Architectural Testing

NFRC U-FACTOR, SHGC, VT, & CONDENSATION RESISTANCE COMPUTER SIMULATION REPORT

Rendered to:
TUBELITE, INC.

SERIES/MODEL:
T24000 Storefront

Report Number: **C5867.02-116-45**
Report Date: **05/03/13**

130 Derry Court
York, PA 17406-8405
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Architectural Testing

NFRC U-FACTOR, SHGC, VT, & CONDENSATION RESISTANCE
COMPUTER SIMULATION REPORT

Rendered to:
TUBELITE, INC.
4878 Mackinaw Trail
Reed City, Michigan 49677

Report Number:	C5867.02-116-45
Simulation Date:	05/03/13
Report Date:	05/03/13

Project Summary:

Architectural Testing, Inc. was contracted to perform U-Factor, Solar Heat Gain Coefficient, Visible Transmittance, and Condensation Resistance* computer simulations in accordance with the National Fenestration Rating Council (NFRC). The products were evaluated in full compliance with NFRC requirements to the standards listed below.

**NFRC's Condensation Resistance rating is NOT equivalent to a Condensation Resistance Factor (CRF) determined in accordance with AAMA 1503.*

Standards:

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*
NFRC 500-2010:	*Procedure for Determining Fenestration Product Condensation Resistance Values*

Software:

Frame and Edge Modeling:	THERM 6.3.46
Center-of-Glass Modeling:	WINDOW 6.3.74
Total Product Calculations:	WINDOW 6.3.74
Spectral Data Library:	IGDB 29.0

Simulations Specimen Description:

Series/Model:	T24000 Storefront
Type:	Glazed Wall System, Window Wall
Frame Material:	AT Aluminum w/ Thermal Breaks - All Members
Sash Material:	NA Not Applicable
Standard Size:	2000mm x 2000mm

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Modeling Assumptions/Technical Interpretations:

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 were grouped for simulation purposes in accordance with NFRC 100-2010, Section 4.2.1.L. The painted finish was simulated since it is worst case (highest emissivity). The test sample was anodized aluminum.
3) The center-line modeling approach was conducted using the vertical intermediate for the jambs. This procedure is outline in the NFRC Simulation Manual Section 8.10.

Specialty Products Table:

The specialty products method allow the manufacturer to determine the overall product SHGC and VT for any glazing option. The center of glass SHGC and/or VT must be determined using WINDOW 6.3.74. The method gives overall product SHGC and VT indexed on center of glass properties. All values used in the calculations are truncated to six decimal place precision.

	No Dividers	Dividers < 1	Dividers > 1
SHGC0	0.005762	0.009185	0.012394
SHGC1	0.897238	0.796006	0.701094
VT0	0.000000	0.000000	0.000000
VT1	0.891476	0.786822	0.688700

SHGC = SHGC0 + SHGCc (SHGC1 - SHGC0)

VT = VT0 + VTc (VT1 - VT0)

Validation Matrix:

The following products are part of a validation matrix. Only one is required for validation testing.

Product Line	*Report Number*
None	-

Spacer Option Description

	Sealant		
Spacer Type	*Primary*	*Secondary*	*Code*
Aluminum Spacer	Butyl Rubber	Butyl Rubber	A1-D

Grid Option Description

Grid Size	*Grid Type*	*Grid Pattern*
None	-	-

Reinforcement Option Description

Location	*Material*
None	-

Gas Filling Technique Description

Fill Type	*Method*
84.48% Xenon	Single Probe Timed
76.14% Argon	Single Probe Timed
88.47% Argon	Single Probe Timed
78.56% Argon	Single Probe Timed
78.10% Krypton	Single Probe Timed
87.41% Argon	Single Probe Timed
64.98% Argon	Single Probe Timed
74.70% Argon	Single Probe Timed
60.78% Argon	Single Probe Timed
62.43% Argon	Single Probe Timed
86.02% Argon	Single Probe Timed
81.60% Xenon	Single Probe Timed
94.54% Xenon	Evacuated Chamber
76.90% Krypton	Single Probe Timed
71.54% Xenon	Single Probe Timed
76.45% Krypton	Single Probe Timed
66.67% Xenon	Single Probe Timed
82.16% Xenon	Single Probe Timed

Edge-of-Glass Construction

Interior Condition	EPDM Gasket Against Glass
Exterior Condition	EPDM Gasket Against Glass

Weatherstripping

Type	*Quantity*	*Location*
None	-	-

Frame/Sash Materials Finish

Interior	Painted Aluminum
Exterior	Painted Aluminum

NFRC 100/200/500 Summary Sheet
T24000 Storefront

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)					Visible Transmittance (VT) Grids (None / <1 / >=1)		Condensation Resistance	
1	COG=0.4400											
	0.222	0.500	0.225					XEN84		CL	A1-D	N
	U-Factor		**0.49**	**SHGC (N)**				**0.62**	**VT (N)**	**0.66**	**CR**	**41**
2	COG=0.4200											
	0.236	0.500	0.225					ARG76	0.654(#2)	RC	A1-D	N
	U-Factor		**0.47**	**SHGC (N)**				**0.31**	**VT (N)**	**0.29**	**CR**	**42**
3	COG=0.4000											
	0.223	0.500	0.225					ARG88	0.571(#2)	CL	A1-D	N
	U-Factor		**0.46**	**SHGC (N)**				**0.22**	**VT (N)**	**0.15**	**CR**	**42**
4	COG=0.3800											
	0.236	0.500	0.225					ARG79	0.465(#2)	RC	A1-D	N
	U-Factor		**0.44**	**SHGC (N)**				**0.19**	**VT (N)**	**0.13**	**CR**	**43**
5	COG=0.3600											
	0.221	0.500	0.225					KRY78	0.406(#2)	SR	A1-D	N
	U-Factor		**0.42**	**SHGC (N)**				**0.19**	**VT (N)**	**0.16**	**CR**	**45**
6	COG=0.3400											
	0.232	0.500	0.225					ARG87	0.318(#2)	GY	A1-D	N
	U-Factor		**0.41**	**SHGC (N)**				**0.42**	**VT (N)**	**0.51**	**CR**	**45**
7	COG=0.3200											
	0.223	0.500	0.225					ARG65	0.215(#2)	CL	A1-D	N
	U-Factor		**0.39**	**SHGC (N)**				**0.56**	**VT (N)**	**0.65**	**CR**	**46**
8	COG=0.3000											
	0.233	0.500	0.225					ARG75	0.166(#2)	CL	A1-D	N
	U-Factor		**0.38**	**SHGC (N)**				**0.40**	**VT (N)**	**0.48**	**CR**	**47**
9	COG=0.2800											
	0.223	0.500	0.225					ARG61	0.087(#2)	CL	A1-D	N
	U-Factor		**0.36**	**SHGC (N)**				**0.49**	**VT (N)**	**0.68**	**CR**	**47**
10	COG=0.2600											
	0.223	0.500	0.225					ARG62	0.035(#2)	CL	A1-D	N
	U-Factor		**0.34**	**SHGC (N)**				**0.34**	**VT (N)**	**0.63**	**CR**	**48**

NFRC 100/200/500 Summary Sheet
T24000 Storefront

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)					Visible Transmittance (VT) Grids (None / <1 / >=1)		Condensation Resistance	
11	COG=0.2400											
	0.223	0.500	0.223					ARG86	0.035(#2) / 0.035(#3)	CL	A1-D	N
	U-Factor		**0.33**	**SHGC (N)**				**0.32**	**VT (N)**	**0.56**	**CR**	**49**
12	COG=0.2200											
	0.223	0.500	0.223					XEN82	0.018(#2) / 0.018(#3)	CL	A1-D	N
	U-Factor		**0.31**	**SHGC (N)**				**0.23**	**VT (N)**	**0.46**	**CR**	**51**
13	COG=0.2000											
	0.223	0.500	0.223					XEN95	0.018(#2) / 0.018(#3)	CL	A1-D	N
	U-Factor		**0.29**	**SHGC (N)**				**0.23**	**VT (N)**	**0.46**	**CR**	**51**
14	COG=0.1800											
	0.223	0.250	0.003	0.250	0.221			KRY77/AIR	0.018(#2)/0.755(#3)/0.122(#4)/0.028(#5)	CL	A1-D	N
	U-Factor		**0.27**	**SHGC (N)**				**0.22**	**VT (N)**	**0.39**	**CR**	**53**
15	COG=0.1600											
	0.223	0.250	0.003	0.250	0.223			XEN72/AIR	0.018(#2,5) / 0.755(#3) / 0.122(#4)	CL	A1-D	N
	U-Factor		**0.26**	**SHGC (N)**				**0.22**	**VT (N)**	**0.41**	**CR**	**53**
16	COG=0.1400											
	0.223	0.250	0.003	0.250	0.223			KRY76	0.018(#2,#5) / 0.755(#3) / 0.122(#4)	CL	A1-D	N
	U-Factor		**0.24**	**SHGC (N)**				**0.21**	**VT (N)**	**0.41**	**CR**	**53**
17	COG=0.1200											
	0.223	0.250	0.003	0.250	0.223			XEN67	0.018(#2,#5) / 0.755(#3) / 0.122(#4)	CL	A1-D	N
	U-Factor		**0.22**	**SHGC (N)**				**0.21**	**VT (N)**	**0.41**	**CR**	**53**
18	COG=0.1000											
	0.223	0.250	0.003	0.250	0.223			XEN82	0.018(#2,#5) / 0.755(#3) / 0.122(#4)	CL	A1-D	N
	U-Factor		**0.21**	**SHGC (N)**				**0.21**	**VT (N)**	**0.41**	**CR**	**53**

The Condensation Resistance results obtained from this procedure are for controlled laboratory conditions and do not include the effects of air movement through the specimen, solar radiation, and the thermal bridging that may occur due to the specific design and construction of the fenestration system opening.

Ratings values included in this report are for submittals to an NFRC-licensed IA and are not meant to be used directly for labeling purposes. Only those values identified on a valid Certification Authorization Report (CAR) by an NFRC accredited Inspection Agency (IA) are to be used for labeling purposes. The ratings values were rounded in accordance to NFRC 601, NFRC Unit and Measurement Policy.

