12.1 GENERAL

Non-residential glazing is currently considered under NFRC 100 Section 5.6. This section currently covers but is not limited to the following product types:

- Glazed wall support and framing systems
- Products of any size or design
- Products with single or multiple glazing layers
- Products with spacer systems between glazings
- Horizontal, vertical and sloped systems
- Products that, by design, may have multiple framing components and/or glazing combinations
- Fenestration systems using unitised construction, where a system is field assembled from factory-assembled sub-units

The systems not covered include:

- Totally opaque walls, including spandrels.

The standard size for a Glazed Wall is 2000mm by 2000mm consisting of two lights with one vertical mullion. See Section 4.10 for further details.

Shopfront windows to be modelled as per the current NFRC modelling rules for Window Walls. Shopfront windows to be modelled without sub sills as per the current NFRC modelling rules. See Section 4.10 for further details.

12.2 AUSTRALIAN EXCEPTION

Pre-assembled or pre-glazed fenestration products can be simulated, eg. unitised curtain walls.

Glazed spandrel panels are currently excluded but may be considered for inclusion in a future revision.