

AAMA 507-07 THERMAL PERFORMANCE REPORT

Rendered to:

CMI ARCHITECTURAL PRODUCTS, INC.

SERIES/MODEL: 6600 Curtain Wall

Report No: A0683.01-201-45
Simulation Date: 05/21/10
Report Date: 05/21/10
Report Retention Date: 05/21/14

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

Report No: A0683.01-201-45
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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 6600 Curtain Wall. 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

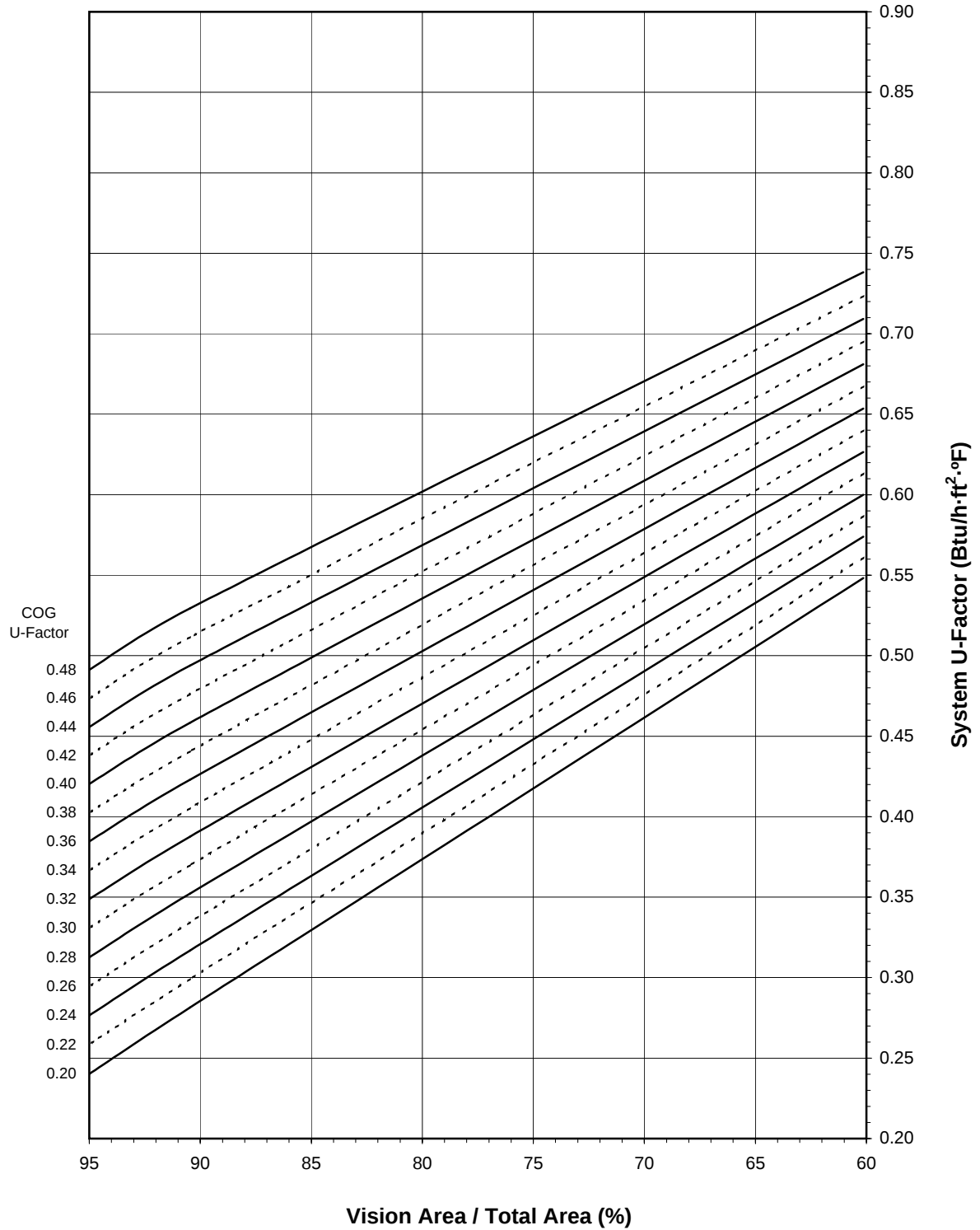
NFRC 200-2010, Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence

Simulation Specimen Description:

Series/Model: 6600 Curtain Wall
Type: Glazed Wall
Frame Material: Aluminum with Thermally Broken 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

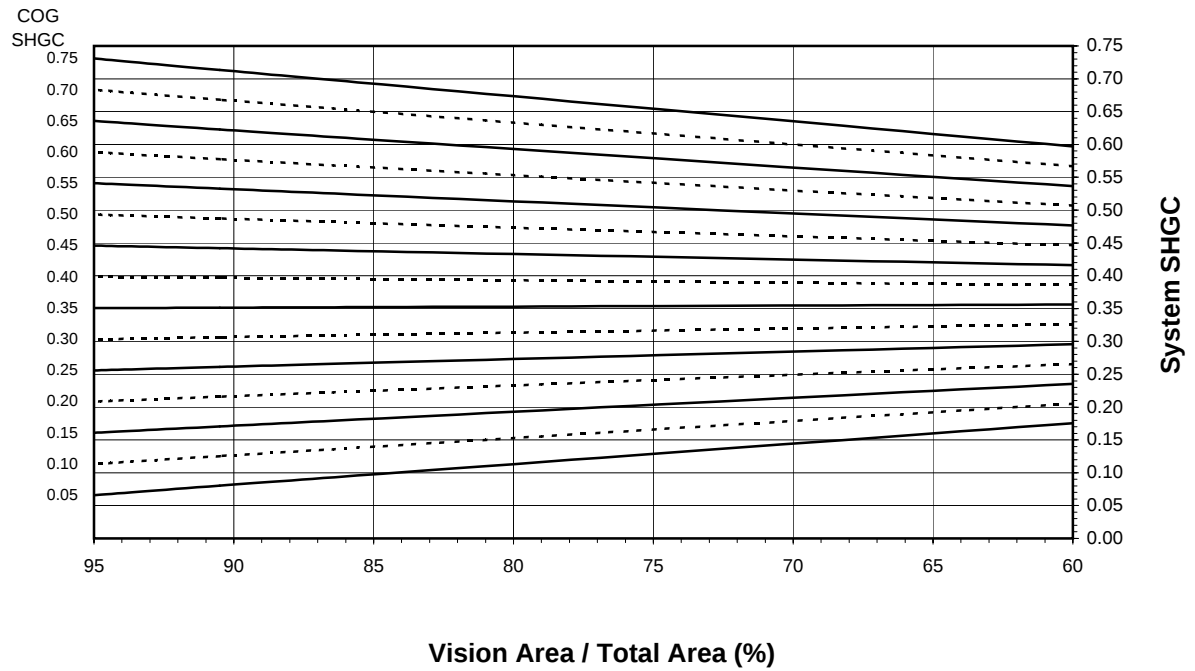
CMI Architectural Products, Inc.
6600 Curtain Wall - Glazed Wall

