December 17, 2023

Acro Aluminum Inc.

Thermal Simulation for Acro Aluminum 8000 series Awning

Thermal simulations have been completed by the undersigned on the Acro Aluminum 8000 series single operating awning window.

Simulation Notes:

- Window construction details used were taken from CAD files and other information provided by Acro Aluminum. The simulation does not verify the accuracy of the information provided by Acro Aluminum.
- Modeling and simulations were completed as per the requirements of
  - NFRC 100-2023[E0A0] Procedure for Determining Fenestration Product U-Factors
  - NFRC 200-2023[E0A0] Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.
- The simulation was completed for the standard single awning size of 600 mm high x 1500 mm wide given in NFRC 100-2023[E0A0].
- Data for the glass layers were taken from the latest International Glazing Database (IGDB) with COG properties calculated using WINDOW 7.8.71 software.
- Frame material types and properties used are given in Table 1 and Figure 1.
- THERM 7.8.71 software was used to determine the frame and edge of glass U-factors.
- WINDOW 7.8.71 software along with the imported frame results from the THERM models was used to determine the overall fenestration U-factor, Solar Heat Gain Coefficient (SHGC) and Visible Transmittance (VT). The results are summarized in Table 2.
- Simulations were completed for 3 different Insulated Glazing Units (IGU). Details of these glazing units is given in Table 2.
- The output reports from THERM and WINDOW software have been attached to the end of this report.
- Rating values from this report are not to be used directly for labelling purposes.

TABLE 1 – Frame Material Types and Properties

Therm Model material list	Model Colour	Material	Keff (W/mK)	Keff Source
Frame		Anodized Aluminum Alloy	160	THERM library
Gasket		EPDM	0.25	THERM library
Butyl Shim Tape		Butyl Rubber	0.24	THERM library
Thermal Break		P & D Polyurethane	0.12	THERM library
IG Spacer		Quanex T-Spacer	0.141	Client
IG Spacer Primary Seal		Butyl Rubber - solid hot melt	0.24	THERM library
Frame Shim		XPS	0.034	THERM library
Frame Sealant		Silicone	0.35	THERM library

2021 Uplands Road, Revelstoke, BC, V0E 2S3, 587-225-0570

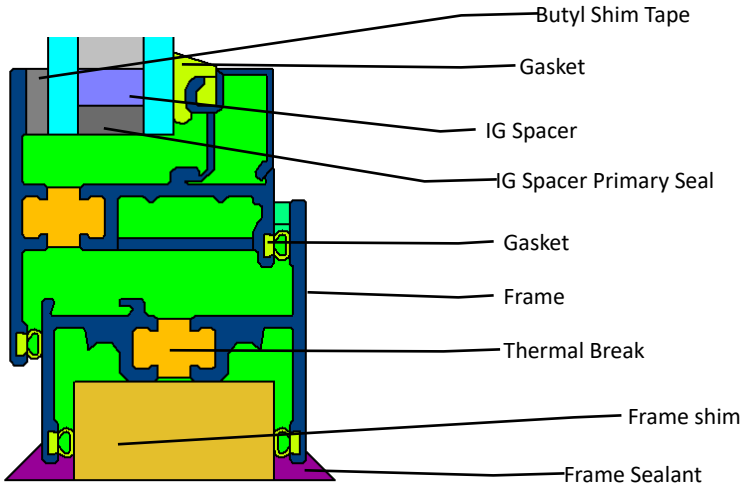


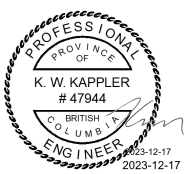
FIGURE 1 – 8000 series Awning Model Showing Materials

TABLE 2 – Thermal Modeling Results

Product Name	Glazing Detail	Center of Glass U-Factor (Glazing only) (W/m2K)	Overall Glass U-Factor (W/m2K)	Overall Glass U-Factor (Btu/hft2F)	SHGC	VT
Acro 8000 Single Awning	6 mm Cardinal 272 Low-E Surface #2 1/2" Butyl Rubber x Quanex T-spacer Argon 90% / Air 10% 6 mm Clear	1.406	2.491	0.439	0.275	0.450
Acro 8000 Single Awning	6 mm Cardinal 270 Low-E Surface #2 1/2" Butyl Rubber x Quanex T-spacer Argon 90% / Air 10% 6 mm Clear	1.390	2.477	0.436	0.248	0.435
Acro 8000 Single Awning	6 mm Cardinal 272 Low-E Surface #2 1/2" Butyl Rubber x Quanex T-spacer Argon 90% / Air 10% 6 mm i89 Surface #4	1.136	2.320	0.409	0.270	0.440

Contact the undersigned if there are any questions in regards to this report.

Regards



Kim Kappler, P.Eng.
EGBC Permit 1001874

SIMULATION OUTPUT REPORTS

8000 Vent 2"- Sill- 272 x clear – Therm Report

Glazing
6 mm Cardinal 272 Low-E Surface #2
1/2" Butyl Rubber x Quanex T-spacer
Argon 90% / Air 10%
6 mm Clear

```
Therm Version 7.8.71.0
Date: Sat Dec 16 04:53:45 2023

Created by: Kim Kappler
Created for: Acro Aluminum

Therm Filename: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\8000 Vent - 2 inch -
Sill - 272 x clear.THM
Cross Section Type: Sill
Underlay Name: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\Detail 1a.dxf

U-factors

Name                 Length  Basis        U-factor
                       mm                  W/m2-K
-------------------- ------- ------------ --------
Frame                 82.53  Projected in glass plane  4.1108
SHGC Exterior         79.37  Projected in glass plane  4.4112
Edge                  63.50  Projected in glass plane  1.8808


Solid Materials

Name                            Conductivity   Emissivity
                                   W/m-K
------------------------------  -------------  ----------
Ethylene Propylene Diene Monom
er (EPDM)*                           0.25         0.90
Aluminum Alloys (Anodized)*        160.00         0.80
Urethane - Thermal Break*            0.12         0.90
Butyl rubber*                        0.24         0.90
Silicone*                            0.35         0.90
Extruded Polystyrene (XPS) wit
h CO2*                               0.03         0.90
Butyl rubber, (Isobutene), Sol
id / Hot Melt*                       0.24         0.90
Quanex Super Spacer                  0.14         0.90


Cavities


Name: Frame Cavity NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099
Radiation Model: Standard

Poly  Heat                      Side 1        Side 2    Dimension      Nu    Keff    Cavity
 ID   Flow                   Temp    Emis   Temp    Emis  Horz.  Vert.    #             Height
      Dir                     C              C           mm     mm           W/m-K     mm
----- --------------------  -------- ---- -------- ---- ------ ------ ------ ------   ------
   4  Horizontal              4.75   0.90   1.75   0.90   1.94  3.68   1.00  0.0307    N/A
   8  Horizontal            -10.56   0.90 -10.76   0.90   1.94  3.68   1.00  0.0287    N/A
  10  Horizontal              5.18   0.90   5.00   0.90   1.94  3.68   1.00  0.0309    N/A
  18  Horizontal            -11.22   0.90 -13.84   0.90   1.94  3.68   1.00  0.0284    N/A
  24  Horizontal            -10.39   0.85 -10.68   0.80  10.04 14.22   1.00  0.0470    N/A
```

27	Horizontal	4.90	0.89	-10.34	0.89	7.30	0.61	1.00	0.0389	N/A
28	Horizontal	5.14	0.80	4.92	0.85	10.04	14.22	1.00	0.0526	N/A
29	Horizontal	-1.00	0.80	-11.64	0.81	44.58	14.41	2.49	0.1454	N/A
30	Horizontal	1.25	0.80	1.08	0.80	27.07	7.73	1.00	0.0804	N/A
32	Horizontal	1.25	0.81	-8.10	0.82	29.24	11.85	1.69	0.1010	N/A
34	Down	1.25	0.80	1.38	0.80	12.35	16.27	1.00	0.0624	N/A

Name: Frame Cavity Slightly Ventilated NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099 Ventilated
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
68	Horizontal	5.10	0.80	1.28	0.90	2.95	4.16	1.00	0.0654	N/A
74	Horizontal	5.10	0.90	2.16	0.90	2.48	1.86	1.00	0.0626	N/A

Glazing Systems

Name	COG U-factor W/m2-K	Overall Thickness mm	Cavity Height mm
Acro Vent 272 x clear	1.41	24.10	1000.00

