

# TRULITE GLASS & ALUMINUM COMPUTER SIMULATION REPORT

## SCOPE OF WORK

SERIES CT452 STOREFRONT - AAMA 507

## REPORT NUMBER

Q0752.01-116-45 R0

## TEST DATE

07/06/23

## ISSUE DATE

07/06/23

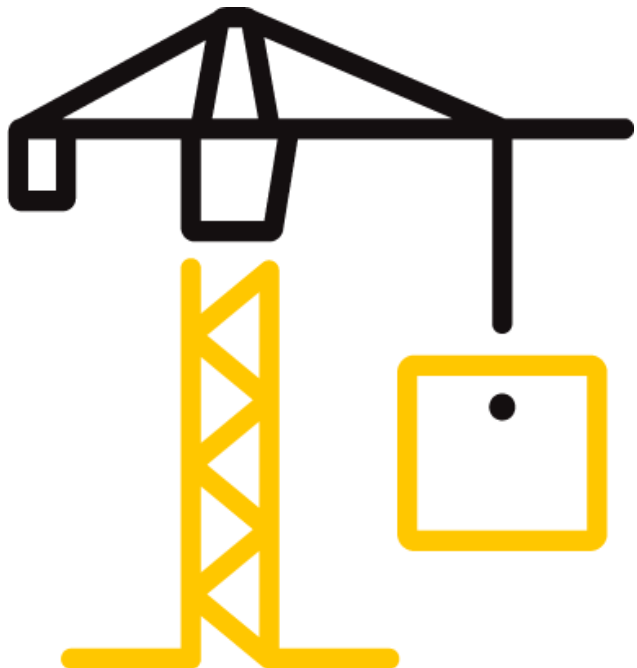
## PAGES

18

## DOCUMENT CONTROL NUMBER

RT-R-AMER-Test-3754 (02/20/18)

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## TEST REPORT FOR TRULITE GLASS & ALUMINUM

Report No.: Q0752.01-116-45 R0

Date: 07/06/23

### REPORT ISSUED TO

#### TRULITE GLASS & ALUMINUM

8136 NW 74th Avenue

Medley, Florida 33166

### SECTION 1

#### SUMMARY

##### SERIES/MODEL: Series CT452 Storefront

Architectural Testing, Inc. (an Intertek company), dba Intertek Building & Construction (Intertek B&C) was contracted to perform AAMA 507 computer simulations utilizing thermal thermal modeling computer software developed by Lawrence Berkeley National Laboratory Laboratory (LBNL). Results obtained are simulated values and were secured using the designated test methods.

Intertek B&C is an NFRC accredited simulation laboratory and all simulations were conducted in full compliance with NFRC approved procedures and specifications.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. The record retention end date of this report is 07/06/28.

For INTERTEK B&C:

**COMPLETED BY:** Allison M. Ford  
**TITLE:** Technician Team Leader  
**SIGNATURE:**  
**DATE:** 07/06/23

AMF:amf

**REVIEWED BY:** Eric S. Leitner  
**TITLE:** Manager - Thermal Testing & Simulations  
**SIGNATURE:**  
**DATE:** 07/06/23

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## TEST REPORT FOR TRULITE GLASS & ALUMINUM

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### SECTION 2

#### TEST METHODS

The products were evaluated in accordance with the following:

*AAMA 507-15, Standard Practice for Determining the Thermal Performance Characteristics of Fenestration Systems Installed in Commercial Buildings*

*ANSI/NFRC 100-2020, Procedure for Determining Fenestration Product U-Factors*

*ANSI/NFRC 200-2020, Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence*

### SECTION 3

#### TEST PROCEDURE

The total product, including specific frame, spacer, and glass details, was modeled using NFRC approved software.

<b>FRAME AND EDGE MODELING</b>	THERM 7.8.57
<b>CENTER-OF-GLASS MODELING</b>	WINDOW 7.8.57
<b>TOTAL PRODUCT CALCULATIONS</b>	WINDOW 7.8.57
<b>SPECTRAL DATA LIBRARY</b>	IGDB 92.0

#### Modeling Assumptions / Technical Interpretations

Any modeling assumptions and technical interpretations required to model this product are listed below.

- 1) To prevent air infiltration, tape was applied to all interior sash crack locations.
- 2) This product is available in either a painted or anodized finish. These two finish types may be grouped in accordance with ANSI/NFRC 100-2020, Section 4.2.1.L. The painted finish was simulated since it is the worst case (highest emissivity).
- 3) The center-line modeling approach was conducted using the vertical intermediate for the jambs. This procedure is outlined in the NFRC Simulation Manual, Section 8.9.

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### SECTION 4

#### SIMULATION SPECIMEN DESCRIPTION

<b>SERIES/MODEL</b>	Series CT452 Storefront
<b>PRODUCT TYPE</b>	Glazed Wall System
<b>FRAME MATERIAL</b>	AT - Aluminum w/ Thermal Breaks - All Members
<b>SASH MATERIAL</b>	NA - Not Applicable

GLAZING OPTIONS					
	<i>OUTER PANE</i>	<i>MIDDLE PANE</i>	<i>INNER PANE</i>	<i>GAP SIZES</i>	<i>IG OVERALL</i>
GL1	1/4"	N/A	1/4"	0.500"	1"
GL2	1/4"	Heat Mirror	1/4"	0.250"	1"

GL1: Dual glazed IG unit (COG=0.48 - COG=0.20)

GL2: Dual glazed IG unit w/ heat mirror (COG=0.18 - COG=0.10)

SPACER OPTIONS			
<i>TYPE</i>	<i>PRIMARY SEAL</i>	<i>SECONDARY SEAL</i>	<i>CODE</i>
Generic Aluminum Dual Seal Spacer	Butyl Rubber	Butyl Rubber	A1-D