System U-Factor vs. Percentage of Vision Area

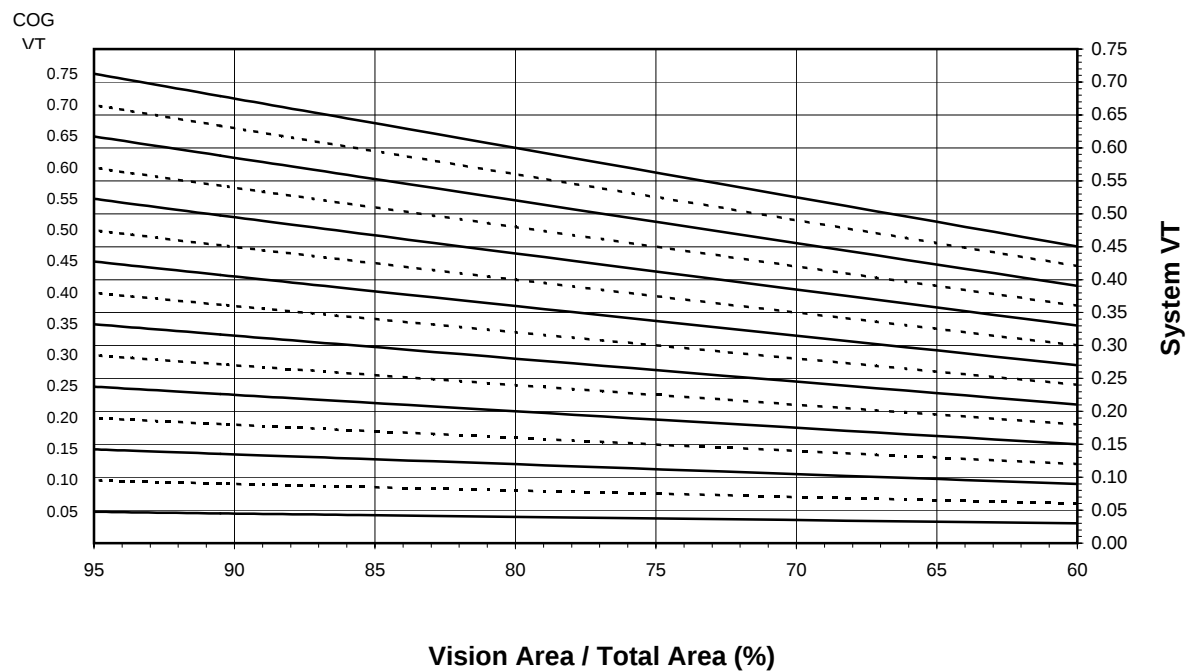


CMI Architectural Products, Inc.
6600 Curtain Wall - Glazed Wall

System SHGC vs. Percentage of Vision Area



System VT vs. Percentage of Vision Area



**CMI Architectural Products, Inc.
6600 Curtain Wall - Glazed Wall**

Size Specific U-Factor Matrix*

Glazing Option	Center of Glass U-Factor	Overall U-Factor
1	0.48	0.53
2	0.46	0.51
3	0.44	0.49
4	0.42	0.48
5	0.40	0.46
6	0.38	0.44
7	0.36	0.42
8	0.34	0.41
9	0.32	0.39
10	0.30	0.37
11	0.28	0.35
12	0.26	0.33
13	0.24	0.32
14	0.22	0.30
15	0.20	0.28

Size Specific SHGC Matrix*

Center of Glass SHGC	Overall SHGC
0.75	0.71
0.70	0.67
0.65	0.62
0.60	0.58
0.55	0.53
0.50	0.49
0.45	0.44
0.40	0.40
0.35	0.35
0.30	0.31
0.25	0.26
0.20	0.22
0.15	0.17
0.10	0.13
0.05	0.08

Size Specific VT Matrix*

Center of Glass VT	Overall VT
0.75	0.68
0.70	0.63
0.65	0.59
0.60	0.54
0.55	0.50
0.50	0.45
0.45	0.41
0.40	0.36
0.35	0.32
0.30	0.27
0.25	0.23
0.20	0.18
0.15	0.14
0.10	0.09
0.05	0.05

