

AAMA 507-07 THERMAL PERFORMANCE REPORT

Rendered to:

CMI ARCHITECTURAL PRODUCTS, INC.

SERIES/MODEL: 450TB Storefront Window

Report No: A0695.01-201-45
Simulation Date: 05/04/10
Report Date: 05/06/10
Report Retention Date: 05/06/14



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Rendered to:

CMI ARCHITECTURAL PRODUCTS, INC.
2800 Freeway Blvd Ste 205
Minneapolis, Minnesota 55430

Report No: A0695.01-201-45
Simulation Date: 05/04/10
Report Date: 05/06/10
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Project Summary:

Architectural Testing, Inc. was contracted by CMI Architectural Products, Inc. to provide U-Factor and Solar Heat Gain Coefficient thermal performance ratings on the 450TB Storefront Window. The thermal performance ratings were determined in accordance with AAMA 507-03, Standard Practice for Determining the Thermal Performance Characteristics of Fenestration Systems Installed in Commercial Building.

Reference Documents:

AAMA 507-07, Standard Practice for Determining the Thermal Performance Characteristics of Fenestration Systems Installed in Commercial Buildings

NFRC 100-2010, Procedure for Determining Fenestration Product U-Factors

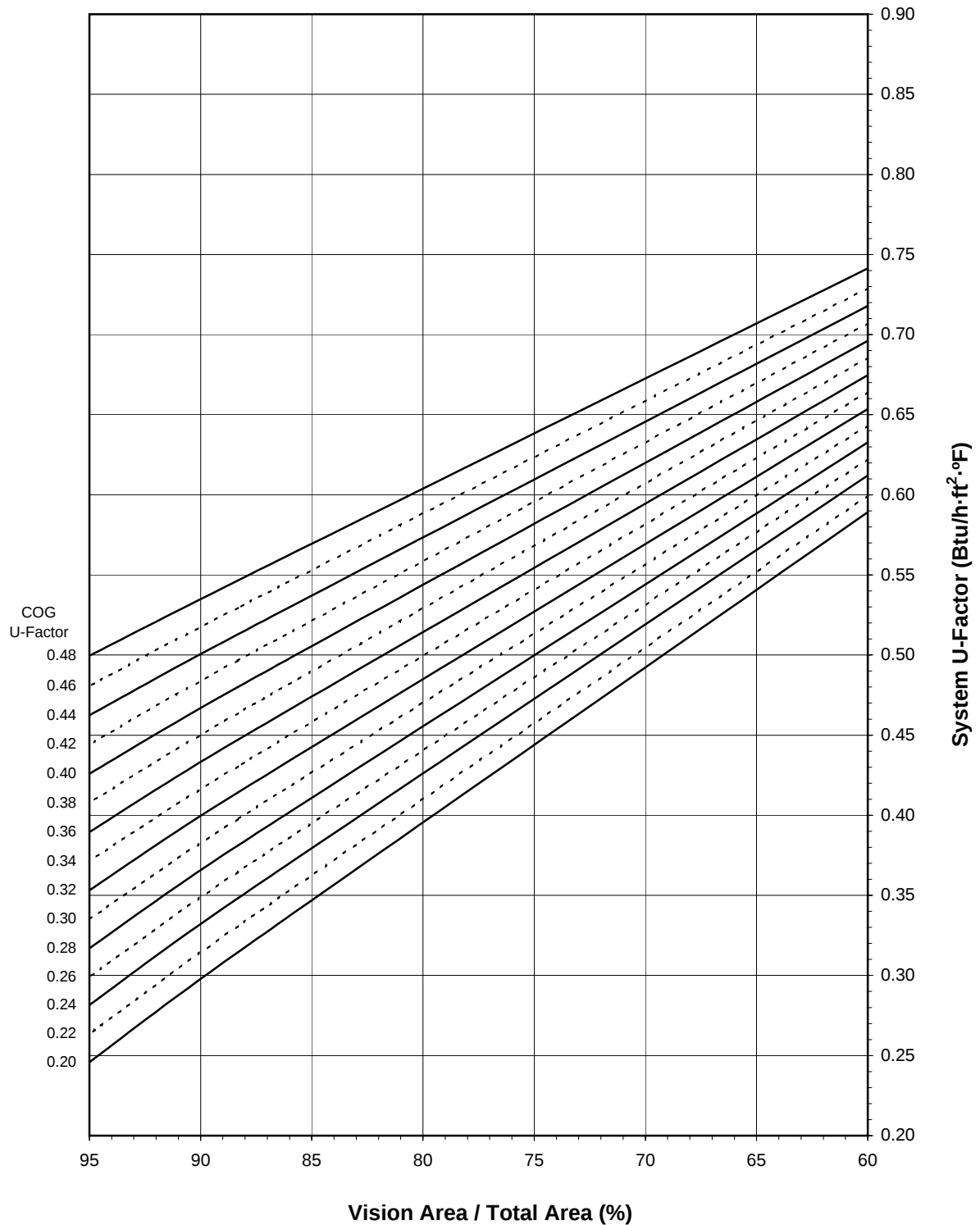
NFRC 200-2010, Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence

Simulation Specimen Description:

Series/Model:	450TB Storefront Window
Type:	Glazed Wall
Frame Material:	Aluminum with Thermal Break Framing System
Specimen Size:	2000mm wide by 2000mm high (78-3/4" by 78-3/4")
Configuration:	Two vision lites separated by one intermediate vertical
Drawing Reference:	CMI Drawing

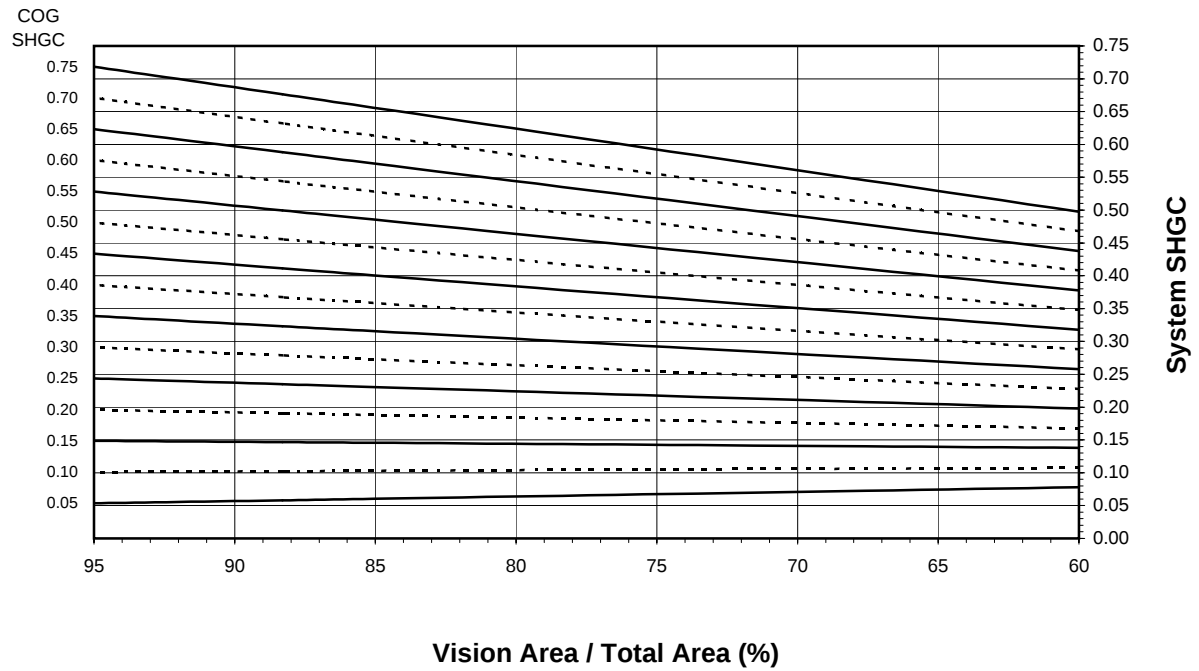
CMI Architectural Products, Inc.
450TB Storefront Window - Glazed Wall