### SECTION 5

#### MEASURED SIMULATION DATA

U-FACTOR CALCULATIONS	
Exterior Air Temperature	-0.4°F
Exterior Wind Velocity	12.3 mph (Perpendicular Flow)
Interior Air Temperature	69.8°F

## TEST REPORT FOR TRULITE GLASS & ALUMINUM

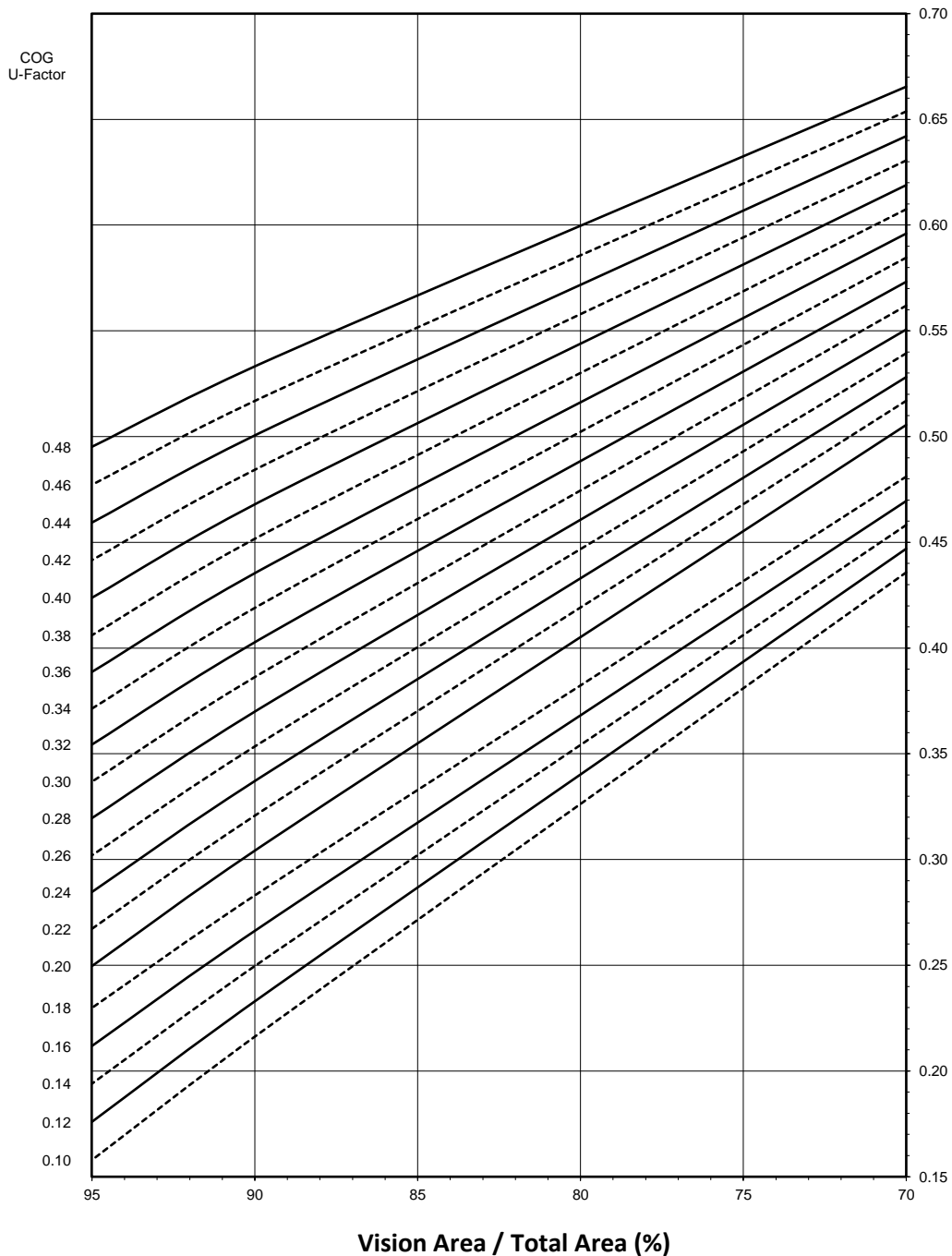
Report No.: Q0752.01-116-45 R0

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### SECTION 6

### SIMULATION RESULTS

#### U-FACTOR CALCULATIONS: System U-Factor vs. Percentage of Vision Area



## TEST REPORT FOR TRULITE GLASS & ALUMINUM

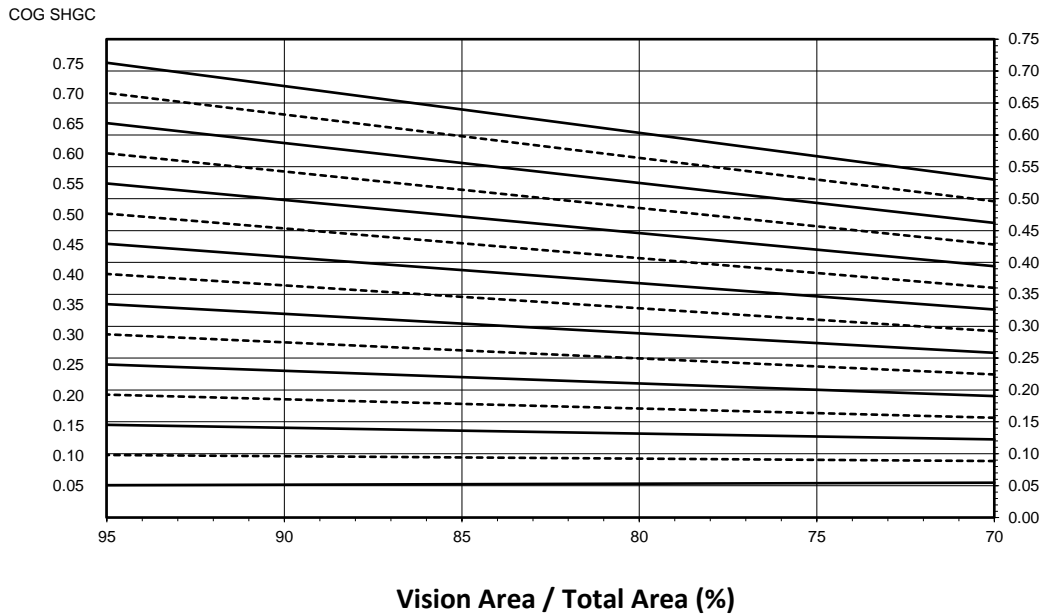
Report No.: Q0752.01-116-45 R0

Date: 07/06/23

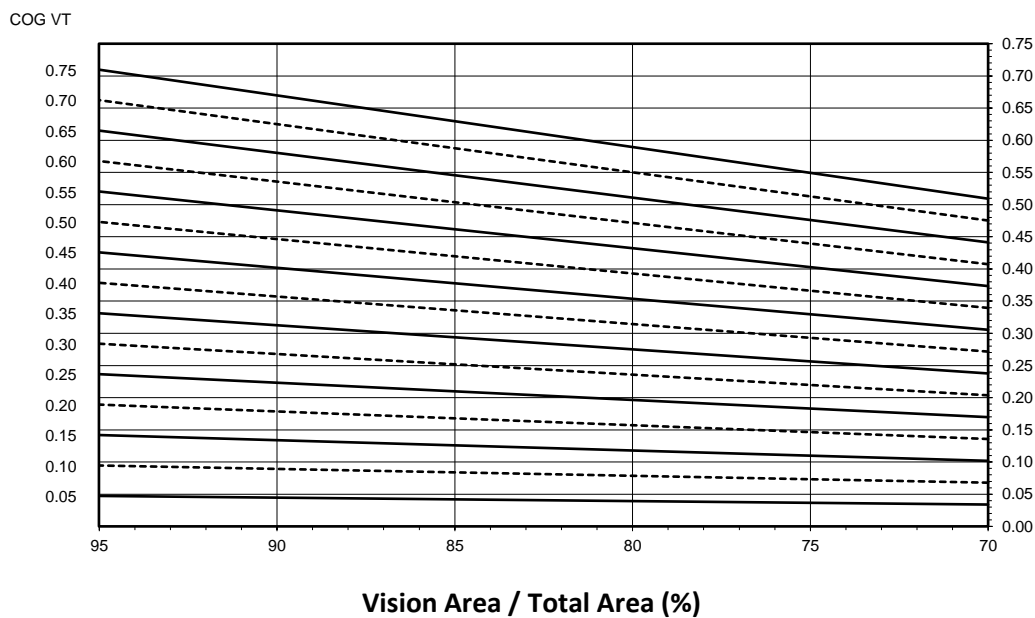
### SECTION 6

### SIMULATION RESULTS

#### SHGC CALCULATIONS: System SHGC vs. Percentage of Vision Area



#### VT CALCULATIONS: System VT vs. Percentage of Vision Area



**TEST REPORT FOR TRULITE GLASS & ALUMINUM**

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**SECTION 6**

**SIMULATION RESULTS**

<b>U-FACTOR CALCULATIONS (Series CT452 Storefront)</b>		
<b>Size Specific U-Factor Matrix*</b>		
<b>Glazing Option</b>	<b>Center-of-Glass U-Factor</b>	<b>Overall U-Factor</b>
1	0.48	0.54
2	0.46	0.52
3	0.44	0.51
4	0.42	0.49