Standard Boundary Conditions

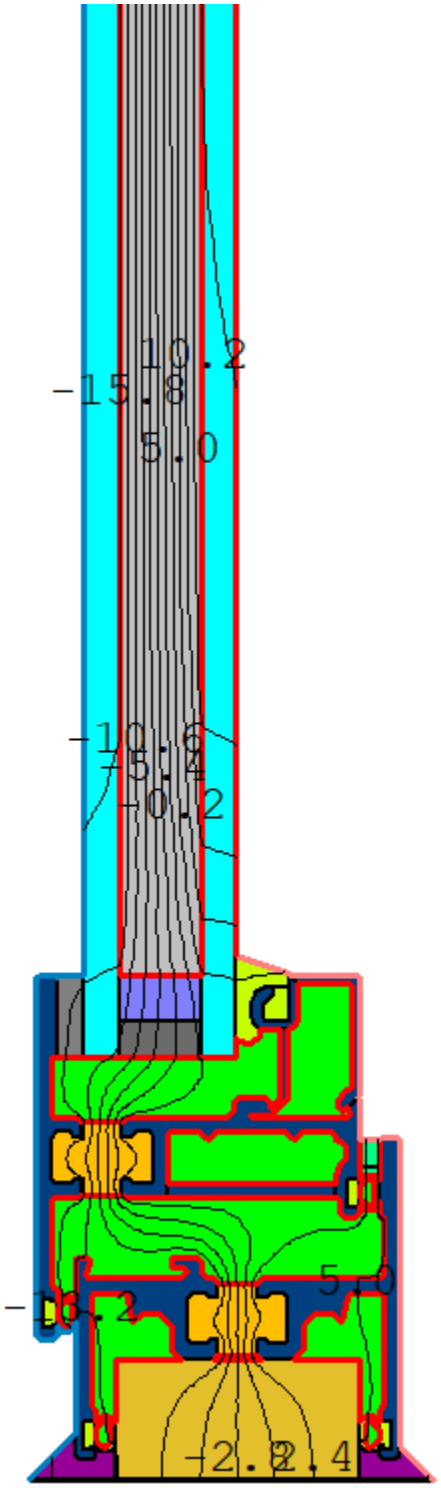
None

Advanced Boundary Conditions

Name	Convection Temp C	Convection Film Coef W/m2-K	Const Flux Heat W/m2	Black Body Radiation View Fact	Black Body Radiation Temp C	Const Temp Temp C
Interior Aluminum Frame (convection only)*	21.00	3.290		Enc. Model		
8000 Vent - 2 inch - Sill - 272 x clear:Acro Vent 272 x clear (ID:64) U-factor Inside Film	21.00	2.423		Enc. Model		
NFRC 100-2010 Exterior*	-18.00	26.000		1.00	-18.00	

Calculation Specifications

Mesh Parameter : 6
Estimated Error: 7.8%
CR results available
Calculations done in Version 7.8.71.0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-15.8
5.0
-10.6
-5.4
-0.2
5.0
-16.2
-2.2
2.4

8000 Vent 2" - Jamb - 272 x clear – Therm Report

Glazing
6 mm Cardinal 272 Low-E Surface #2
1/2" Butyl Rubber x Quanex T-spacer
Argon 90% / Air 10%
6 mm Clear

Therm Version 7.8.71.0
Date: Sun Dec 17 10:52:47 2023

Created by: Kim Kappler
Created for: Acro Aluminum

Therm Filename: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\8000 Vent - 2 inch - Jamb - 272 x clear.THM
Cross Section Type: Jamb
Underlay Name: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\Detail 1a.dxf

U-factors

Name	Length mm	Basis	U-factor W/m2-K
Frame	82.53	Projected in glass plane	4.2000
SHGC Exterior	79.37	Projected in glass plane	4.5136
Edge	63.50	Projected in glass plane	1.8925

Solid Materials

Name	Conductivity W/m-K	Emissivity
Ethylene Propylene Diene Monomer (EPDM)*	0.25	0.90
Aluminum Alloys (Anodized)*	160.00	0.80
Urethane - Thermal Break*	0.12	0.90
Butyl rubber*	0.24	0.90
Silicone*	0.35	0.90
Extruded Polystyrene (XPS) with CO2*	0.03	0.90
Butyl rubber, (Isobutene), Solid / Hot Melt*	0.24	0.90
Quanex Super Spacer	0.14	0.90

Cavities

Name: Frame Cavity NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
4	Jamb: left to right	4.34	0.90	1.37	0.90	1.94	3.68	1.00	0.0306	1508.0
8	Jamb: left to right	-10.47	0.90	-10.65	0.90	1.94	3.68	1.00	0.0287	1508.0
10	Jamb: left to right	4.77	0.90	4.60	0.90	1.94	3.68	1.00	0.0309	1508.0
18	Jamb: left to right	-11.11	0.90	-13.72	0.90	1.94	3.68	1.00	0.0284	1508.0
24	Jamb: left to right	-10.29	0.85	-10.57	0.80	10.04	14.22	1.00	0.0470	1508.0

27	Jamb: left to right	4.49	0.89	-10.22	0.89	7.30	0.61	1.00	0.0389	1508.0
28	Jamb: left to right	4.73	0.80	4.51	0.85	10.04	14.22	1.00	0.0525	1508.0
29	Jamb: left to right	-1.22	0.80	-11.56	0.81	44.58	14.41	3.39	0.1665	1508.0
30	Jamb: left to right	0.88	0.80	0.70	0.80	27.07	7.73	1.00	0.0801	1508.0
32	Jamb: left to right	0.88	0.81	-8.16	0.82	29.24	11.85	2.11	0.1109	1508.0
34	Jamb: bottom to top	0.88	0.80	1.01	0.80	12.35	16.27	1.00	0.0622	1508.0

Name: Frame Cavity Slightly Ventilated NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099 Ventilated
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
68	Jamb: left to right	4.69	0.80	0.91	0.90	2.95	4.16	1.00	0.0653	1508.0
74	Jamb: left to right	4.69	0.90	1.78	0.90	2.48	1.86	1.00	0.0624	1508.0

Glazing Systems

Name	COG U-factor W/m2-K	Overall Thickness mm	Cavity Height mm
Acro Vent 272 x clear	1.41	24.10	1000.00

Standard Boundary Conditions

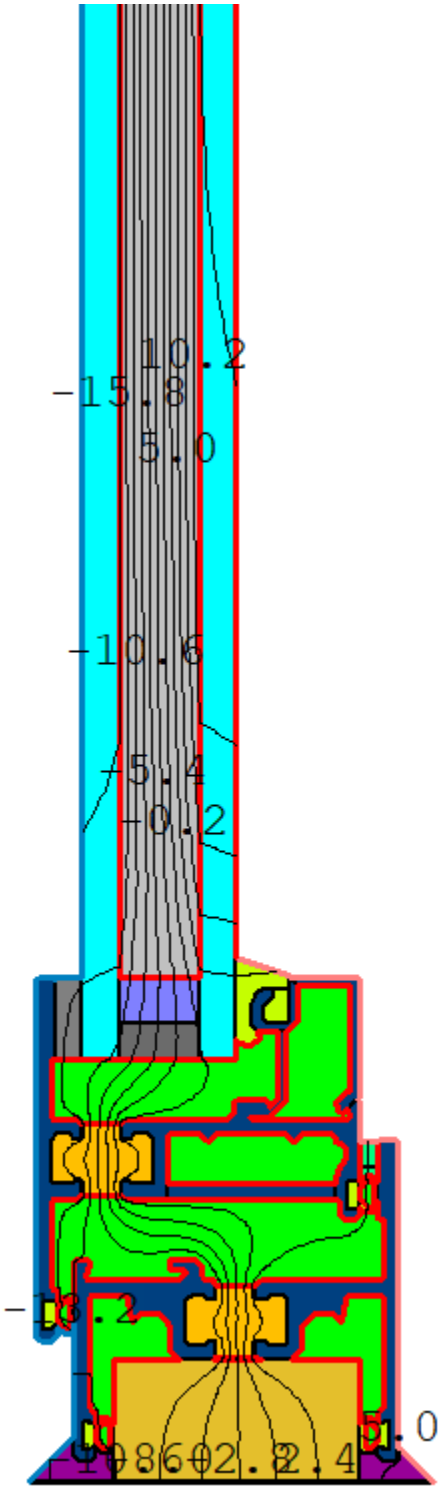
None

Advanced Boundary Conditions

Name	Convection Temp C	Convection Film Coef W/m2-K	Const Flux Heat W/m2	Black Body Radiation View Fact	Black Body Radiation Temp C	Const Temp Temp C
Interior Aluminum Frame (conve ction only)*	21.00	3.290		Enc. Model		
Acro Vent 272 x clear (ID:64) U-factor Inside Film	21.00	2.423		Enc. Model		
NFRC 100-2010 Exterior*	-18.00	26.000		1.00	-18.00	

Calculation Specifications

Mesh Parameter : 6
Estimated Error: 7.7%
Calculations done in Version 7.8.71.0


10.2
15.8
5.0
10.6
5.4
0.2
0
2.4

8000 Vent 2" - Head - 272 x clear – Therm Report

Glazing
6 mm Cardinal 272 Low-E Surface #2
1/2" Butyl Rubber x Quanex T-spacer
Argon 90% / Air 10%
6 mm Clear

Therm Version 7.8.71.0
Date: Sat Dec 16 05:01:52 2023

Created by: Kim Kappler
Created for: Acro Aluminum

Therm Filename: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\8000 Vent - 2 inch - Head - 272 x clear.THM
Cross Section Type: Head
Underlay Name: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\Detail 1a.dxf

U-factors

Name	Length mm	Basis	U-factor W/m2-K
Frame	82.53	Projected in glass plane	4.1108
SHGC Exterior	79.37	Projected in glass plane	4.4112
Edge	63.50	Projected in glass plane	1.8808