System U-Factor vs. Percentage of Vision Area

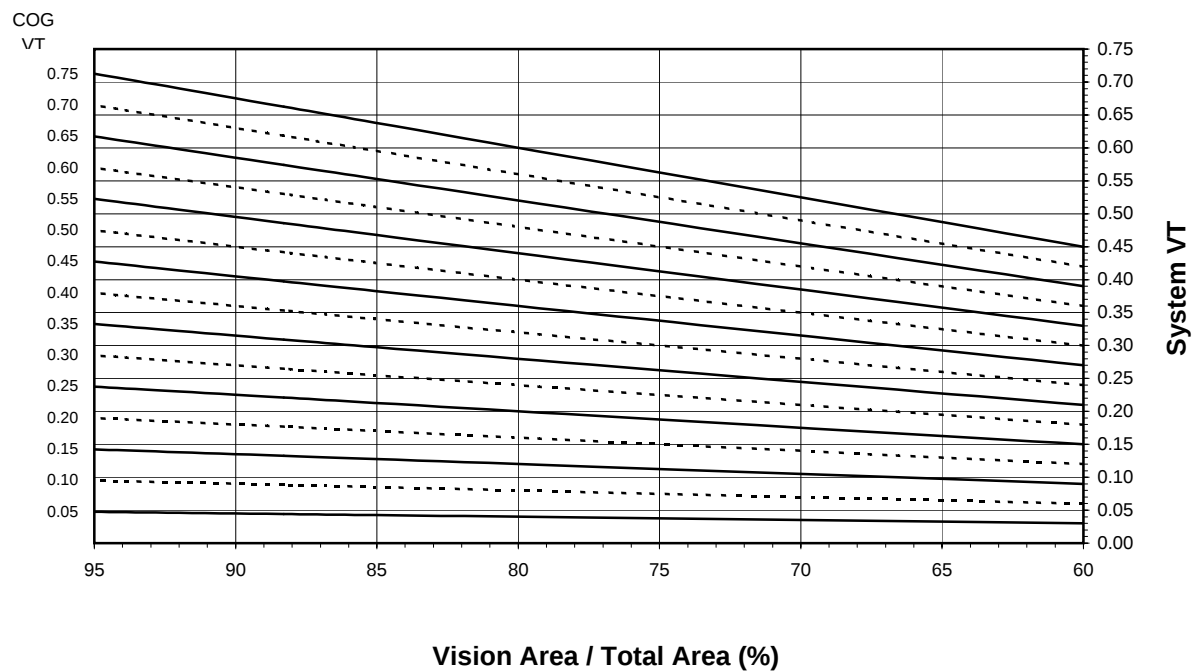


CMI Architectural Products, Inc.
450TB Storefront Window - Glazed Wall

System SHGC vs. Percentage of Vision Area



System VT vs. Percentage of Vision Area



**CMI Architectural Products, Inc.
450TB Storefront Window - Glazed Wall**

Size Specific U-Factor Matrix*

Glazing Option	Center of Glass U-Factor	Overall U-Factor
1	0.48	0.55
2	0.46	0.53
3	0.44	0.51
4	0.42	0.50
5	0.40	0.48
6	0.38	0.46
7	0.36	0.45
8	0.34	0.43
9	0.32	0.41
10	0.30	0.40
11	0.28	0.38
12	0.26	0.36
13	0.24	0.35
14	0.22	0.33
15	0.20	0.31

Size Specific SHGC Matrix*

Center of Glass SHGC	Overall SHGC
0.75	0.68
0.70	0.63
0.65	0.59
0.60	0.54
0.55	0.50
0.50	0.46
0.45	0.41
0.40	0.37
0.35	0.32
0.30	0.28
0.25	0.23
0.20	0.19
0.15	0.15
0.10	0.10
0.05	0.06

Size Specific VT Matrix*

Center of Glass VT	Overall VT
0.75	0.66
0.70	0.62
0.65	0.57
0.60	0.53
0.55	0.49
0.50	0.44
0.45	0.40
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.18
0.15	0.13
0.10	0.09
0.05	0.04

*Size Specific U-Factor, SHGC, and VT Matrices are based on the standard Glazed Wall specimen size of 2000mm wide by 2000mm high (78-3/4" by 78-3/4"). This represents 88.3% Vision Area / Total Area.

Vision Area Data

Option No.	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							60% Vision Area	NFRC 100-2010	95% Vision Area
							21.02" by 21.02"	78.74" by 78.74"	187.40" by 187.40"
1	0.48	43.7	Ext. Head	2.1772	1.0244	0.4540	0.7415	0.5465	0.4995
			Left Jamb	1.1872	1.2659	0.4432			
			Int. Head	2.1772	1.0244	0.4540			
			Mullion	2.3708	1.2668	0.4460			
			Right Jamb	1.1909	1.2606	0.4488			
			Ext. Sill	2.5560	1.1115	0.4586			
			Int. Sill	2.5560	1.1115	0.4586			
2	0.46	44.7	Ext. Head	2.1772	1.0216	0.4391	0.7290	0.5295	0.4808
			Left Jamb	1.1872	1.2545	0.4279			
			Int. Head	2.1772	1.0216	0.4391			
			Mullion	2.3708	1.2553	0.4308			
			Right Jamb	1.1909	1.2492	0.4336			
			Ext. Sill	1.1909	1.1104	0.4438			
			Int. Sill	2.5560	1.1104	0.4438			
3	0.44	45.8	Ext. Head	2.1772	1.0200	0.4242	0.7180	0.5130	0.4624
			Left Jamb	1.1872	1.2502	0.4127			
			Int. Head	2.1772	1.0200	0.4242			
			Mullion	2.3708	1.2510	0.4156			
			Right Jamb	1.1909	1.2448	0.4185			
			Ext. Sill	2.5560	1.1094	0.4291			
			Int. Sill	2.5560	1.1094	0.4291			
4	0.42	46.8	Ext. Head	2.1772	1.0185	0.4096	0.7071	0.4966	0.4442
			Left Jamb	1.1872	1.2461	0.3977			
			Int. Head	2.1772	1.0185	0.4096			
			Mullion	2.3708	1.2469	0.4007			
			Right Jamb	1.1909	1.2406	0.4036			
			Ext. Sill	2.5560	1.1086	0.4146			
			Int. Sill	2.5560	1.1086	0.4146			
5	0.40	47.9	Ext. Head	2.1772	1.0170	0.3950	0.6963	0.4801	0.4259
			Left Jamb	1.1872	1.2421	0.3828			
			Int. Head	2.1772	1.0170	0.3950			
			Mullion	2.3708	1.2428	0.3858			
			Right Jamb	1.1909	1.2366	0.3887			
			Ext. Sill	2.5560	1.1077	0.4001			
			Int. Sill	2.5560	1.1077	0.4001			

