ATIR-2014-*03*
11/09/2014

# *AFRC Technical Interpretation Request Form*

Please complete the highlighted fields and return to the AFRC.

Mail: Suite 1, Level 1, Building 1, 20 Bridge Street, Pymble NSW 2073

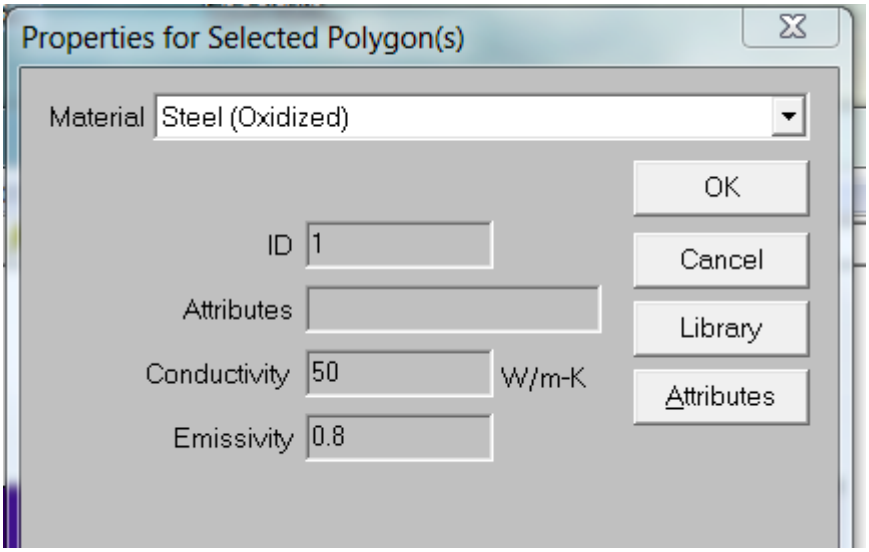
Email: Sustainability@agwa.com.au

***Interpretation Requested:***

What interior BC should be used for Steel framed windows?

Energy ratings on steel framed windows are now being requested. In order to provide the most accurate simulation should steel framed windows be modelled using the Interior Aluminium of Interior Thermally Improved Aluminium BC.

The conductivity of Steel (oxidised) is 50 W/m-K. This is much lower than the 160 W/m-K of Aluminium Alloy which raises the question of if the material should be modelled with a different BC.




Further the NFRC Simulation manual (January 2014) in Section 8.6 outlines the use of the thermally improved Boundary Condition for Steel Skin Doors.

**Boundary Conditions for Steel Skin Doors**

The following boundary conditions (BC) shall be applied when modeling doors containing a steel skin with either a non-metal or wood edge or steel edge. The appropriate BC shall be applied to applicable individual sections.

| Door section material | Boundary Condition |
|---|---|
| Non-metal / wood edge | Wood / Vinyl |
| Steel edge | Thermally-Improved |

According to NFRC-100-2014 the definition of a Steel Door is as follows

***Steel Door***: a door manufactured from steel skins, which may be coated with paint, plastic, wood veneers, or other finishes. The door leaf may or may not incorporate a structural perimeter, including (but not limited to) materials of wood, wood products, composites, or other reinforcing materials. The core of the door leaf may be hollow or filled with material, including (but not limited to) insulating polyurethanes, styrenes, or honeycombs.

Which indicates that as the door may (or may not) have a fill material the Boundary condition is not reliant on an insulating fill or break in the steel and as such could apply to steel framed windows.

| *Date Requested:* | *Initial Interpretation Date:* | *Final TAC Approval Date:* |
|---|---|---|
| 11/9/14 | | |

| *Pertinent Document:* | |
|---|---|
| NFRC Simulation Manual (January 2014)<br>NFRC-100-2014 | |
| *Referenced Sections:* | *Referenced Pages:* |
| Section 8.6<br>Section 3. Definitions | Page 8-73<br>Page 5 |

***Interpretation :***

Based on the documentation in NFRC – 100 and the NFRC Simulation manual, the modelling of steel windows and doors should be modelled using the 'Interior Thermally Improved Frame' Boundary Condition for AFRC certified ratings on steel window or door products.

If the product also provides a thermal break between the interior and exterior members of the frame that comply with the 'Interior Thermally Broken Frame' requirements then a thermally broken steel product may apply the 'Interior Thermally Broken Frame' boundary conditions.

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