Solid Materials

Name	Conductivity W/m-K	Emissivity
Ethylene Propylene Diene Monomer (EPDM)*	0.25	0.90
Aluminum Alloys (Anodized)*	160.00	0.80
Urethane - Thermal Break*	0.12	0.90
Butyl rubber*	0.24	0.90
Silicone*	0.35	0.90
Extruded Polystyrene (XPS) with CO2*	0.03	0.90
Butyl rubber, (Isobutene), Solid / Hot Melt*	0.24	0.90
Quanex Super Spacer	0.14	0.90

Cavities

Name: Frame Cavity NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
4	Horizontal	4.75	0.90	1.75	0.90	1.94	3.68	1.00	0.0307	N/A
8	Horizontal	-10.56	0.90	-10.76	0.90	1.94	3.68	1.00	0.0287	N/A
10	Horizontal	5.18	0.90	5.00	0.90	1.94	3.68	1.00	0.0309	N/A
18	Horizontal	-11.22	0.90	-13.84	0.90	1.94	3.68	1.00	0.0284	N/A
24	Horizontal	-10.39	0.85	-10.68	0.80	10.04	14.22	1.00	0.0470	N/A

27	Horizontal	4.90	0.89	-10.34	0.89	7.30	0.61	1.00	0.0389	N/A
28	Horizontal	5.14	0.80	4.92	0.85	10.04	14.22	1.00	0.0526	N/A
29	Horizontal	-1.00	0.80	-11.64	0.81	44.58	14.41	2.49	0.1454	N/A
30	Horizontal	1.25	0.80	1.08	0.80	27.07	7.73	1.00	0.0804	N/A
32	Horizontal	1.25	0.81	-8.10	0.82	29.24	11.85	1.69	0.1010	N/A
34	Up	1.25	0.80	1.38	0.80	12.35	16.27	1.00	0.0624	N/A

Name: Frame Cavity Slightly Ventilated NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099 Ventilated
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
68	Horizontal	5.10	0.80	1.28	0.90	2.95	4.16	1.00	0.0654	N/A
74	Horizontal	5.10	0.90	2.16	0.90	2.48	1.86	1.00	0.0626	N/A

Glazing Systems

Name	COG U-factor W/m2-K	Overall Thickness mm	Cavity Height mm
Acro Vent 272 x clear	1.41	24.10	1000.00

Standard Boundary Conditions

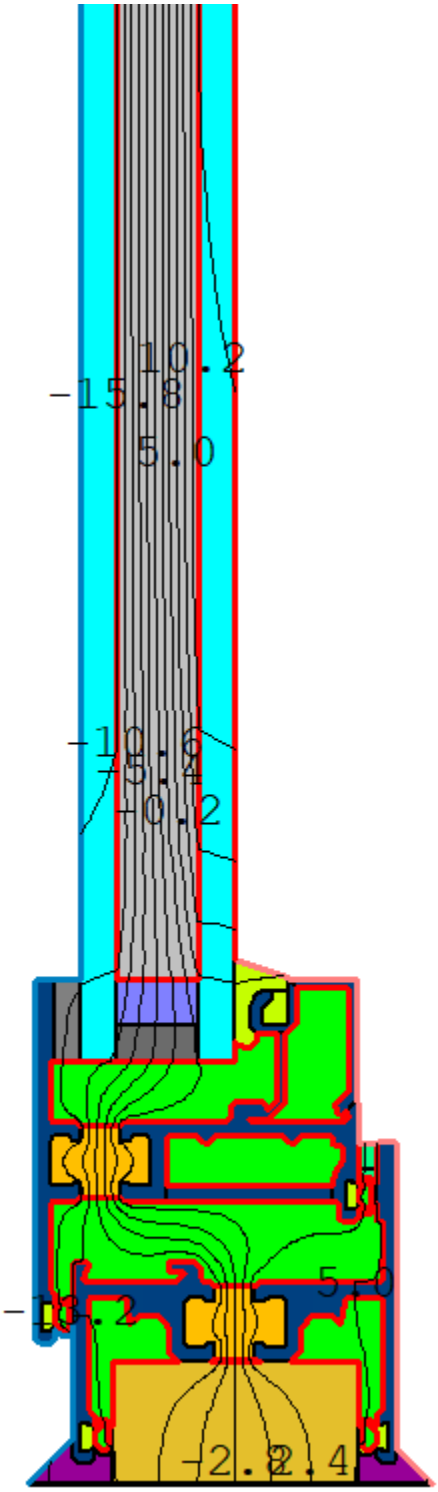
None

Advanced Boundary Conditions

Name	Convection Temp C	Convection Film Coef W/m2-K	Const Flux Heat W/m2	Black Body Radiation View Fact	Black Body Radiation Temp C	Const Temp Temp C
Interior Aluminum Frame (convection only)*	21.00	3.290		Enc. Model		
8000 Vent - 2 inch - Head - 272 x clear:Acro Vent 272 x clear (ID:64) U-factor Inside Film	21.00	2.423		Enc. Model		
NFRC 100-2010 Exterior*	-18.00	26.000		1.00	-18.00	

Calculation Specifications

Mesh Parameter : 6
Estimated Error: 7.8%
CR results available
Calculations done in Version 7.8.71.0


-10.2
-15.8
5.0
-10.6
+5.4
+0.2
5.0
-2.4

8000 Vent 2" - Sill - 270 x clear – Therm Report

Glazing
6 mm Cardinal 270 Low-E Surface #2
1/2" Butyl Rubber x Quanex T-spacer
Argon 90% / Air 10%
6 mm Clear

Therm Version 7.8.71.0
Date: Sat Dec 16 05:06:32 2023

Created by: Kim Kappler
Created for: Acro Aluminum

Therm Filename: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\8000 Vent - 2 inch - Sill - 270 x clear.THM
Cross Section Type: Sill
Underlay Name: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\Detail 1a.dxf

U-factors

Name	Length mm	Basis	U-factor W/m2-K
Frame	82.53	Projected in glass plane	4.1101
SHGC Exterior	79.37	Projected in glass plane	4.4121
Edge	63.50	Projected in glass plane	1.8693

Solid Materials

Name	Conductivity W/m-K	Emissivity
Ethylene Propylene Diene Monomer (EPDM)*	0.25	0.90
Aluminum Alloys (Anodized)*	160.00	0.80
Urethane - Thermal Break*	0.12	0.90
Butyl rubber*	0.24	0.90
Silicone*	0.35	0.90
Extruded Polystyrene (XPS) with CO2*	0.03	0.90
Butyl rubber, (Isobutene), Solid / Hot Melt*	0.24	0.90
Quanex Super Spacer	0.14	0.90

Cavities

Name: Frame Cavity NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
4	Horizontal	4.75	0.90	1.76	0.90	1.94	3.68	1.00	0.0307	N/A
8	Horizontal	-10.56	0.90	-10.76	0.90	1.94	3.68	1.00	0.0287	N/A
10	Horizontal	5.19	0.90	5.00	0.90	1.94	3.68	1.00	0.0309	N/A
18	Horizontal	-11.22	0.90	-13.84	0.90	1.94	3.68	1.00	0.0284	N/A
24	Horizontal	-10.39	0.85	-10.68	0.80	10.04	14.22	1.00	0.0470	N/A

27	Horizontal	4.91	0.89	-10.33	0.89	7.30	0.61	1.00	0.0389	N/A
28	Horizontal	5.14	0.80	4.92	0.85	10.04	14.22	1.00	0.0526	N/A
29	Horizontal	-0.99	0.80	-11.63	0.81	44.58	14.41	2.49	0.1454	N/A
30	Horizontal	1.26	0.80	1.09	0.80	27.07	7.73	1.00	0.0804	N/A
32	Horizontal	1.26	0.81	-8.09	0.82	29.24	11.85	1.69	0.1010	N/A
34	Down	1.26	0.80	1.39	0.80	12.35	16.27	1.00	0.0624	N/A

Name: Frame Cavity Slightly Ventilated NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099 Ventilated
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
68	Horizontal	5.11	0.80	1.29	0.90	2.95	4.16	1.00	0.0654	N/A
74	Horizontal	5.10	0.90	2.17	0.90	2.48	1.86	1.00	0.0626	N/A

Glazing Systems

Name	COG U-factor W/m2-K	Overall Thickness mm	Cavity Height mm
Acro Vent 270 x clear	1.39	24.10	1000.00