Vision Area Data

Option No.	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							60% Vision Area	NFRC 100-2010	95% Vision Area
							21.02" by 21.02"	78.74" by 78.74"	187.40" by 187.40"
6	0.38	48.9	Ext. Head	2.1772	1.0156	0.3806	0.6855	0.4637	0.4076
			Left Jamb	1.1872	1.2382	0.3680			
			Int. Head	2.1772	1.0156	0.3806			
			Mullion	2.3708	1.2389	0.3710			
			Right Jamb	1.1909	1.2326	0.3740			
			Ext. Sill	2.5560	1.1070	0.3858			
			Int. Sill	2.5560	1.1070	0.3858			
7	0.36	50.0	Ext. Head	2.1772	1.0142	0.3661	0.6748	0.4472	0.3894
			Left Jamb	1.1872	1.2344	0.3531			
			Int. Head	2.1772	1.0142	0.3661			
			Mullion	2.3708	1.2351	0.3562			
			Right Jamb	1.1909	1.2287	0.3593			
			Ext. Sill	2.5560	1.1062	0.3715			
			Int. Sill	2.5560	1.1062	0.3715			
8	0.34	51.0	Ext. Head	2.1772	1.0129	0.3518	0.6643	0.4307	0.3713
			Left Jamb	1.1872	1.2307	0.3385			
			Int. Head	2.1772	1.0129	0.3518			
			Mullion	2.3708	1.2314	0.3417			
			Right Jamb	1.1909	1.2250	0.3448			
			Ext. Sill	2.5560	1.1055	0.3573			
			Int. Sill	2.5560	1.1055	0.3573			
9	0.32	52.1	Ext. Head	2.1772	1.0116	0.3375	0.6537	0.4142	0.3531
			Left Jamb	1.1872	1.2271	0.3238			
			Int. Head	2.1772	1.0116	0.3375			
			Mullion	2.3708	1.2278	0.3270			
			Right Jamb	1.1909	1.2213	0.3302			
			Ext. Sill	2.5560	1.1048	0.3431			
			Int. Sill	2.5560	1.1048	0.3431			
10	0.30	53.1	Ext. Head	2.1772	1.0104	0.3235	0.6433	0.3977	0.3351
			Left Jamb	1.1872	1.2236	0.3094			
			Int. Head	2.1772	1.0104	0.3235			
			Mullion	2.3708	1.2243	0.3127			
			Right Jamb	1.1909	1.2178	0.3159			
			Ext. Sill	2.5560	1.1042	0.3292			
			Int. Sill	2.5560	1.1042	0.3292			