Architectural Testing, Inc. is an NFRC accredited simulation laboratory and all simulations were conducted in full compliance with NFRC approved procedures and specifications. The NFRC procedure requires that the computational results be verified through actual test results.

Architectural Testing will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Architectural Testing, Inc. for the entire test record retention period. The test record retention end date for this report is May 3, 2017.

Results obtained are simulated values and were secured by using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the product simulated. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.:

SIMULATED BY:

Kristen L. Livelsberger

Digitally Signed by: Kristen L. Livelsberger

Kristen L. Livelsberger
Senior Simulation Technician
NFRC Certified Simulator

REVIEWED BY:

Michael J. Thoman

Digitally Signed by: Michael J. Thoman

Michael J. Thoman
Director - Simulations and Thermal Testing
Simulator-In-Responsible-Charge

KLL:kll

C5867.02-116-45

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix A: Drawings and Bills of Material (13)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
.02R0	05/03/13	All	Original Report Issued to Tubelite, Inc.

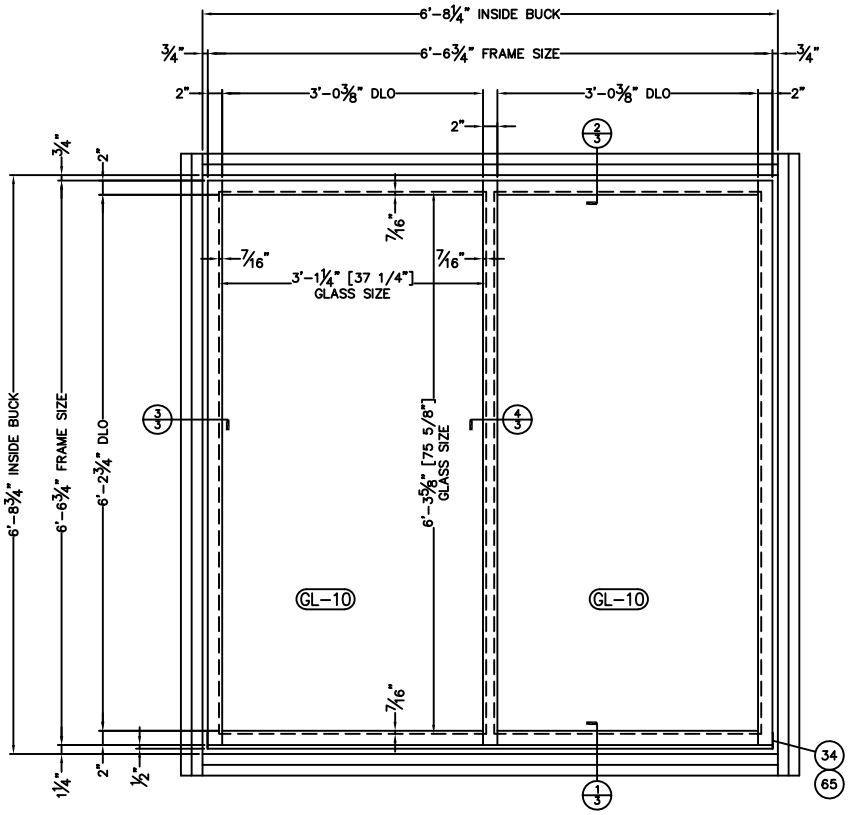
All drawings and Bills of Material used to simulate this product are enclosed in this Appendix

Appendix A

C5867.02-116-45

Architectural Testing

Report #: C5867-116-45
Date: 05/03/13
Verified by: Kristen K. Liedsteger



T24000 STOREFRONT TEST SPECIMEN 1
NON IMPACT

GLAZING NOTES:
1" GLASS ~ 1/4 TEMPERED 1/2 AIR SPACE 1/4" TEMPERED
DRY GLAZED

TUBELITE
NON IMPACT
T24000 STOREFRONT
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REVISIONS			
NO.	DATED	BY	DESCRIPTION
-	-	-	-

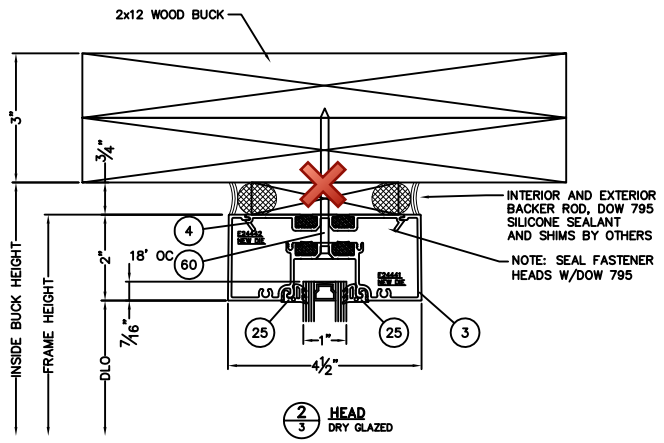
DATED	LATEST RELEASE
1-07-13	1-18-13

DRAWINGS BY: HLP
ENGINEERED BY:
TEST ELEVATION

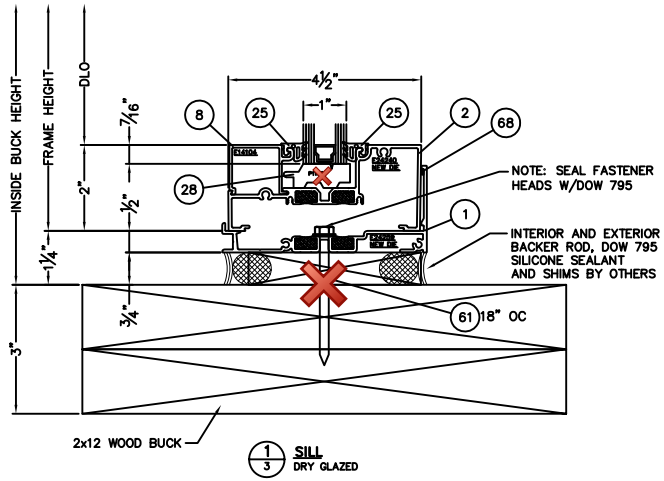
1.0

Architectural Testing

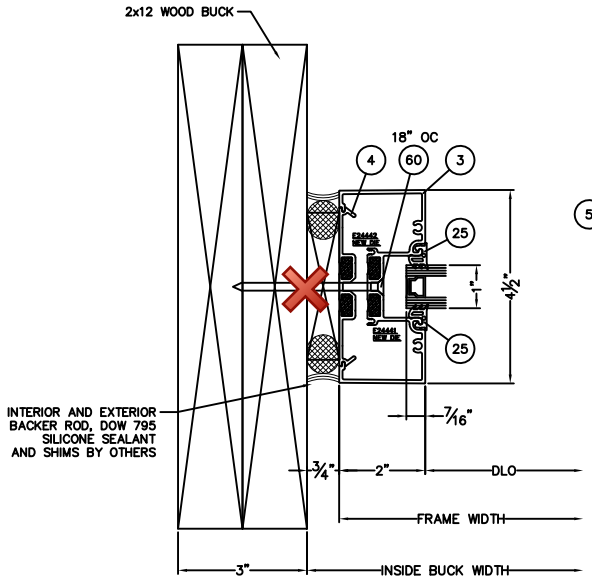
Report #: C5867-116-45
Date: 05/03/13
Verified by: Kristen L. Kuelsberger



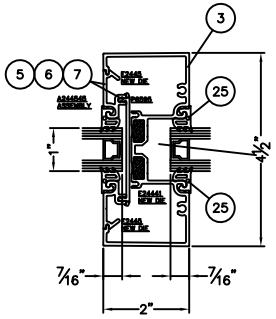
2/3 HEAD
DRY GLAZED



1/3 SILL
DRY GLAZED



3/3 JAMB
DRY GLAZED



4/3 TYPICAL MULL
DRY GLAZED

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DATED	LATEST RELEASE
1-07-13	1-18-13

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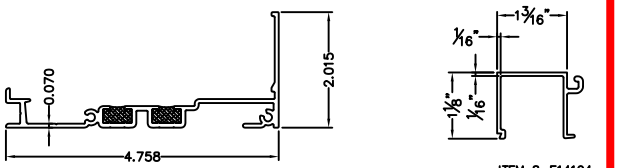
TEST ELEVATION

3.0

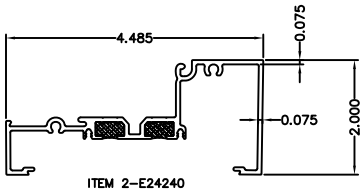
Architectural Testing

Report #: C5867-116-45
Date: 05/03/13
Verified by: Kristen K. Landsberger

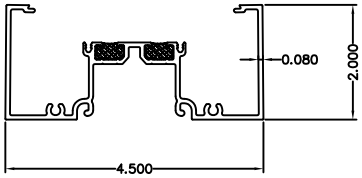


ITEM 1–E24259
THERMAL SUB SILL

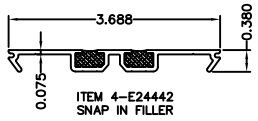
ITEM 8–E14104
GLAZING STOP



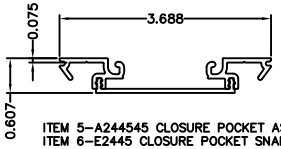
ITEM 2–E24240
OPEN BACK SILL



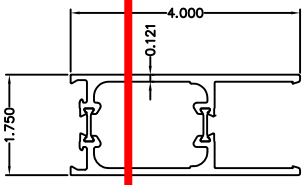
ITEM 3–E24441
THERMAL OPEN BACK HEAD/JAMB/VERTICAL



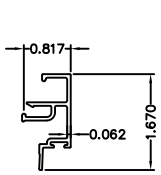
ITEM 4–E24442
SNAP IN FILLER



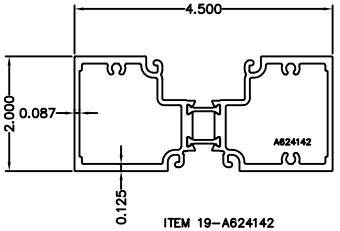
ITEM 5–A244545 CLOSURE POCKET ASSEMBLY
ITEM 6–E2445 CLOSURE POCKET SNAP
ITEM 7–P6595 BRIDGE (PLASTIC)