Standard Boundary Conditions

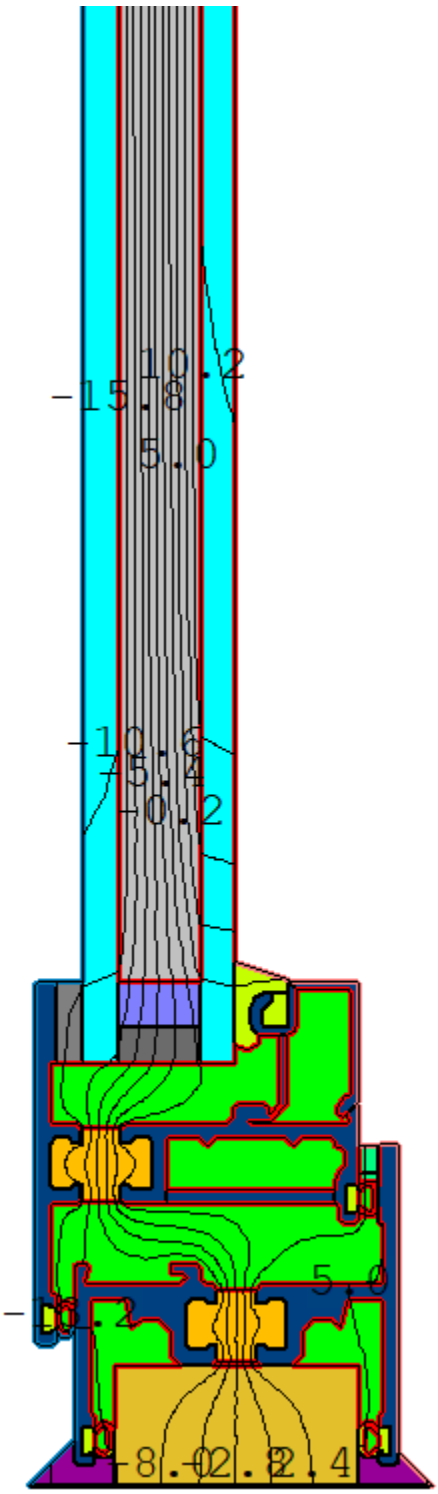
None

Advanced Boundary Conditions

Name	Convection Temp C	Convection Film Coef W/m2-K	Const Flux Heat W/m2	Black Body Radiation View Fact	Black Body Radiation Temp C	Const Temp Temp C
Interior Aluminum Frame (convection only)*	21.00	3.290		Enc. Model		
8000 Vent - 2 inch - Sill - 270 x clear:Acro Vent 270 x clear (ID:65) U-factor Inside Film	21.00	2.417		Enc. Model		
NFRC 100-2010 Exterior*	-18.00	26.000		1.00	-18.00	

Calculation Specifications

Mesh Parameter : 6
Estimated Error: 7.8%
CR results available
Calculations done in Version 7.8.71.0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15.8
5.0
10.6
5.4
0.2
5.0
8.0
2.4

8000 Vent 2" - Jamb - 270 x clear – Therm Report

Glazing
6 mm Cardinal 270 Low-E Surface #2
1/2" Butyl Rubber x Quanex T-spacer
Argon 90% / Air 10%
6 mm Clear

Therm Version 7.8.71.0
Date: Sat Dec 16 05:09:29 2023

Created by: Kim Kappler
Created for: Acro Aluminum

Therm Filename: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\8000 Vent - 2 inch - Jamb - 270 x clear.THM
Cross Section Type: Jamb
Underlay Name: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\Detail 1a.dxf

U-factors

Name	Length mm	Basis	U-factor W/m2-K
Frame	82.53	Projected in glass plane	4.1990
SHGC Exterior	79.37	Projected in glass plane	4.5142
Edge	63.50	Projected in glass plane	1.8811

Solid Materials

Name	Conductivity W/m-K	Emissivity
Ethylene Propylene Diene Monomer (EPDM)*	0.25	0.90
Aluminum Alloys (Anodized)*	160.00	0.80
Urethane - Thermal Break*	0.12	0.90
Butyl rubber*	0.24	0.90
Silicone*	0.35	0.90
Extruded Polystyrene (XPS) with CO2*	0.03	0.90
Butyl rubber, (Isobutene), Solid / Hot Melt*	0.24	0.90
Quanex Super Spacer	0.14	0.90

Cavities

Name: Frame Cavity NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
4	Jamb: left to right	4.34	0.90	1.37	0.90	1.94	3.68	1.00	0.0306	1508.0
8	Jamb: left to right	-10.46	0.90	-10.65	0.90	1.94	3.68	1.00	0.0287	1508.0
10	Jamb: left to right	4.78	0.90	4.60	0.90	1.94	3.68	1.00	0.0309	1508.0
18	Jamb: left to right	-11.11	0.90	-13.72	0.90	1.94	3.68	1.00	0.0284	1508.0
24	Jamb: left to right	-10.29	0.85	-10.57	0.80	10.04	14.22	1.00	0.0470	1508.0

27	Jamb: left to right	4.49	0.89	-10.22	0.89	7.30	0.61	1.00	0.0389	1508.0
28	Jamb: left to right	4.73	0.80	4.51	0.85	10.04	14.22	1.00	0.0525	1508.0
29	Jamb: left to right	-1.22	0.80	-11.56	0.81	44.58	14.41	3.39	0.1665	1508.0
30	Jamb: left to right	0.88	0.80	0.71	0.80	27.07	7.73	1.00	0.0801	1508.0
32	Jamb: left to right	0.89	0.81	-8.15	0.82	29.24	11.85	2.11	0.1109	1508.0
34	Jamb: bottom to top	0.89	0.80	1.02	0.80	12.35	16.27	1.00	0.0622	1508.0

Name: Frame Cavity Slightly Ventilated NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099 Ventilated
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
68	Jamb: left to right	4.70	0.80	0.92	0.90	2.95	4.16	1.00	0.0653	1508.0
74	Jamb: left to right	4.69	0.90	1.78	0.90	2.48	1.86	1.00	0.0625	1508.0

Glazing Systems

Name	COG U-factor W/m2-K	Overall Thickness mm	Cavity Height mm
Acro Vent 270 x clear	1.39	24.10	1000.00

Standard Boundary Conditions

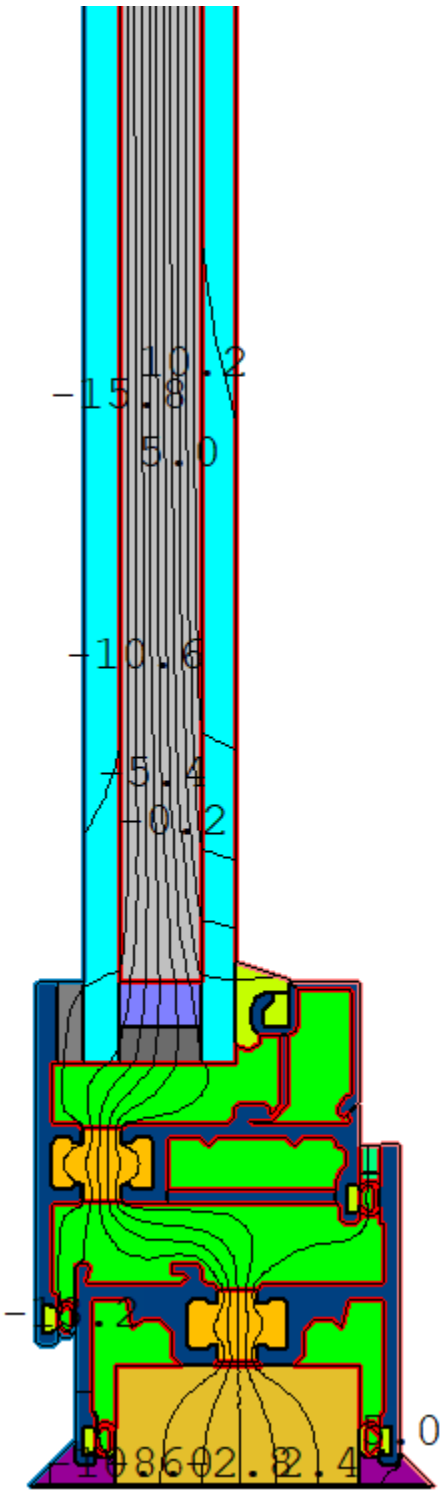
None

Advanced Boundary Conditions

Name	Convection Temp C	Convection Film Coef W/m2-K	Const Flux Heat W/m2	Black Body Radiation View Fact	Black Body Radiation Temp C	Const Temp Temp C
Interior Aluminum Frame (convection only)*	21.00	3.290		Enc. Model		
8000 Vent - 2 inch - Jamb - 270 x clear:Acro Vent 270 x clear (ID:65) U-factor Inside Film	21.00	2.417		Enc. Model		
NFRC 100-2010 Exterior*	-18.00	26.000		1.00	-18.00	

Calculation Specifications

Mesh Parameter : 6
Estimated Error: 7.7%
Calculations done in Version 7.8.71.0


10.2
-15.8
5.0
-10.6
-5.4
-0.2
0

8000 Vent 2" - Head - 270 x clear – Therm Report

Glazing

6 mm Cardinal 270 Low-E Surface #2
1/2" Butyl Rubber x Quanex T-spacer
Argon 90% / Air 10%
6 mm Clear

Therm Version 7.8.71.0
Date: Sat Dec 16 05:12:18 2023

Created by: Kim Kappler
Created for: Acro Aluminum

Therm Filename: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\8000 Vent - 2 inch - Head - 270 x clear.THM
Cross Section Type: Head
Underlay Name: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\Detail 1a.dxf

U-factors

Name	Length mm	Basis	U-factor W/m2-K
Frame	82.53	Projected in glass plane	4.1101
SHGC Exterior	79.37	Projected in glass plane	4.4121
Edge	63.50	Projected in glass plane	1.8693

Solid Materials

Name	Conductivity W/m-K	Emissivity
Ethylene Propylene Diene Monomer (EPDM)*	0.25	0.90
Aluminum Alloys (Anodized)*	160.00	0.80
Urethane - Thermal Break*	0.12	0.90
Butyl rubber*	0.24	0.90
Silicone*	0.35	0.90
Extruded Polystyrene (XPS) with CO2*	0.03	0.90
Butyl rubber, (Isobutene), Solid / Hot Melt*	0.24	0.90
Quanex Super Spacer	0.14	0.90