*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 90.5% 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
							17.32" by 17.32"	78.74" by 78.74"	151.69" by 151.69"
1	0.48	43.7	Ext. Head	1.3427	1.6839	0.4290	0.7382	0.5294	0.4912
			Left Jamb	1.2500	0.9234	0.4210			
			Int. Head	1.3427	1.6839	0.4290			
			Mullion	2.5000	0.9234	0.4210			
			Right Jamb	1.2500	0.9235	0.4210			
			Ext. Sill	1.3341	1.6964	0.4307			
			Int. Sill	1.3341	1.6964	0.4307			
2	0.46	44.7	Ext. Head	1.3427	1.6809	0.4140	0.7235	0.5115	0.4734
			Left Jamb	1.2500	0.9065	0.4046			
			Int. Head	1.3427	1.6809	0.4140			
			Mullion	2.5000	0.9066	0.4046			
			Right Jamb	1.2500	0.9066	0.4046			
			Ext. Sill	1.2500	1.6934	0.4158			
			Int. Sill	1.3341	1.6934	0.4158			
3	0.44	45.8	Ext. Head	1.3427	1.6780	0.3991	0.7091	0.4938	0.4557
			Left Jamb	1.2500	0.8911	0.3881			
			Int. Head	1.3427	1.6780	0.3991			
			Mullion	2.5000	0.8911	0.3882			
			Right Jamb	1.2500	0.8912	0.3882			
			Ext. Sill	1.3341	1.6905	0.4010			
			Int. Sill	1.3341	1.6905	0.4010			
4	0.42	46.8	Ext. Head	1.3427	1.6753	0.3843	0.6950	0.4761	0.4380
			Left Jamb	1.2500	0.8761	0.3719			
			Int. Head	1.3427	1.6753	0.3843			
			Mullion	2.5000	0.8761	0.3719			
			Right Jamb	1.2500	0.8762	0.3720			
			Ext. Sill	1.3341	1.6878	0.3864			
			Int. Sill	1.3341	1.6878	0.3864			
5	0.40	47.9	Ext. Head	1.3427	1.6726	0.3696	0.6810	0.4584	0.4202
			Left Jamb	1.2500	0.8613	0.3557			
			Int. Head	1.3427	1.6726	0.3696			
			Mullion	2.5000	0.8614	0.3557			
			Right Jamb	1.2500	0.8614	0.3558			
			Ext. Sill	1.3341	1.6851	0.3718			
			Int. Sill	1.3341	1.6851	0.3718			

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
							17.32" by 17.32"	78.74" by 78.74"	151.69" by 151.69"
6	0.38	48.9	Ext. Head	1.3427	1.6701	0.3551	0.6672	0.4406	0.4024
			Left Jamb	1.2500	0.8470	0.3397			
			Int. Head	1.3427	1.6701	0.3551			
			Mullion	2.5000	0.8470	0.3397			
			Right Jamb	1.2500	0.8471	0.3397			
			Ext. Sill	1.3341	1.6825	0.3574			
			Int. Sill	1.3341	1.6825	0.3574			
7	0.36	50.0	Ext. Head	1.3427	1.6676	0.3405	0.6535	0.4229	0.3845
			Left Jamb	1.2500	0.8328	0.3236			
			Int. Head	1.3427	1.6676	0.3405			
			Mullion	2.5000	0.8328	0.3236			
			Right Jamb	1.2500	0.8329	0.3236			
			Ext. Sill	1.3341	1.6800	0.3429			
			Int. Sill	1.3341	1.6800	0.3429			
8	0.34	51.0	Ext. Head	1.3427	1.6653	0.3261	0.6400	0.4052	0.3666
			Left Jamb	1.2500	0.8191	0.3077			
			Int. Head	1.3427	1.6653	0.3261			
			Mullion	2.5000	0.8191	0.3078			
			Right Jamb	1.2500	0.8191	0.3078			
			Ext. Sill	1.3341	1.6777	0.3287			
			Int. Sill	1.3341	1.6777	0.3287			
9	0.32	52.1	Ext. Head	1.3427	1.6631	0.3117	0.6265	0.3875	0.3486
			Left Jamb	1.2500	0.8054	0.2918			
			Int. Head	1.3427	1.6631	0.3117			
			Mullion	2.5000	0.8054	0.2918			
			Right Jamb	1.2500	0.8055	0.2918			
			Ext. Sill	1.3341	1.6754	0.3144			
			Int. Sill	1.3341	1.6754	0.3144			
10	0.30	53.1	Ext. Head	1.3427	1.6610	0.2975	0.6133	0.3699	0.3307
			Left Jamb	1.2500	0.7922	0.2761			
			Int. Head	1.3427	1.6610	0.2975			
			Mullion	2.5000	0.7923	0.2761			
			Right Jamb	1.2500	0.7923	0.2762			
			Ext. Sill	1.3341	1.6733	0.3004			
			Int. Sill	1.3341	1.6733	0.3004			