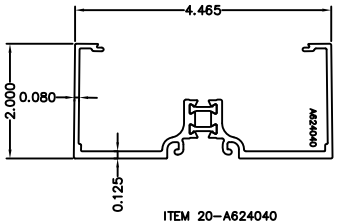
ITEM 15 – A621414
ASSEMBLY
MED STILE TOP RAIL



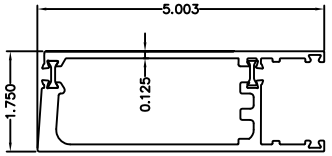
ITEM 18–E6223
INNER DOOR STOP



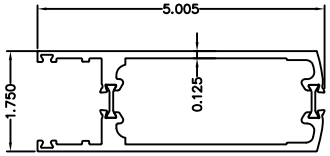
ITEM 19–A624142
DOOR HEADER



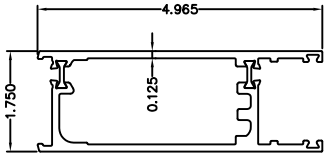
ITEM 20–A624040
DOOR JAMB



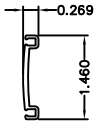
ITEM 11 – A627879
ASSEMBLY
MED STILE – HINGE



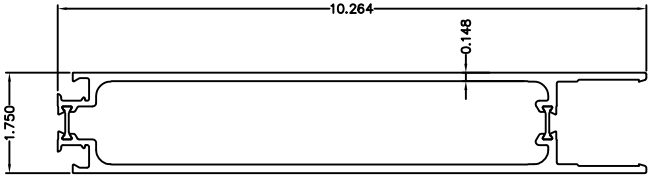
ITEM 12 – A628282
ASSEMBLY
MED RD FACE STILE



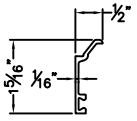
ITEM 13 – A628384
ASSEMBLY
MED STILE – LOCK W/ASTRAGAL



ITEM 14 – E1152
ASTRAGAL



ITEM 16 – A621010
ASSEMBLY
BOTTOM RAIL



ITEM 17 –E6291
GLAZING STOP

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REVISIONS	NO.	DATED	BY	DESCRIPTION
	-	-	-	-

DATED	LATEST RELEASE
1–07–13	1–18–13

DRAWINGS BY: HLP
ENGINEERED BY:
TEST ELEVATION

5.0

Architectural Testing

Report #: C5867-116-45
Date: 05/03/13
Verified by: Kristen L. Ruedsberger

NON-IMPACT STOREFRONT TEST SPECIMEN – PARTS LIST				MATERIAL
ITEM	QTY	PART NUMBER	DESCRIPTION	
1	1	E24259	EXTRUSION ~ THERMAL SUB SILL	ALUMINUM-6063-T5
2	2	E24240	EXTRUSION ~ THERMAL OPEN BACK SILL	ALUMINUM-6063-T5
3	5	E24441	EXTRUSION ~ THERMAL HEAD/JAMB/VERTICAL	ALUMINUM-6063-T5
4	8	E24442	EXTRUSION ~ SNAP IN FILLER	ALUMINUM-6063-T5
5	1	A244545	CLOSURE POCKET ASSEMBLY	
6	2 PER ASSY	E24445	EXTRUSION ~ CLOSURE POCKET SNAP END 12'-2"	ALUMINUM-6063-T5
7	1 PER ASSY	P6595	BRIDGE 12'-2"	P-PART-PLASTIC
8	2	E14104	EXTRUSION ~ GLAZING STOP	ALUMINUM-6063-T5
9				
10				
11	4	A627879	EXTRUSION ASSEMBLY ~ STILE MED ~ HINGE	ALUMINUM-6063-T5
12	1	A628282	EXTRUSION ASSEMBLY ~ STILE, MED ~ RD FACE	ALUMINUM-6063-T5
13	1	A628384	EXTRUSION ASSEMBLY ~ STILE, MED ~ LOCK/ASTRICAL	ALUMINUM-6063-T5
14	1	E1152	EXTRUSION ~ ASTRICAL (DOOR)	ALUMINUM-6063-T5
15	3	A621414	EXTRUSION ASSEMBLY ~ TOP RAIL 4"	ALUMINUM-6063-T5
16	3	A621010	EXTRUSION ASSEMBLY ~ BOTTOM RAIL 10"	ALUMINUM-6063-T5
17	12	E6291	EXTRUSION ~ GLASS STOP TOP & BOTTOM RAIL	ALUMINUM-6063-T5
18	6	E6223	EXTRUSION ~ INNER DOOR STOP	ALUMINUM-6063-T5
19	2	A624142	EXTRUSION ASSEMBLY ~ DOOR FRAME ~ HEADER	ALUMINUM-6063-T5
20	4	A624040	EXTRUSION ASSEMBLY ~ DOOR FRAME ~ JAMB	ALUMINUM-6063-T5
21	2	T6250	THERMAL THRESHOLD	ALUMINUM-6063-T5
22				
23				
24				
25	80'	P2728	GASKET, GLASS, EPG	P-PART-RUBBER
26	50'	P1112	GASKET, GLASS, EPG (DOOR)	P-PART-RUBBER
27	50'	P2183	GASKET, GLASS, EPG (DOOR)	P-PART-RUBBER
28	6	P1132	SETTING BLOCK 4" LG	P-PART-RUBBER
29	6	P1912	SETTING BLOCK 1/4 x 1/2 x 4" LG	P-PART-RUBBER
30	40'	P6296	BULB WEATHERSEAL	P-PART-WEATHERSEAL
31	20'	P938	PILE, DOOR STOP, AMESBURY GROUP	P-PART-PLASTIC/FAB
32	3	P6240	ELEMENT INHIBITOR (TOP & BOTTOM RAIL)	P-PART-RIGID PVC
33	3	P1276	CONCEALED SCREW WEATHERSTRIP 41 7/8" LG	P-PART-WEATHERSTRIP
34	2	P65XX	END DAM FOR SUB SILL E24259	P-PART-ALUM .040 SHT.
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DOOR PARTS AS REQ'D

ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
60	50	NA	SCREW ~ 12-11 x 3 1/2" FH WOOD (FRAME TO BUCK)	P-PART-FASTENER
61	8	NA	SCREW ~ 1/4" x 3" HEX FLG HD GALV LAG (FR. TO WOOD SUBSTRATE)	P-PART-FASTENER
62	10	NA	SCREW ~ 12-1" x 2" FT HD WOOD (THRES. TO WOOD BUCK)	P-PART-FASTENER
63	75	S070	SCREW ~ #12-24 x 1/2" FLAT HD PHIL (HINGE)	P-PART-FASTENER
64	50	S341	SCREW ~ #10-24 x 3/4" FLAT HD PHIL (ASTRAGAL)	P-PART-FASTENER
65	4	S196	SCREW ~ #8 X 3/8" SELF TAPPING PAN HEAD (END DAM TO SUB SILL)	P-PART-FASTENER
66	30	S202	SCREW ~ #10-24 x1 TYPE 23 HEX HEAD PHIL (FRAME TO FRAME)	P-PART-FASTENER
67				
68	AS REQ'D	BY OTHERS	SILICONE SEALANT DOW 795	P-PART-SEALANT
69				
70				
71	1	NA	3'-4" x 7'-2" MEDIUM STILE THERMAL DOOR	DOOR ASSEMBLY
72	1	NA	6'-4" x 7'-2" MEDIUM STILE THERMAL DOOR	DOOR ASSEMBLY
73	X	P518	LABEL, DOOR, GREEN BRUSHED SILVER (DOOR) (NOT SHOWN)	P-PART-LABEL
74	X	P1539	SPRING, STEEL, ASTRAGAL, ADJUSTABLE, (DOOR)	P-PART-HARDWARE
75	X	P1553	WASHER, SCREW & SHOULDER SCREW (DOOR) (NOT SHOWN)	P-PART-FASTENER
76	X	S071	NUT, STUD, 3/8-16 X 3/4 (DOOR TIE ROD) (NOT SHOWN)	P-PART - FASTENER
77	X	S186	WASHER, 1/2 OD X 1/4 ID X .062 ALUMINUM (DOOR) (NOT SHOWN)	P-PART - FASTENER
78	X	S161	SCREW, 10-24 X 1/2 FLAT HEAD PHIL (DR HINGE/FLUSH BOLTS) (NOT SHOWN)	P-PART - FASTENER
79	X	P908	SCREW, 10-24 X 1/2 FH MACH PHIL (DOOR) (NOT SHOWN)	P-PART - FASTENER
80	X	P020B	ROD, THREADED TIE, 8" (DOOR) (NOT SHOWN)	P-PART - FASTENER
81	X	P676	TAB - FOR MORTISED LOCKS (DOOR) (NOT SHOWN)	P-PART - HARDWARE
82	X	P853	WASHER, DOOR ROD (DOOR) (NOT SHOWN)	P-PART - HARDWARE
83	9	P2092	HINGE, BUTT, REINFORCEMENT (DOOR)	P-PART - HARDWARE
84	9	P092	BUTT HINGE HAGAR BB-1191	P-PART - HARDWARE
85				
86				
87	X	P572	CYLINDER PARTS, P572-C2 (DOOR)	P-PART - HARDWARE
88	X	P1825	M-SR-SR28 COLLAR, SPLIT RING CYL RYADON (DOOR)	P-PART - HARDWARE
89	X	P6508	ADAMS-RITE MS1853S-410-000 ADAMS-TITE (DOOR)	P-PART - HARDWARE
90	X	P1750	HEADER BOLT, ADAM-RITE P1750-OR (DOOR)	P-PART - HARDWARE
91	X	P571	CYLINDER, LOCK (DOOR)	P-PART - HARDWARE
92	X	P2201	CLOSER, DORMA, 8616, SURFACE MOUNT	P-PART - HARDWARE
93	X	P1420	DEAD BOLT	P-PART - HARDWARE
94	X	P059	FLUSH BOLTS	P-PART - HARDWARE
95	X	P6527	ROCKWOOD BF157 10" PULL	P-PART - HARDWARE
96				
97				
98				
99				