Cavities

Name: Frame Cavity NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
4	Horizontal	4.75	0.90	1.76	0.90	1.94	3.68	1.00	0.0307	N/A
8	Horizontal	-10.56	0.90	-10.76	0.90	1.94	3.68	1.00	0.0287	N/A
10	Horizontal	5.19	0.90	5.00	0.90	1.94	3.68	1.00	0.0309	N/A
18	Horizontal	-11.22	0.90	-13.84	0.90	1.94	3.68	1.00	0.0284	N/A
24	Horizontal	-10.39	0.85	-10.68	0.80	10.04	14.22	1.00	0.0470	N/A

2021 Uplands Road, Revelstoke, BC, V0E 2S3, 587-225-0570

27	Horizontal	4.91	0.89	-10.33	0.89	7.30	0.61	1.00	0.0389	N/A
28	Horizontal	5.14	0.80	4.92	0.85	10.04	14.22	1.00	0.0526	N/A
29	Horizontal	-0.99	0.80	-11.63	0.81	44.58	14.41	2.49	0.1454	N/A
30	Horizontal	1.26	0.80	1.09	0.80	27.07	7.73	1.00	0.0804	N/A
32	Horizontal	1.26	0.81	-8.09	0.82	29.24	11.85	1.69	0.1010	N/A
34	Up	1.26	0.80	1.39	0.80	12.35	16.27	1.00	0.0624	N/A

Name: Frame Cavity Slightly Ventilated NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099 Ventilated
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
68	Horizontal	5.11	0.80	1.29	0.90	2.95	4.16	1.00	0.0654	N/A
74	Horizontal	5.10	0.90	2.17	0.90	2.48	1.86	1.00	0.0626	N/A

Glazing Systems

Name	COG U-factor W/m2-K	Overall Thickness mm	Cavity Height mm
Acro Vent 270 x clear	1.39	24.10	1000.00

Standard Boundary Conditions

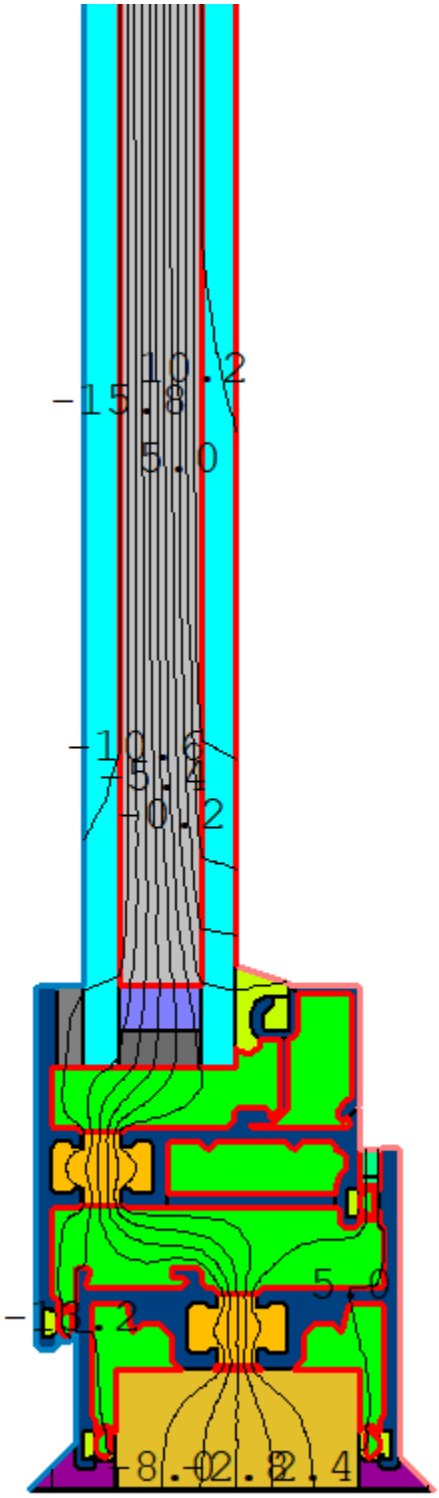
None

Advanced Boundary Conditions

Name	Convection Temp C	Convection Film Coef W/m2-K	Const Flux Heat W/m2	Black Body Radiation View Fact	Black Body Radiation Temp C	Const Temp Temp C
Interior Aluminum Frame (convection only)*	21.00	3.290		Enc. Model		
8000 Vent - 2 inch - Head - 270 x clear:Acro Vent 270 x clear (ID:65) U-factor Inside Film	21.00	2.417		Enc. Model		
NFRC 100-2010 Exterior*	-18.00	26.000		1.00	-18.00	

Calculation Specifications

Mesh Parameter : 6
Estimated Error: 7.8%
CR results available
Calculations done in Version 7.8.71.0


15.8
10.2
5.0
10.6
5.4
0.2
5.0
8.0
2.8
2.4

8000 Vent 2" - Sill - 272 x i89 – Therm Report

Glazing
6 mm Cardinal 272 Low-E Surface #2
1/2" Butyl Rubber x Quanex T-spacer
Argon 90% / Air 10%
6 mm i89 Surface #4

Therm Version 7.8.71.0
Date: Sat Dec 16 05:16:32 2023

Created by: Kim Kappler
Created for: Acro Aluminum

Therm Filename: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\8000 Vent - 2 inch - Sill - 272 x i89.THM
Cross Section Type: Sill
Underlay Name: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\Detail 1a.dxf

U-factors

Name	Length mm	Basis	U-factor W/m2-K
Frame	82.53	Projected in glass plane	4.2530
SHGC Exterior	79.37	Projected in glass plane	4.3133
Edge	63.50	Projected in glass plane	1.3637

Solid Materials

Name	Conductivity W/m-K	Emissivity
Ethylene Propylene Diene Monomer (EPDM)*	0.25	0.90
Aluminum Alloys (Anodized)*	160.00	0.80
Urethane - Thermal Break*	0.12	0.90
Butyl rubber*	0.24	0.90
Silicone*	0.35	0.90
Extruded Polystyrene (XPS) with CO2*	0.03	0.90
Butyl rubber, (Isobutene), Solid / Hot Melt*	0.24	0.90
Quanex Super Spacer	0.14	0.90

Cavities

Name: Frame Cavity NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
4	Horizontal	4.53	0.90	1.40	0.90	1.94	3.68	1.00	0.0306	N/A
8	Horizontal	-10.68	0.90	-10.87	0.90	1.94	3.68	1.00	0.0286	N/A
10	Horizontal	4.98	0.90	4.80	0.90	1.94	3.68	1.00	0.0309	N/A
18	Horizontal	-11.33	0.90	-13.94	0.90	1.94	3.68	1.00	0.0284	N/A
24	Horizontal	-10.51	0.85	-10.79	0.80	10.04	14.22	1.00	0.0469	N/A

27	Horizontal	4.70	0.89	-10.46	0.89	7.30	0.61	1.00	0.0389	N/A
28	Horizontal	4.94	0.80	4.72	0.85	10.04	14.22	1.00	0.0526	N/A
29	Horizontal	-1.19	0.80	-11.76	0.81	44.58	14.41	2.49	0.1451	N/A
30	Horizontal	0.88	0.80	0.71	0.80	27.07	7.73	1.00	0.0801	N/A
32	Horizontal	0.84	0.81	-8.39	0.82	29.24	11.85	1.68	0.1006	N/A
34	Down	0.88	0.80	1.00	0.80	12.35	16.27	1.00	0.0622	N/A

Name: Frame Cavity Slightly Ventilated NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099 Ventilated
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
68	Horizontal	4.90	0.80	0.91	0.90	2.95	4.16	1.00	0.0653	N/A
74	Horizontal	4.90	0.90	1.82	0.90	2.48	1.86	1.00	0.0625	N/A

Glazing Systems

Name	COG U-factor W/m2-K	Overall Thickness mm	Cavity Height mm
Acro Vent 272 x i89	1.14	24.06	1000.00