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
							17.32" by 17.32"	78.74" by 78.74"	151.69" by 151.69"
11	0.28	54.2	Ext. Head	1.3427	1.6589	0.2832	0.6000	0.3521	0.3126
			Left Jamb	1.2500	0.7790	0.2603			
			Int. Head	1.3427	1.6589	0.2832			
			Mullion	2.5000	0.7791	0.2603			
			Right Jamb	1.2500	0.7791	0.2604			
			Ext. Sill	1.3341	1.6712	0.2862			
			Int. Sill	1.3341	1.6712	0.2862			
12	0.26	55.2	Ext. Head	1.3427	1.6569	0.2690	0.5868	0.3343	0.2944
			Left Jamb	1.2500	0.7661	0.2446			
			Int. Head	1.3427	1.6569	0.2690			
			Mullion	2.5000	0.7662	0.2446			
			Right Jamb	1.2500	0.7662	0.2447			
			Ext. Sill	1.3341	1.6692	0.2721			
			Int. Sill	1.3341	1.6692	0.2721			
13	0.24	56.3	Ext. Head	1.3427	1.6551	0.2550	0.5739	0.3168	0.2764
			Left Jamb	1.2500	0.7535	0.2291			
			Int. Head	1.3427	1.6551	0.2550			
			Mullion	2.5000	0.7536	0.2291			
			Right Jamb	1.2500	0.7536	0.2291			
			Ext. Sill	1.3341	1.6673	0.2582			
			Int. Sill	1.3341	1.6673	0.2582			
14	0.22	57.3	Ext. Head	1.3427	1.6532	0.2410	0.5610	0.2991	0.2583
			Left Jamb	1.2500	0.7410	0.2136			
			Int. Head	1.3427	1.6532	0.2410			
			Mullion	2.5000	0.7411	0.2136			
			Right Jamb	1.2500	0.7411	0.2137			
			Ext. Sill	1.3341	1.6654	0.2444			
			Int. Sill	1.3341	1.6654	0.2444			
15	0.20	58.4	Ext. Head	1.3427	1.6515	0.2270	0.5482	0.2814	0.2402
			Left Jamb	1.2500	0.7288	0.1982			
			Int. Head	1.3427	1.6515	0.2270			
			Mullion	2.5000	0.7288	0.1982			
			Right Jamb	1.2500	0.7289	0.1983			
			Ext. Sill	1.3341	1.6636	0.2305			
			Int. Sill	1.3341	1.6636	0.2305			

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
A0683.01-201-45

Attachments (pages):

Appendix A: Drawings and Bills of Material (2)