5	0.40	0.47
6	0.38	0.46
7	0.36	0.44
8	0.34	0.42
9	0.32	0.41
10	0.30	0.39
11	0.28	0.38
12	0.26	0.36
13	0.24	0.34
14	0.22	0.33
15	0.20	0.31
16	0.18	0.29
17	0.16	0.27
18	0.14	0.26
19	0.12	0.24
20	0.10	0.22

\*The size specific U-Factor matrix is based on the Glazed Wall System NFRC specimen size of 2000mm x 2000mm (78.75 in x 78.75 in). This represents 89.3% Vision Area / Total Area.

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**SECTION 6**

**SIMULATION RESULTS**

<b>SHGC/VT CALCULATIONS (Series CT452 Storefront)</b>			
<b>Size Specific SHGC Matrix*</b>		<b>Size Specific VT Matrix*</b>	
<b>Center-of-Glass SHGC</b>	<b>Overall SHGC</b>	<b>Center-of-Glass VT</b>	<b>Overall VT</b>
0.75	0.67	0.75	0.66
0.70	0.63	0.70	0.62
0.65	0.58	0.65	0.58
0.60	0.54	0.60	0.53
0.55	0.49	0.55	0.49
0.50	0.45	0.50	0.44
0.45	0.41	0.45	0.40
0.40	0.36	0.40	0.35
0.35	0.32	0.35	0.31
0.30	0.27	0.30	0.27
0.25	0.23	0.25	0.22
0.20	0.18	0.20	0.18
0.15	0.14	0.15	0.13
0.10	0.10	0.10	0.09
0.05	0.05	0.05	0.04

\*The size specific SHGC and VT matrices are based on the Glazed Wall System NFRC specimen size of 2000mm x 2000mm (78.75 in x 78.75 in). This represents 89.3% Vision Area / Total Area.