TUBELITE
NON IMPACT
T24000 STOREFRONT
THERMAL & ACOUSTIC TESTING

TUBELITE
DEPENDABLE
LEADERS IN ECO-EFFICIENT STOREFRONT, CURTAINWALL AND ENTRANCE SYSTEMS

3056 WALKER RIDGE DRIVE N.W.
WALKER, MICHIGAN 49544
PH: 800.866.2227
FX: 616.301.0008
WEB SITE: WWW.TUBELITEINC.COM

REVISIONS			
NO.	DATED	BY	DESCRIPTION
-	-	-	-

DATED	LATEST RELEASE
1-07-13	1-18-13

DRAWINGS BY: HLP
ENGINEERED BY:

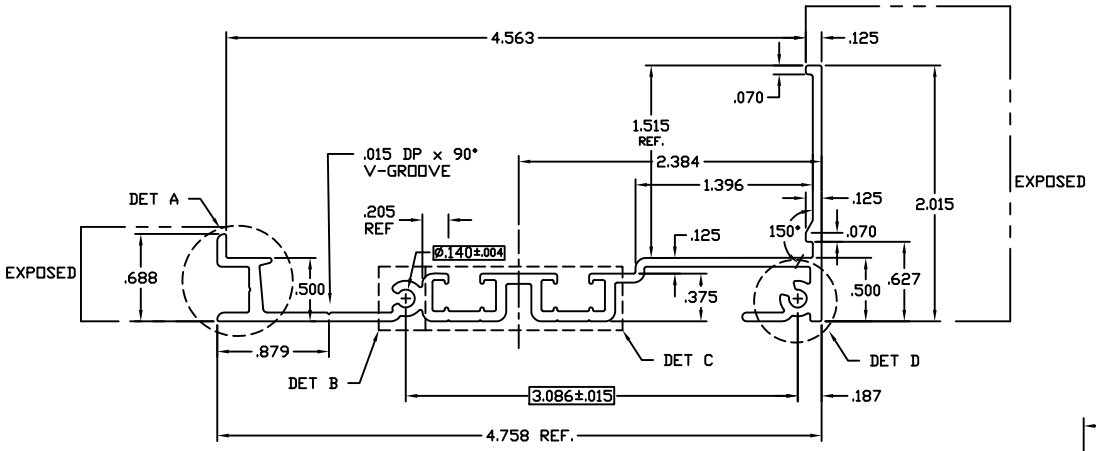
TEST ELEVATION

6.0

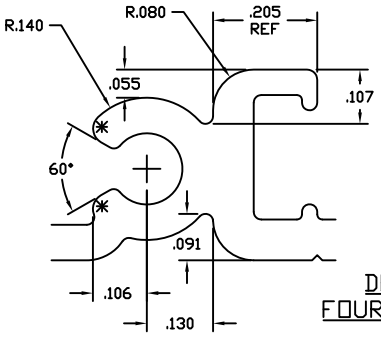
Architectural Testing

Report #: C5867-116-45
Date: 05/03/13
Verified by: Kristen K. Riedsberger

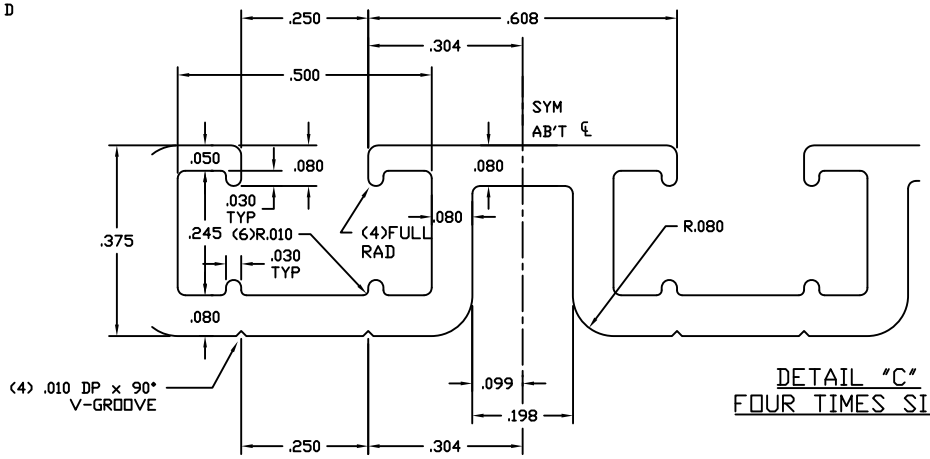
E24259



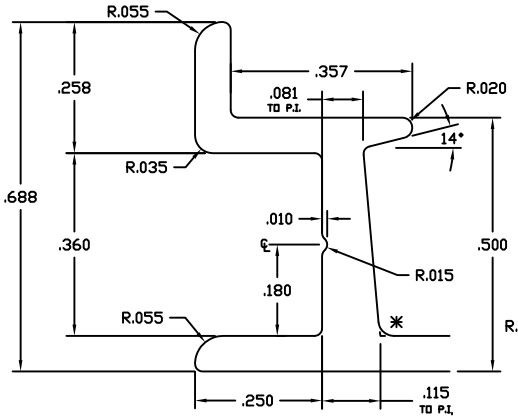
FULL SIZE



DETAIL "B"
FOUR TIMES SIZE



DETAIL "C"
FOUR TIMES SIZE



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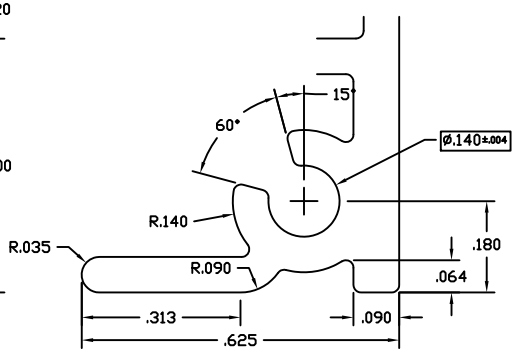
FOUR TIMES SIZE



DETAIL "D"
FOUR TIMES SIZE

LANCED AND
FULLY DEBRIDGE

ALUMINUM ASSOCIATION STANDARD TOLERANCES APPLY UNLESS NOTED
ALL UNSPECIFIED RADII .015
* INDICATES .031 RADIUS
☐ DENOTES CRITICAL DIMENSION
ALL DIES PROPERTY OF TUBELITE

TUBELITE DEPENDABLE
LEADERS IN ECO-EFFICIENT STOREFRONT, CURTAINWALL AND ENTRANCE SYSTEMS

3056 WALKER RIDGE NW, SUITE G
WALKER, MICHIGAN 49544

REV	DATE	DESCRIPTION	INTL
	12/12/2012	RELEASED FOR TOOLING, ACCT#4827300000.7020.770	CRH

WALL THK. 0.070	SECTION CLASS S	MAT'L 6063-T5	RATIO 70:1		
PERIMETER OUT (TOTAL) 20.965		AREA .785	WGT/FT .923		
FACTOR 23	CIRCLE SIZE 5.157		INFILL VOLUME .263		
RXX 1.601	SXX .726	IXX 2.012	CXX 2.771		
RYY .436	SYY .091	IYY .149	CYY 1.642		

SILL FLASHING
T24000 THERMAL STOREFRONT

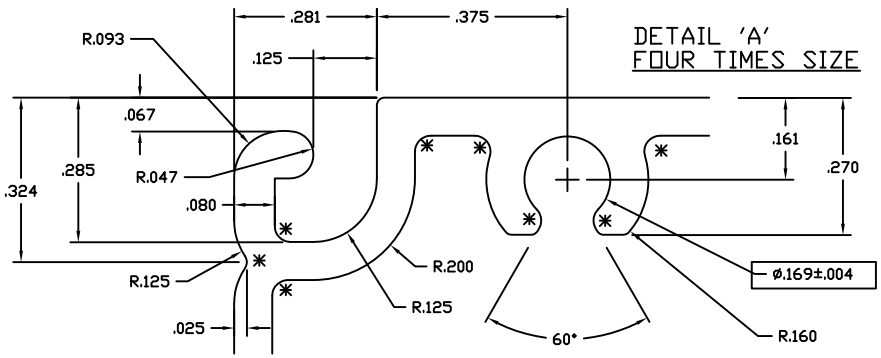
DRAWN BY HLP	DRVG DATE 12-03-12	APPV'D BY	DATE APPV'D	
DWG SCALE NOTED	PRODUCT CODE 190	E24259		REV

