Architectural Testing

AAMA 507-07 THERMAL PERFORMANCE REPORT

Rendered to:

UNITED STATES ALUMINUM

SERIES/MODEL: TT451 Top Notch Ribbon Wall SSG
TYPE: Glazed Wall System

Report No: **B6092.02-116-45**
Report Date: **02/14/12**

130 Derry Court
York, PA 17406-8405
phone: 717-764-7700
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www.archtest.com

Architectural Testing

AAMA 507-07 THERMAL PERFORMANCE REPORT

Rendered to:

UNITED STATES ALUMINUM
200 Singleton Road
Waxahachie, Texas 75165

Report No:	B6092.02-116-45
Report Date:	02/14/12
Simulation Date:	02/07/12

Project Summary:

Architectural Testing, Inc. was contracted by United States Aluminum to provide U-Factor and Solar Heat Gain Coefficient thermal performance ratings on the TT451 Top Notch Ribbon Wall SSG Glazed Wall System. The thermal performance ratings were determined in accordance with AAMA 507-07, 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:	TT451 Top Notch Ribbon Wall SSG
Product Groupings:	Material finish grouped per NFRC 100, Section 4.2.1 L
Type:	Glazed Wall System
Frame Material:	Aluminum Thermally Broken Framing System
Material Finish:	Painted Aluminum
Specimen Size:	2000mm wide by 2000mm high (78-3/4" by 78-3/4")
Configuration:	Single vision lIte
Drawing Reference:	US Aluminum Drawings: TT451_SSG Horiz, & TT451_SSG Vert

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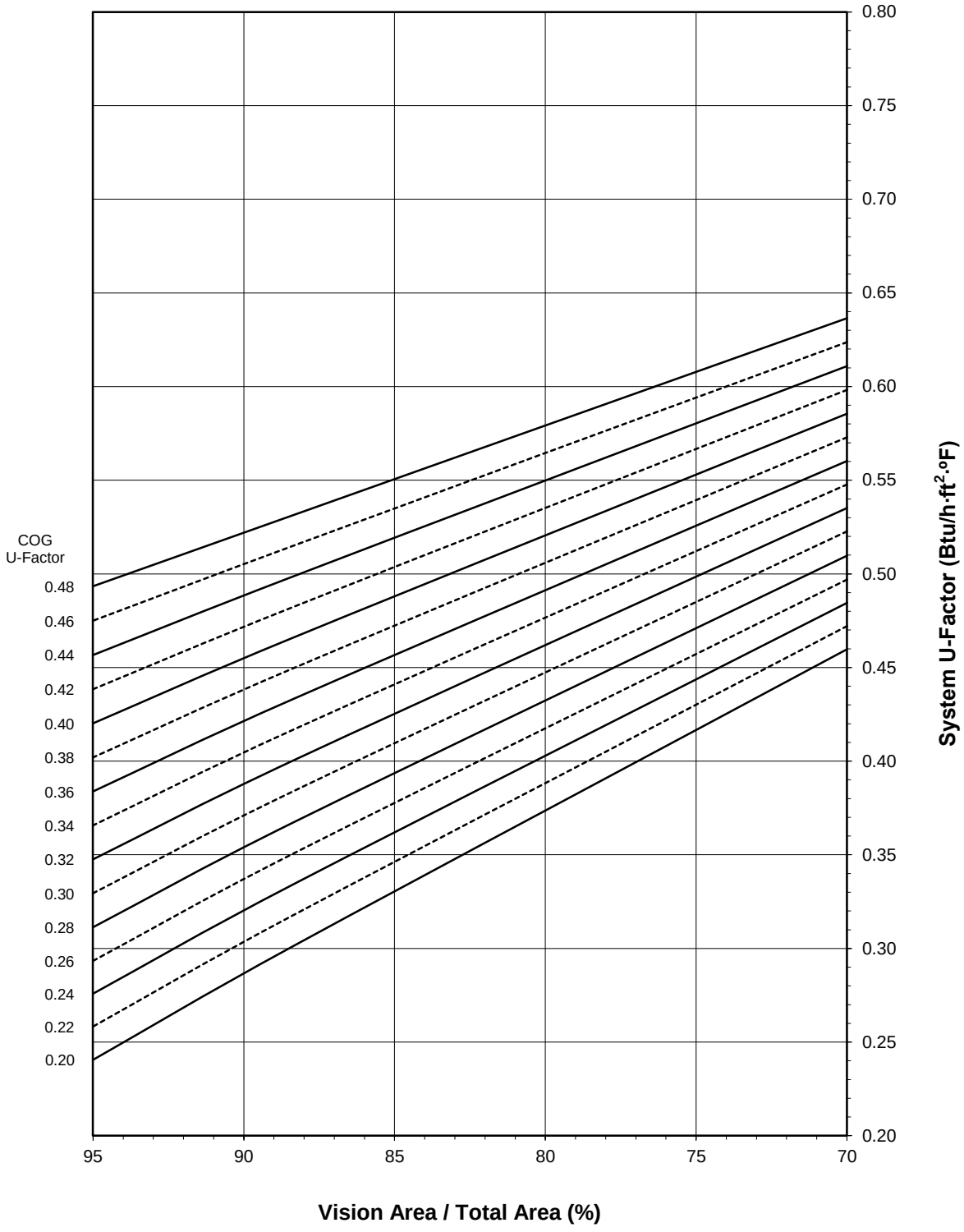
United States Aluminum
TT451 Top Notch Ribbon Wall SSG - Glazed Wall System

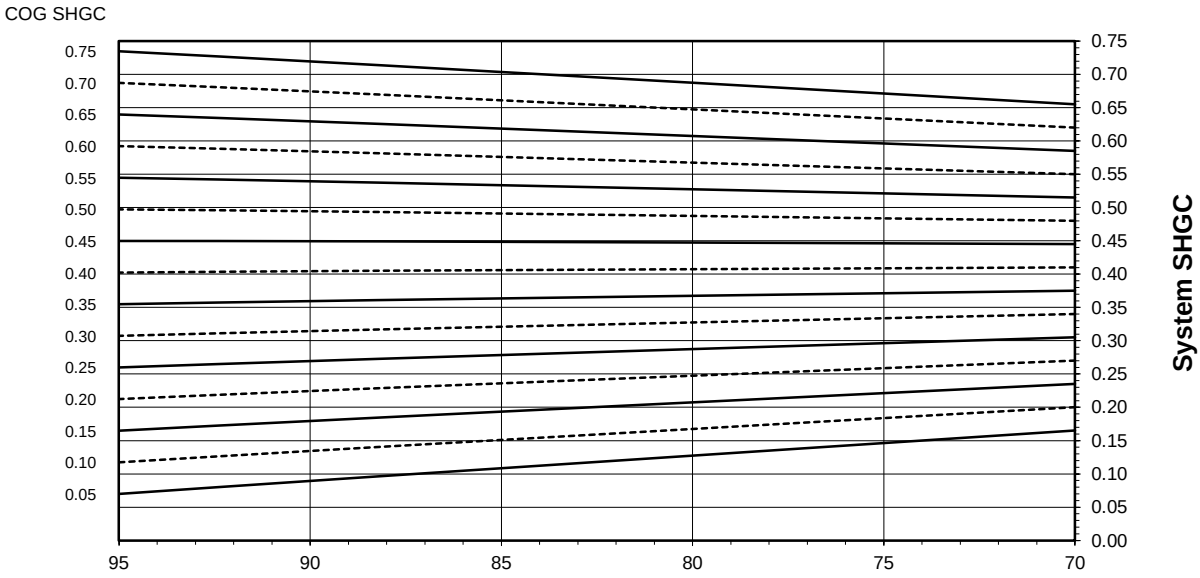
System U-Factor vs. Percentage of Vision Area