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**SECTION 6**

**SIMULATION RESULTS**

<b>TOTAL PRODUCT CALCULATIONS (Series CT452 Storefront)</b>									
Option Number	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							70.00% Vision Area	ANSI/NFRC 100-2020	95.00% Vision Area
1	0.48	43.7°F	Head	2.1125	0.9247	0.5044	0.6654	0.5377	0.4952
			L. Jamb	1.1125	1.0376	0.5026			
			R. Jamb	1.1125	1.0705	0.5026			
			Mullion	2.2251	1.0540	0.5026			
			Sill	2.7375	1.0482	0.5094			
2	0.46	44.8°F	Head	2.1125	0.9241	0.4904	0.6537	0.5216	0.4773
			L. Jamb	1.1125	1.0356	0.4884			
			R. Jamb	1.1125	1.0685	0.4885			
			Mullion	2.2251	1.0521	0.4885			
			Sill	2.7375	1.0481	0.4957			
3	0.44	45.8°F	Head	2.1125	0.9234	0.4766	0.6421	0.5054	0.4594
			L. Jamb	1.1125	1.0337	0.4744			
			R. Jamb	1.1125	1.0667	0.4744			
			Mullion	2.2251	1.0502	0.4744			
			Sill	2.7375	1.0480	0.4821			
4	0.42	46.8°F	Head	2.1125	0.9229	0.4630	0.6306	0.4893	0.4416
			L. Jamb	1.1125	1.0320	0.4607			
			R. Jamb	1.1125	1.0649	0.4607			
			Mullion	2.2251	1.0485	0.4607			
			Sill	2.7375	1.0480	0.4688			
5	0.40	47.9°F	Head	2.1125	0.9223	0.4491	0.6189	0.4732	0.4238
			L. Jamb	1.1125	1.0302	0.4466			
			R. Jamb	1.1125	1.0632	0.4466			
			Mullion	2.2251	1.0467	0.4466			
			Sill	2.7375	1.0480	0.4552			
6	0.38	48.9°F	Head	2.1125	0.9218	0.4357	0.6075	0.4570	0.4061
			L. Jamb	1.1125	1.0285	0.4330			
			R. Jamb	1.1125	1.0615	0.4331			
			Mullion	2.2251	1.0450	0.4330			
			Sill	2.7375	1.0480	0.4420			

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**SECTION 6**

**SIMULATION RESULTS**

<b>TOTAL PRODUCT CALCULATIONS (Series CT452 Storefront)</b>									
Option Number	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							70.00% Vision Area	ANSI/NFRC 100-2020	95.00% Vision Area
7	0.36	50.0°F	Head	2.1125	0.9212	0.4222	0.5960	0.4409	0.3888
			L. Jamb	1.1125	1.0268	0.4193			
			R. Jamb	1.1125	1.0599	0.4193			
			Mullion	2.2251	1.0434	0.4193			
			Sill	2.7375	1.0480	0.4287			
8	0.34	51.0°F	Head	2.1125	0.9208	0.4087	0.5846	0.4247	0.3714
			L. Jamb	1.1125	1.0252	0.4056			
			R. Jamb	1.1125	1.0583	0.4056			
			Mullion	2.2251	1.0418	0.4056			
			Sill	2.7375	1.0480	0.4154			
9	0.32	52.0°F	Head	2.1125	0.9203	0.3953	0.5732	0.4086	0.3544
			L. Jamb	1.1125	1.0237	0.3921			
			R. Jamb	1.1125	1.0568	0.3921			
			Mullion	2.2251	1.0403	0.3921			
			Sill	2.7375	1.0481	0.4023			
10	0.30	53.1°F	Head	2.1125	0.9198	0.3820	0.5619	0.3923	0.3369
			L. Jamb	1.1125	1.0222	0.3786			
			R. Jamb	1.1125	1.0554	0.3786			
			Mullion	2.2251	1.0388	0.3786			
			Sill	2.7375	1.0481	0.3892			
11	0.28	54.2°F	Head	2.1125	0.9194	0.3687	0.5506	0.3761	0.3197
			L. Jamb	1.1125	1.0208	0.3652			
			R. Jamb	1.1125	1.0540	0.3652			
			Mullion	2.2251	1.0374	0.3652			
			Sill	2.7375	1.0482	0.3762			
12	0.26	55.2°F	Head	2.1125	0.9190	0.3554	0.5394	0.3598	0.3021
			L. Jamb	1.1125	1.0194	0.3517			
			R. Jamb	1.1125	1.0526	0.3517			
			Mullion	2.2251	1.0360	0.3517			
			Sill	2.7375	1.0482	0.3631			

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**SECTION 6**

**SIMULATION RESULTS**

<b>TOTAL PRODUCT CALCULATIONS (Series CT452 Storefront)</b>									
Option Number	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							70.00% Vision Area	ANSI/NFRC 100-2020	95.00% Vision Area
13	0.24	56.3°F	Head	2.1125	0.9187	0.3423	0.5281	0.3436	0.2847
			L. Jamb	1.1125	1.0181	0.3384			
			R. Jamb	1.1125	1.0513	0.3384			
			Mullion	2.2251	1.0347	0.3384			
			Sill	2.7375	1.0484	0.3501			
14	0.22	57.3°F	Head	2.1125	0.9185	0.3290	0.5169	0.3273	0.2673
			L. Jamb	1.1125	1.0170	0.3250			
			R. Jamb	1.1125	1.0503	0.3250			
			Mullion	2.2251	1.0336	0.3250			
			Sill	2.7375	1.0486	0.3370			
15	0.20	58.4°F	Head	2.1125	0.9182	0.3159	0.5055	0.3110	0.2497
			L. Jamb	1.1125	1.0158	0.3117			
			R. Jamb	1.1125	1.0491	0.3117			
			Mullion	2.2251	1.0324	0.3117			
			Sill	2.7375	1.0458	0.3238			
16	0.18	59.5°F	Head	2.1125	0.8990	0.2926	0.4810	0.2897	0.2299
			L. Jamb	1.1125	0.9701	0.2871			
			R. Jamb	1.1125	1.0031	0.2864			
			Mullion	2.2251	0.9866	0.2867			
			Sill	2.7375	1.0354	0.3026			
17	0.16	60.6°F	Head	2.1125	0.8955	0.2789	0.4695	0.2731	0.2119
			L. Jamb	1.1125	0.9688	0.2735			
			R. Jamb	1.1125	1.0019	0.2728			
			Mullion	2.2251	0.9854	0.2731			
			Sill	2.7375	1.0355	0.2893			
18	0.14	61.6°F	Head	2.1125	0.8958	0.2646	0.4582	0.2566	0.1941
			L. Jamb	1.1125	0.9686	0.2590			
			R. Jamb	1.1125	1.0018	0.2584			
			Mullion	2.2251	0.9852	0.2587			
			Sill	2.7375	1.0361	0.2751			