Revision Log

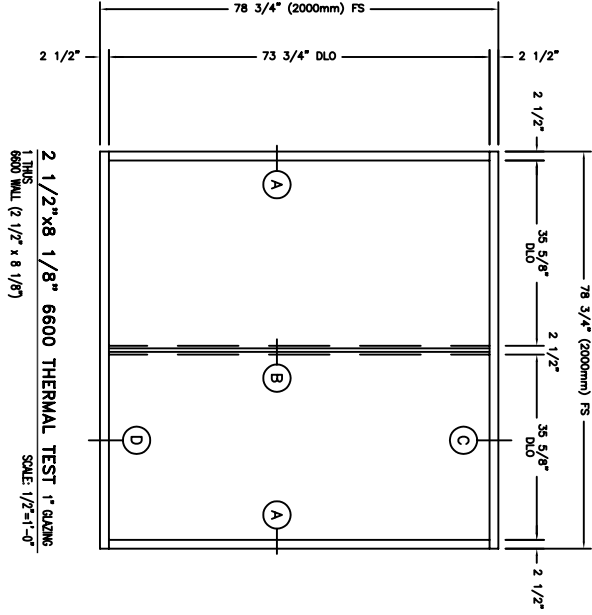
Rev. #	Date	Page(s)	Revision(s)
01-R0	5/4/10	All	Original Report Issue. Work requested by Philip Leonard of CMI Architectural Products, Inc.



Drawings and Bill of Materials

TEST SAMPLE COMPLIES WITH THESE DETAILS,
ANY DEVIATION IS NOTED.
ATI Report No. A0683
Verified Date: 5/04/10

Reviewed: **AS**

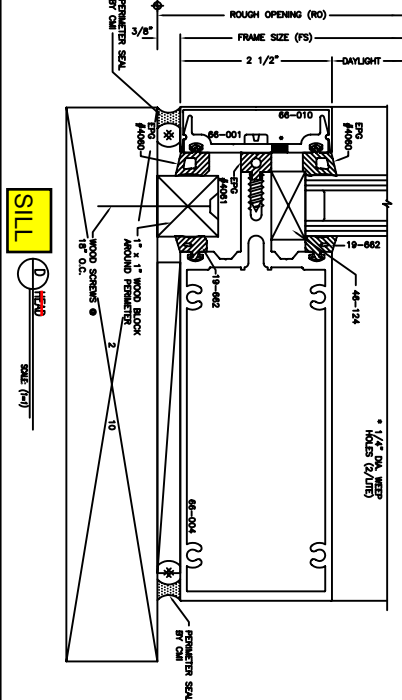
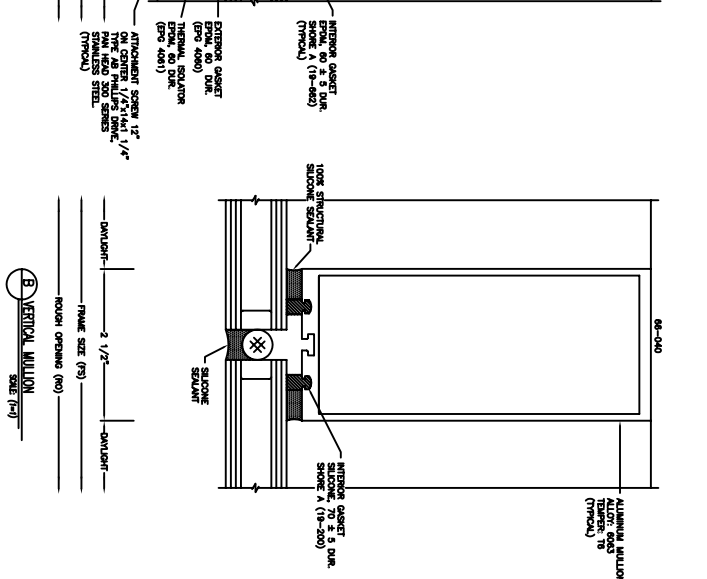
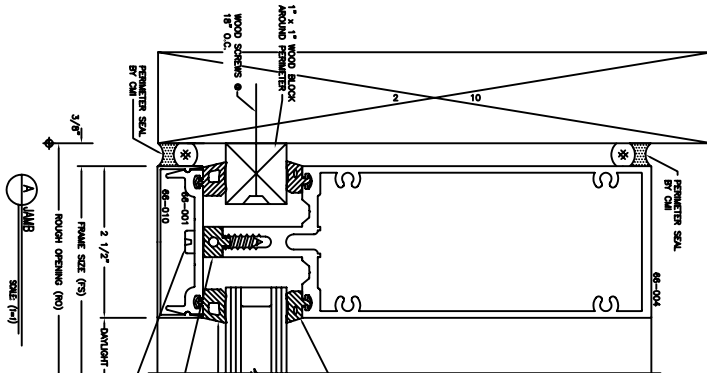
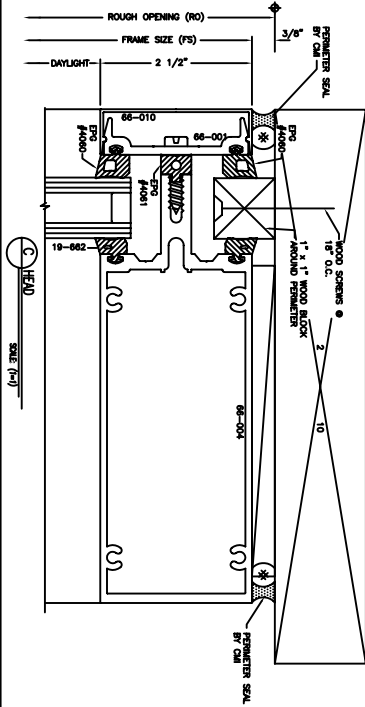