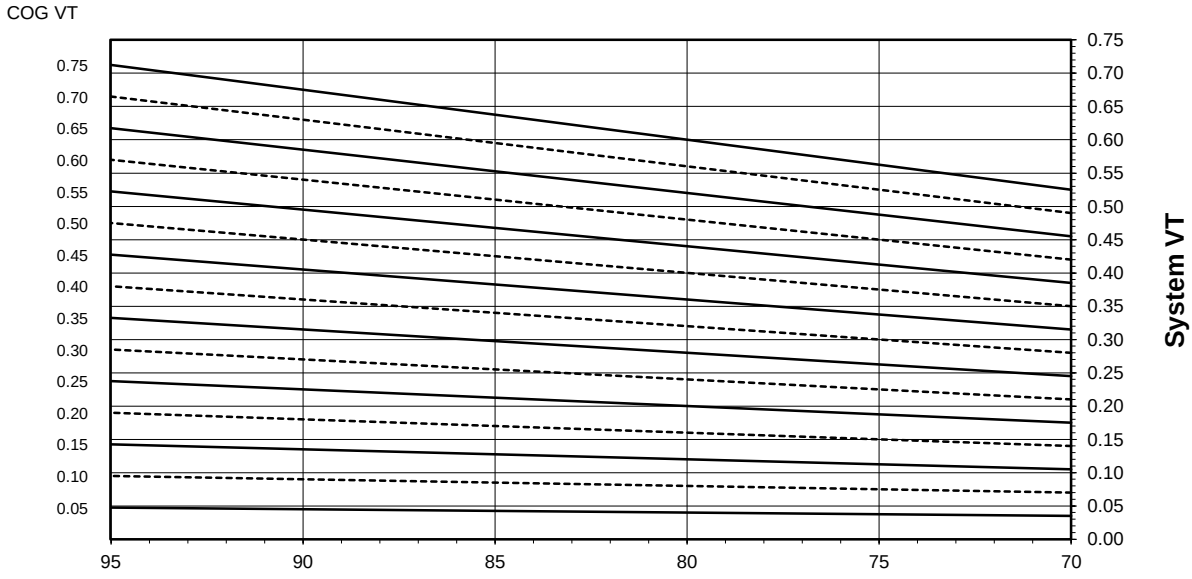
Note: 1 inch Overall - Dual Glazed Glass (0.48-0.20 COG) with Aluminum Spacer

United States Aluminum
TT451 Top Notch Ribbon Wall SSG - Glazed Wall System

System SHGC vs. Percentage of Vision Area



System VT vs. Percentage of Vision Area



United States Aluminum
TT451 Top Notch Ribbon Wall SSG - Glazed Wall System

Size Specific U-Factor Matrix*

Glazing Option	Center of Glass U-Factor	Overall U-Factor
1	0.48	0.53
2	0.46	0.52
3	0.44	0.50
4	0.42	0.48
5	0.40	0.47
6	0.38	0.45
7	0.36	0.43
8	0.34	0.42
9	0.32	0.40
10	0.30	0.38
11	0.28	0.37
12	0.26	0.35
13	0.24	0.34
14	0.22	0.32
15	0.20	0.30

Note: 1 inch Overall - Dual Glazed Glass (0.48-0.20 COG) with Aluminum Spacer

Size Specific SHGC Matrix*

Center of Glass SHGC	Overall SHGC
0.75	0.71
0.70	0.67
0.65	0.63
0.60	0.58
0.55	0.54
0.50	0.49
0.45	0.45
0.40	0.41
0.35	0.36
0.30	0.32
0.25	0.27
0.20	0.23
0.15	0.18
0.10	0.14
0.05	0.10

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 System specimen size of 2000mm wide by 2000mm high (78-3/4" by 78-3/4"). This represents 88.2% 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		
							70% Vision Area	*NFRC 100-2010*	*95% Vision Area*
							29.25" by 29.25"	*78.74" by 78.74"*	*188.53" by 188.53"*
1	0.48	43.7	Head	2.3946	1.0244	0.4938	0.6365	0.5321	0.4934
			L. Jamb	1.1912	1.0099	0.4705			
			R. Jamb	1.1928	1.0088	0.4706			
			Mullion	2.3840	1.0093	0.4706			
			Sill	2.3946	0.9532	0.4880			
2	0.46	44.8	Head	2.3946	1.0242	0.4813	0.6237	0.5158	0.4750
			L. Jamb	1.1912	1.0034	0.4562			
			R. Jamb	1.1928	1.0023	0.4563			
			Mullion	2.3840	1.0029	0.4562			
			Sill	2.3946	0.9528	0.4753			
3	0.44	45.8	Head	2.3946	1.0240	0.4687	0.6109	0.4995	0.4567
			L. Jamb	1.1912	0.9970	0.4418			
			R. Jamb	1.1928	0.9960	0.4419			
			Mullion	2.3840	0.9965	0.4419			
			Sill	2.3946	0.9523	0.4627			
4	0.42	46.8	Head	2.3946	1.0238	0.4563	0.5982	0.4832	0.4385
			L. Jamb	1.1912	0.9908	0.4275			
			R. Jamb	1.1928	0.9898	0.4276			
			Mullion	2.3840	0.9903	0.4276			
			Sill	2.3946	0.9520	0.4500			
5	0.40	47.9	Head	2.3946	1.0236	0.4439	0.5855	0.4668	0.4202
			L. Jamb	1.1912	0.9848	0.4132			
			R. Jamb	1.1928	0.9837	0.4133			
			Mullion	2.3840	0.9842	0.4133			
			Sill	2.3946	0.9516	0.4374			
6	0.38	48.9	Head	2.3946	1.0235	0.4316	0.5729	0.4505	0.4020
			L. Jamb	1.1912	0.9790	0.3990			
			R. Jamb	1.1928	0.9779	0.3992			
			Mullion	2.3840	0.9784	0.3991			
			Sill	2.3946	0.9512	0.4250			
7	0.36	50.0	Head	2.3946	1.0234	0.4192	0.5603	0.4341	0.3839
			L. Jamb	1.1912	0.9731	0.3847			
			R. Jamb	1.1928	0.9720	0.3849			
			Mullion	2.3840	0.9726	0.3848			
			Sill	2.3946	0.9509	0.4125			
8	0.34	51.0	Head	2.3946	1.0233	0.4070	0.5478	0.4177	0.3657
			L. Jamb	1.1912	0.9675	0.3706			
			R. Jamb	1.1928	0.9663	0.3708			
			Mullion	2.3840	0.9669	0.3707			
			Sill	2.3946	0.9506	0.4002			
9	0.32	52.0	Head	2.3946	1.0232	0.3946	0.5352	0.4013	0.3476
			L. Jamb	1.1912	0.9618	0.3563			
			R. Jamb	1.1928	0.9607	0.3565			
			Mullion	2.3840	0.9612	0.3564			
			Sill	2.3946	0.9503	0.3877			

