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GAMCO CORPORATION COMPUTER SIMULATION REPORT

SCOPE OF WORK
TD350 DOOR W/ FG451IS FRAME SINGLE DOOR - 1" IG (WITH FOAM) - AAMA 507

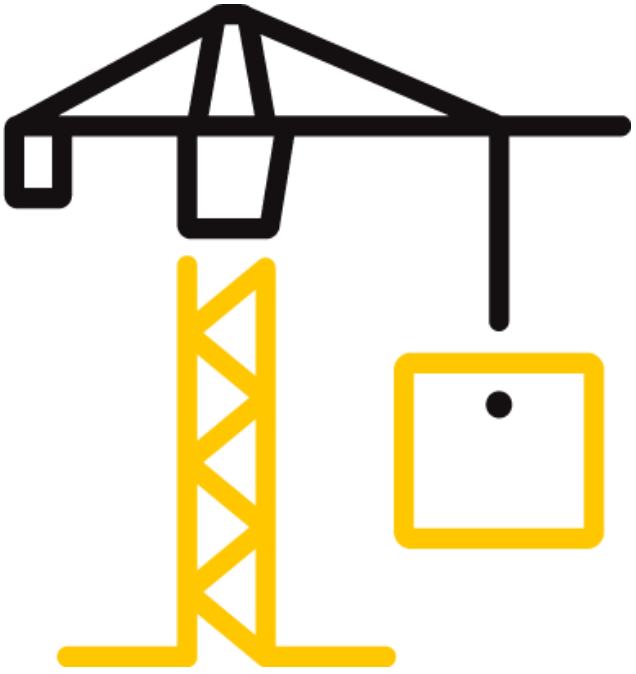
REPORT NUMBER
Q0178.01-116-45 R0

TEST DATE
10/17/23

ISSUE DATE
10/18/23

PAGES
20

DOCUMENT CONTROL NUMBER
RT-R-AMER-Test-3753 (02/20/18)



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TEST REPORT FOR GAMCO CORPORATION
Report No.: Q0178.01-116-45 R0
Date: 10/18/23

REPORT ISSUED TO
GAMCO CORPORATION
131-10 Maple Avenue
Flushing, New York 11355

SECTION 1
SUMMARY

SERIES/MODEL: TD350 Door w/ FG451IS Frame Single Door - 1" IG (With Foam)

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 10/17/28.

For INTERTEK B&C:

COMPLETED BY:	Allison M. Ford	**REVIEWED BY:**	Eric S. Leitner
TITLE:	Technician Team Leader	**TITLE:**	Manager - Thermal Testing & Simulations
SIGNATURE:	Allison M. Ford Digitally Signed by: Allison Ford	**SIGNATURE:**	Eric S. Leitner Digitally Signed by: Eric S. Leitner
DATE:	10/18/23	**DATE:**	10/18/23

AMF:amf

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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 100-2023, *Procedure for Determining Fenestration Product U-Factors*

ANSI/NFRC 200-2023, *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.

FRAME AND EDGE MODELING	THERM 7.8.71
CENTER-OF-GLASS MODELING	WINDOW 7.8.71
TOTAL PRODUCT CALCULATIONS	WINDOW 7.8.71
SPECTRAL DATA LIBRARY	IGDB 93.0

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 100-2023, Section 4.2.1.L. The painted finish was simulated since it is the worst case (highest emissivity).
3) Non-continuous hardware was not modeled.

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SECTION 4
SIMULATION SPECIMEN DESCRIPTION

SERIES/MODEL	TD350 Door w/ FG451IS Frame Single Door - 1" IG (With Foam)
PRODUCT TYPE	Swinging Door - Single
FRAME MATERIAL	AT - Aluminum w/ Thermal Breaks - All Members
SASH MATERIAL	AT - Aluminum w/ Thermal Breaks - All Members

GLAZING OPTIONS					
	OUTER PANE	***MIDDLE PANE***	***INNER PANE***	***GAP SIZES***	***IG OVERALL***
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			
TYPE	***PRIMARY SEAL***	***SECONDARY SEAL***	***CODE***
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