2 1/2"x8 1/8" 6600 THERMAL TEST 1" GLAZING
1 THIS
6600 BULL (2 1/2" x 8 1/8")
SCALE 1/2"=1'-0"

GLASS TYPE:
CLEAR 1" INSULATED GLASS UNITS
1/4" GLAZING WITH PVB INTERLAYER 60 SOLAR CONTROL LOW-E #7 ANNEALED
1/4" SPACER WITH 1/4" ARGON - SPACER WITH 1/4" ARGON FILLED
1/4" CLEAR ANNEALED
GLASS SIZE = 2 PICES 37 1/8" x 74 3/4"

TESTING PARAMETERS:
ASTM H60-04 THERMAL TEST METHOD FOR THERMAL TRANSMITTANCE AND CONDENSATION
RESISTANCE OF WINDOW, DOORS AND GLAZED CURTAIN WALL SYSTEMS
ASTM 102-2010 PROCEDURE FOR MEASURING THE STEADY STATE THERMAL TRANSMITTANCE
OF THERMISTION SYSTEMS
ASTM 507-03 STANDARD PRACTICE FOR DETERMINING THE THERMAL PERFORMANCE
CHARACTERISTICS OF THERMISTION SYSTEMS INSTALLED IN COMMERCIAL BUILDING
- UNIT CONSTRUCTION WITH ALUMINUM SPACERS

NOTES:
FACTORY INSTALL FRAME IN WOOD BLOCK PERIMETER
FACTORY INSTALL GLAZING
FACTORY INSTALL EXTERIOR AND INTERIOR PERIMETER GASKET SEAL TO
WOOD BLOCK PERIMETER
FACTORY INSTALL TEMPORARY DIAGONAL WOOD BRACING FOR SHIPPING
PROTECTION.



SILL
SCALE 1/2"=1'-0"

