



NATIONAL CERTIFIED TESTING LABORATORIES

3310 HILL AVENUE • EVERETT, WASHINGTON 98201 • TELEPHONE (425) 259-6799
FAX (425) 259-4938
www.nctlinc.com

NFRC SIMULATION REPORT

310-2126_{E0A0}

REPORT TO: Custom Designed Systems, Inc.
P.O. Box 247
Gladstone, OR 97027

SIMULATION NUMBER:	310-2126
SIMULATION DATE:	12/02/2011
SIMULATION REVISION DATE:	N/A
ADDENDUM SIMULATION DATE:	N/A
SIMULATION RE-ISSUE DATE:	N/A

PRODUCT: 3100 Series Sloped Glazing System

Professionals In The Science of Testing

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P.O. Box 247
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SIMULATION METHOD: NFRC 100, Procedure for Determining Fenestration Product U-Factors (2010)
NFRC 200, Procedure for Determining Fenestration Product Solar Heat Gain Coefficients at Normal Incidence (2010)
NFRC 500, Procedure for Determining Fenestration Product Condensation Resistance Values (2010) including all currently published Technical Interpretations

SIMULATION PROGRAMS: Center of Glass: Windows 6.3.9
2-D Heat Transfer: THERM 6.3.19
Total Product Calculations: Windows 6.3.9

MODEL/TYPE: 3100 Series Sloped Glazing System (SKSL)

VALIDATION MATRIX: NONE

CONFIGURATION: OO

SIMULATION SIZE: 2000mm X 2000mm (79in X 79in)

NAIL FIN: NONE

FRAME TYPE AND FINISH: Aluminum, anodized on main tube and pressure cap, mill finish on remaining components.

SASH TYPE AND FINISH: NONE

THERMAL BREAK TYPE: Air, 36mm.

FRAME OPTIONS: NONE

REINFORCEMENT: NONE

OAVA: NONE

IG GLASS PARAMETERS: Glass IG unit overall dimension remains constant at a nominal 1-1/8" the gap varies with glass thickness.

GLAZING METHOD: IG set on blocks against interior neoprene gasket, held in place by aluminum pressure bar and machine screw with neoprene gaskets on interior.

GAS FILL METHOD: Evacuated chamber.

GAS FILL CONCENTRATION: Argon 90% (manufacturer specified)
(PROVIDED BY THE MANUFACTURER)

SPACERS: A1-D- Mill finish aluminum with Butyl/Silicone sealants.

GRILLS (INTERNAL OR TDL): NONE

GRILLS (PATTERNS): N/A

WEATHERSTRIP: NONE

CONTINUOUS HARDWARE: NONE

THERMAL BRIDGING: Stainless Steel Machine Screw located at all cross sections, see keff calculation below.

ELECTRONIC DATA: Supporting information including THERM 6.3 and WINDOW 6.3 files are being submitted as part of this report. The simulation matrix is being submitted electronically.

ADDITIONAL INFORMATION: The manufacturer is capable of producing, in its normal manufacturing process, products in sizes identical to the model sizes listed in the NFRC 100 Table 4.3 and have a least deviation of 0 within the tolerances of NFRC 100. All simulations are performed in the sizes and configurations listed in NFRC table 1 except that a non-standard size may be simulated and identified in the matrix to match the manufacturer's Physical test sample. Glass and Glazing types, LowE placement, Finishes and other required information is included in the NFRC U-Factor Simulation Summary Report and/or the NFRC SHGC/VT Simulation Summary Report included in this document. Additional supporting information and modeling assumptions are included in the individual reports obtained from the approved simulation programs and in the notes following the required summary reports.

NOTES:

- 1) All simulations use the emissivity from the NFRC approved files in IGDB Version 20.0.
- 2) The following Simplifications to a Product Lines per NFRC 100 were applied:
 - A) For U-Factor purposes, all glazing options which vary only in glazing tint or obscenity are assumed to have the same U-Factor as glazing options without such tints or obscenity and are not simulated, PROVIDED that such options are not associated with a change in coating properties.
- 3) A default frame absorptance of 0.500 is assumed.
- 4) For Solar Heat Gain Coefficient and Visible Light Transmittance, all frame, divider and glass options are grouped using the best case Center of Glass frame values from the U-Factor calculations as required by the simulation manual.
- 5) For SHGC and VT calculations standard default grid pattern established by Window 6.3 which is assumed to be closest to but not greater than 12" OC is used.
- 6) As-Tested IG comprised of: 6mm SB70XL/.625" Argon/3mm Clear 060PVB 3mm Clear, A1-D spacer.