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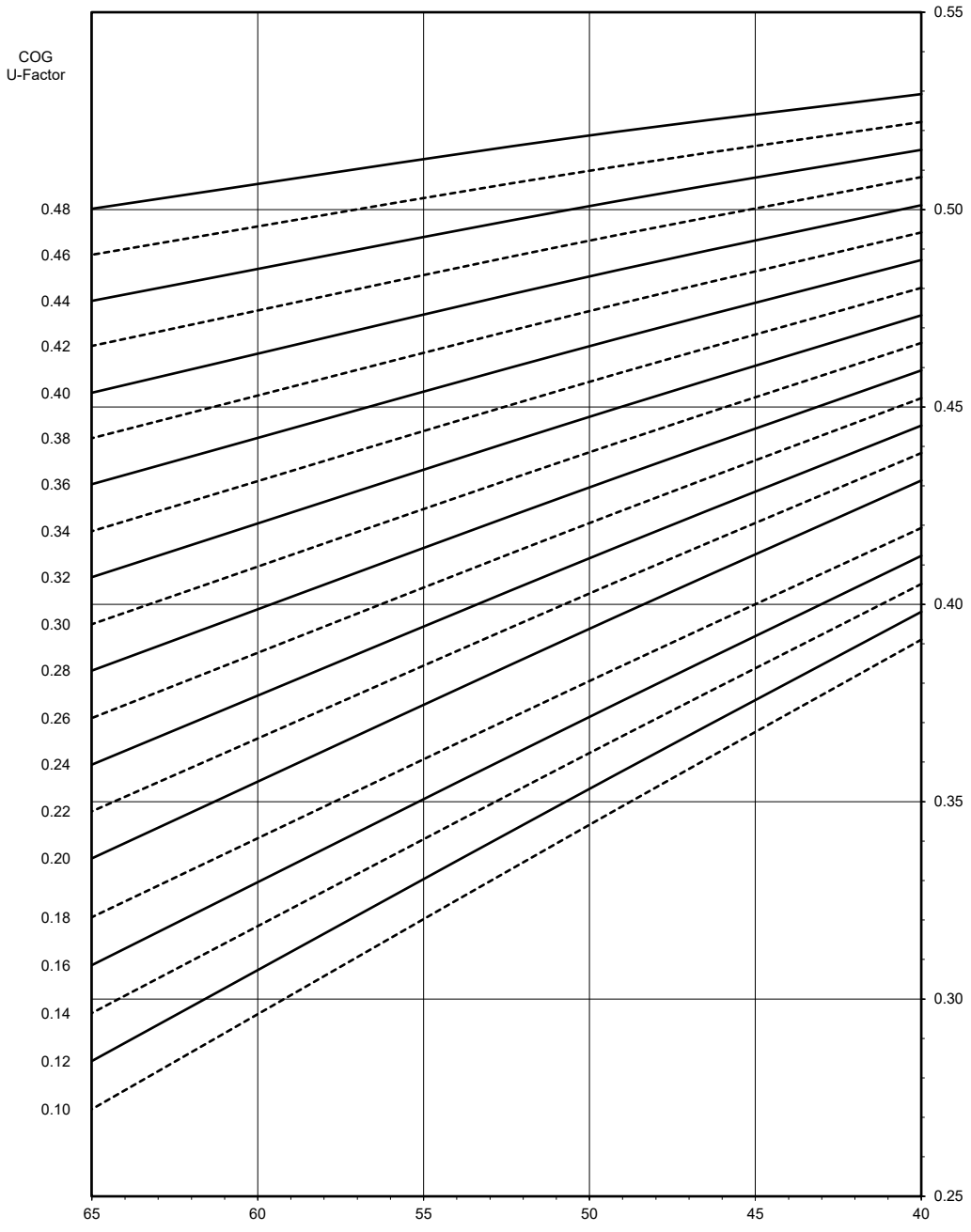
SECTION 6
SIMULATION RESULTS

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



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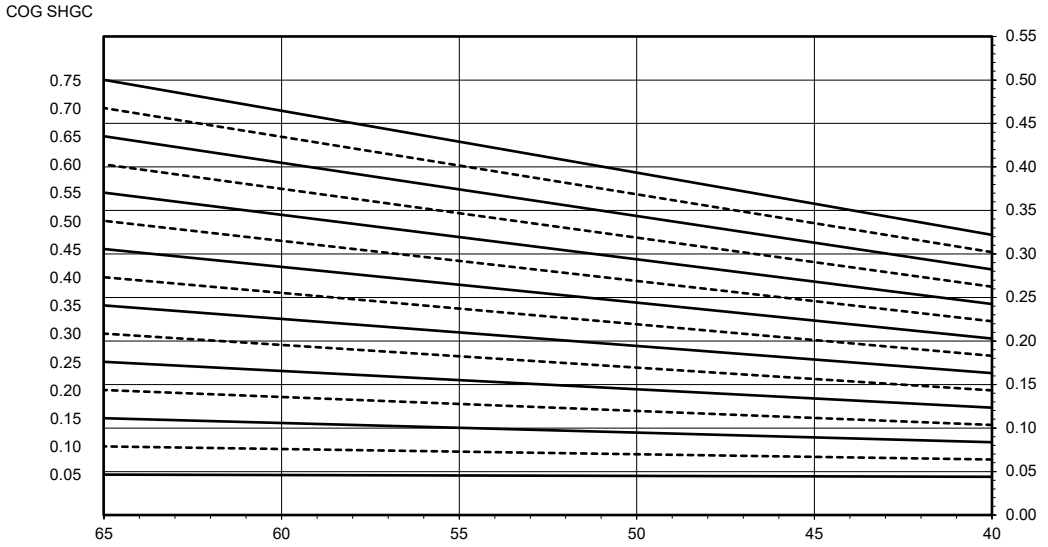
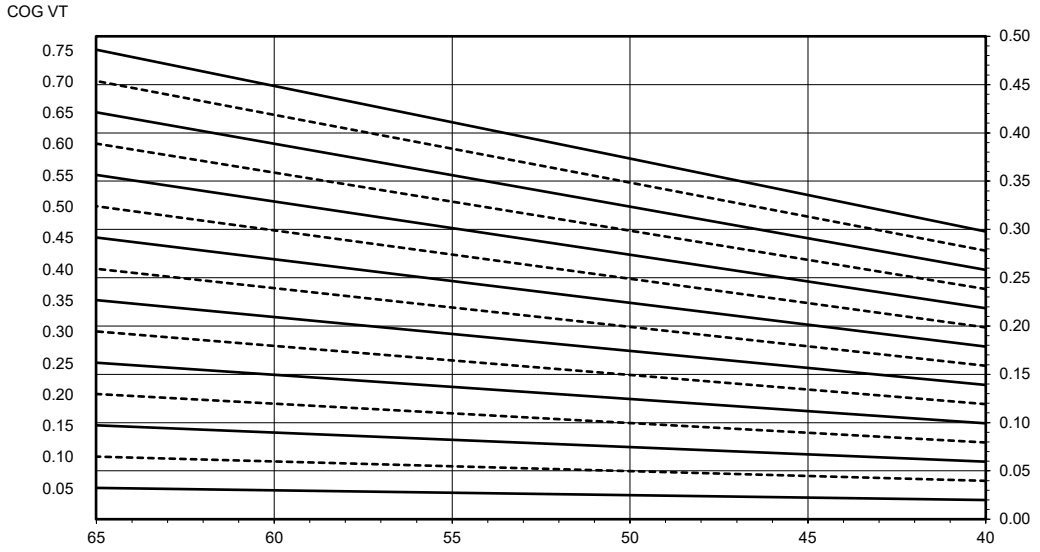
SECTION 6
SIMULATION RESULTS