REV	INTL	DATE
1		

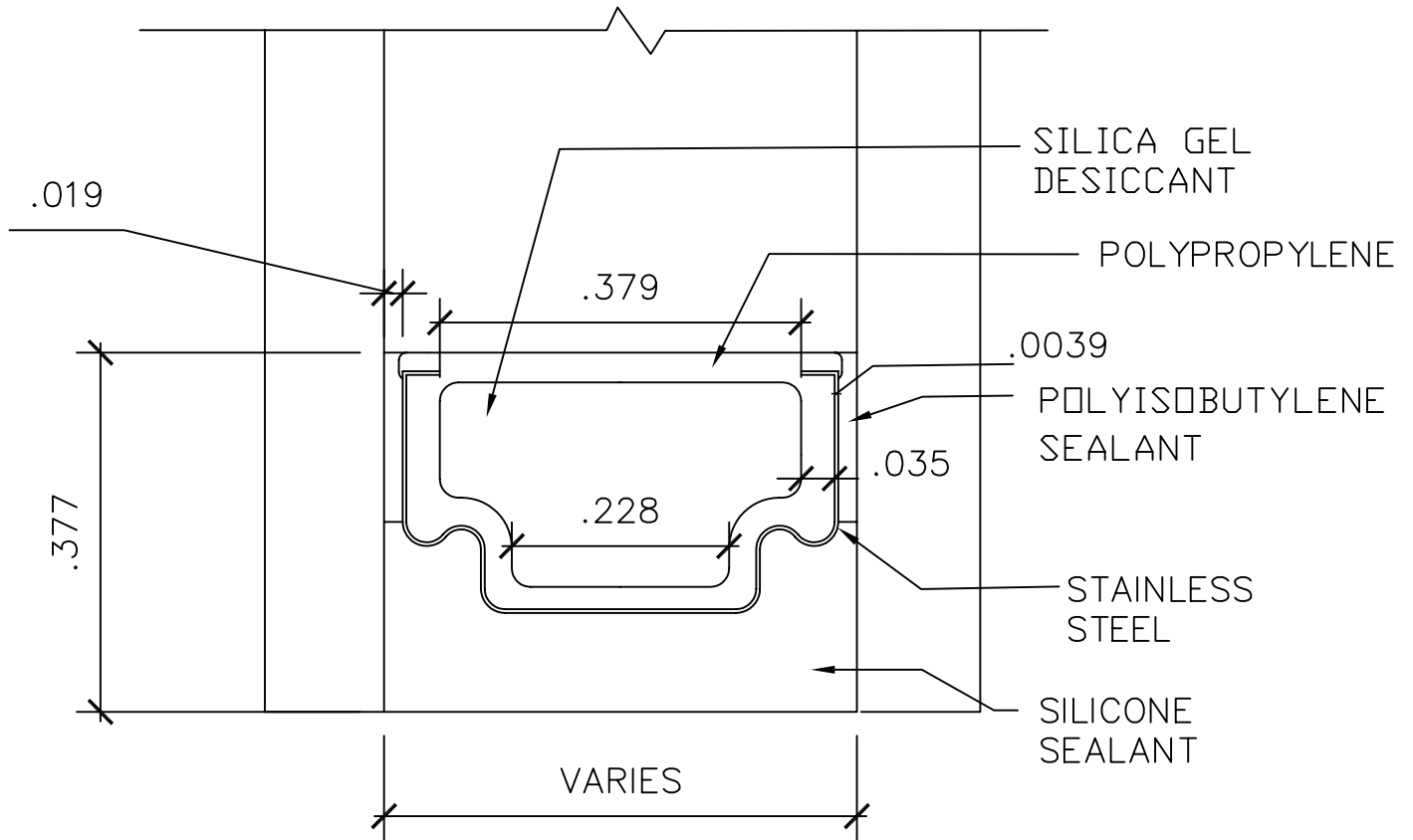
PROJECT: **CMI THERMAL TEST**
6600 WALL 8" ATS THERMAL WINDOW TEST
ARCHITECT:
GLAZING CONTRACTOR:
DATE DRAWN:
DRAWN BY:
CHKD BY:
SCALE:
PROJECT NO.:
CMI 5027
SHEET: 1

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TEST SAMPLE COMPLIES WITH THESE DETAILS,
ANY DEVIATION IS NOTED.
ATI Report No. A0683
Verified Date: 5/04/10

Reviewed: *AS*



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