MATERIAL: PAINTED or ANODIZED ALUMINUM

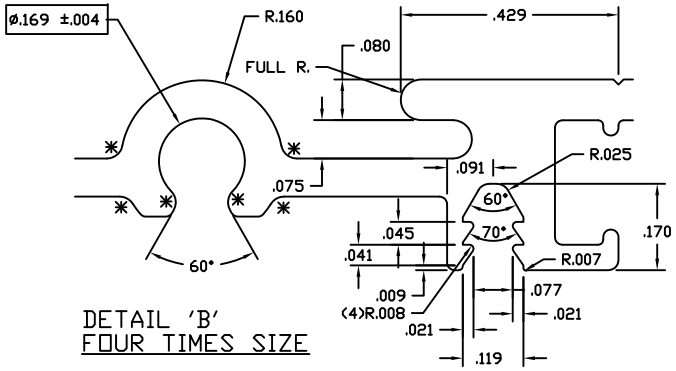
Architectural Testing

Report #: C5867-116-45
Date: 05/03/13
Verified by: Kristen K. Landsberger

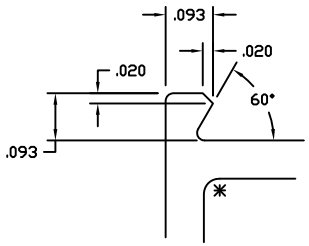
E24240



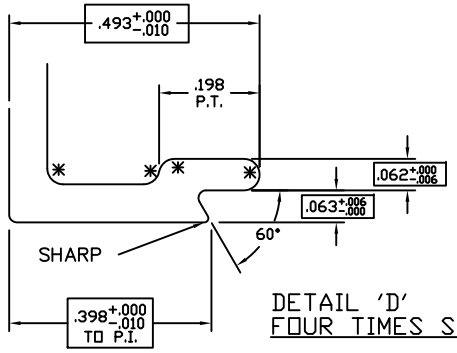
DETAIL 'A'
FOUR TIMES SIZE



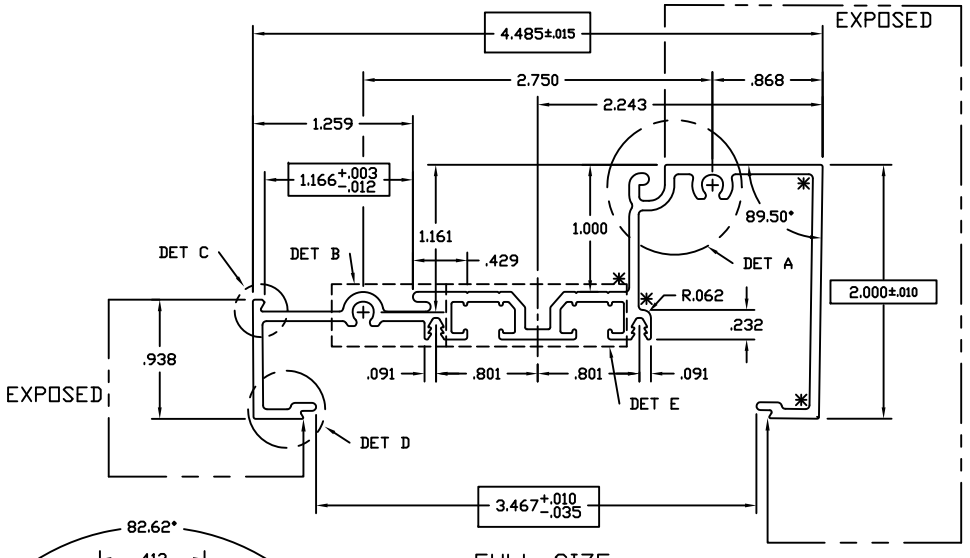
DETAIL 'B'
FOUR TIMES SIZE



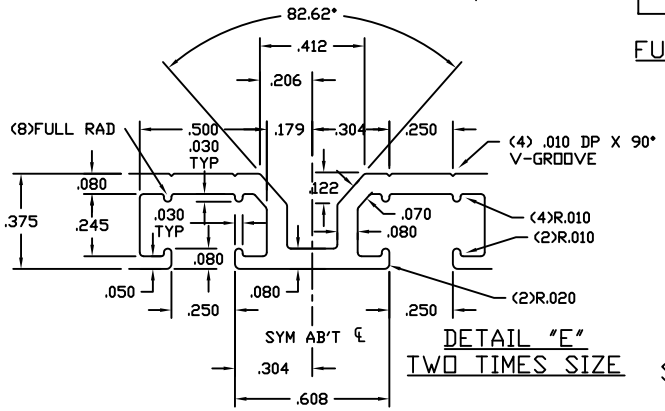
DETAIL 'C'
FOUR TIMES SIZE



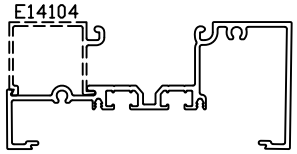
DETAIL 'D'
FOUR TIMES SIZE



FULL SIZE



DETAIL "E"
TWO TIMES SIZE



HALF SIZE ASSEMBLY

SNAP FIT WITH E-14142 AND E-14104

LANCED AND FULLY DEBRIDGE

ALUMINUM ASSOCIATION STANDARD TOLERANCES APPLY UNLESS NOTED
ALL UNSPECIFIED RADII .015
* INDICATES .031 RADIUS
☐ DENOTES CRITICAL DIMENSION
ALL DIES PROPERTY OF TUBELITE

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LEADERS IN ECO-EFFICIENT STOREFRONT, CURTAINWALL AND ENTRANCE SYSTEMS

3056 WALKER RIDGE NW, SUITE G
WALKER, MICHIGAN 49544

REV	DATE	DESCRIPTION	INTL
	12/12/2012	RELEASED FOR TOOLING, ACCT#4827300000.7020.770	CRH

WALL THK.	.075	SECTION CLASS	S	MAT'L	6063-T5	RATIO	59:1
PERIMETER OUT (TOTAL)	24.529			AREA	.928	WGT/FT	1.091
FACTOR	22	CIRCLE SIZE	4.897			INFILL VOLUME	.261

RXX	1.466	SXX	.794	IXX	1.995	CXX	2.512
RYY	.567	SYY	.298	IYY	.298	CYY	1.002

OPEN BACK SILL 2" X 4 1/2"
E24000 THERMAL STOREFRONT

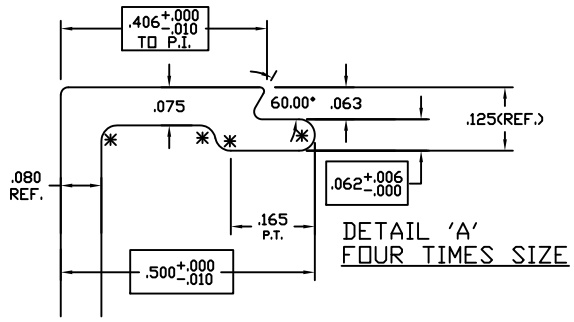
DRAWN BY	HLP	DRWG DATE	12-04-12	APPV'D BY	DATE APPV'D
DWG SCALE	NOTED	PRODUCT CODE	190	E24240	REV