Vision Area Data

Option No.	COG U-Factor	COG Temperature	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	Total Product U-Factor		
							70% Vision Area *29.25" by 29.25"*	*NFRC 100-2010* *78.74" by 78.74"*	*95% Vision Area* *188.53" by 188.53"*
10	0.30	53.1	Head	2.3946	1.0231	0.3824	0.5227	0.3849	0.3295
			L. Jamb	1.1912	0.9563	0.3423			
			R. Jamb	1.1928	0.9552	0.3424			
			Mullion	2.3840	0.9557	0.3423			
			Sill	2.3946	0.9500	0.3755			
11	0.28	54.2	Head	2.3946	1.0171	0.3700	0.5097	0.3683	0.3114
			L. Jamb	1.1912	0.9509	0.3280			
			R. Jamb	1.1928	0.9497	0.3282			
			Mullion	2.3840	0.9503	0.3281			
			Sill	2.3946	0.9498	0.3631			
12	0.26	55.2	Head	2.3946	1.0171	0.3578	0.4970	0.3517	0.2934
			L. Jamb	1.1912	0.9454	0.3140			
			R. Jamb	1.1928	0.9443	0.3141			
			Mullion	2.3840	0.9449	0.3140			
			Sill	2.3946	0.9458	0.3503			
13	0.24	56.3	Head	2.3946	1.0171	0.3456	0.4845	0.3353	0.2759
			L. Jamb	1.1912	0.9402	0.2999			
			R. Jamb	1.1928	0.9391	0.3000			
			Mullion	2.3840	0.9396	0.3000			
			Sill	2.3946	0.9455	0.3381			
14	0.22	57.3	Head	2.3946	1.0170	0.3336	0.4721	0.3189	0.2584
			L. Jamb	1.1912	0.9343	0.2859			
			R. Jamb	1.1928	0.9341	0.2860			
			Mullion	2.3840	0.9342	0.2860			
			Sill	2.3946	0.9453	0.3259			
15	0.20	58.4	Head	2.3946	1.0170	0.3216	0.4598	0.3024	0.2406
			L. Jamb	1.1912	0.9296	0.2719			
			R. Jamb	1.1928	0.9284	0.2720			
			Mullion	2.3840	0.9290	0.2720			
			Sill	2.3946	0.9451	0.3138			

Detailed drawings, datasheets, representative samples of test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period such materials shall be discarded without notice and the service life of this report by Architectural Testing will expire. 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 named herein and relates only to the specimen(s) simulated. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.:

SIMULATED BY:

Digitally Signed by: Eric Barilar

Eric Barilar
Simulation Technician

REVIEWED BY:

Digitally Signed by: Kevin Louder

Kevin S. Louder
Project Engineer

EAB:EAB
B6092.02-116-45

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix A: Drawings and Bills of Material (8)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
.02R0	2/14/2012	All	Original Report Issue

All drawings and Bills of Material used in simulating this product are enclosed in this Appendix.

Appendix A

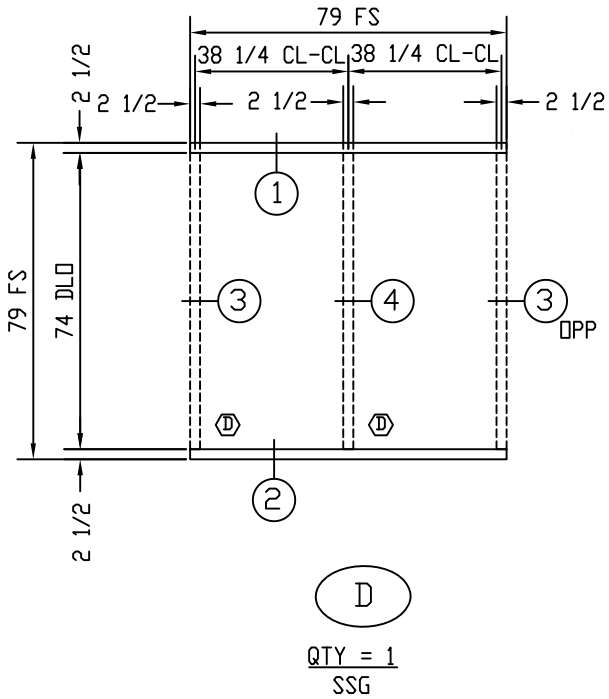
MU2011-004-01

ATI

Report # B6092-116-45

Date 2/3/2012

Simulator Eric Bakilas



SYMBOL KEY			
SYMBOL	DESCRIPTION	QTY	COMMENTS
D	37.875 X 74.875	2	1 INS = INSULATED GLASS

REV	REV_DESCRIPTION	DATE	XXX
SYM	REVISION	DATE	BY

CRL

2100 E. 38TH STREET VERNON, CA 90058
PHONE: (323) 588-1281 FAX: (323) 232-2523

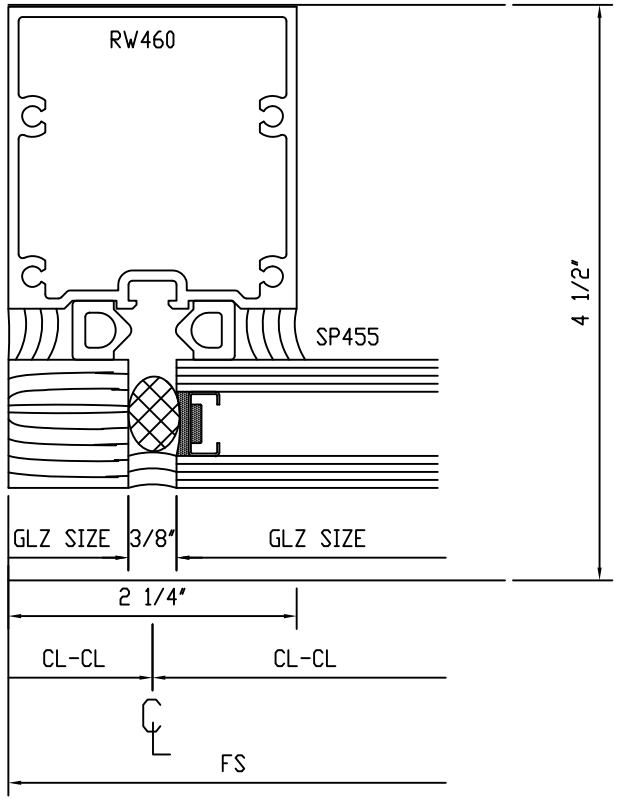
DIVISION UNITED STATES ALUMINUM

DRWN BY: DCW
DATE: 12/20/2011
SCALE: 3/8"=1"

