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SIMULATION TEST REPORT

NCTL-610-20862-1$_{E0A0}$

REPORT TO:
ClimateGuard Manufacturing
2500 North Pulaski Rd.
Chicago, IL 60639

SIMULATION DATE: 03/23/18

PRODUCT:
4000 Series Vinyl Awning

PRODUCT CPD DESIGNATION:
RSC-A-13

This report is for recertification of an existing product line.

SIMULATION TEST REPORT

Simulation Standards	ANSI/NFRC 100-2017 "Procedure for Determining Fenestration Product U-factors" ANSI/NFRC 200-2017 "Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Transmittance at Normal Incidence" NFRC 500-2017 "Procedure for Determining Fenestration Product Condensation Resistance Values" THERM 7 / WINDOW 7 NFRC Simulation Manual (July 2017) NFRC 2010 Technical Interpretations Manual (November 2017)
Approved Simulation Software	Center of Glass: Window 7.4 2-D Heat Transfer: THERM 7.4 Total Product Calculations: Window 7.4

Note: All dimensions are in the order (Width x Height) unless otherwise noted.

Report Number	NCTL-610-20862-1$_{E0A0}$
Model/ Series	4000 Series Vinyl Awning
Operator Type	Projected Awning (PRAW)
Simulation Size	1500 mm x 600 mm (59" x 24")
Frame Type	Vinyl (VY)
Nail Fin	Removable and simulated without
Sash Type	Vinyl (VY)
Frame/Sash Material & Finish	Rigid vinyl (PVC)
Reinforcement	Not applicable
Thermal Break(s)	Not applicable (NA)
Continuous Hardware	Not applicable

Weather Seal(s)	Head (1) Strip mohair; (1) Rigid/Flexible Vinyl (PVC) bulb seal Jambs (1) Strip mohair; (1) Rigid/Flexible Vinyl (PVC) bulb seal Sill (1) Strip mohair; (1) Rigid/Flexible Vinyl (PVC) bulb seal
Edge of Glass	Interior glazed with a rigid vinyl glazing bead with flexible vinyl fins and a silicone back bedding and dual leaf flexible vinyl gasket.
Spacer System(s)	Coated Steel U-shaped spacer system embedded in sealant - single seal (CU-S)
Gas Fillings	Argon 95% dual probe per the client (ARG)
Divider(s)	Grid 1 0.1875" x 0.610" painted aluminum rectangle
Divider Notes	Where the space between lite and divider is greater than 3 mm, dividers are not modeled. Solar Heat Gain Coefficient (SHGC) and Visible Light Transmittance (VT) are calculated using default dividers of less than 1" and greater than/ equal to 1". For U-factor, SHGC, and VT calculations the standard default grid pattern of 12" is used, as established by the Window 7 program.
Validation Matrix	The product(s) represented in this test report is a multi-purpose product and will use the validation matrix for 4000 Series Casement/ NCTL-610-20864-1.

Notes, Additional Information, Comments, and Assumptions

All simulations use the emissivity from the approved ANSI/NFRC spectral data files with the International Glazing Database (IGDB).

For Solar Heat Gain and Visible Light Transmittance; all frame, divider and glass options are grouped using the best case center of glass/ worst-case frame values from the "U" Factor calculations as required by ANSI/NFRC 200-2017.

A default frame absorptance of 0.30 is assumed for all products except glazing window walls, glazing curtain walls, and slopped glazing wall - all of which will have a frame absorptance of 0.50

Supporting information including THERM 7 and WINDOW 7 files are being submitted as part of this report. The simulation matrix is being submitted electronically.

Detailed assembly drawings, horizontal and vertical cross-sectional drawings, profile drawings, parts 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 only to the sample as shown in the attached drawings, using the components and construction methods described herein. NCTL does not warrant the accuracy of the computer programs used to obtain the results. Client request for work performed by NCTL and its associated documentation constitute approval by client for Inspection Agency (IA) submission.
Ratings values included in this report are for submittals to an NFRC-licensed IA and are not meant to be used directly for labeling purposes. Only those values identified on a valid Certification Authorization Report (CAR) by an NFRC accredited Inspection Agency (IA) are to be used for labeling purposes.

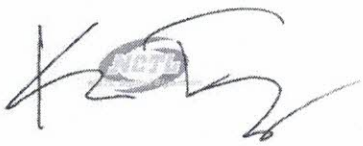
The Condensation Resistance results obtained from this procedure are for controlled laboratory conditions and do not include the effects of air movement through the specimen, solar radiation and the thermal bridging that may occur due to the specific design and construction of the fenestration system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

Units and rounding is in accordance with NFRC 601, *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.