MATERIAL: PAINTED or ANODIZED ALUMINUM

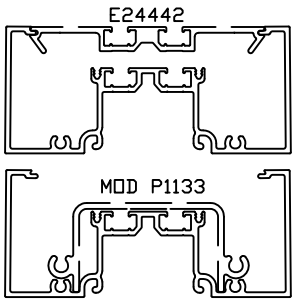
Architectural Testing

Report #: C5867-116-45
Date: 05/03/13
Verified by: Kristen K. Lindsberger

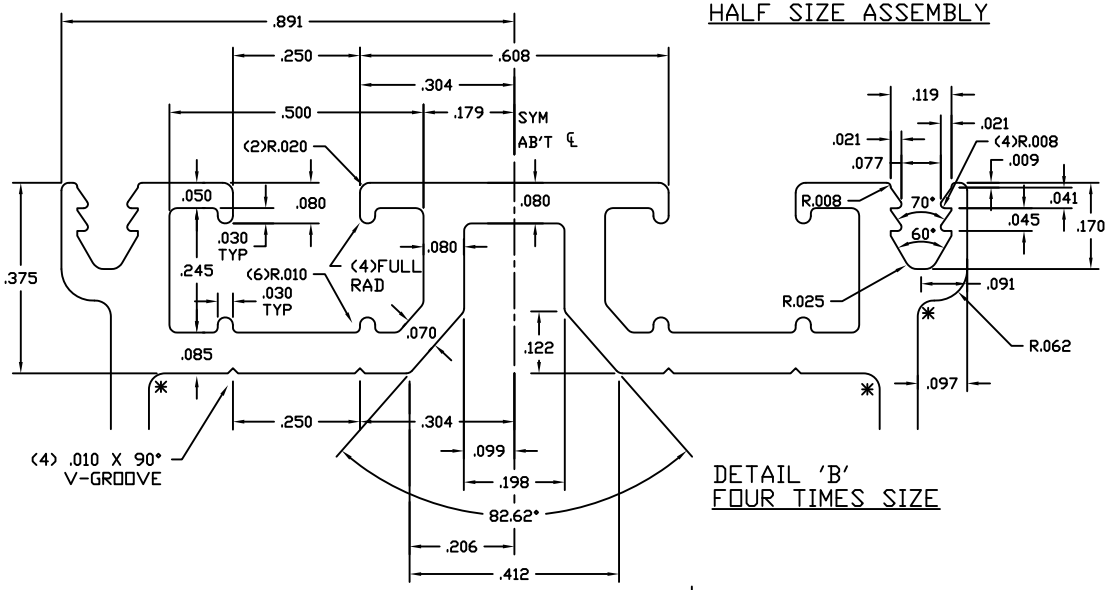
E24441



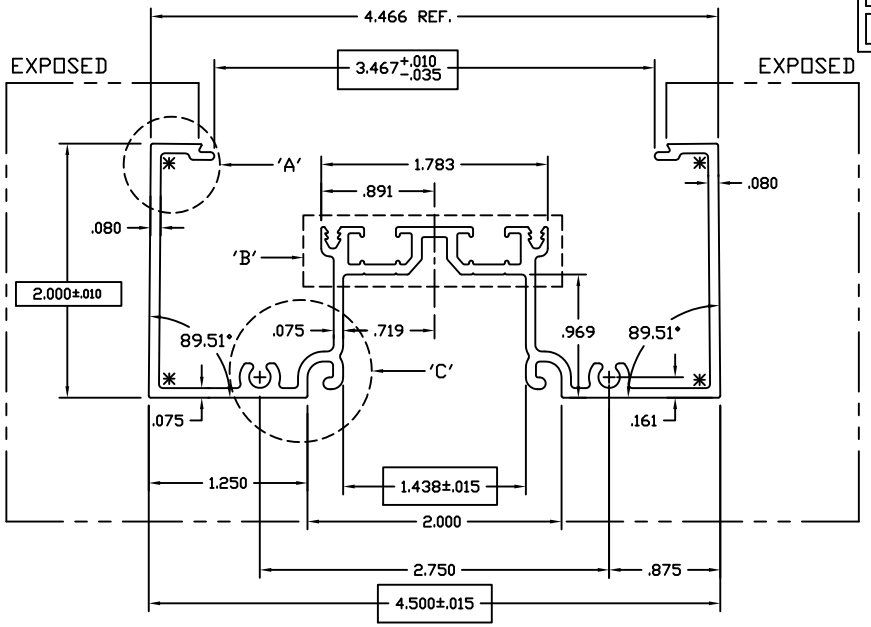
DETAIL 'A'
FOUR TIMES SIZE



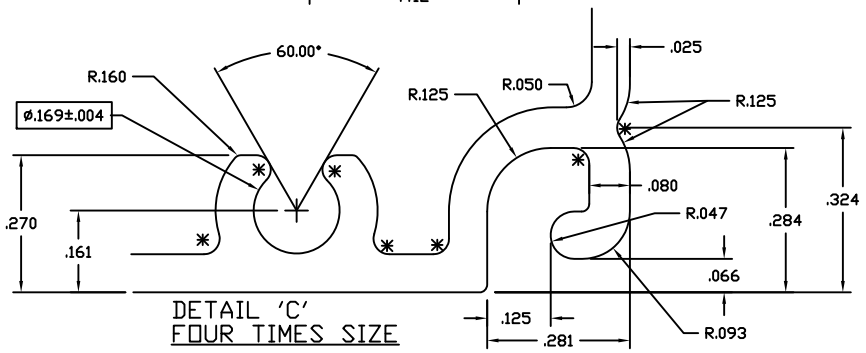
HALF SIZE ASSEMBLY



DETAIL 'B'
FOUR TIMES SIZE



ACTUAL SIZE



DETAIL 'C'
FOUR TIMES SIZE

LANCED AND FULLY DEBRIDGE

ALUMINUM ASSOCIATION STANDARD TOLERANCES APPLY UNLESS NOTED
ALL UNSPECIFIED RADII .015
* INDICATES .031 RADIUS
☐ DENOTES CRITICAL DIMENSION
ALL DIES PROPERTY OF TUBELITE

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3056 WALKER RIDGE NW, SUITE G
WALKER, MICHIGAN 49544

REV	DATE	DESCRIPTION	INTL

WALL THK. .075	SECTION CLASS S	MAT'L 6063-T5	RATIO 49:1
PERIMETER OUT (TOTAL) 28.912		AREA 1.116	WGT/FT 1.312
FACTOR 22	CIRCLE SIZE 4.899		INFILL VOLUME .261

RXX	SXX	IXX	CXX
RYY	SYY	IYY	CYY

THERM. HEAD/JAMB/VERTICAL 2" X 4 1/2"
T24000 THERMAL STOREFRONT

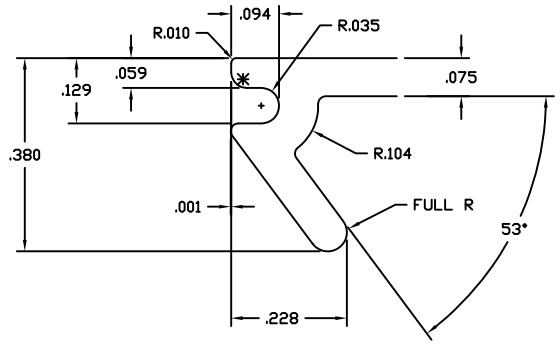
DRAWN BY HLP	DRVG DATE 12-04-12	APPV'D BY	DATE APPV'D	
DWG SCALE NOTED	PRODUCT CODE 180	E24441		REV

MATERIAL: PAINTED or ANODIZED ALUMINUM

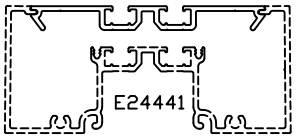
Architectural Testing

Report #: C5867-116-45
Date: 05/03/13
Verified by: Kristen K. Luedsburger

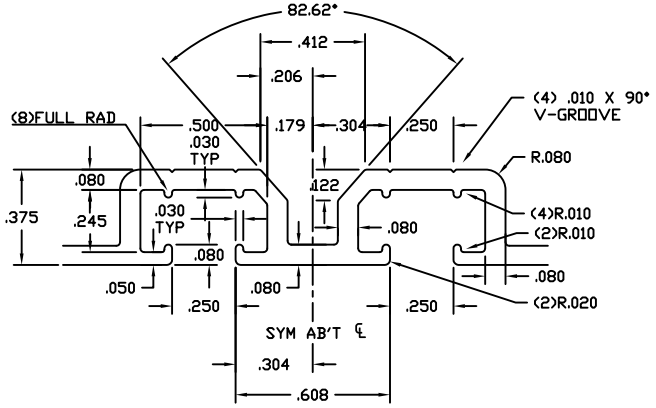
E24442



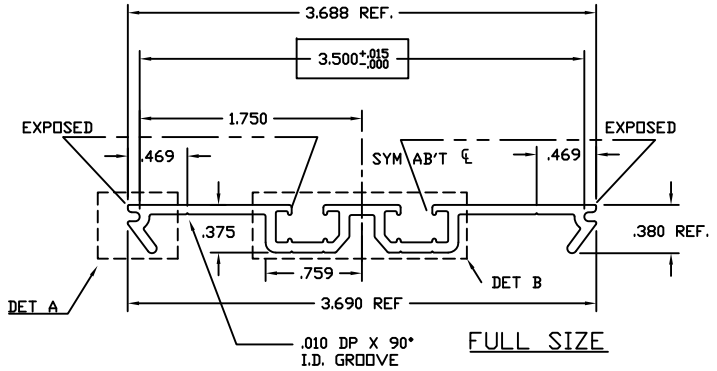
DETAIL "A"
FOUR TIMES SIZE



HALF SIZE ASSEMBLY



DETAIL "B"
TWO TIMES SIZE



FULL SIZE

NOTES:
MATES WITH E24441, E24243
FULLY DEBRIDGE
P & D THERMAL BREAK

LANCED AND FULLY DEBRIDGE

ALUMINUM ASSOCIATION STANDARD TOLERANCES APPLY UNLESS NOTED
ALL UNSPECIFIED RADII .015
* INDICATES .031 RADIUS
☐ DENOTES CRITICAL DIMENSION
ALL DIES PROPERTY OF TUBELITE

TUBELITE® DEPENDABLE
LEADERS IN ECO-EFFICIENT STOREFRONT, CURTAINWALL AND ENTRANCE SYSTEMS

3056 WALKER RIDGE NW, SUITE G
WALKER, MICHIGAN 49544

REV	DATE	DESCRIPTION	INTL
	12/07/2012	RELEASED FOR TOOLING, ACCT#4827300000.7020.770	CRH

WALL THK. .075	SECTION CLASS S	MAT'L 6063-T5	RATIO 122:1
PERIMETER OUT (TOTAL) 12.323		AREA .453	WGT/FT .532
FACTOR 23	CIRCLE SIZE 3.696		INFILL VOLUME .261

RXX 1.060	SXX .276	IXX .509	CXX 1.845
RYY .127	SYY .031	IYY .007	CYY .235

SNAP IN FILLER
T24000 THERMAL STOREFRONT

DRAWN BY HLP	DRVG DATE 12-04-12	APPV'D BY	DATE APPV'D	REV
DWG SCALE NOTED	PRODUCT CODE 180	E24442		

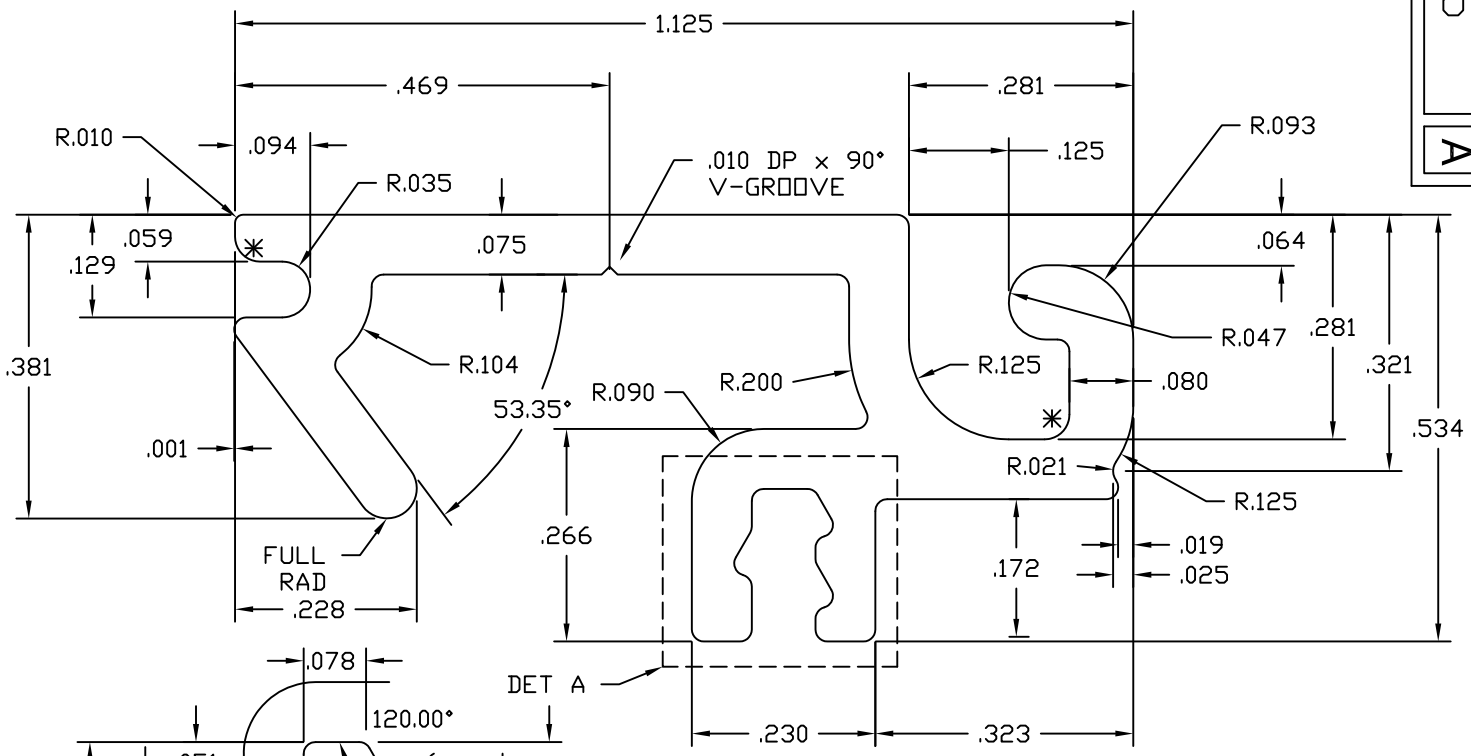
MATERIAL: PAINTED or ANODIZED ALUMINUM

Architectural Testing

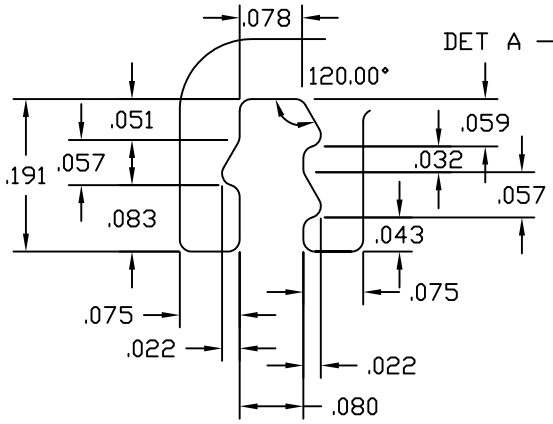
Report #: C5867-116-45
Date: 05/03/13
Verified by: Kristen K. Riedsteger