Standard Boundary Conditions

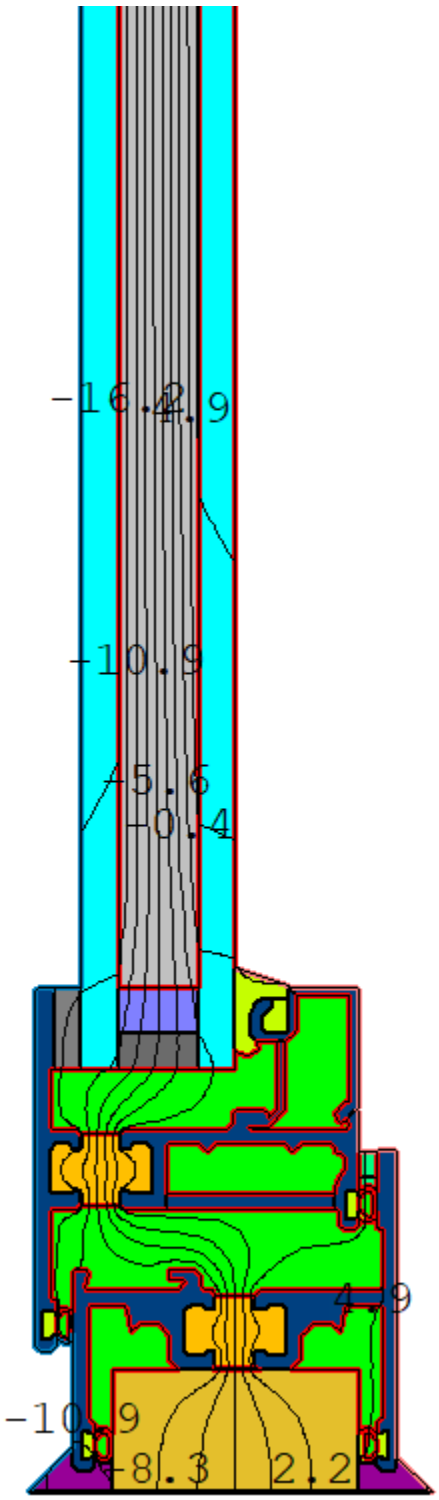
None

Advanced Boundary Conditions

Name	Convection Temp C	Convection Film Coef W/m2-K	Const Flux Heat W/m2	Black Body Radiation View Fact	Black Body Radiation Temp C	Const Temp Temp C
Interior Aluminum Frame (convection only)*	21.00	3.290		Enc. Model		
8000 Vent - 2 inch - Sill - 272 x i89:Acro Vent 272 x i89 (ID:66) U-factor Inside Film	21.00	2.735		Enc. Model		
NFRC 100-2010 Exterior*	-18.00	26.000		1.00	-18.00	

Calculation Specifications

Mesh Parameter : 6
Estimated Error: 8.4%
CR results available
Calculations done in Version 7.8.71.0


-16.4
-10.9
-5.6
-0.4
4.9
-10.9
-8.3
2.2

8000 Vent 2" - Jamb - 272 x i89 – Therm Report

Glazing
6 mm Cardinal 272 Low-E Surface #2
1/2" Butyl Rubber x Quanex T-spacer
Argon 90% / Air 10%
6 mm i89 Surface #4

Therm Version 7.8.71.0
Date: Sat Dec 16 05:19:24 2023

Created by: Kim Kappler
Created for: Acro Aluminum

Therm Filename: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\8000 Vent - 2 inch - Jamb - 272 x i89.THM
Cross Section Type: Jamb
Underlay Name: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\Detail 1a.dxf

U-factors

Name	Length mm	Basis	U-factor W/m2-K
Frame	82.53	Projected in glass plane	4.3421
SHGC Exterior	79.37	Projected in glass plane	4.4134
Edge	63.50	Projected in glass plane	1.3721

Solid Materials

Name	Conductivity W/m-K	Emissivity
Ethylene Propylene Diene Monomer (EPDM)*	0.25	0.90
Aluminum Alloys (Anodized)*	160.00	0.80
Urethane - Thermal Break*	0.12	0.90
Butyl rubber*	0.24	0.90
Silicone*	0.35	0.90
Extruded Polystyrene (XPS) with CO2*	0.03	0.90
Butyl rubber, (Isobutene), Solid / Hot Melt*	0.24	0.90
Quanex Super Spacer	0.14	0.90

Cavities

Name: Frame Cavity NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
4	Jamb: left to right	4.12	0.90	1.02	0.90	1.94	3.68	1.00	0.0306	1508.0
8	Jamb: left to right	-10.59	0.90	-10.77	0.90	1.94	3.68	1.00	0.0287	1508.0
10	Jamb: left to right	4.57	0.90	4.39	0.90	1.94	3.68	1.00	0.0308	1508.0

18	Jamb: left to right	-11.23	0.90	-13.82	0.90	1.94	3.68	1.00	0.0284	1508.0
24	Jamb: left to right	-10.41	0.85	-10.69	0.80	10.04	14.22	1.00	0.0470	1508.0
27	Jamb: left to right	4.28	0.89	-10.35	0.89	7.30	0.61	1.00	0.0389	1508.0
28	Jamb: left to right	4.52	0.80	4.30	0.85	10.04	14.22	1.00	0.0524	1508.0
29	Jamb: left to right	-1.42	0.80	-11.69	0.81	44.58	14.41	3.39	0.1662	1508.0
30	Jamb: left to right	0.51	0.80	0.33	0.80	27.07	7.73	1.00	0.0799	1508.0
32	Jamb: left to right	0.48	0.81	-8.44	0.82	29.24	11.85	2.11	0.1105	1508.0
34	Jamb: bottom to top	0.51	0.80	0.63	0.80	12.35	16.27	1.00	0.0620	1508.0

Name: Frame Cavity Slightly Ventilated NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099 Ventilated
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
68	Jamb: left to right	4.48	0.80	0.54	0.90	2.95	4.16	1.00	0.0652	1508.0
74	Jamb: left to right	4.48	0.90	1.44	0.90	2.48	1.86	1.00	0.0624	1508.0

Glazing Systems

Name	COG U-factor W/m2-K	Overall Thickness mm	Cavity Height mm
Acro Vent 272 x i89	1.14	24.06	1000.00

Standard Boundary Conditions

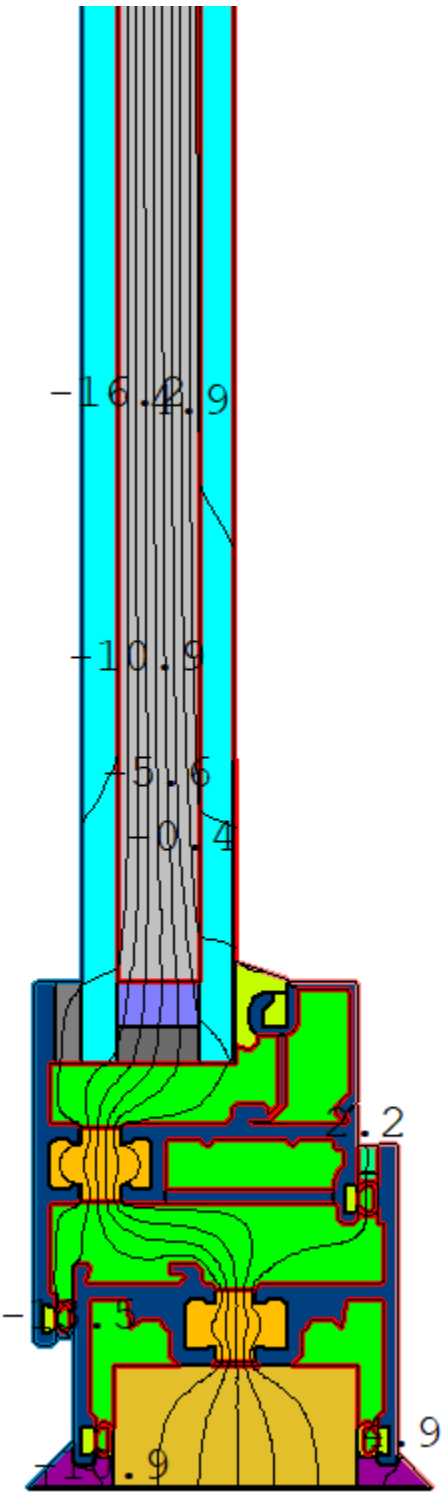
None

Advanced Boundary Conditions

Name	Convection Temp C	Convection Film Coef W/m2-K	Const Flux Heat W/m2	Black Body Radiation View Fact	Black Body Radiation Temp C	Const Temp Temp C
Interior Aluminum Frame (convection only)*	21.00	3.290		Enc. Model		
8000 Vent - 2 inch - Jamb - 272 x i89:Acro Vent 272 x i89 (ID:66) U-factor Inside Film	21.00	2.735		Enc. Model		
NFRC 100-2010 Exterior*	-18.00	26.000		1.00	-18.00	

Calculation Specifications

Mesh Parameter : 6
Estimated Error: 8.3%
Calculations done in Version 7.8.71.0


-16.9
-10.9
-5.6
-0.4
2.2
6.9

8000 Vent 2" - Head - 272 x i89 – Therm Report

Glazing
6 mm Cardinal 272 Low-E Surface #2
1/2" Butyl Rubber x Quanex T-spacer
Argon 90% / Air 10%
6 mm i89 Surface #4

```
Therm Version 7.8.71.0
Date: Sun Dec 17 10:50:32 2023

Created by: Kim Kappler
Created for: Acro Aluminum

Therm Filename: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\8000 Vent - 2 inch -
Head - 272 x i89.THM
Cross Section Type: Head
Underlay Name: C:\Users\Kim\Desktop\TND\23-12-07 Acro Vent\Thermal model\Detail 1a.dxf

U-factors

Name                 Length  Basis        U-factor
                       mm                 W/m2-K
-------------------- ------- ------------ --------
Frame                 82.53  Projected in glass plane  4.2530
SHGC Exterior         79.37  Projected in glass plane  4.3133
Edge                  63.50  Projected in glass plane  1.3637


Solid Materials

Name                             Conductivity   Emissivity
                                    W/m-K
------------------------------  -------------  ----------
Ethylene Propylene Diene Monom
er (EPDM)*                            0.25         0.90
Aluminum Alloys (Anodized)*         160.00         0.80
Urethane - Thermal Break*             0.12         0.90
Butyl rubber*                         0.24         0.90
Silicone*                             0.35         0.90
Extruded Polystyrene (XPS) wit
h CO2*                                0.03         0.90
Butyl rubber, (Isobutene), Sol
id / Hot Melt*                        0.24         0.90
Quanex Super Spacer                   0.14         0.90


Cavities


Name: Frame Cavity NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099
Radiation Model: Standard

Poly  Heat                      Side 1        Side 2    Dimension      Nu    Keff    Cavity
 ID   Flow                   Temp   Emis   Temp   Emis  Horz.  Vert.    #             Height
      Dir                     C             C           mm     mm           W/m-K     mm
----- --------------------  -------- ---- -------- ---- ------ ------ ------ ------   ------
   4  Horizontal              4.53   0.90   1.40   0.90   1.94  3.68   1.00  0.0306    N/A
   8  Horizontal            -10.68   0.90 -10.87   0.90   1.94  3.68   1.00  0.0286    N/A
  10  Horizontal              4.98   0.90   4.80   0.90   1.94  3.68   1.00  0.0309    N/A
  18  Horizontal            -11.33   0.90 -13.94   0.90   1.94  3.68   1.00  0.0284    N/A
  24  Horizontal            -10.51   0.85 -10.79   0.80  10.04 14.22   1.00  0.0469    N/A
```