Vision Area Data

Option No.	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							60% Vision Area	NFRC 100-2010	95% Vision Area
							21.02" by 21.02"	78.74" by 78.74"	187.40" by 187.40"
11	0.28	54.2	Ext. Head	2.1772	1.0092	0.3093	0.6328	0.3812	0.3169
			Left Jamb	1.1872	1.2202	0.2949			
			Int. Head	2.1772	1.0092	0.3093			
			Mullion	2.3708	1.2209	0.2982			
			Right Jamb	1.1909	1.2143	0.3014			
			Ext. Sill	2.5560	1.1035	0.3151			
			Int. Sill	2.5560	1.1035	0.3151			
12	0.26	55.2	Ext. Head	2.1772	1.0081	0.2952	0.6225	0.3646	0.2991
			Left Jamb	1.1872	1.2169	0.2804			
			Int. Head	2.1772	1.0081	0.2952			
			Mullion	2.3708	1.2175	0.2838			
			Right Jamb	1.1909	1.2110	0.2871			
			Ext. Sill	2.5560	1.1030	0.3011			
			Int. Sill	2.5560	1.1030	0.3011			
13	0.24	56.3	Ext. Head	2.1772	1.0070	0.2812	0.6122	0.3482	0.2816
			Left Jamb	1.1872	1.2137	0.2662			
			Int. Head	2.1772	1.0070	0.2812			
			Mullion	2.3708	1.2143	0.2696			
			Right Jamb	1.1909	1.2077	0.2729			
			Ext. Sill	2.5560	1.1024	0.2873			
			Int. Sill	2.5560	1.1024	0.2873			
14	0.22	57.3	Ext. Head	2.1772	1.0059	0.2673	0.5996	0.3309	0.2636
			Left Jamb	1.1872	1.1985	0.2515			
			Int. Head	2.1772	1.0059	0.2673			
			Mullion	2.3708	1.1991	0.2549			
			Right Jamb	1.1909	1.1926	0.2582			
			Ext. Sill	2.5560	1.1019	0.2735			
			Int. Sill	2.5560	1.1019	0.2735			
15	0.20	58.4	Ext. Head	2.1772	1.0049	0.2535	0.5894	0.3144	0.2459
			Left Jamb	1.1872	1.1954	0.2373			
			Int. Head	2.1772	1.0049	0.2535			
			Mullion	2.3708	1.1960	0.2407			
			Right Jamb	1.1909	1.1895	0.2440			
			Ext. Sill	2.5560	1.1014	0.2597			
			Int. Sill	2.5560	1.1014	0.2597			

Detailed drawings, simulation data disks, and a copy of this report will be retained by Architectural Testing, Inc. for a period of four years. The above results are the exclusive property of the client so named herein and are applicable to the sample simulated. This report does not constitute an opinion or endorsement by this laboratory. This report may not be reproduced except in full without the approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.:

SIMULATED BY:

REVIEWED BY:

Armeya R. Saroufiem
Simulation Technician

Stephanie M. Skoglund
Project Manager
Simulator-In-Responsible-Charge

ARS:ars
A0695.01-201-45

Attachments (pages):

Appendix A: Drawings and Bills of Material (2)

Revision Log

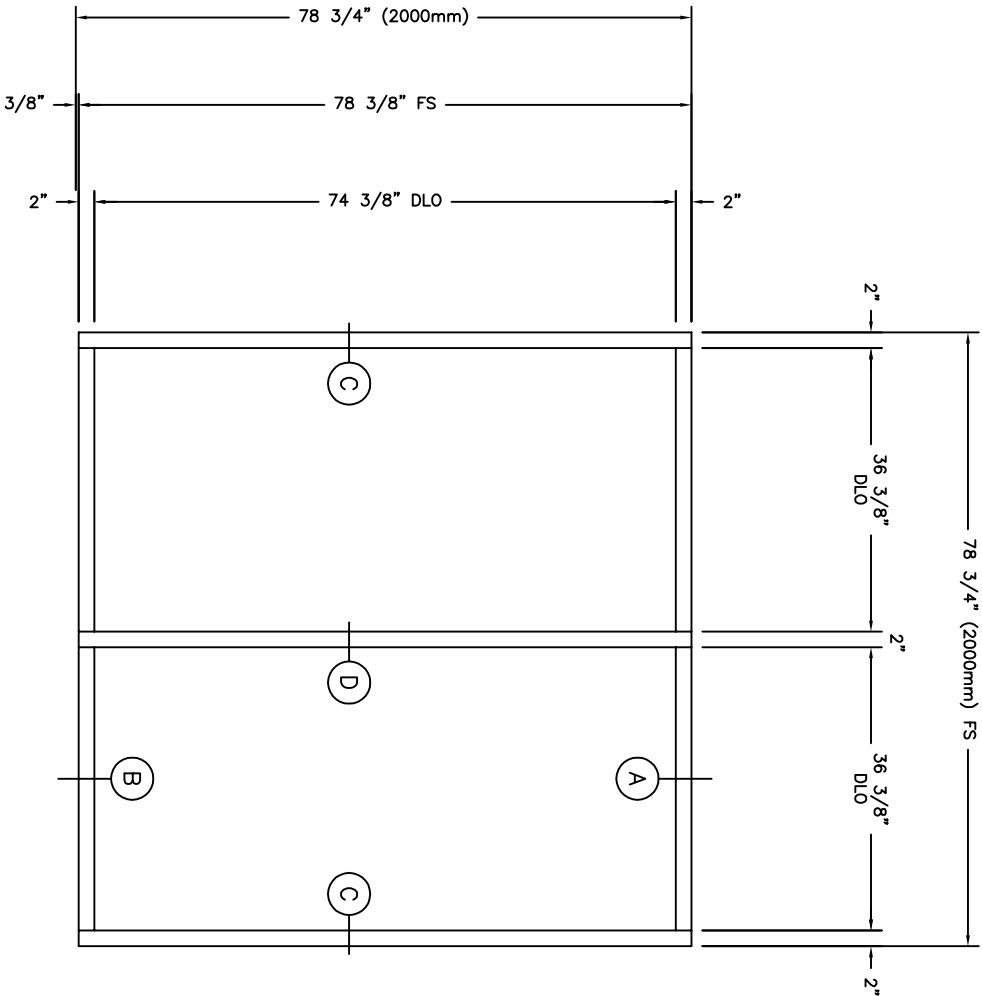
Rev. #	Date	Page(s)	Revision(s)
01-R0	5/6/10	All	Original Report Issue. Work requested by Philip Leonard of CMI Architectural Products, Inc.