MATERIAL: PAINTED or ANODIZED ALUMINUM

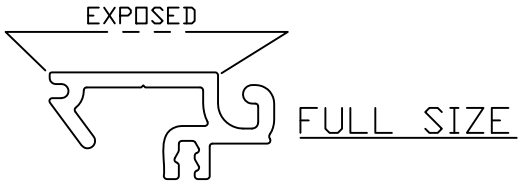
E2445 A



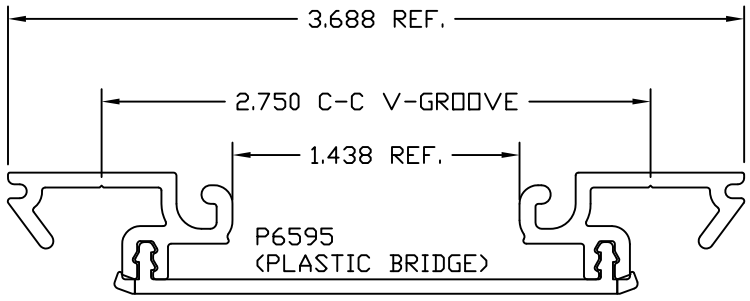
DETAIL
FOUR TIMES SIZE



DETAIL "A"
FOUR TIMES SIZE



FULL SIZE



A244545
ASSEMBLY

ALUMINUM ASSOCIATION STANDARD TOLERANCES APPLY UNLESS NOTED

ALL UNSPECIFIED RADII .015

✳ INDICATES .031 RADIUS

▭ DENOTES CRITICAL DIMENSION

ALL DIES PROPERTY OF TUBELITE

TUBELITE®
DEPENDABLE
LEADERS IN ECO-EFFICIENT STOREFRONT, CURTAINWALL AND ENTRANCE SYSTEMS

3056 WALKER RIDGE NW, SUITE G
WALKER, MICHIGAN 49544

REV	DATE	DESCRIPTION	INTL
	12/07/2012	RELEASED FOR TOOLING, ACCT#4827300000.7020.770	CRH
A	1-29-13	DWG #E2445 WAS E24445	HLP

WALL THK. .075	SECTION CLASS S	MAT'L 6063-T5	RATIO 283:1
PERIMETER OUT (TOTAL) 5.207		AREA .194	WGT/FT .229
FACTOR 23	CIRCLE SIZE 1.156	INFILL VOLUME NA	

RXX .330	SXX .035	IXX .021	CXX .608
RYY .146	SYY .012	IYY .004	CYY .334

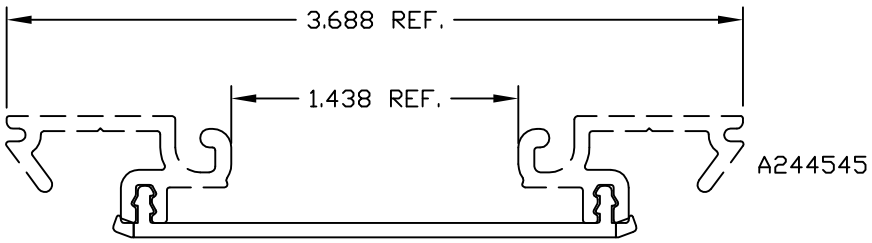
CLOSURE POCKET
E24000

DRAWN BY HLP	DRWG DATE 12-04-12	APPV'D BY	DATE APPV'D
DWG SCALE NOTED	PRODUCT CODE A E2445		REV A

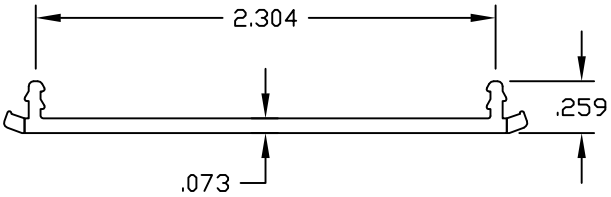
Architectural Testing

Report #: C5867-116-45
Date: 05/03/13
Verified by: Kristen K. Ludsteger

P6595



FULL SIZE ASSEMBLY



FULL SIZE

MATERIAL - RIGID PVC / 60 'A' ALCRYN
SUPPLIER: TRELLEBORG
SUPPLIER PART NUMBER: #9724-01-00

ALL UNSPECIFIED RADII .015
* INDICATES .031 RADIUS
▭ DENOTES CRITICAL DIMENSION

TUBELITE® DEPENDABLE
LEADERS IN ECO-EFFICIENT STOREFRONT, CURTAINWALL AND ENTRANCE SYSTEMS

3056 WALKER RIDGE NW, SUITE G
WALKER, MICHIGAN 49544

REV	DATE	DESCRIPTION	INTL
			CRH
			CRH

BRIDGE - PLASTIC
T24000 SERIES

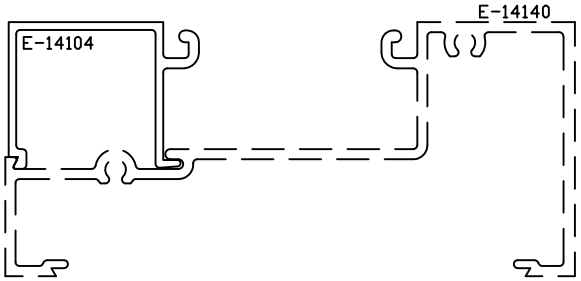
DRAWN BY	DRWG DATE	APPV'D BY	DATE APPV'D
HLP	12-04-12		

DRWG SCALE	PRODUCT CODE		REV
FULL	TH SF	P6595	

Architectural Testing

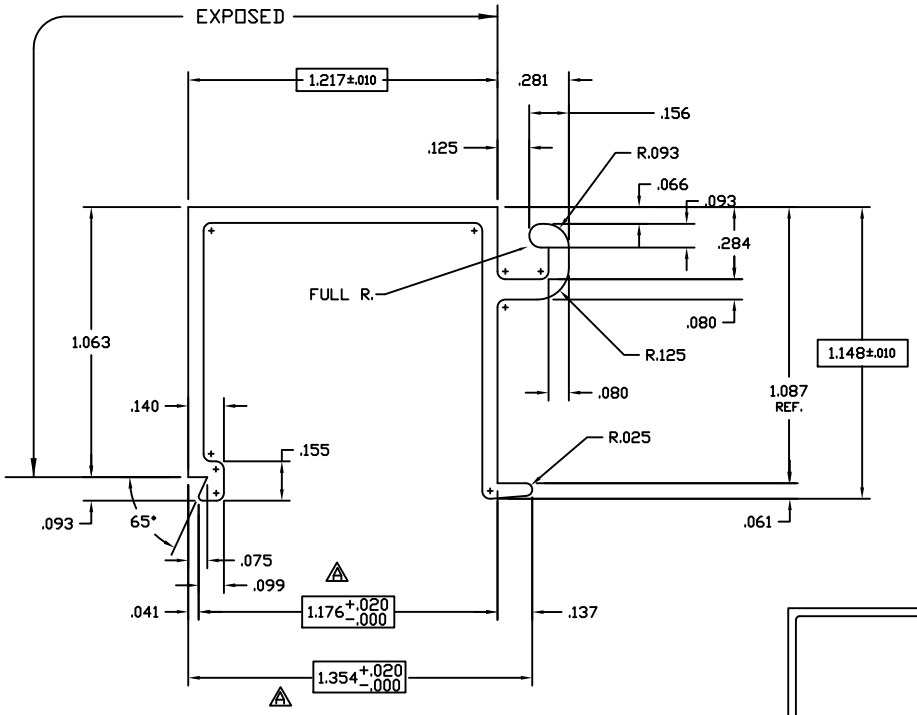
Report #: C5867-116-45
Date: 05/03/13
Verified by: Kristen K. Kriedsberger

E14104 B

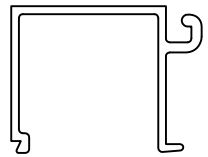


ASSEMBLY

NOTE : MATES WITH E-14140 AND E-14103



TWO TIMES SCALE



SCALE: FULL

ALUMINUM ASSOCIATION STANDARD TOLERANCES APPLY UNLESS NOTED

ALL UNSPECIFIED RADII .015

* INDICATES .031 RADIUS

▭ DENOTES CRITICAL DIMENSION

ALL DIES PROPERTY OF TUBELITE

TUBELITE® DEPENDABLE
LEADERS IN ECO-EFFICIENT STOREFRONT, CURTAINWALL AND ENTRANCE SYSTEMS

3056 WALKER RIDGE NW, SUITE G
WALKER, MICHIGAN 49544

REV	DATE	DESCRIPTION	INTL
	4/1/93	RELEASE TO TOOLING	KMH
	5/18/93	RELEASE TO PRODUCTION	KMH
	7/7/93	REVISE EXTR. # WAS E-14003	KMH
A	12/2/97	REVISE TOLERANCES	KMH
B	3/18/98	REV. & REL. TO PROD./TOL. CHANGE NOTED AS	SMF