THERMAL_TEST_NFRC_AAMA_1503
SERIES_TT451_SSG

DWG NO.
MU2011-004-01

MU2011-004-03



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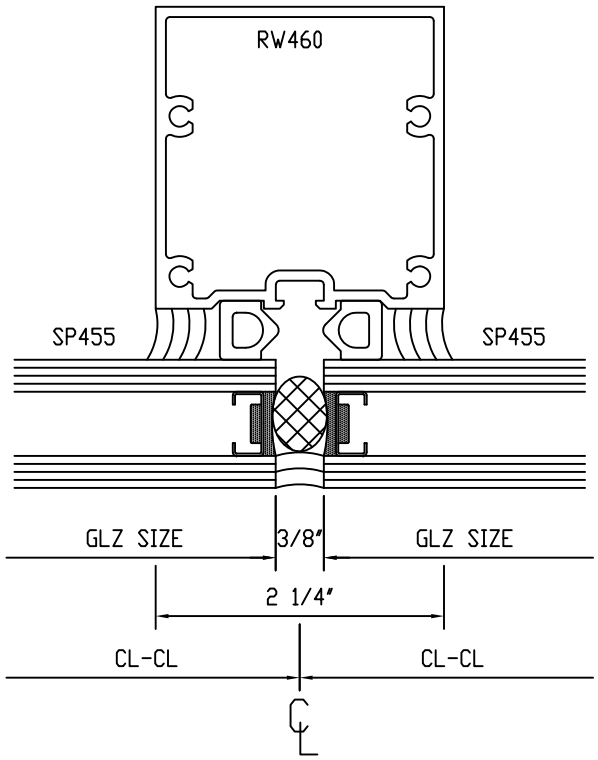


6

ATI

Report # B6092-116-45

Date 2/3/2012

Simulator Eric Bahilo

REV	REV_DESCRIPTION	DATE	XXX
SYM	REVISION	DATE	BY

2100 E. 38TH STREET VERNON, CA 90058
PHONE: (323) 588-1281 FAX: (323) 232-2523

DIVISION UNITED STATES ALUMINUM

DRWN BY: DCW

DATE: 12/20/2011

SCALE: FULL

THERMAL_TEST_NFRC_AAMA_1503

SERIES_TT451_SSG

DWG NO. MU2011-004-03

MU2011-004-02

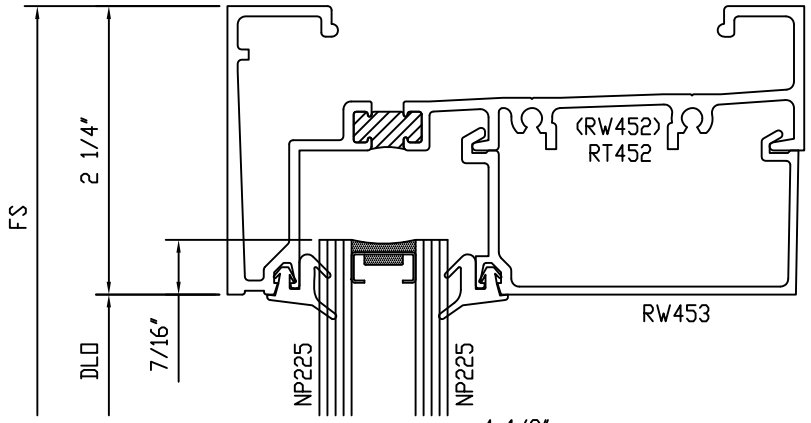
ATI

Report # B6092-116-45

Date 2/3/2012

Simulator Eric Bakilas

1



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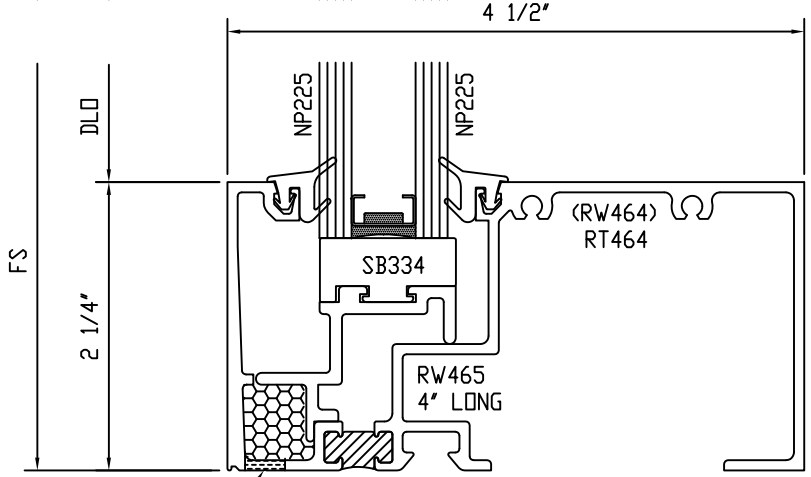