Drawings and Bill of Materials

TEST SAMPLE COMPLIES WITH THESE DETAILS,
ANY DEVIATION IS NOTED.
ATI Report No. A0695
Verified Date: 5/04/10

Reviewed: **AS**



450TB THERMAL TEST
1 THIS
450TB (2' x 4 1/2')

1" GLAZING
SCALE: 1/2"=1'-0"

GLASS TYPE:
CLEAR 1" INSULATED GLASS UNITS
1/4" CLEAR WITH PPG SOLARBAN 80 SOLAR CONTROL LOW-E #2 ANNEALED
1/2" AIRSPACE - TECHNOFORM I-SPACER WARM EDGE SPACER / 90% ARGON FILLED
1/4" CLEAR ANNEALED
GLASS SIZE = 2 PIECES 37 1/8" x 75 1/8"

TESTING PARAMETERS:

AAMA 1503-09 VOLUNTARY TEST METHOD FOR THERMAL TRANSMITTANCE AND CONDENSATION RESISTANCE OF WINDOWS, DOORS AND GLAZED CURTAIN WALL SECTIONS.

NFRC 102-2010 PROCEDURE FOR MEASURING THE STEADY STATE THERMAL TRANSMITTANCE OF FENESTRATION SYSTEMS.

AAMA 507-03 STANDARD PRACTICE FOR DETERMINING THE THERMAL PERFORMANCE CHARACTERISTICS OF FENESTRATION SYSTEMS INSTALLED IN COMMERCIAL BUILDING.
- STANDARD AAMA 507 INSULATED GLASS
- UNIT COMPOSITION WITH ALUMINUM SPACER