SHGC CALCULATIONS: System SHGC vs. Percentage of Vision Area



Vision Area / Total Area (%)

VT CALCULATIONS: System VT vs. Percentage of Vision Area



otal Area (%)

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SECTION 6
SIMULATION RESULTS

U-FACTOR CALCULATIONS (TD350 Door w/ FG451IS Frame Single Door - 1" IG (With Foam))		
Size Specific U-Factor Matrix*		
Glazing Option	Center-of-Glass U-Factor	Overall U-Factor
1	0.48	0.52
2	0.46	0.51
3	0.44	0.50
4	0.42	0.49
5	0.40	0.48
6	0.38	0.47
7	0.36	0.46
8	0.34	0.45
9	0.32	0.45
10	0.30	0.44
11	0.28	0.43
12	0.26	0.42
13	0.24	0.41
14	0.22	0.40
15	0.20	0.39
16	0.18	0.38
17	0.16	0.37
18	0.14	0.36
19	0.12	0.35
20	0.10	0.34

*The size specific U-Factor matrix is based on the Swinging Door - Single NFRC specimen size of 960mm x 2090mm (37.75 in x 82.375 in). This represents 50.7% Vision Area / Total Area.

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SECTION 6
SIMULATION RESULTS

SHGC/VT CALCULATIONS (TD350 Door w/ FG451IS Frame Single Door - 1" IG (With Foam))			
Size Specific SHGC Matrix*		Size Specific VT Matrix*	
Center-of-Glass SHGC	Overall SHGC	Center-of-Glass VT	Overall VT
0.75	0.40	0.75	0.38
0.70	0.37	0.70	0.35
0.65	0.35	0.65	0.33
0.60	0.32	0.60	0.30
0.55	0.30	0.55	0.28
0.50	0.27	0.50	0.25
0.45	0.25	0.45	0.23
0.40	0.22	0.40	0.20
0.35	0.20	0.35	0.18
0.30	0.17	0.30	0.15
0.25	0.15	0.25	0.13
0.20	0.12	0.20	0.10
0.15	0.10	0.15	0.08
0.10	0.07	0.10	0.05
0.05	0.05	0.05	0.03

*The size specific SHGC and VT matrices are based on the Swinging Door - Single NFRC specimen size of 960mm x 2090mm (37.75 in x 82.375 in). This represents 50.7% Vision Area / Total Area.

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SECTION 6
SIMULATION RESULTS

TOTAL PRODUCT CALCULATIONS (TD350 Door w/ FG451IS Frame Single Door - 1" IG (With Foam))									
Option Number	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							40.00% Vision Area	ANSI/NFRC 100-2023	65.00% Vision Area
1	0.48	43.7°F	Head	6.6681	0.6495	0.5450	0.5293	0.5179	0.5002
			L. Jamb	6.6674	0.5629	0.5420			
			R. Jamb	6.6674	0.5629	0.5420			
			Sill	######	0.4561	0.5373			
2	0.46	44.8°F	Head	6.6681	0.6493	0.5310	0.5222	0.5088	0.4886
			L. Jamb	6.6674	0.5625	0.5279			
			R. Jamb	6.6674	0.5625	0.5279			
			Sill	######	0.4558	0.5231			
3	0.44	45.8°F	Head	6.6681	0.6491	0.5171	0.5151	0.4998	0.4769
			L. Jamb	6.6674	0.5622	0.5139			
			R. Jamb	6.6674	0.5622	0.5139			
			Sill	######	0.4556	0.5090			
4	0.42	46.8°F	Head	6.6681	0.6489	0.5035	0.5082	0.4909	0.4655
			L. Jamb	6.6674	0.5619	0.5002			
			R. Jamb	6.6674	0.5619	0.5002			
			Sill	######	0.4554	0.4952			
5	0.40	47.9°F	Head	6.6681	0.6487	0.4895	0.5011	0.4817	0.4536
			L. Jamb	6.6674	0.5616	0.4861			
			R. Jamb	6.6674	0.5616	0.4861			
			Sill	######	0.4551	0.4811			
6	0.38	48.9°F	Head	6.6681	0.6485	0.4761	0.4942	0.4728	0.4421
			L. Jamb	6.6674	0.5613	0.4726			
			R. Jamb	6.6674	0.5613	0.4726			
			Sill	######	0.4549	0.4675			
7	0.36	50.0°F	Head	6.6681	0.6483	0.4625	0.4872	0.4637	0.4304
			L. Jamb	6.6674	0.5610	0.4590			
			R. Jamb	6.6674	0.5610	0.4590			
			Sill	######	0.4547	0.4537			
8	0.34	51.0°F	Head	6.6681	0.6481	0.4489	0.4802	0.4546	0.4185
			L. Jamb	6.6674	0.5607	0.4453			
			R. Jamb	6.6674	0.5607	0.4453			
			Sill	######	0.4545	0.4400			