27	Horizontal	4.70	0.89	-10.46	0.89	7.30	0.61	1.00	0.0389	N/A
28	Horizontal	4.94	0.80	4.72	0.85	10.04	14.22	1.00	0.0526	N/A
29	Horizontal	-1.19	0.80	-11.76	0.81	44.58	14.41	2.49	0.1451	N/A
30	Horizontal	0.88	0.80	0.71	0.80	27.07	7.73	1.00	0.0801	N/A
32	Horizontal	0.84	0.81	-8.39	0.82	29.24	11.85	1.68	0.1006	N/A
34	Up	0.88	0.80	1.00	0.80	12.35	16.27	1.00	0.0622	N/A

Name: Frame Cavity Slightly Ventilated NFRC 100*
Gas Fill: Air
Convection Model: ISO 15099 Ventilated
Radiation Model: Standard

Poly ID	Heat Flow Dir	Side 1 Temp C	Side 1 Emis	Side 2 Temp C	Side 2 Emis	Dimension Horz. mm	Dimension Vert. mm	Nu #	Keff W/m-K	Cavity Height mm
68	Horizontal	4.90	0.80	0.91	0.90	2.95	4.16	1.00	0.0653	N/A
74	Horizontal	4.90	0.90	1.82	0.90	2.48	1.86	1.00	0.0625	N/A

Glazing Systems

Name	COG U-factor W/m2-K	Overall Thickness mm	Cavity Height mm
Acro Vent 272 x i89	1.14	24.06	1000.00

Standard Boundary Conditions

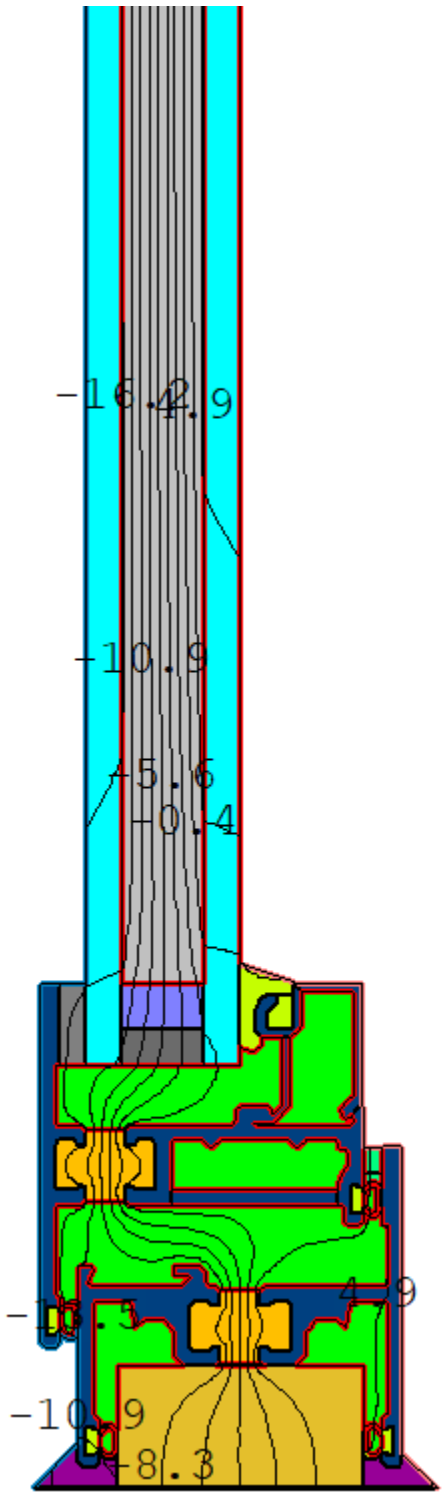
None

Advanced Boundary Conditions

Name	Convection Temp C	Convection Film Coef W/m2-K	Const Flux Heat W/m2	Black Body Radiation View Fact	Black Body Radiation Temp C	Const Temp Temp C
Interior Aluminum Frame (convection only)*	21.00	3.290		Enc. Model		
8000 Vent - 2 inch - Head - 272 x i89:Acro Vent 272 x i89 (ID:66) U-factor Inside Film	21.00	2.735		Enc. Model		
NFRC 100-2010 Exterior*	-18.00	26.000		1.00	-18.00	

Calculation Specifications

Mesh Parameter : 6
Estimated Error: 8.4%
CR results available
Calculations done in Version 7.8.71.0


-16.4
-10.9
-5.6
-0.4
4.9
-10.9
-8.3

8000 Vent 2" - 272 x clear – Window Report

Glazing
6 mm Cardinal 272 Low-E Surface #2
1/2" Butyl Rubber x Quanex T-spacer
Argon 90% / Air 10%
6 mm Clear

```
Window5 Data File for EnergyPlus
BERKELEY LAB WINDOW v7.8.71.0
Date             : Sat Dec 16 05:31:50 2023
Window name      : 2 8000 Vent 2" 272 x clear
Description      : Projecting (Awning-Single)
# Glazing Systems: 1
GLAZING SYSTEM DATA: Height Width nPanes Uval-center SC-center SHGC-center Tvis-center
 System1         :    435  1335      2      1.421      0.460      0.400       0.697
FRAME/MULLION DATA: Width OutsideProj InsideProj Cond EdgeCondRatio SolAbs VisAbs Emiss  Orient'n
(mull)
    L Sill       :   82.5     25.4       25.4   11.775    1.461      0.300  0.300  0.90
    R Sill       :   82.5     25.4       25.4   11.775    1.461      0.300  0.300  0.90
    L Head       :   82.5     25.4       25.4   11.775    1.461      0.300  0.300  0.90
    R Head       :   82.5     25.4       25.4   11.775    1.461      0.300  0.300  0.90
    Top L Jamb   :   82.5     25.4       25.4   12.537    1.474      0.300  0.300  0.90
    Bot L Jamb   :   82.5     25.4       25.4   12.537    1.474      0.300  0.300  0.90
    Top R Jamb   :   82.5     25.4       25.4   12.537    1.474      0.300  0.300  0.90
    Bot R Jamb   :   82.5     25.4       25.4   12.537    1.474      0.300  0.300  0.90
    Mullion      :   None
    Average frame:   82.5     25.4       25.4   11.978    1.464      0.300  0.300  0.90
DIVIDER DATA     : Width OutsideProj InsideProj Cond EdgeCondRatio SolAbs VisAbs Emiss Type
#Hor #Vert
 System1         :   0.0     0.0        0.0    0.000      0.000     0.000  0.000 0.000 None
0    0
GLASS DATA       : Layer#  Thickness  Cond  Tsol  Rfsol  Rbsol  Tvis  Rfvis  Rbvis   Tir  EmissF
EmissB   SpectralDataFile
 System1         :   1     5.700     1.000 0.409  0.264  0.417 0.781  0.055  0.042 0.000   0.840
0.042   LoE272-6.CIG
                     2     5.700     1.000 0.793  0.073  0.073 0.889  0.080  0.080 0.000   0.840
0.840   Clr-6.CIG
GAP DATA         : Gap# Thick nGasses
 System1         :   1  12.70    2
GAS DATA         : GasName       Fraction MWeight    ACond      BCond   CCond      AVisc
BVisc  CVisc ASpHeat  BSpHeat CSpHeat
 System1 Gap1    : Air        0.1000   28.97 0.002873   7.76e-05       0  3.723e-06   4.94e-08
0 1002.74 0.012324       0
                 : Argon      0.9000   39.95 0.002285  5.149e-05       0  3.379e-06  6.451e-08
0 521.929        0       0
GLAZING SYSTEM OPTICAL DATA
Angle     0    10    20    30    40    50    60    70    80    90 Hemis
System1
Tsol  0.350 0.352 0.347 0.340 0.330 0.312 0.273 0.198 0.091 0.000 0.290
Abs1  0.333 0.336 0.343 0.347 0.347 0.348 0.356 0.358 0.287 0.001 0.342
Abs2  0.032 0.033 0.033 0.033 0.034 0.034 0.033 0.029 0.021 0.000 0.032
Rfsol 0.285 0.279 0.278 0.280 0.289 0.306 0.338 0.415 0.601 0.999 0.326
Rbsol 0.315 0.311 0.308 0.307 0.310 0.322 0.354 0.437 0.616 1.000 0.347
Tvis  0.697 0.701 0.691 0.679 0.661 0.625 0.546 0.396 0.183 0.000 0.581
Rfvis 0.105 0.097 0.095 0.098 0.110 0.134 0.181 0.287 0.520 0.999 0.164
Rbvis 0.114 0.108 0.107 0.111 0.125 0.155 0.220 0.366 0.637 1.000 0.196
```