The manufacturer is capable of producing, in its normal manufacturing process, products in sizes identical to the model sizes listed in the ANSI/NFRC 100 Table 4-3 and have a least deviation of 0 within the tolerances of ANSI/NFRC 100. All simulations are performed in the sizes and configurations listed in ANSI/NFRC 100 Table 4-3 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, Low-E 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.

National Certified Testing Laboratories

Performed by:



KEVIN TRACY
NFRC Certified Simulator

Reviewed by:

MARK BENNETT
NFRC Certified Simulator
Simulator-In-Responsible-Charge

Attachments
Glazing Matrix
Appendix A - Revision Summary
Appendix B - Product Drawings

PRODUCT	Product Number	Pane ID #1	Pane ID #2	Pane ID #3	Pane Thickness #1	Pane Thickness #2	Pane Thickness #3	Gap 1	Gap 2	Gap Fill 1	Gap Fill 2	% of Gap Fill 1	% of Gap Fill 2	Emissivity Surface 1	Emissivity Surface 2	Emissivity Surface 3	Emissivity Surface 4	Emissivity Surface 5	Emissivity Surface 6	Tint	Spacer	Grid Type	Grid Size	U-factor	Condensation Resistance		SHGC NO GRID	SHGC GRID<1"	SHGC GRID>=1"	VT NO GRID	VT GRID<1"	VT GRID >=1"
Grids / No Grids	1	2 mm Clear	2 mm Clear		0.090	0.090		0.678		AIR										CL	CU-S	N,G	0.75	0.41	43		0.52	0.47		0.53	0.48	
Grids / No Grids	2	3 mm Clear	3 mm Clear		0.118	0.118		0.639		AIR										CL	CU-S	N,G	0.75	0.41	44		0.51	0.46		0.53	0.48	
No Grids	3	2 mm Clear	2 mm Clear	2 mm Clear	0.090	0.090	0.090	0.290	0.290	AIR	AIR									CL	CU-S	N		0.33	53		0.47			0.49		
Grids / No Grids	4	2 mm i89	2 mm Clear		0.087	0.090		0.678		ARG		95			0.149					CL	CU-S	N,G	0.75	0.30	53		0.45	0.41		0.52	0.47	
Grids / No Grids	5	3 mm i89	3 mm Clear		0.117	0.118		0.639		ARG		95			0.149					CL	CU-S	N,G	0.75	0.29	53		0.45	0.41		0.52	0.47	
No Grids	6	2 mm i89	2 mm Clear	2 mm Clear	0.087	0.090	0.090	0.290	0.290	ARG	ARG	95	95		0.149					CL	CU-S	N		0.26	61		0.42			0.48		
Grids / No Grids	7	2 mm LoE³ 366	2 mm Clear		0.087	0.090		0.678		ARG		95			0.022					CL	CU-S	N,G	0.75	0.27	56		0.18	0.17		0.42	0.38	
Grids / No Grids	8	3 mm LoE³ 366	3 mm Clear		0.117	0.118		0.639		ARG		95			0.022					CL	CU-S	N,G	0.75	0.27	55		0.18	0.17		0.42	0.38	
No Grids	9	2 mm LoE³ 366	2 mm Clear	2 mm Clear	0.087	0.090	0.090	0.290	0.290	ARG	ARG	95	95		0.022					CL	CU-S	N		0.25	63		0.17			0.38		
No Grids	10	2 mm LoE³ 366	2 mm Clear	2 mm LoE³ 366	0.087	0.090	0.087	0.290	0.290	ARG	ARG	95	95		0.022			0.022		CL	CU-S	N		0.21	67		0.16			0.30		
Grids / No Grids	11	2 mm LoE² 270	2 mm Clear		0.087	0.090		0.678		ARG		95			0.037					CL	CU-S	N,G	0.75	0.27	55		0.24	0.22		0.45	0.41	
Grids / No Grids	12	3 mm LoE² 270	3 mm Clear		0.118	0.118		0.639		ARG		95			0.037					CL	CU-S	N,G	0.75	0.27	55		0.24	0.22		0.45	0.41	
No Grids	13	2 mm LoE² 270	2 mm Clear	2 mm Clear	0.087	0.090	0.090	0.290	0.290	ARG	ARG	95	95		0.037					CL	CU-S	N		0.25	63		0.23			0.42		
Grids / No Grids	14	2 mm LoE² 270	2 mm i89		0.087	0.087		0.678		ARG		95			0.037		0.149			CL	CU-S	N,G	0.75	0.24	44		0.24	0.22		0.45	0.40	
Grids / No Grids	15	3 mm LoE² 270	3 mm i89		0.118	0.117		0.639		ARG		95			0.037		0.149			CL	CU-S	N,G	0.75	0.24	43		0.24	0.22		0.44	0.40	
No Grids	16	2 mm LoE² 270	2 mm Clear	2 mm LoE² 270	0.087	0.090	0.087	0.290	0.290	ARG	ARG	95	95		0.037			0.037		CL	CU-S	N		0.21	67		0.21			0.35		
Grids / No Grids	17	2 mm LoE² 270	3 mm Bronze		0.087	0.125		0.658		ARG		95			0.037					BZ	CU-S	N,G	0.75	0.27	45		0.24	0.22		0.34	0.31	
Grids / No Grids	18	3 mm LoE² 270	3 mm Bronze		0.118	0.125		0.639		ARG		95			0.037					BZ	CU-S	N,G	0.75	0.27	55		0.24	0.22		0.34	0.31	
No Grids	19	2 mm LoE² 270	2 mm Clear	3 mm Bronze	0.087	0.090	0.125	0.280	0.280	ARG	ARG	95	95		0.037					BZ	CU-S	N		0.25	60		0.22			0.31		
0.1875" x 0.610" Rectangle	20	2 mm Clear	2 mm Clear	2 mm Clear	0.090	0.090	0.090	0.290	0.290	AIR	AIR									CL	CU-S	G	0.75	0.33	53			0.43			0.44	
0.1875" x 0.610" Rectangle	21	2 mm i89	2 mm Clear	2 mm Clear	0.087	0.090	0.090	0.290	0.290	ARG	ARG	95	95		0.149					CL	CU-S	G	0.75	0.27	61			0.38			0.43	
0.1875" x 0.610" Rectangle	22	2 mm LoE³ 366	2 mm Clear	2 mm Clear	0.087	0.090	0.090	0.290	0.290	ARG	ARG	95	95		0.022					CL	CU-S	G	0.75	0.25	63			0.16			0.35	