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Option Number	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							40.00% Vision Area	ANSI/NFRC 100-2023	65.00% Vision Area
9	0.32	52.0°F	Head	6.6681	0.6479	0.4355	0.4732	0.4455	0.4069
			L. Jamb	6.6674	0.5604	0.4318			
			R. Jamb	6.6674	0.5604	0.4318			
			Sill	######	0.4543	0.4264			
10	0.30	53.1°F	Head	6.6681	0.6477	0.4222	0.4662	0.4364	0.3950
			L. Jamb	6.6674	0.5602	0.4184			
			R. Jamb	6.6674	0.5602	0.4184			
			Sill	######	0.4541	0.4129			
11	0.28	54.2°F	Head	6.6681	0.6476	0.4088	0.4593	0.4274	0.3832
			L. Jamb	6.6674	0.5599	0.4050			
			R. Jamb	6.6674	0.5599	0.4050			
			Sill	######	0.4539	0.3995			
12	0.26	55.2°F	Head	6.6681	0.6474	0.3955	0.4522	0.4182	0.3712
			L. Jamb	6.6674	0.5596	0.3916			
			R. Jamb	6.6674	0.5596	0.3916			
			Sill	######	0.4537	0.3860			
13	0.24	56.3°F	Head	6.6681	0.6473	0.3823	0.4453	0.4091	0.3594
			L. Jamb	6.6674	0.5594	0.3783			
			R. Jamb	6.6674	0.5594	0.3783			
			Sill	######	0.4535	0.3727			
14	0.22	57.3°F	Head	6.6681	0.6472	0.3689	0.4383	0.4001	0.3476
			L. Jamb	6.6674	0.5592	0.3648			
			R. Jamb	6.6674	0.5592	0.3648			
			Sill	######	0.4533	0.3592			
15	0.20	58.4°F	Head	6.6681	0.6470	0.3558	0.4314	0.3910	0.3356
			L. Jamb	6.6674	0.5589	0.3516			
			R. Jamb	6.6674	0.5589	0.3516			
			Sill	######	0.4531	0.3459			
16	0.18	59.5°F	Head	6.6681	0.6422	0.3329	0.4193	0.3777	0.3207
			L. Jamb	6.6674	0.5521	0.3278			
			R. Jamb	6.6674	0.5521	0.3278			
			Sill	######	0.4487	0.3212			

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TOTAL PRODUCT CALCULATIONS (TD350 Door w/ FG451IS Frame Single Door - 1" IG (With Foam))									
Option Number	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							40.00% Vision Area	ANSI/NFRC 100-2023	65.00% Vision Area
17	0.16	60.6°F	Head	6.6681	0.6420	0.3194	0.4123	0.3684	0.3086
			L. Jamb	6.6674	0.5519	0.3142			
			R. Jamb	6.6674	0.5519	0.3142			
			Sill	######	0.4485	0.3076			
18	0.14	61.6°F	Head	6.6681	0.6420	0.3048	0.4051	0.3591	0.2965
			L. Jamb	6.6674	0.5517	0.2995			
			R. Jamb	6.6674	0.5517	0.2995			
			Sill	######	0.4484	0.2929			
19	0.12	62.7°F	Head	6.6681	0.6419	0.2914	0.3981	0.3499	0.2843
			L. Jamb	6.6674	0.5515	0.2860			
			R. Jamb	6.6674	0.5515	0.2860			
			Sill	######	0.4482	0.2794			
20	0.10	63.9°F	Head	6.6681	0.6417	0.2779	0.3910	0.3406	0.2721
			L. Jamb	6.6674	0.5513	0.2725			
			R. Jamb	6.6674	0.5513	0.2725			
			Sill	######	0.4480	0.2658			

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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.