5/16" DIA WEEP
W/UB625 BAFFLE

2100 E. 38TH STREET VERNON, CA 90058
PHONE: (323) 588-1281 FAX: (323) 232-2523
DIVISION UNITED STATES ALUMINUM

REV	REV_DESCRIPTION	DATE	XXX
SYM	REVISION	DATE	BY

DRWN BY: DCW
DATE: 12/23/2011
SCALE: FULL

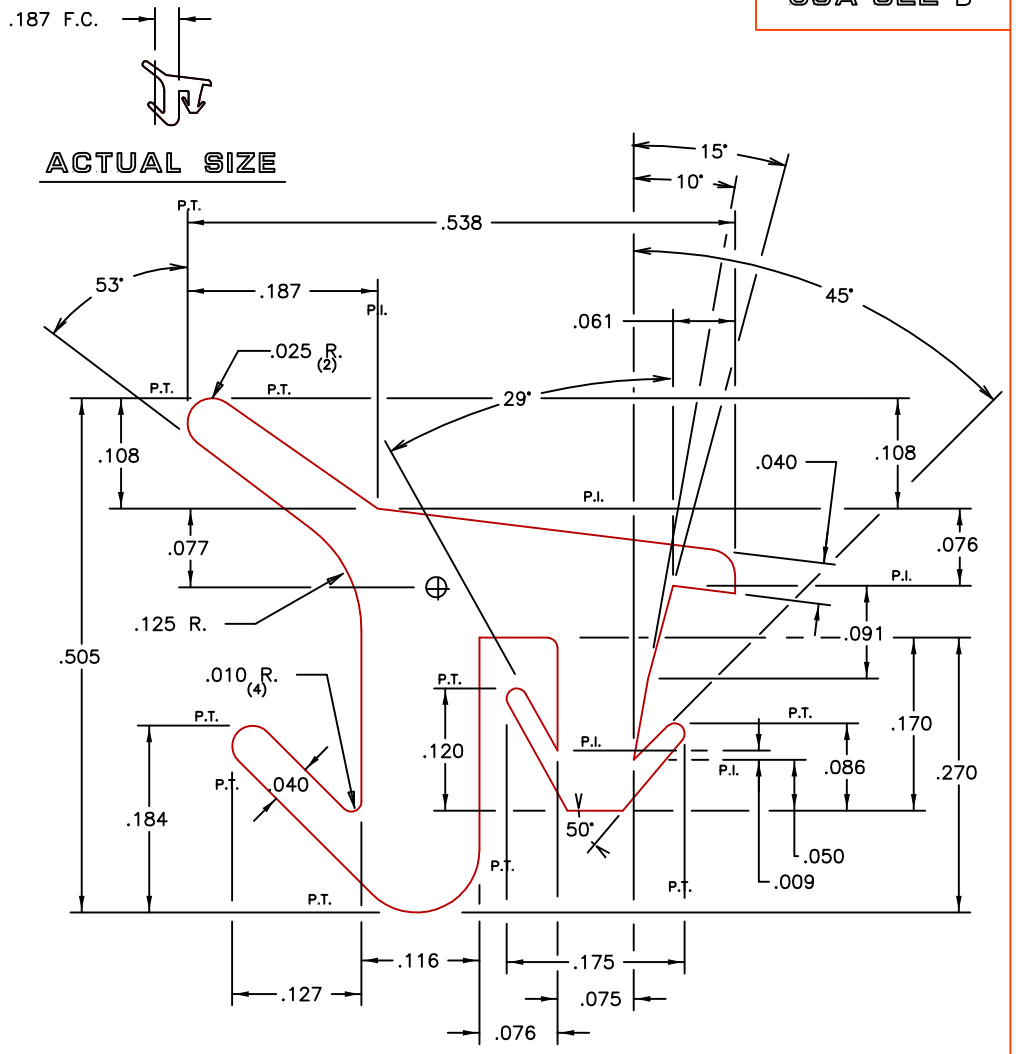
THERMAL_TEST_NFRC_AAMA_1503
SERIES_TT451_SSG

DWG NO.
MU2011-004-02

USA-822 B

NOTE:

1. MATERIAL: EPDM, BLACK
2. HARDNESS: 70 ±5SHORE, "A" SCALE
3. AREA: .101
4. .026 DIA FIBREGLAS CORD(6 STRANDS)
5. UNIVERSAL RUBBER DIE 3765 OR EQUAL
6. (B) SILICONE BATH REQUIRED.



ATI

Report # B6092-116-45

Date 2/3/2012

Simulator Eric Bakilas

B	NOTE ADDED	6/12/96	MM

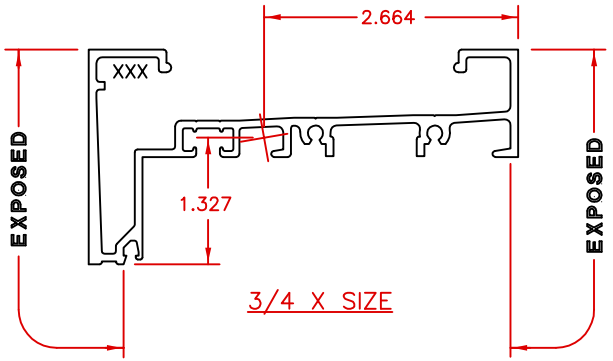
U.S. ALUMINUM CORP.

MAMO 8/16/90

8X SIZE

TOP LOAD GASKET
1/4" OR 1" GLASS
PART NO: NP225

USA-822B



UNITED STATES ALUMINUM CORP.		T-60605
HEAD	GLH	10-26-00
RW452	FULL SIZE	

ATI

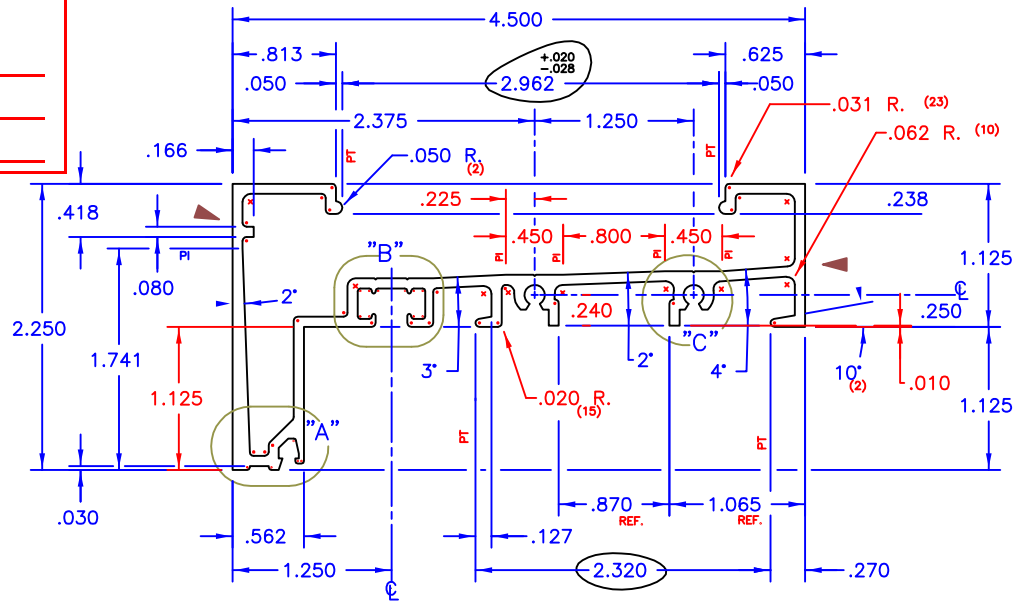
Report # B6092-116-45

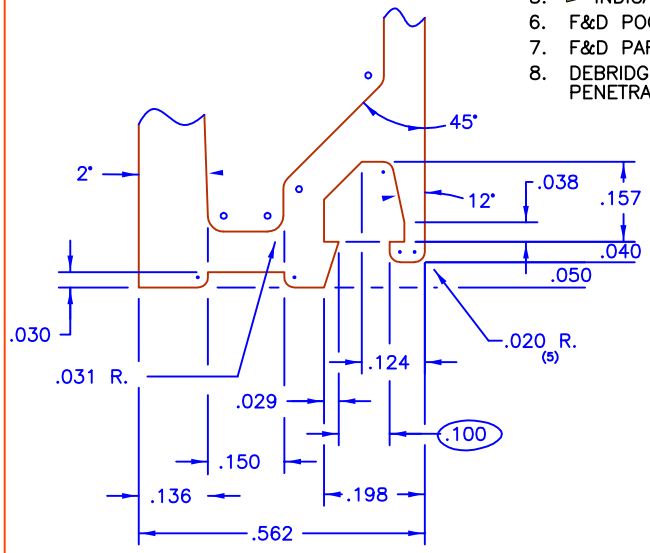
Date 2/3/2012

Simulator Eric Bahilla

NOTES:

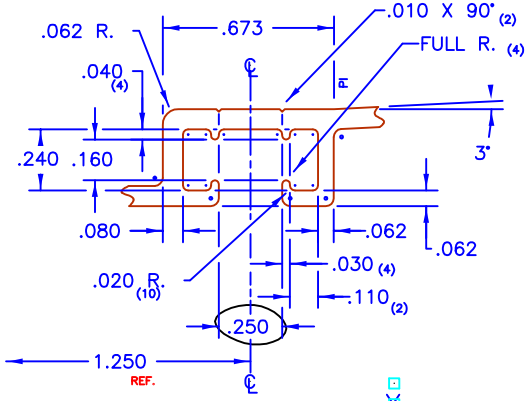
1. 6063-T5 ALLOY AND TEMPER
2. PAINT PERIMETER = 3.741"
3. XXX INDICATES I.D. MARK FOR IEC-TX
4. MATES WITH RW443 DIE#
   RW453; DIE#60606
   RW250; DIE#60598
   RW260; DIE#60600
5. ▻ INDICATES POSSIBLE STREAKING
6. F&D POCKET AREA = .130"
7. F&D PART NUMBER: RT452
8. DEBRIDGE WITH A .218 X .015 MAX PENETRATION INTO THERMAL AREA





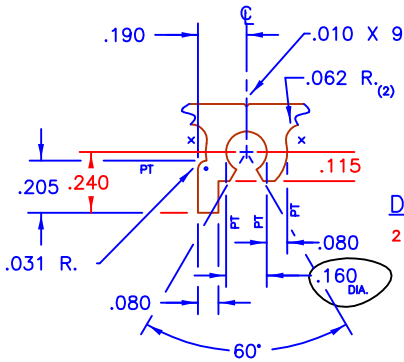
DETAIL "A"

4 X SIZE



DETAIL "B"

2 X SIZE



DETAIL "C"

2 X SIZE (2)PLACES

SECTION PROPERTIES

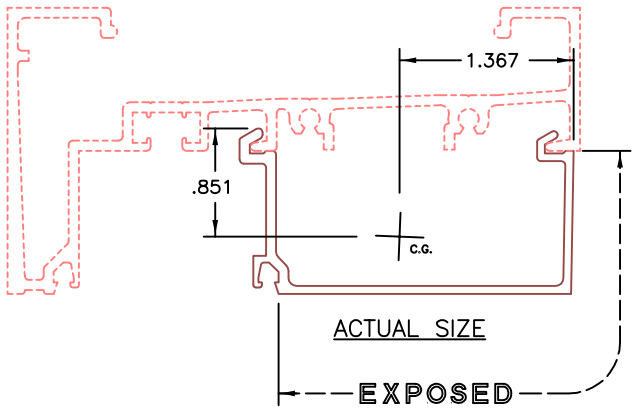
Ixx =	2.933	IN⁴
Sxx =	1.097	IN³
Iyy =	0.370	IN⁴
Syy =	0.279	IN³

.080

4 1/2" TOP NOTCH

1.132	100437	
1.358	5.031	
26.404	SOLID	
19		T-60605

UNITED STATES ALUMINUM CORP.		T-60606
1" GLASS STOP	GLH	7-21-00
RW453	2 X SIZE	



NOTES:

1. 6063-T5 ALLOY AND TEMPER
2. PAINT PERIMETER = 3.623"
3. XXX INDICATES I.D. MARK FOR IEC-TX
4. MATES WITH RW452; DIE#60605
   RW433; DIE#60606
   RW463; DIE#60608