**TEST REPORT FOR TRULITE GLASS & ALUMINUM**

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**SECTION 6**

**SIMULATION RESULTS**

<b>TOTAL PRODUCT CALCULATIONS (Series CT452 Storefront)</b>									
Option Number	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							70.00% Vision Area	ANSI/NFRC 100-2020	95.00% Vision Area
19	0.12	62.7°F	Head	2.1125	0.8954	0.2513	0.4470	0.2401	0.1760
			L. Jamb	1.1125	0.9673	0.2456			
			R. Jamb	1.1125	1.0005	0.2449			
			Mullion	2.2251	0.9839	0.2452			
			Sill	2.7375	1.0363	0.2619			
20	0.10	63.9°F	Head	2.1125	0.8952	0.2378	0.4358	0.2236	0.1580
			L. Jamb	1.1125	0.9661	0.2320			
			R. Jamb	1.1125	0.9993	0.2313			
			Mullion	2.2251	0.9827	0.2317			
			Sill	2.7375	1.0365	0.2486			

**TEST REPORT FOR TRULITE GLASS & ALUMINUM**

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**SECTION 7**

**DRAWINGS / BILL OF MATERIALS**

The drawings which follow have been reviewed by Intertek B&C and are representative of the simulation result(s) reported herein. Any deviations are documented herein or on the drawings.



Report #: P8920-116-45

Date: 07/05/23

Verified by: *Allison M. Ford*



http://www.trulite.com

403 Westpark Court, Suite 201  
Peachtree City, GA 30269  
p. 800-432-8132

# SERIES CT452 STOREFRONT DOUBLE THERMAL MOCKUP

PRODUCT:

SERIES CT452  
STOREFRONT  
DOUBLE THERMAL MOCKUP

REVN	DATE/REMARKS

ENGINEER:

STAMP:

PRODUCT CONTROL APPROVAL:

DRAWN: -

DATE: 04/03/23

DWG: -

DRAWING No:

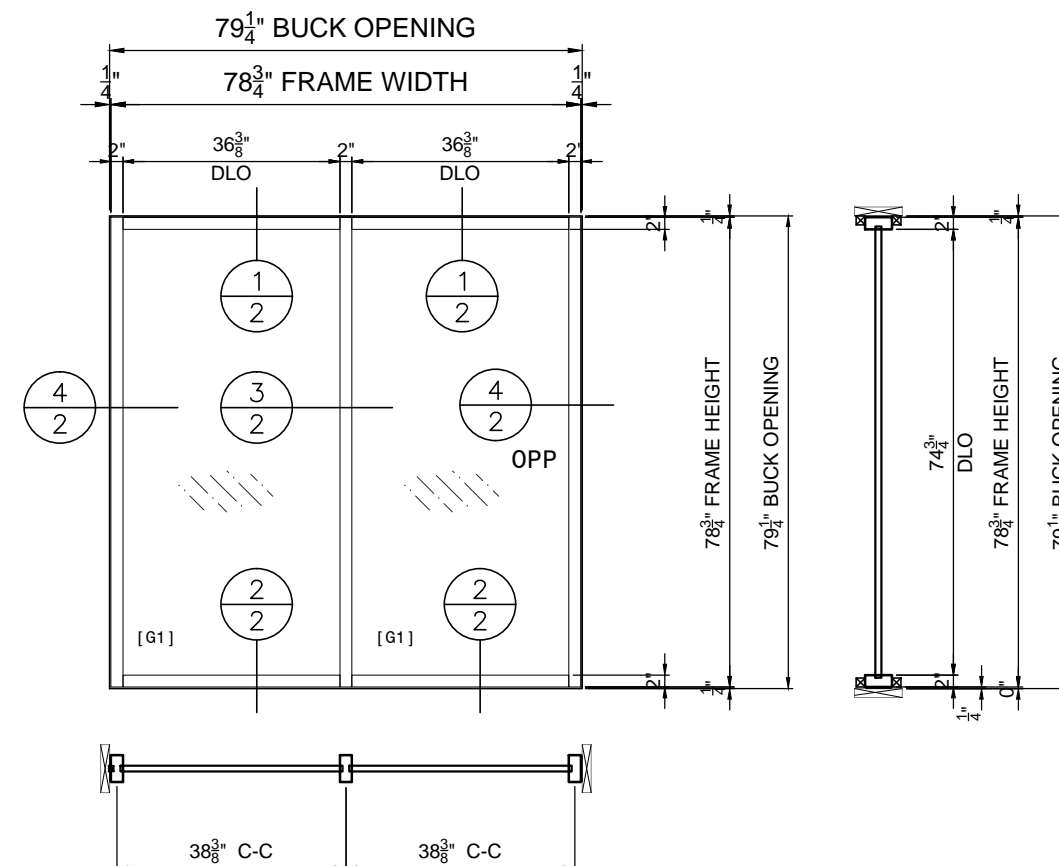
1 OF 3

## DRAWING INDEX

1	INDEX TO DRAWING, NOTE AND ELEVATION
2	FRAMING DETAILS
3	PARTS TABLE , GLASS SCHEDULE AND BILL OF MATERIALS

NOTE: TESTING STANDARDS TO:

- COMPLY WITH NFRC-102, AAMA 1503 & ASTM E90 (ACOUSTICAL PERFORMANCE TEST)
- GLASS SPECS: (G1) 1" THICK INSULATED GLASS
  - 1/4" TEMP CLR WITH SB70 ON SURFACE #2 (OUTBOARD)
  - 1/2" AIR SPACE WITH ALUMINUM SPACER
  - 1/4" TEMP CLR (INBOARD)
- GLASS SIZE: DLO + 7/8"
- DLO = DAYLIGHT OPENING





Report #: P8920-116-45

Date: 07/05/23

Verified by: *Allison M. Ford*



http://www.trulite.com

403 Westpark Court, Suite 201  
Peachtree City, GA 30269  
p. 800-432-8132

PRODUCT:

**SERIES CT452  
STOREFRONT  
DOUBLE THERMAL  
MOCKUP**

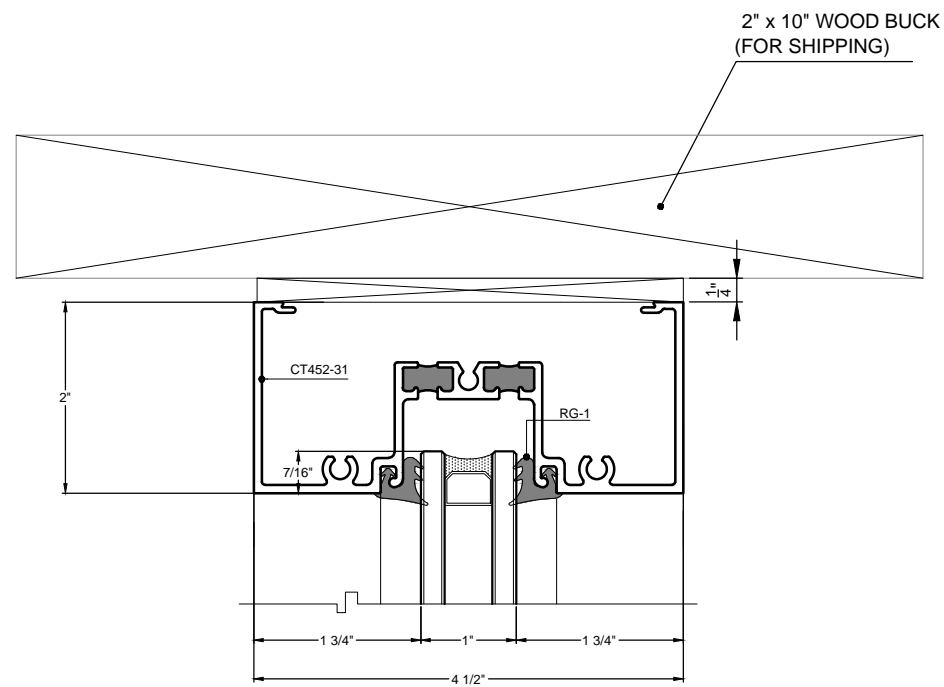
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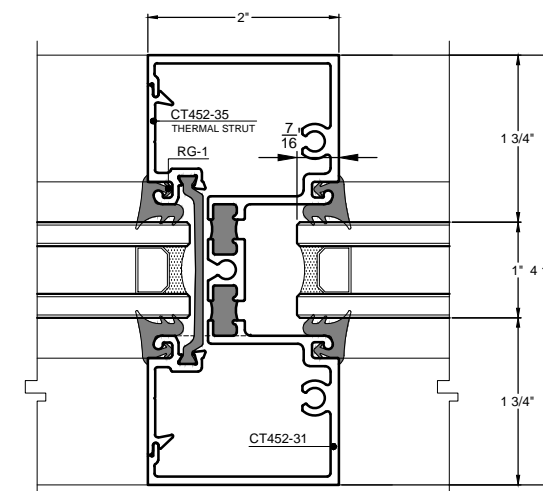
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PRODUCT CONTROL APPROVAL:

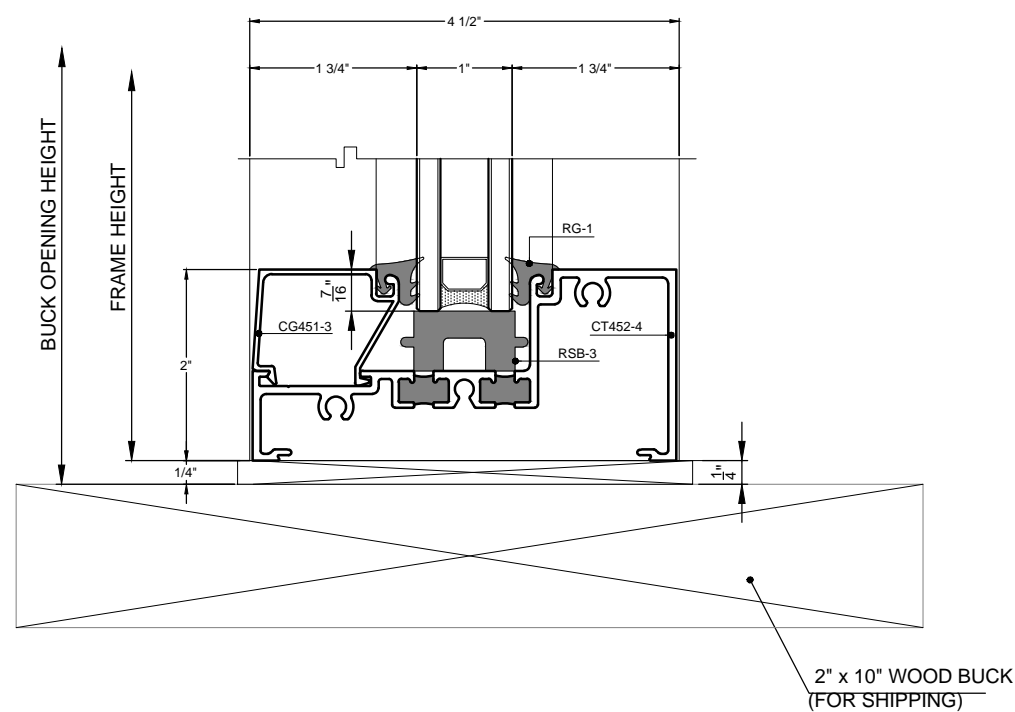
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DATE: 04/03/23	<b>2 OF 3</b>
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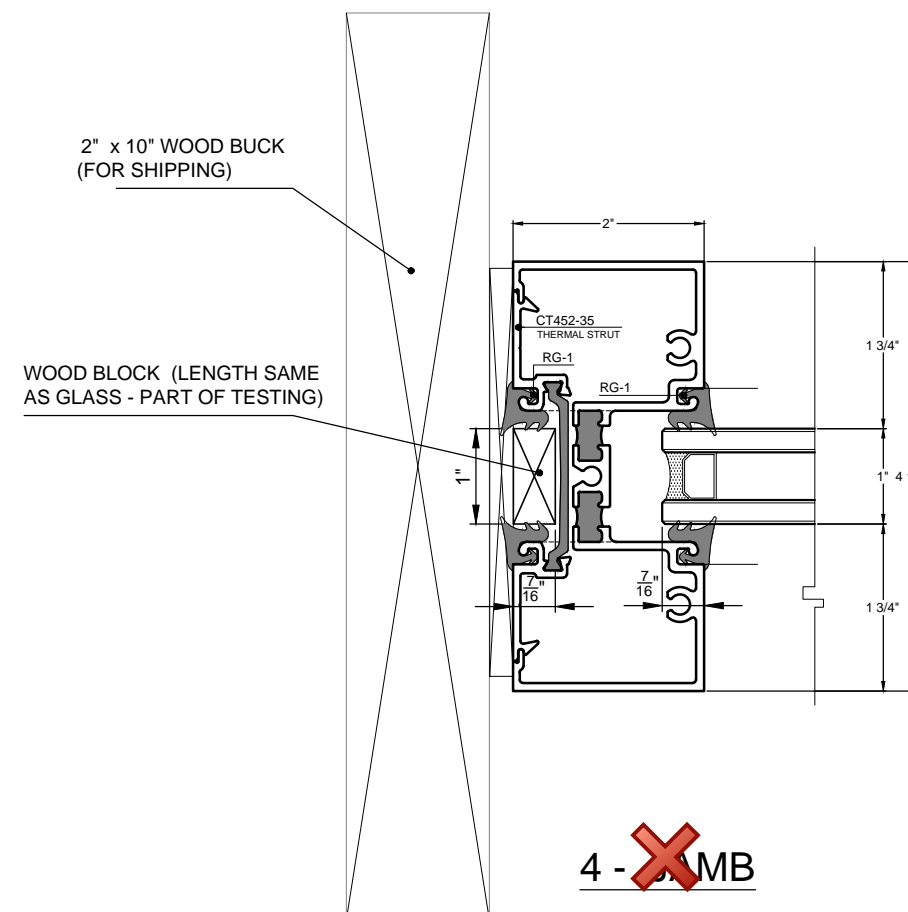
**1 - HEAD**



**3 - INTERMEDIATE VERTICAL**



**2 - SILL**



### CT452 FRAME PARTS TABLE

A1.) CT452-31 LIGHT MULLION	A2.) CT452-4 HEAD / SILL	A3.) CT452-35 MULLION FILLER	A4.) CG451-3 GLASS STOP
A5.) CT451-37 STARTER SILL	B1.) RG-1 GLAZING GASKET	B2.) RSB-3 SETTING BLOCK	
C1.) FAS 14-2 (1/4-14) HWH-F ASSEMBLY SCREW	C2.) FAS 10-12 (#10-12) UC PFH STARTER SILL SCREW		

### GLASS SCHEDULE

GLASS MARK UP SYMBOL	GLASS TYPE	MANUFACTURER	MAXIMUM GLASS SIZE	MAXIMUM SQ. FT.
G1	1" THICK INSULATED GLASS - 1/4" TEMP. WITH SOLARBAN 70 ON SURFACE #2 CLR (OUTBOARD) - 1/2" AIR SPACE WITH ALUMINUM SPACER - 1/4" TEMP. CLR GLASS (INBOARD)	TRULITE	37 1/4" X 75 5/8"	19.6