THERMAL UNITS

Report #: Q0178-116-45
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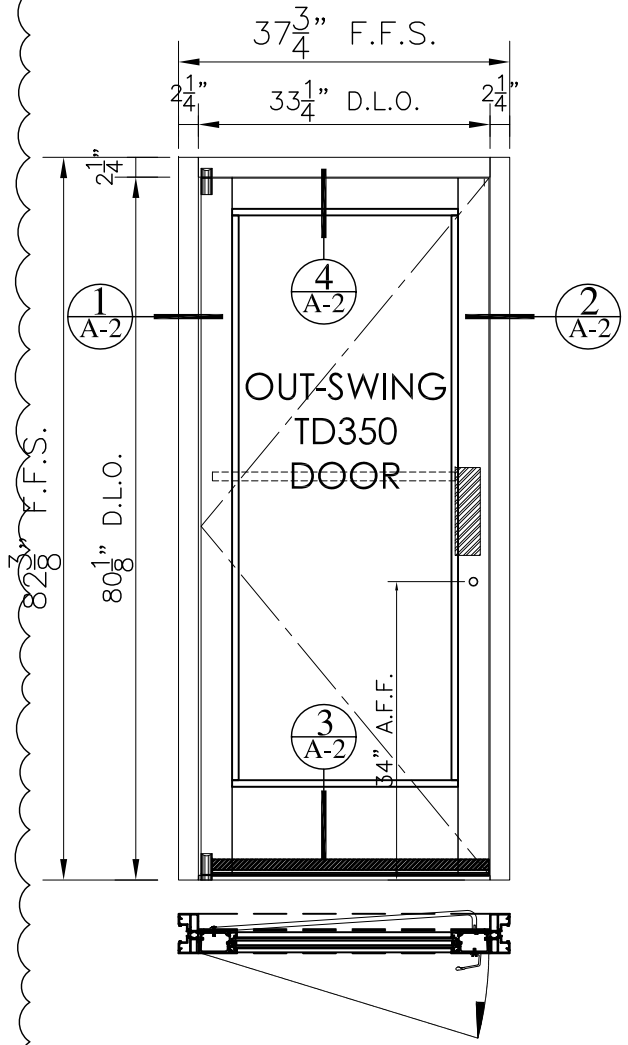
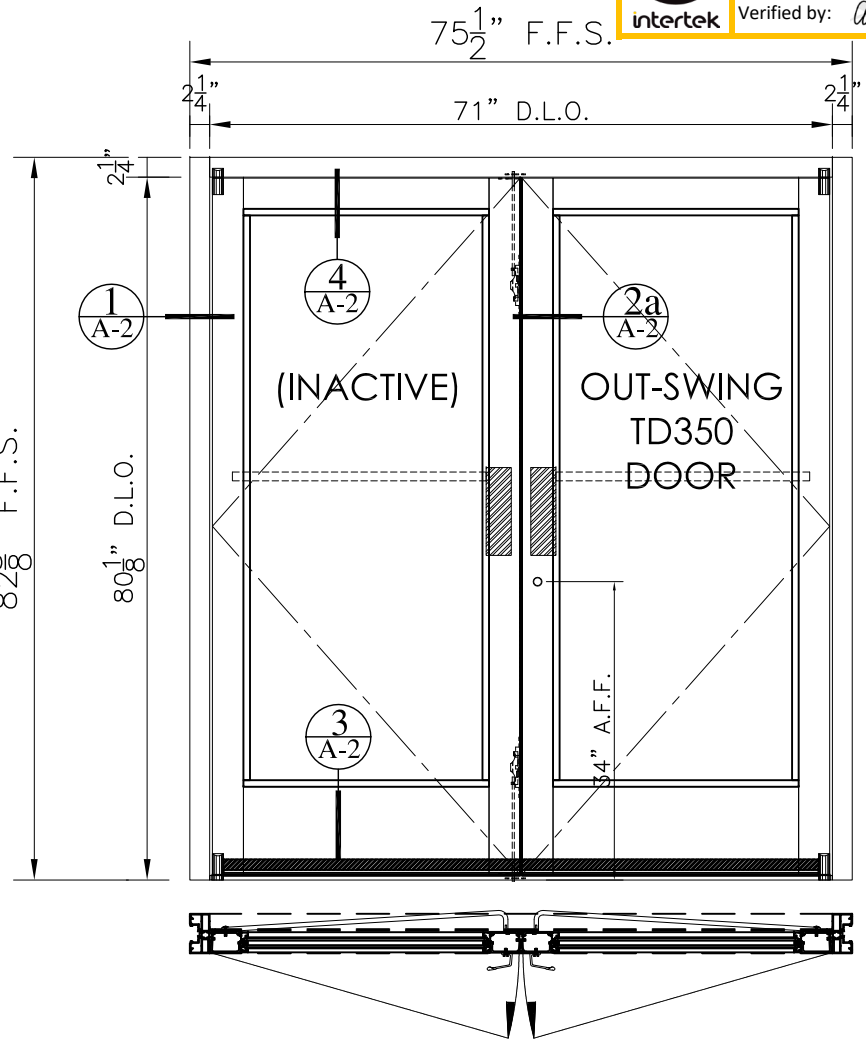
Verified by: Allison M Ford



PLAN
QTY: 1 UNIT W/ 1" I.G.
1" GLASS SIZE: 25-9/16" X 65-3/8" - 1 PCS



PLAN
QTY: 1 UNIT W/ 1" I.G.
1" GLASS SIZE: 27-13/16" X 65-3/8" - 2 PCS

ALUMINUM STOREFRONT ELEVATIONS

* NOTE: ALL ELEVATIONS SHOWN TO BE VIEW FROM EXTERIOR.