WALL THK. .060	SECTION CLASS S	MAT'L 6063-T5	RATIO 70
PERIMETER OUT (TOTAL) 8.270		AREA .264	WGT/FT .310
FACTOR 27	CIRCLE SIZE 1.784		INFILL VOLUME N/A

RXX .550	SXX .106	IXX .080	CXX .757
RYY .374	SYY .049	IYY .037	CYY .749

GLASS STOP FOR 1" GLASS
E14000 NON THERMAL STOREFRONT

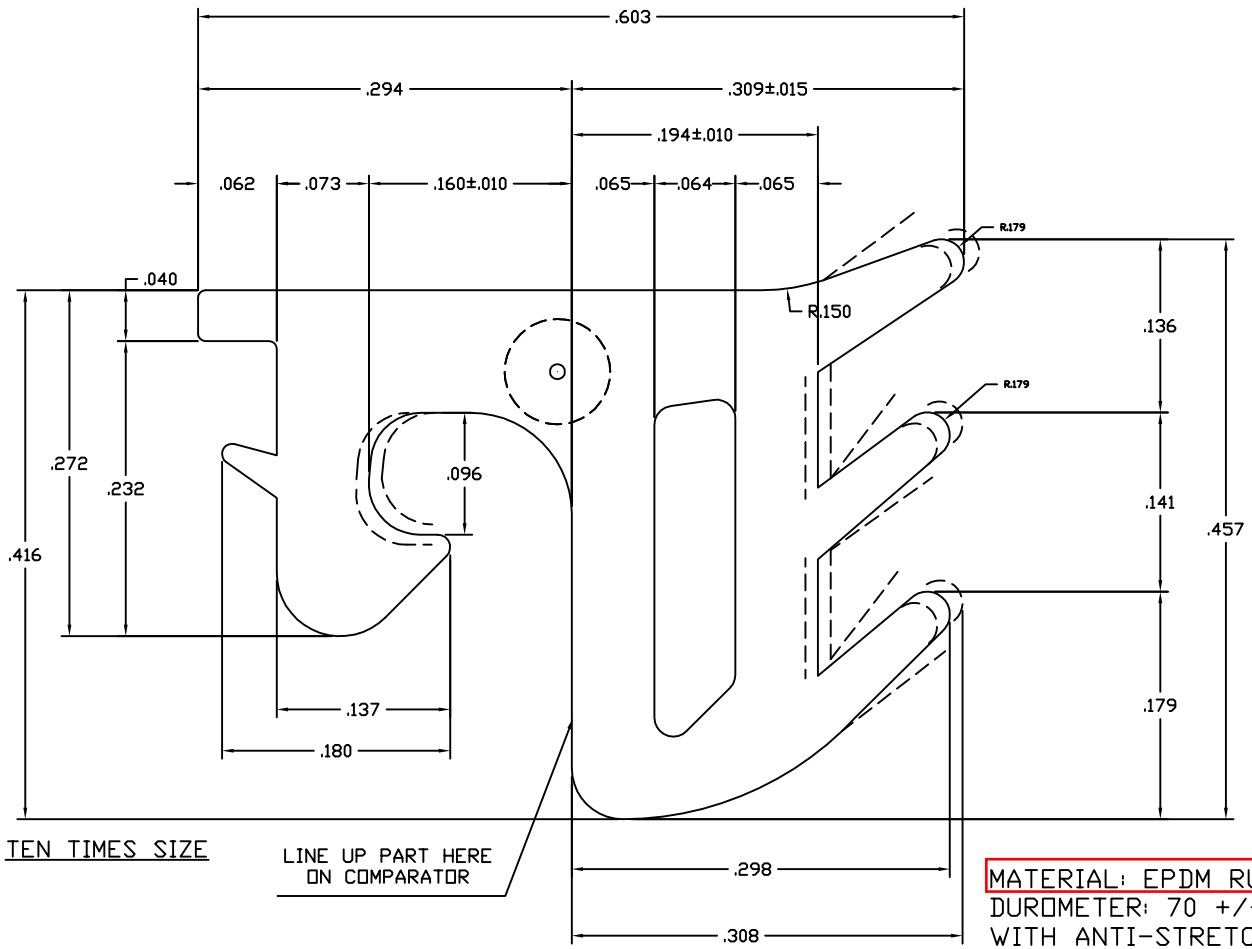
DRAWN BY KMH	DRVG DATE 03/11/93	APPV'D BY	DATE APPV'D	
DWG SCALE NOTED	PRODUCT CODE 190	E14104		REV B

MATERIAL: PAINTED or ANODIZED ALUMINUM

Architectural Testing

Report #: C5867-116-45
Date: 05/03/13
Verified by: Kristen L. Liedsteger

P2728



TEN TIMES SIZE

LINE UP PART HERE ON COMPARATOR

MATERIAL: EPDM RUBBER WITH ANTI-STRETCH CORD
DUROMETER: 70 +/- 5
WITH ANTI-STRETCH CORD
WITH LUBRICANT

ACTUAL SIZE

ACCEPTABLE STRING LOCATION

ALL TOLERANCES ARE RMA CLASS II UNLESS OTHERWISE NOTED

ALL UNSPECIFIED RADII .015
* INDICATES .031 RADIUS
DENOTES CRITICAL DIMENSION

REV	DATE	DESCRIPTION	INTL
	08/20/09	RELEASE FOR PRODUCTION	NSJ

TUBELITE® DEPENDABLE
LEADERS IN ECO-EFFICIENT STOREFRONT, CURTAINWALL AND ENTRANCE SYSTEMS

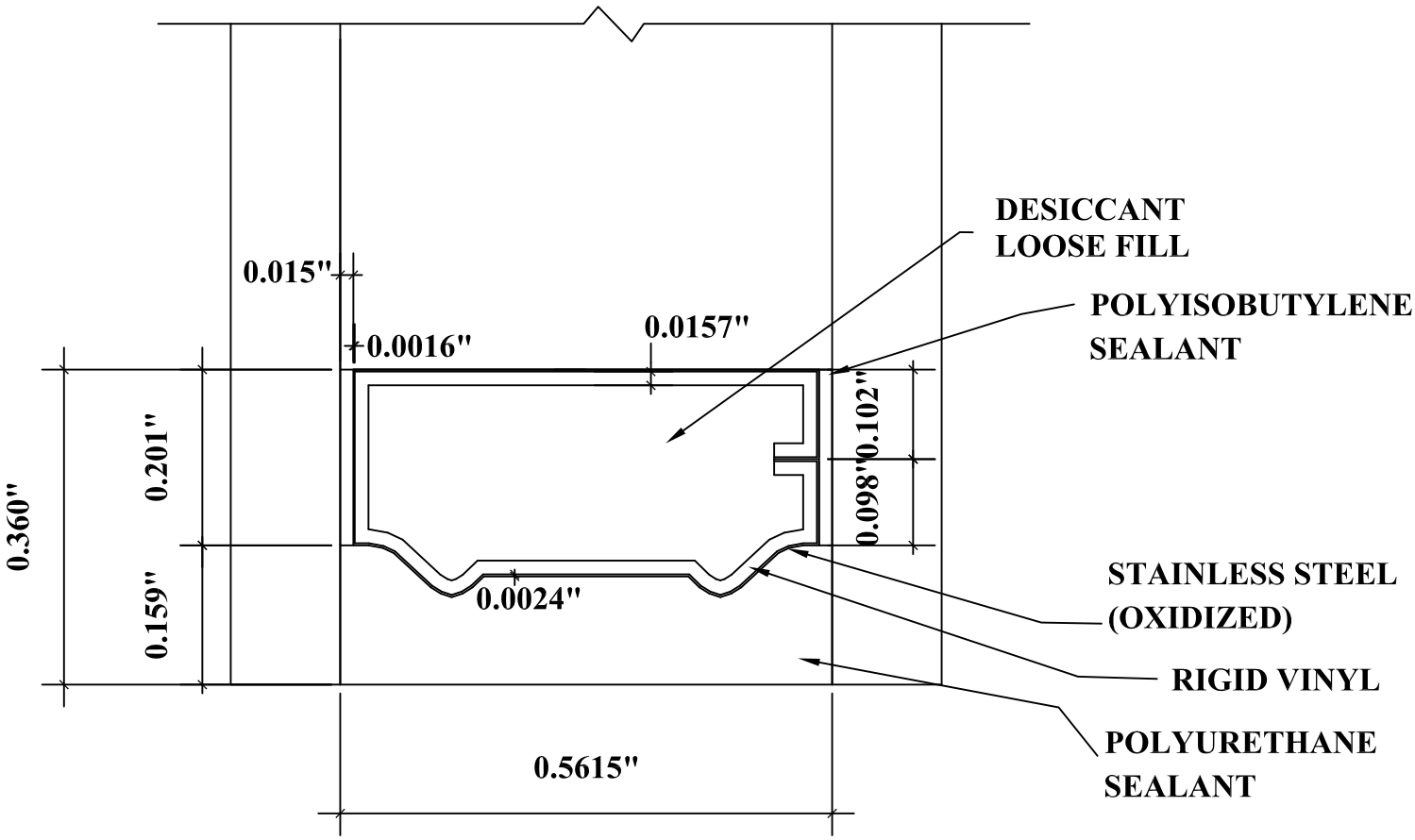
3056 WALKER RIDGE NW, SUITE G
WALKER, MICHIGAN 49544

ROLL-IN GLAZING GASKET
14000 AND 4500 STOREFRONT SYSTEMS

DRAWN BY	DRWG DATE	APPV'D BY	DATE APPV'D	REV
JEM	08/14/09			
DRWG SCALE: NOTED	PRODUCT CODE: 190	P2728		

Architectural Testing

Report #: C5867-116-45
Date: 05/03/13
Verified by: Kristen K. Riedsberger



DETAIL FOR THERMAL MODELING OF
VIRACON EXTREMEEDGE SPACER (SS-D)