8000 Vent 2" - 270 x clear – Window Report

Glazing
6 mm Cardinal 270 Low-E Surface #2
1/2" Butyl Rubber x Quanex T-spacer
Argon 90% / Air 10%
6 mm Clear

```
Window5 Data File for EnergyPlus
BERKELEY LAB WINDOW v7.8.71.0
Date             : Sat Dec 16 05:33:35 2023
Window name      : 3 8000 Vent 2" 270 x clear
Description      : Projecting (Awning-Single)
# Glazing Systems: 1
GLAZING SYSTEM DATA: Height Width nPanes Uval-center SC-center SHGC-center Tvis-center
 System1         :    435  1335      2      1.405      0.410      0.357       0.675
FRAME/MULLION DATA: Width OutsideProj InsideProj Cond EdgeCondRatio SolAbs VisAbs Emiss  Orient'n
(mull)
    L Sill       :   82.5     25.4       25.4   11.769    1.470      0.300  0.300  0.90
    R Sill       :   82.5     25.4       25.4   11.769    1.470      0.300  0.300  0.90
    L Head       :   82.5     25.4       25.4   11.769    1.470      0.300  0.300  0.90
    R Head       :   82.5     25.4       25.4   11.769    1.470      0.300  0.300  0.90
    Top L Jamb   :   82.5     25.4       25.4   12.529    1.483      0.300  0.300  0.90
    Bot L Jamb   :   82.5     25.4       25.4   12.529    1.483      0.300  0.300  0.90
    Top R Jamb   :   82.5     25.4       25.4   11.769    1.470      0.300  0.300  0.90
    Bot R Jamb   :   82.5     25.4       25.4   11.769    1.470      0.300  0.300  0.90
    Mullion      :   None
    Average frame:   82.5     25.4       25.4   11.871    1.471      0.300  0.300  0.90
DIVIDER DATA     : Width OutsideProj InsideProj Cond EdgeCondRatio SolAbs VisAbs Emiss Type
#Hor #Vert
 System1         :   0.0     0.0        0.0    0.000      0.000     0.000  0.000 0.000 None
0    0
GLASS DATA       : Layer#  Thickness  Cond  Tsol  Rfsol  Rbsol  Tvis  Rfvis  Rbvis   Tir  EmissF
EmissB   SpectralDataFile
 System1         :   1     5.700     1.000 0.362  0.305  0.463 0.755  0.073  0.061 0.000   0.840
0.035   LoE270-6.CIG
                     2     5.700     1.000 0.793  0.073  0.073 0.889  0.080  0.080 0.000   0.840
0.840   Clr-6.CIG
GAP DATA         : Gap# Thick nGasses
 System1         :   1  12.70    2
GAS DATA         : GasName       Fraction MWeight    ACond      BCond   CCond      AVisc
BVisc  CVisc ASpHeat  BSpHeat CSpHeat
 System1 Gap1    : Air        0.1000   28.97 0.002873   7.76e-05       0  3.723e-06   4.94e-08
0 1002.74 0.012324       0
                 : Argon      0.9000   39.95 0.002285  5.149e-05       0  3.379e-06  6.451e-08
0 521.929        0       0
GLAZING SYSTEM OPTICAL DATA
Angle     0    10    20    30    40    50    60    70    80    90 Hemis
System1
Tsol  0.313 0.314 0.310 0.304 0.295 0.279 0.244 0.178 0.082 0.000 0.260
Abs1  0.339 0.342 0.349 0.352 0.351 0.352 0.357 0.354 0.280 0.001 0.344
Abs2  0.025 0.026 0.026 0.026 0.027 0.027 0.026 0.023 0.017 0.000 0.025
Rfsol 0.323 0.318 0.316 0.318 0.327 0.342 0.372 0.445 0.620 0.999 0.361
Rbsol 0.343 0.339 0.337 0.335 0.337 0.347 0.376 0.454 0.623 1.000 0.371
Tvis  0.675 0.679 0.669 0.657 0.640 0.606 0.530 0.384 0.178 0.000 0.563
Rfvis 0.119 0.112 0.109 0.112 0.124 0.147 0.193 0.296 0.526 0.999 0.176
Rbvis 0.129 0.123 0.122 0.126 0.140 0.169 0.232 0.375 0.641 1.000 0.208
```

8000 Vent 2" - 272 x i89 – Window Report

Glazing
6 mm Cardinal 272 Low-E Surface #2
1/2" Butyl Rubber x Quanex T-spacer
Argon 90% / Air 10%
6 mm i89 Surface #4

```
Window5 Data File for EnergyPlus
BERKELEY LAB WINDOW v7.8.71.0
Date             : Sun Dec 17 10:58:07 2023
Window name      : 4 8000 Vent 2" 272 x i89
Description      : Projecting (Awning-Single)
# Glazing Systems: 1
GLAZING SYSTEM DATA: Height Width nPanes Uval-center SC-center SHGC-center Tvis-center
 System1         :    435  1335      2      1.174      0.449      0.390       0.682
FRAME/MULLION DATA: Width OutsideProj InsideProj Cond EdgeCondRatio SolAbs VisAbs Emiss  Orient'n
(mull)
    L Sill       :   82.5     25.4       25.4   13.022    1.206      0.300  0.300  0.90
    R Sill       :   82.5     25.4       25.4   13.022    1.206      0.300  0.300  0.90
    L Head       :   82.5     25.4       25.4   13.022    1.206      0.300  0.300  0.90
    R Head       :   82.5     25.4       25.4   13.022    1.206      0.300  0.300  0.90
    Top L Jamb   :   82.5     25.4       25.4   13.895    1.215      0.300  0.300  0.90
    Bot L Jamb   :   82.5     25.4       25.4   13.895    1.215      0.300  0.300  0.90
    Top R Jamb   :   82.5     25.4       25.4   13.895    1.215      0.300  0.300  0.90
    Bot R Jamb   :   82.5     25.4       25.4   13.895    1.215      0.300  0.300  0.90
    Mullion      :   None
    Average frame:   82.5     25.4       25.4   13.255    1.208      0.300  0.300  0.90
DIVIDER DATA     : Width OutsideProj InsideProj Cond EdgeCondRatio SolAbs VisAbs Emiss Type
#Hor #Vert
 System1         :   0.0     0.0        0.0    0.000      0.000     0.000  0.000 0.000 None
0    0
GLASS DATA       : Layer#  Thickness  Cond  Tsol  Rfsol  Rbsol  Tvis  Rfvis  Rbvis   Tir  EmissF
EmissB   SpectralDataFile
 System1         :   1     5.700     1.000 0.409  0.264  0.417 0.781  0.055  0.042 0.000   0.840
0.042   LoE272-6.CIG
                     2     5.660     1.000 0.683  0.095  0.098 0.870  0.078  0.076 0.000   0.840
0.149   i89-6.CIG
GAP DATA         : Gap# Thick nGasses
 System1         :   1  12.70    2
GAS DATA         : GasName       Fraction MWeight    ACond      BCond   CCond      AVisc
BVisc  CVisc ASpHeat  BSpHeat CSpHeat
 System1 Gap1    : Air        0.1000   28.97 0.002873   7.76e-05       0  3.723e-06   4.94e-08
0 1002.74 0.012324       0
                 : Argon      0.9000   39.95 0.002285  5.149e-05       0  3.379e-06  6.451e-08
0 521.929        0       0
GLAZING SYSTEM OPTICAL DATA
Angle     0    10    20    30    40    50    60    70    80    90 Hemis
System1
Tsol  0.336 0.338 0.333 0.326 0.316 0.298 0.260 0.188 0.085 0.000 0.278
Abs1  0.333 0.336 0.343 0.347 0.347 0.348 0.356 0.357 0.286 0.001 0.341
Abs2  0.047 0.047 0.047 0.048 0.049 0.049 0.048 0.041 0.029 0.000 0.046
Rfsol 0.284 0.279 0.277 0.279 0.288 0.305 0.337 0.414 0.600 0.999 0.325
Rbsol 0.237 0.230 0.228 0.227 0.231 0.243 0.277 0.364 0.557 1.000 0.271
Tvis  0.682 0.685 0.676 0.663 0.645 0.609 0.531 0.384 0.175 0.000 0.566
Rfvis 0.103 0.096 0.093 0.096 0.108 0.132 0.179 0.284 0.518 0.999 0.162
Rbvis 0.108 0.104 0.103 0.107 0.120 0.149 0.211 0.353 0.617 1.000 0.189
```