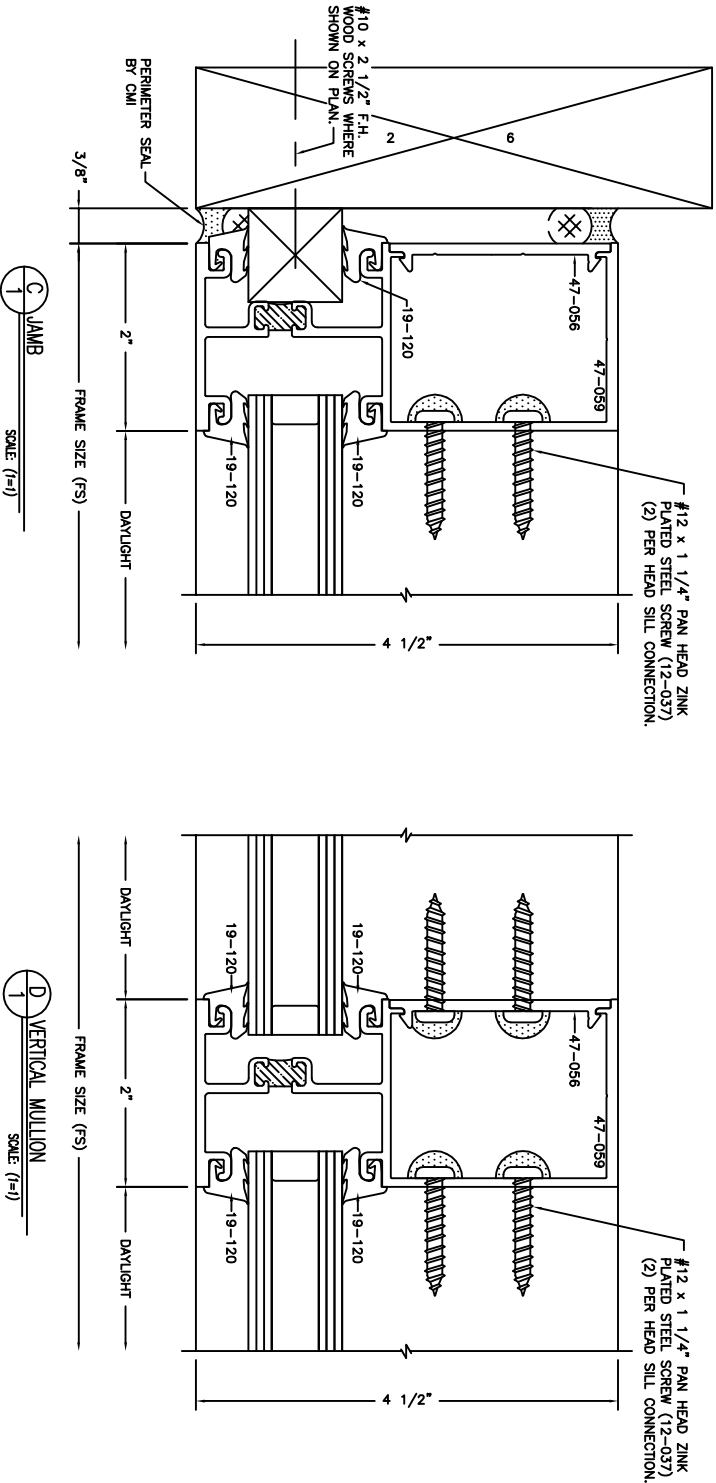
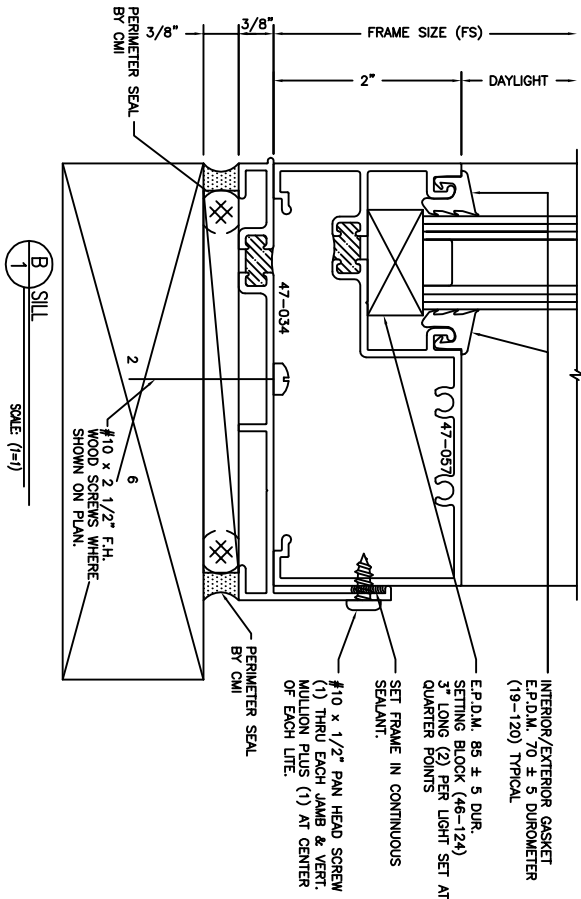
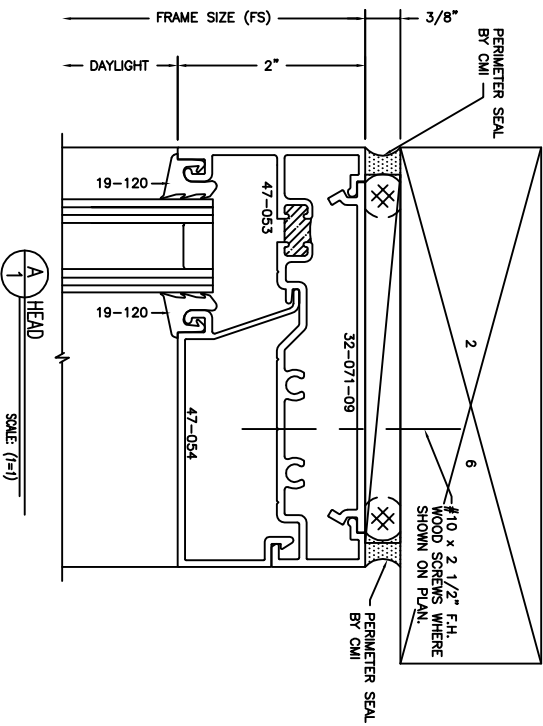
NOTES:

FACTORY INSTALL FRAME IN WOOD BUCK PERIMETER

FACTORY INSTALL GLAZING

FACTORY INSTALL EXTERIOR AND INTERIOR PERIMETER CAULK SEAL TO WOOD BUCK PERIMETER

FACTORY INSTALL TEMPORARY DIAGONAL WOOD BRACING FOR SHIPPING PROTECTION.