PRODUCT	Product Number	Pane ID #1	Pane ID #2	Pane ID #3	Pane Thickness #1	Pane Thickness #2	Pane Thickness #3	Gap 1	Gap 2	Gap Fill 1	Gap Fill 2	% of Gap Fill 1	% of Gap Fill 2	Emissivity Surface 1	Emissivity Surface 2	Emissivity Surface 3	Emissivity Surface 4	Emissivity Surface 5	Emissivity Surface 6	Tint	Spacer	Grid Type	Grid Size	U-factor	Condensation Resistance		SHGC NO GRID	SHGC GRID<1"	SHGC GRID>=1"	VT NO GRID	VT GRID<1"	VT GRID >=1"
0.1875" x 0.610" Rectangle	23	2 mm LoE³ 366	2 mm Clear	2 mm LoE³ 366	0.087	0.090	0.087	0.290	0.290	ARG	ARG	95	95		0.022			0.022		CL	CU-S	G	0.75	0.21	67			0.15			0.27	
0.1875" x 0.610" Rectangle	24	2 mm LoE² 270	2 mm Clear	2 mm Clear	0.087	0.090	0.090	0.290	0.290	ARG	ARG	95	95		0.037					CL	CU-S	G	0.75	0.25	63			0.21			0.38	
0.1875" x 0.610" Rectangle	25	2 mm LoE² 270	2 mm Clear	2 mm LoE² 270	0.087	0.090	0.087	0.290	0.290	ARG	ARG	95	95		0.037			0.037		CL	CU-S	G	0.75	0.22	67			0.19			0.32	
0.1875" x 0.610" Rectangle	26	2 mm LoE² 270	2 mm Clear	3 mm Bronze	0.087	0.090	0.125	0.280	0.280	ARG	ARG	95	95		0.037					BZ	CU-S	G	0.75	0.26	60			0.20			0.28	

Appendix A

Revision Summary

Identification	Date	Revision
Original Issue	03/23/18	Report issued to ClimateGuard Manufacturing and Inspection Agency