KEFF

NCTL FILE 3100: Series Sloped Glazing

BOLT SPACING (mm) = 254
BOLT HEAD WIDTH (mm)= 8.6548
BOLT MATERIAL ST STEEL

SECTION	MATERIAL	CONDUCTIVITY	DEPTH(mm)	R (m2K/w)
1	AIR	0.024	4.3125	0.1796875
2	ALUMINUM	160	1.778	1.1113E-05
3	AIR	0.024	51.801	2.158375
4	AIR	0.024	0	0
5	AIR	0.024	0	0
6	AIR	0.024	0	0

TOTAL Dt Rt
0.0578915 2.33807361

Kn = 0.024760

Kb = 17 ST STEEL

Wb = 8.6548 BOLT HEAD WIDTH(mm)

Sb = 254 BOLT SPACING (mm)

Fb = 0.034074 3.407401575
Fn = 0.965926

Keff = 0.603 W/m-K

CONCLUSIONS

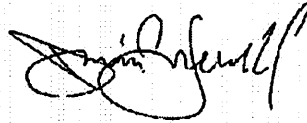
Detailed assembly drawings, cross-sectional drawings, and a bill of materials as supplied by the client were used as the basis for performing the simulations. Copies are attached to this report. The results were secured by using the designated methods and NFRC approved simulation programs as required by, and in full compliance with NFRC procedures. This report does not constitute certification of this product. The results in this report apply to the sample as shown in the attached drawings, using the components and construction methods described herein. NCTL-NW does not warrant the accuracy of the computer programs used to obtain the results.

This report is the joint property of NCTL-NW and the client to whom it is issued. Permission to reproduce this report by anyone other than NCTL-NW and the Client must be granted in writing by both of the above parties. This report may not be reproduced except in its entirety.

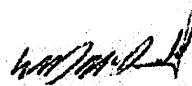
Ratings included in this report are for submittal to an NFRC-licensed IA for certification purposes and are not meant to be used directly for labeling purposes. Only those values identified on a valid Certification Authorization Report (CAR) are to be used for labeling purposes.

The Condensation Resistance results obtained from this procedure are for controlled laboratory conditions and do not include the effects of air movement through the specimen, solar radiation and the thermal bridging that may occur due to the specific design and construction of the fenestration system opening.

Units and rounding is in accordance with NFRC 601 NFRC Units and Measurement Policy except that all units may be reported in IP as the primary units after conversion and any matrix is reported in IP units only unless requested otherwise by the client.



Dan Sowell
NFRC Certified Simulator



Marles D. McDonald
Simulator in Responsible Charge

APPENDIX A

NFRC SIMULATION REPORT MATRIX

VT GRID >=1"				
VT GRID <1"				
VT NO GRID	0.65		0.60	0.60
SHGC GRID >=1"				
SHGC GRID <1"				
SHGC NO GRID	0.36		0.26	0.26
Condensation Resistance	55		55	54
U-factor	0.41		0.41	0.35
Grid Size				
Grid Type	N		N	N
Spacer	A1-D		A1-D	A1-D
Tint	CL		CL	CL
Emissivity Surface 4				
Emissivity Surface 3				
Emissivity Surface 2	0.035		0.018	0.018
Emissivity Surface 1				
% of Gap Fill 1	90		90	90
Gap Fill 1	ARG		ARG	ARG
Gap 1	0.625		0.625	0.625
Pane Thickness #2	0.296		0.296	0.296
Pane Thickness #1	0.223		0.223	0.223
Pane ID #2	3mm/060/3mmLAM		3mm/060/3mmLAM	3mm/060/3mmLAM
Pane ID #1	6mm SB60		6mmSB70XL_stiphre	6mmSB70XL stiphre
Product Number	1		2	0
PRODUCT	NO GRIDS		NO GRIDS	AS-TESTED