SCALE: 3/8" = 1'-0"

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AAMA 507 - THERMAL TEST

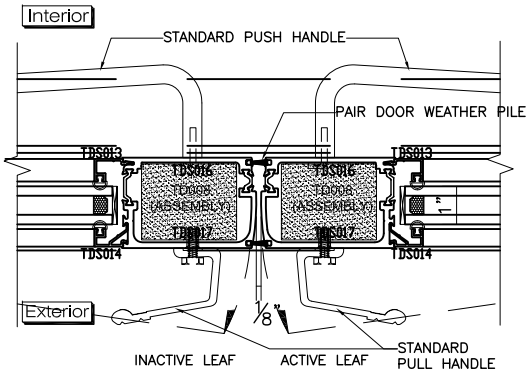
MODEL TESTED: TD350 + FG451IS

GLAZING SET-UP FOR 1" O.A.

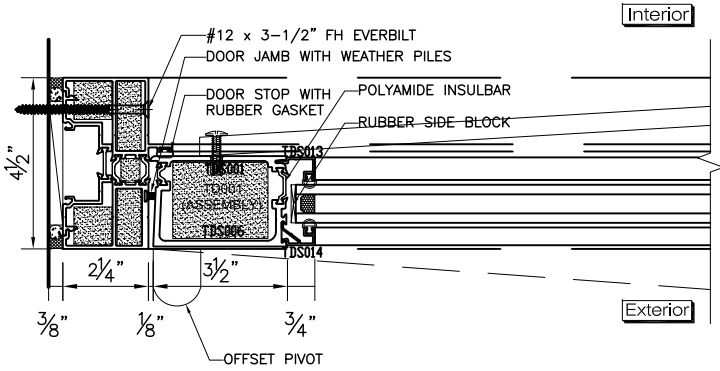
GLASS TYPE:
EXT: 1/4" THICKNESS
1/2" SPACER (ARGON)
INT: 1/4" THICKNESS
GLASS SIZE IS D.L.O. + 1.000

****

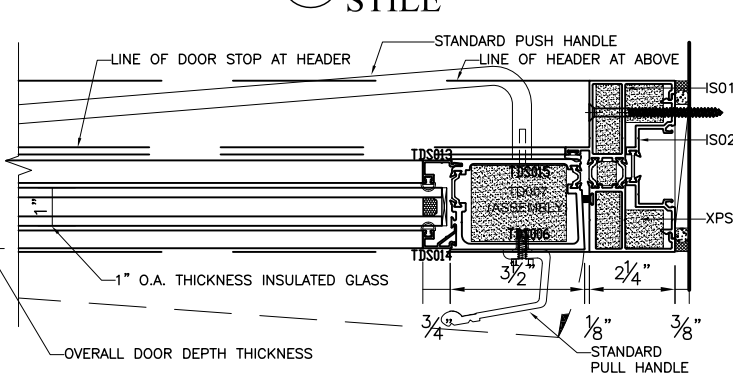
ALL POLYAMIDE INSULBAR'S PROPRIETARY THERMAL CONDUCTIVITY MATERIAL IS LISTED IN THE NFRC 101 DATABASE IN APPENDIX C, PROVIDED COMPANY "ENSINGER"



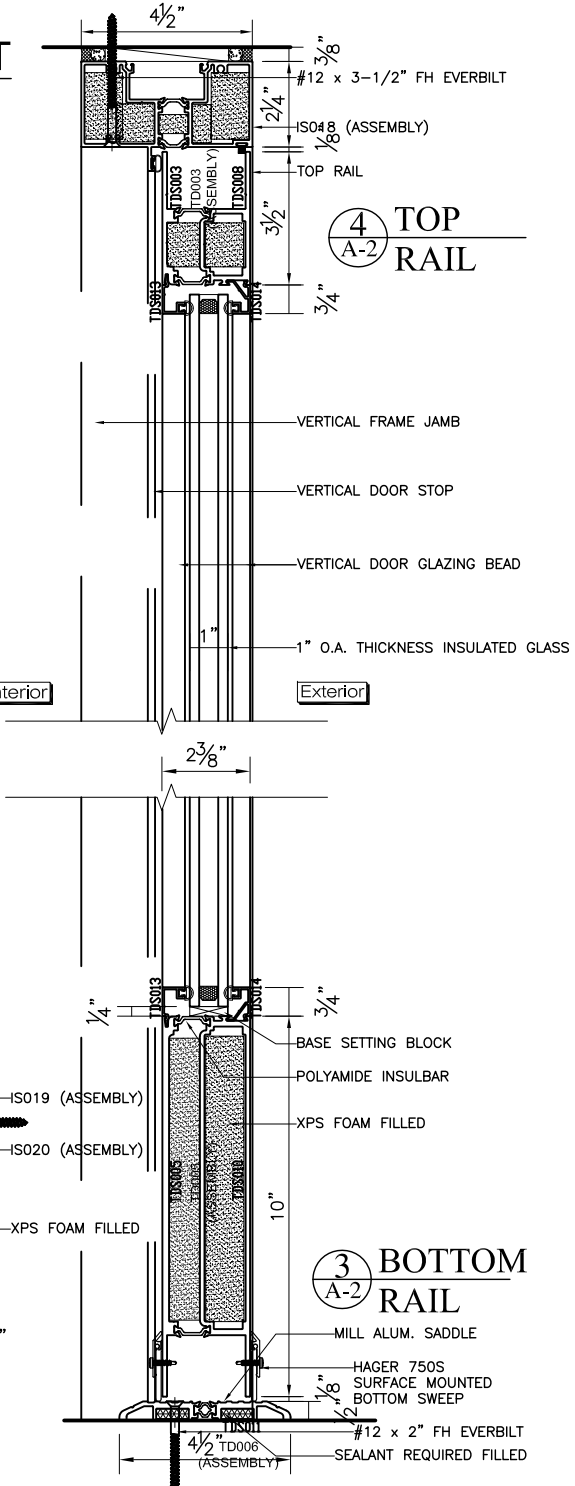
2a / A-2 MEETING STILE



1 / A-2 VERTICAL JAMB



2 / A-2 VERTICAL JAMB



HORIZONTAL SECTIONAL DETAILS

SCALE : 3" = 1'-0"