CMI Architectural

CMI-ARCHITECTURAL PRODUCTS, INC.

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PROJECT: **CMI THERMAL TEST**
450TB FRONT SET THERMAL WINDOW TEST

ARCHITECT:

GLAZING CONTRACTOR:

REVISIONS

REV	INTL	DATE
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DATE DRAWN:

DRAWN BY: SOLD BY:

PO#:

SCALE: AS NOTED

PROJECT MGR:

CMI S.O.#

SHEET: 1

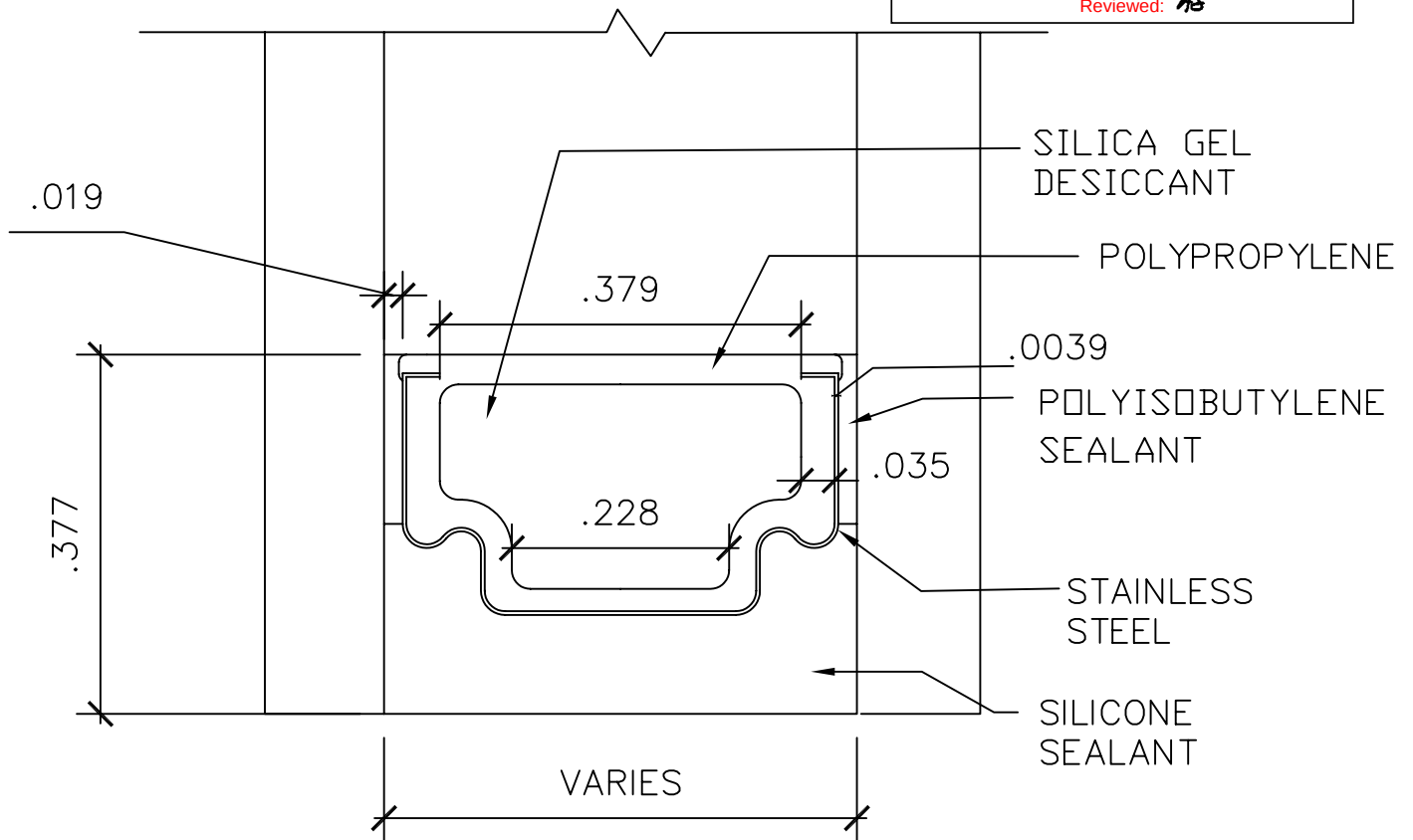
TEST SAMPLE COMPLIES WITH THESE DETAILS,

ANY DEVIATION IS NOTED.

ATI Report No. A0695

Verified Date: 5/04/10

Reviewed: *AS*



DETAIL FOR THERMAL MODELING OF
TGI WAVE SPACER (TS-D)