### CT452 THERMAL BOM

PART #'S	DESCRIPTION	MATERIALS	SUPPLIER/MANUF.	REMARKS
<b>A. FRAME EXTRUSIONS</b>				
A1.) CT452-31	LIGHT MULLION	ALUMINUM ALLOY/ P&D POLYURETHANE	TRULITE	
A2.) CT452-4	HEAD / SILL	ALUMINUM ALLOY / P&D POLYURETHANE	TRULITE	
A3.) CT452-35	MULLION FILLER	ALUMINUM ALLOY / POLYAMIDE	TRULITE	
A4.) CG451-3	GLASS STOP	ALUMINUM ALLOY	TRULITE	
A5.) CT451-37	STARTER SILL	ALUMINUM ALLOY	TRULITE	
<b>B. GASKETS / SETTING BLOCKS</b>				
B1.) RG-1	GLAZING GASKET	EPDM	TRULITE	
<del>B2.) RSB-3</del>	<del>SETTING BLOCK</del>	<del>EPDM</del>	<del>TRULITE</del>	
<b>C. FASTENERS / ANCHORS</b>				
<del>C1.) FAS14-2</del>	<del>Assembly Screw</del>	<del>ZINC COATED STEEL</del>	<del>ALLOY FASTENER</del>	<del>1/4-14 X 1" HWH-F</del>
<del>C2.) FAS10-12</del>	<del>Starter Sill Screw</del>	<del>ZINC COATED STEEL</del>	<del>ALLOY FASTENER</del>	<del>#10-16 X 1" UC PFH</del>



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PRODUCT:

**SERIES CT452  
STOREFRONT  
DOUBLE THERMAL  
MOCKUP**

REVN	DATE/REMARKS

ENGINEER:

STAMP:

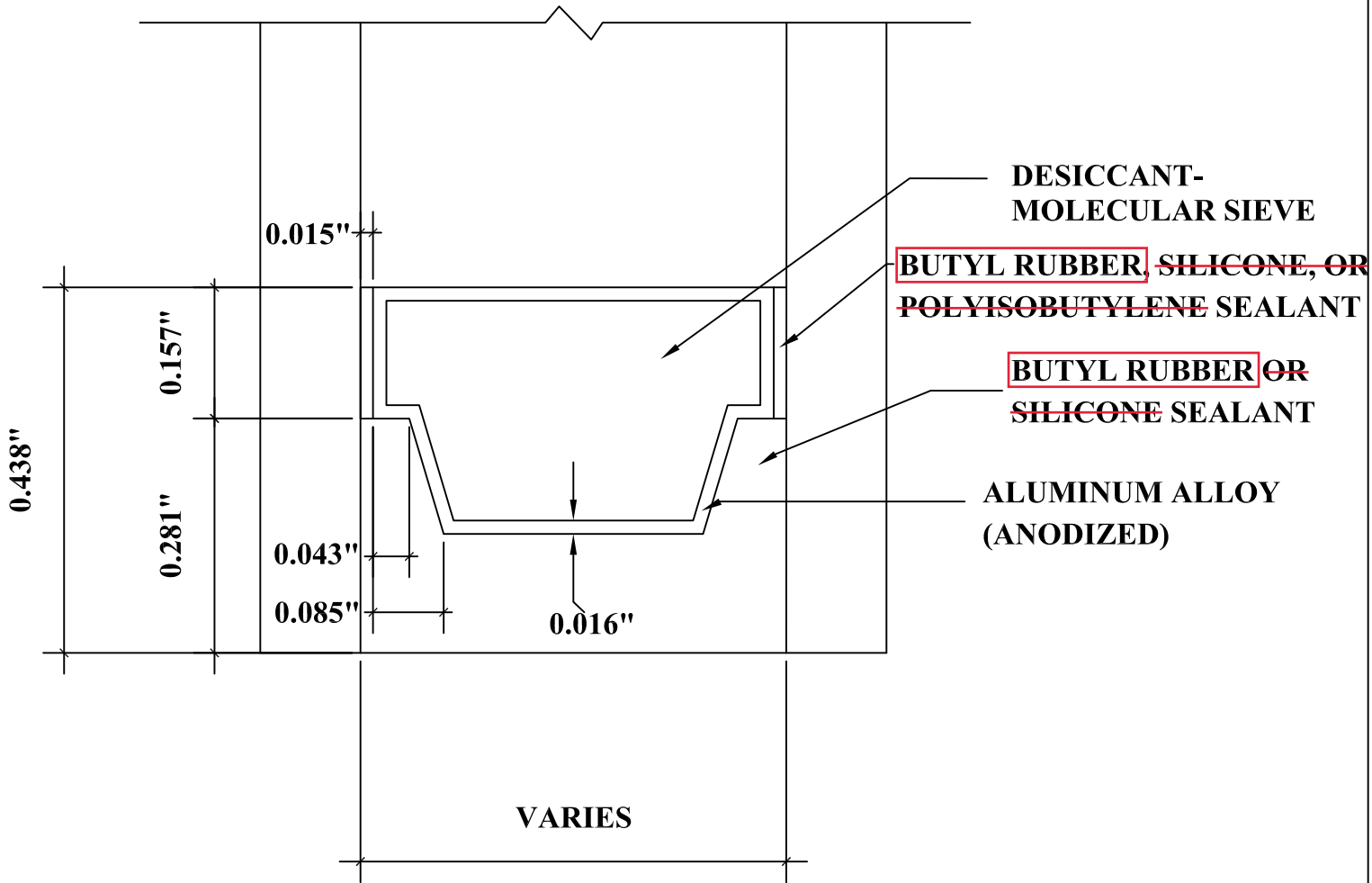
PRODUCT CONTROL APPROVAL:

	Report #: P8920-116-45
	Date: 07/05/23
	Verified by: <i>Allison M Ford</i>

DRAWN: -  
DATE: 04/03/23  
DWG: -

DRAWING No:  
**3 OF 3**





DETAIL FOR THERMAL MODELING OF ALUMINUM SPACER (A1-D)



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## TEST REPORT FOR TRULITE GLASS & ALUMINUM

Report No.: Q0752.01-116-45 R0

Date: 07/06/23

### SECTION 8

#### REVISION LOG

REVISION #	DATE	PAGES	REVISION
.01R0	07/06/23	N/A	Original Report Issued to Trulite Glass & Aluminum.