VERTICAL SECTIONAL DETAILS

SCALE : 3" = 1'-0"

DATE CREATED: 10/12/23

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TD350 DOOR - BOM LIST
THERMAL TESTING MOCK-UP
SINGLE DOOR - 1" I.G.

LINE #	PART #	DESCRIPTION	MATERIAL
1	TD001	HINGE STILE	6063-T5
2	TD003	3.5" TOP RAIL	6063-T5
3	TD005	10" BOTTOM RAIL	6063-T6
4	TDS013	1" GLAZING BEAD	6063-T5
5	TDS014	EXTERIOR GLAZING BEAD	6063-T5
6	TD007	LOCK STILE	6063-T5
~~7~~	~~TD015~~	~~DOOR SHEAR BLOCK~~	~~6063-T5~~
8	IS018	HEADER DOOR FRAME	6063-T5
9	IS019	JAMB DOOR FRAME	6063-T5
10	IS020	DEEP POCKET FILLER	6063-T5
11	TD006	4-1/2" SADDLE	6063-T5
~~12~~	~~S-13020~~	~~SADDLE CLIP~~	~~6063-T5~~
~~13~~	~~OFFSET(1)~~	~~3/4" OFFSET PIVOTS~~	~~6063-T6~~
~~14~~	~~1850~~	~~AR 1850 HOOK LOCK~~	
15	6032	GLAZING BEAD GASKET	EPDM
16	E273	DOOR STOP GASKET	EPDM

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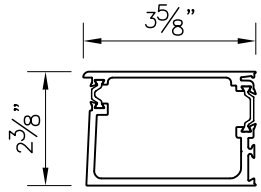
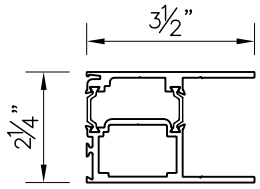
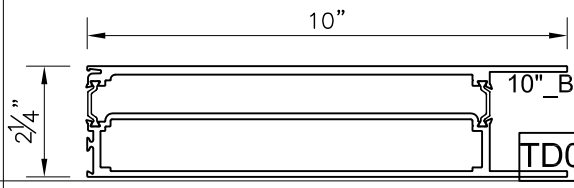
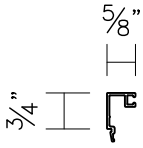
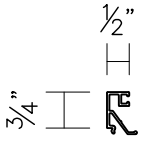
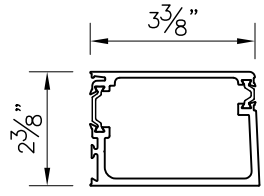
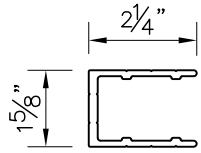
TD350 DOOR - BOM LIST
THERMAL TESTING MOCK-UP
SINGLE DOOR - 1" I.G.

LINE #	PART #	DESCRIPTION	MATERIAL
1	PILE(3)	WEATHER STRIPE	POLYPROPYLENE
2	SWEEP(1)	SURFACE DOOR SWEEP	6063-T5/EPDM
3	SETTING(3)	SETTING BLOCK	EPDM
4	FOAM	VARIES CUT SIZE FOAMS	XPS FOAM
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			

DATE CREATED: 10/11/23

TD350 DOOR - CUTTING LIST
THERMAL TESTING MOCK-UP
SINGLE DOOR - 1" I.G.

QTY.	PROFILE + PART #	COLOR	LENGTH (")
1	 HINGE_STILE TD001	AL	79.375"
1	 3.5"_TOP_RAIL TD003	AL	26.001"
1	 10"_BOT_RAIL TD005	AL	26.001"
2	 1"_BEAD TDS013	AL	25.941"
2			64.375"
2	 EXT_BEAD TDS014	AL	25.941"
2			64.375"
1	 LOCK_STILE TD007	AL	79.375"
6	 SHEAR_BLOCK TD015	AL	3.500"

NOTE:

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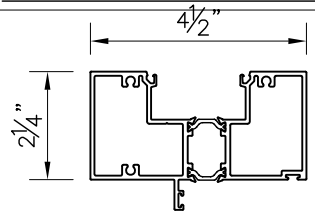
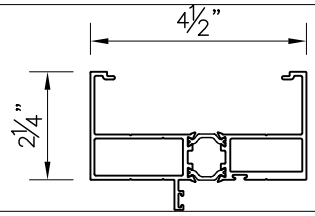
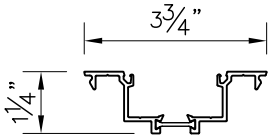
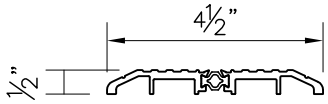
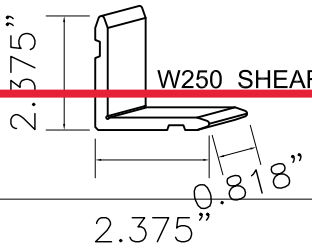
DATE CREATED: 10/11/23

TD350 DOOR - CUTTING LIST
THERMAL TESTING MOCK-UP
SINGLE DOOR - 1" I.G. (FRAME)

QTY.	PROFILE + PART #	COLOR	LENGTH (")
1	 HEADER_DOOR IS018	AL	33.250"
2	 JAMB_DOOR IS019	AL	82.375"
2	 DEEP_POCKET IS020	AL	82.375"
1	 4-1/2"_SADDLE TD006	MILL	33.250"
2	 W250_SHEAR_BLOCK SADDLE_CLIP S-13020	MILL	0.818"

NOTE:

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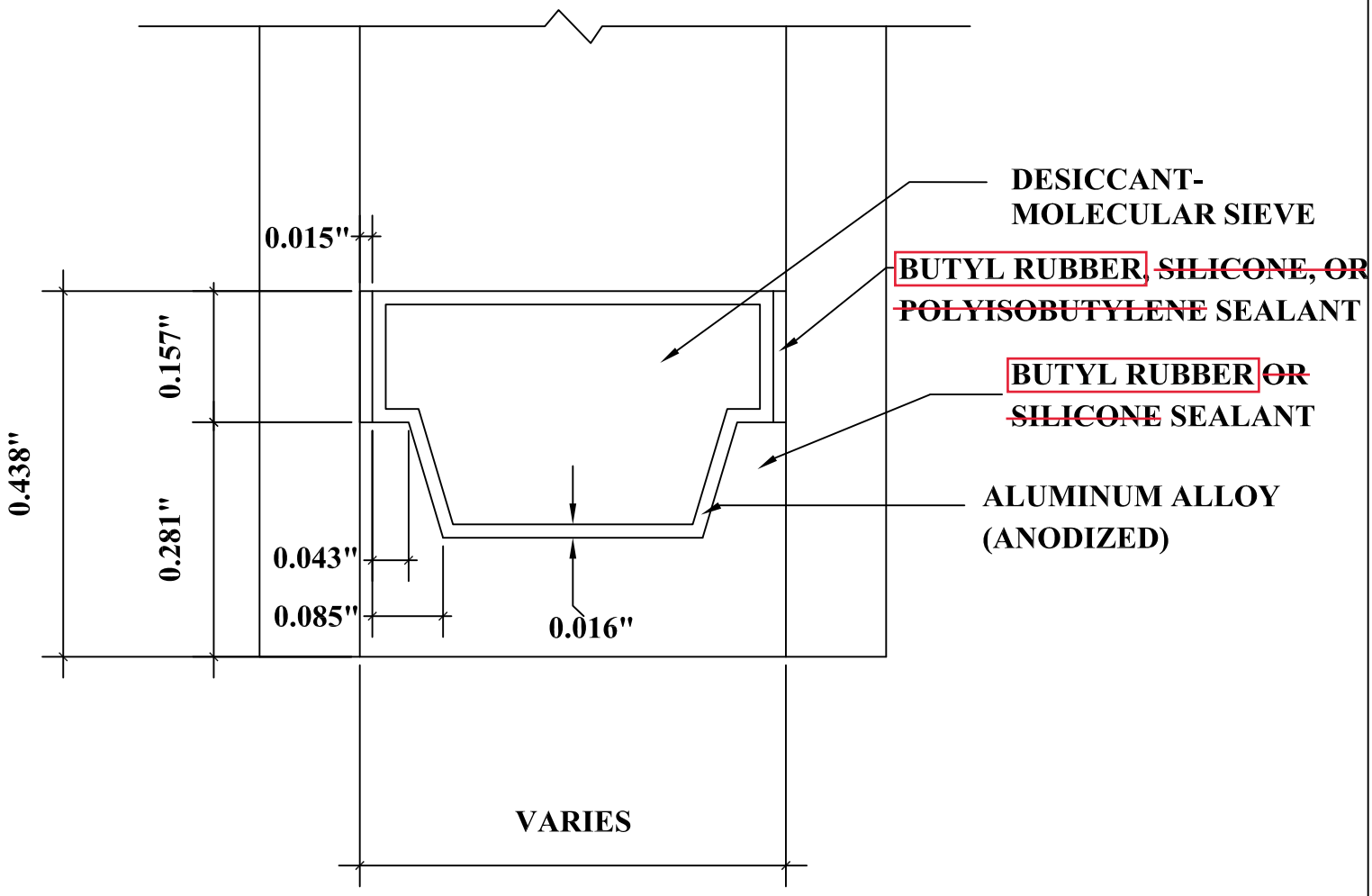

DETAIL FOR THERMAL MODELING OF
ALUMINUM SPACER (A1-D)

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SECTION 8
REVISION LOG

REVISION #	DATE	PAGES	REVISION
.01R0	10/18/23	N/A	Original Report Issued to Gamco Corporation.