ATI

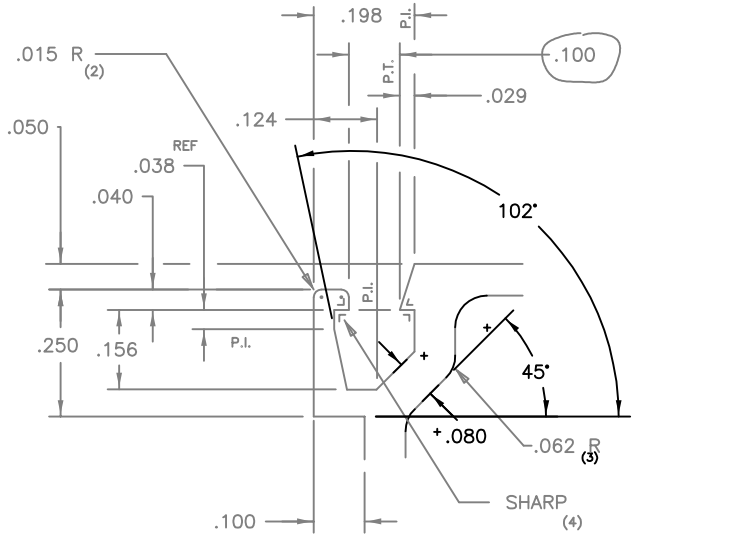
Report # B6092-116-45

Date 2/3/2012

Simulator Eric Barila

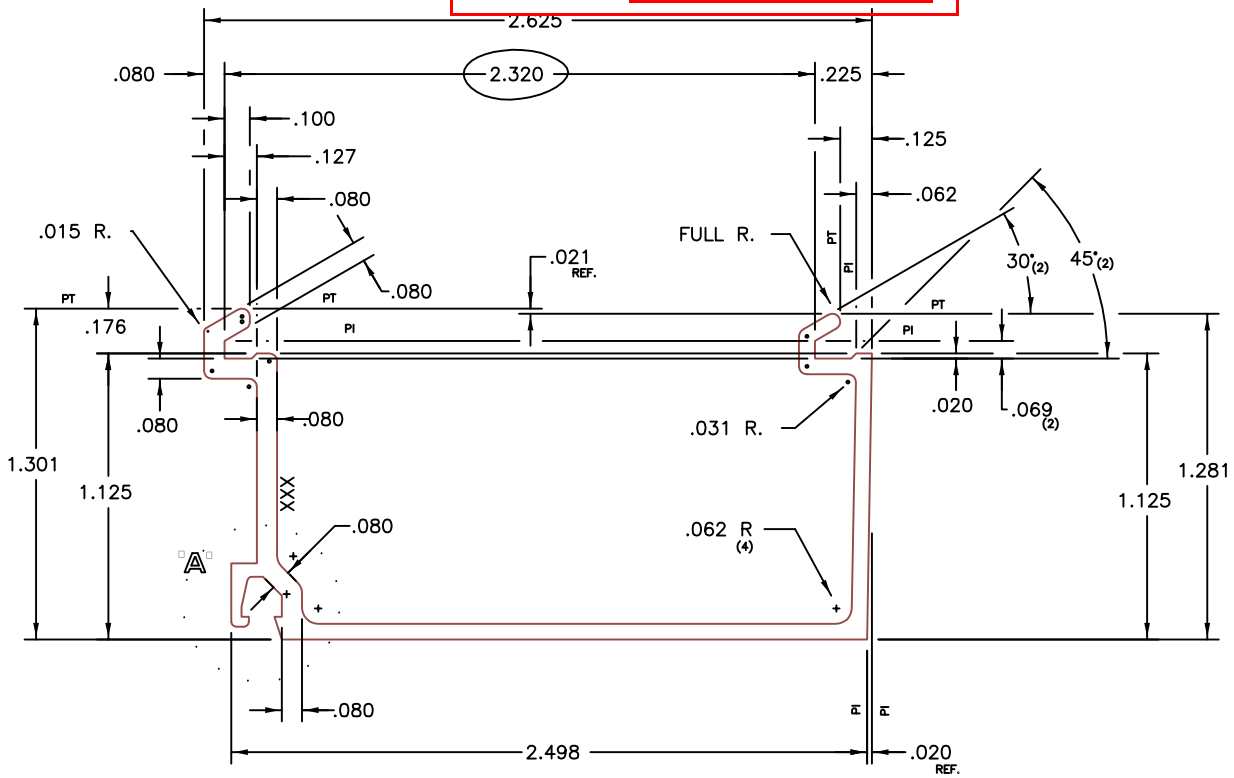
SECTION PROPERTIES

Ixx = 0.383 IN⁴
Sxx = 0.280 IN³
Iyy = 0.745 IN⁴
Syy = 0.875 IN³



GASKET POCKET DETAIL "A"

SCALE: 4X SIZE



.380	US-100374	
.456	2.875	
11.338	SOLID	
25		T-60606

RW450/451

ATI

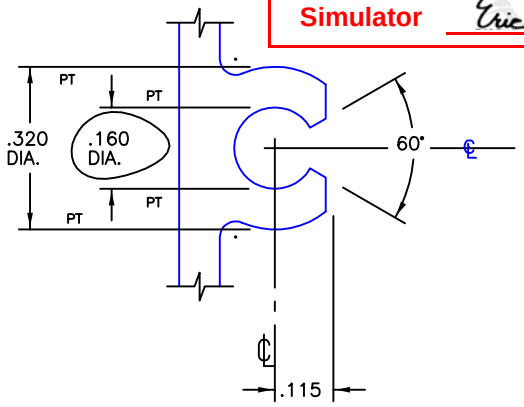
Report # B6092-116-45

Date 2/3/2012

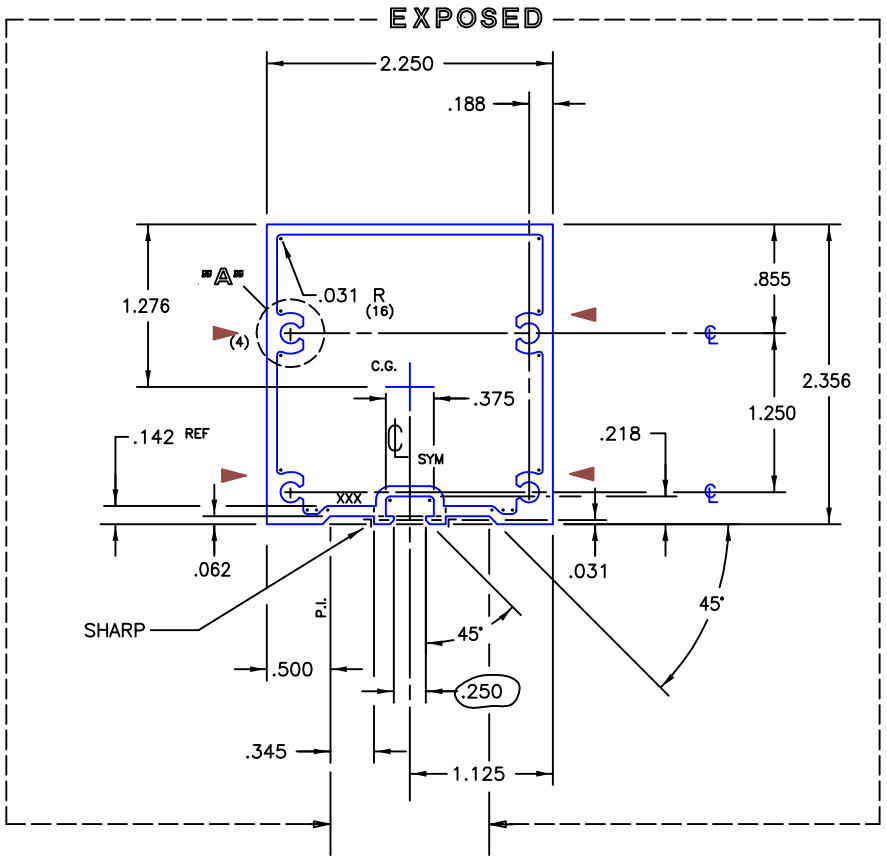
Simulator Eric Bakilas

UNITED STATES ALUMINUM CORP.			H-60607
SILICONE GLAZE VERT. MULL		DWJ	7-24-00
RW460		FULL SIZE	

ECN



DETAIL "A"
4 X SIZE
(4 PLACES)



SECTION PROPERTIES

Ixx =	0.712	IN⁴
Sxx =	0.558	IN³
Iyy =	0.723	IN⁴
Syy =	0.643	IN³

NOTES:

1. 6063-T5 ALLOY AND TEMPER
2. XXX INDICATES I.D. MARK FOR IEC-TX
3. PAINT PERIMETER = 8.126"
4. OUTSIDE PERIMETER =10.173"
5. ► INDICATES POSSIBLE STREAKING

.080

.924	US-100373	
1.109	3.257	
20.989	HOLLOW	
19		H-60607

RW451

NOTES:

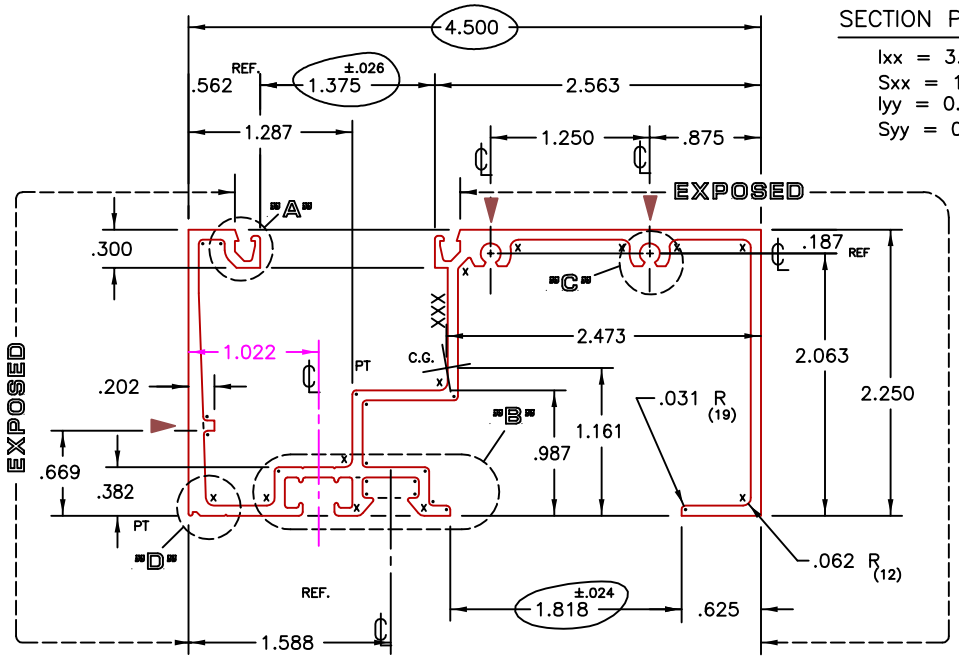
1. 6063–T5 ALLOY AND TEMPER.
2. DEBRIDGE WITH A .218 x .015 MAX PENETRATION INTO THERMAL AREA.
3. ASSEMBLES WITH RW252; DIE# 60599 RW465; DIE#60610
4. THERMAL DETAIL AREA: .138; "AA"
5. PAINT PERIMETER: 7.229
6. XXX INDICATES ID MARK FOR IEC–TX.
7. ◄ = STREAKS POSSIBLE
8. F&D PART NO. IS RT464

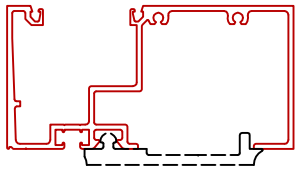
UNITED STATES ALUMINUM CORP.		T–60609
SILL	DWJ	7–24–00
RW464	FULL SIZE	

ECN

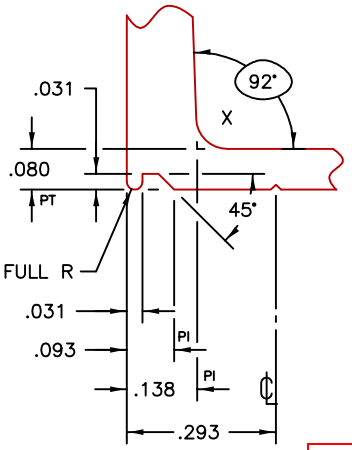
SECTION PROPERTIES:

Ixx = 3.148 in^4
Sxx = 1.273 in^3
Iyy = 0.877 in^4
Syy = 0.755 in^3

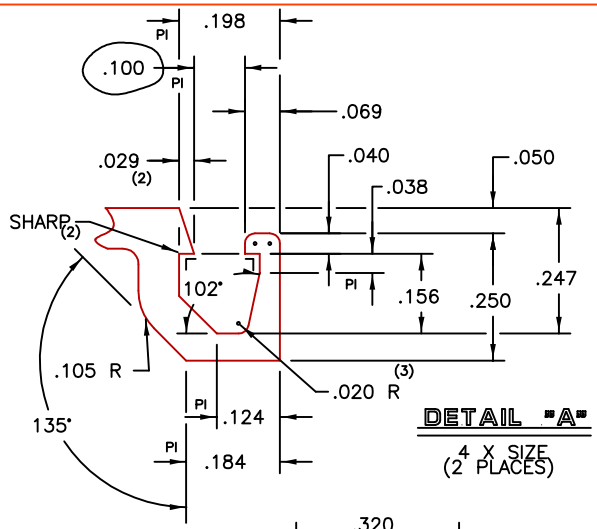




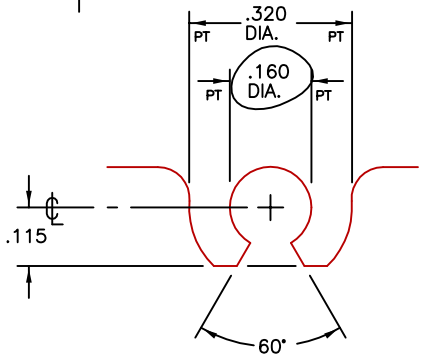
ASSEMBLY
HALF SIZE



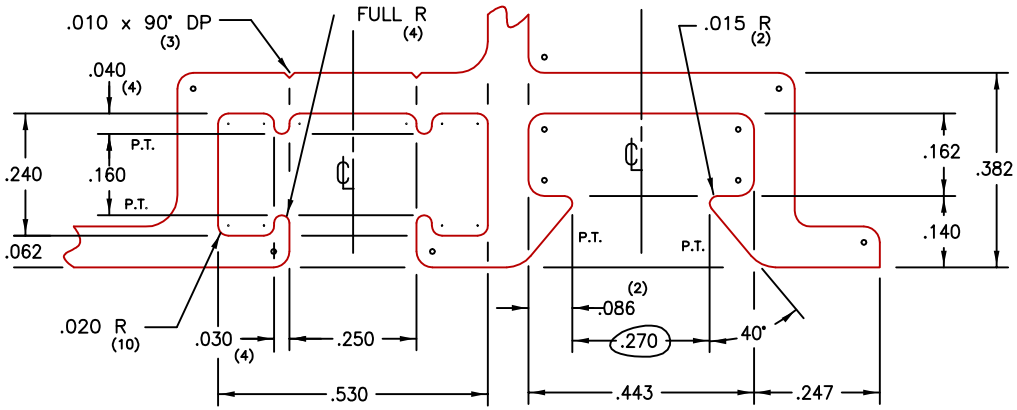
DETAIL "D"
4 X SIZE



DETAIL "A"
4 X SIZE
(2 PLACES)



DETAIL "C"
4 X SIZE
(2 PLACES)



DETAIL "B"
4 X SIZE

ATI	
Report #	B6092-116-45
Date	2/3/2012
Simulator	Eric Bardin

.080

1.279	US–100372	
1.534	5.030	
29.971	SOLID	
20		T–60609

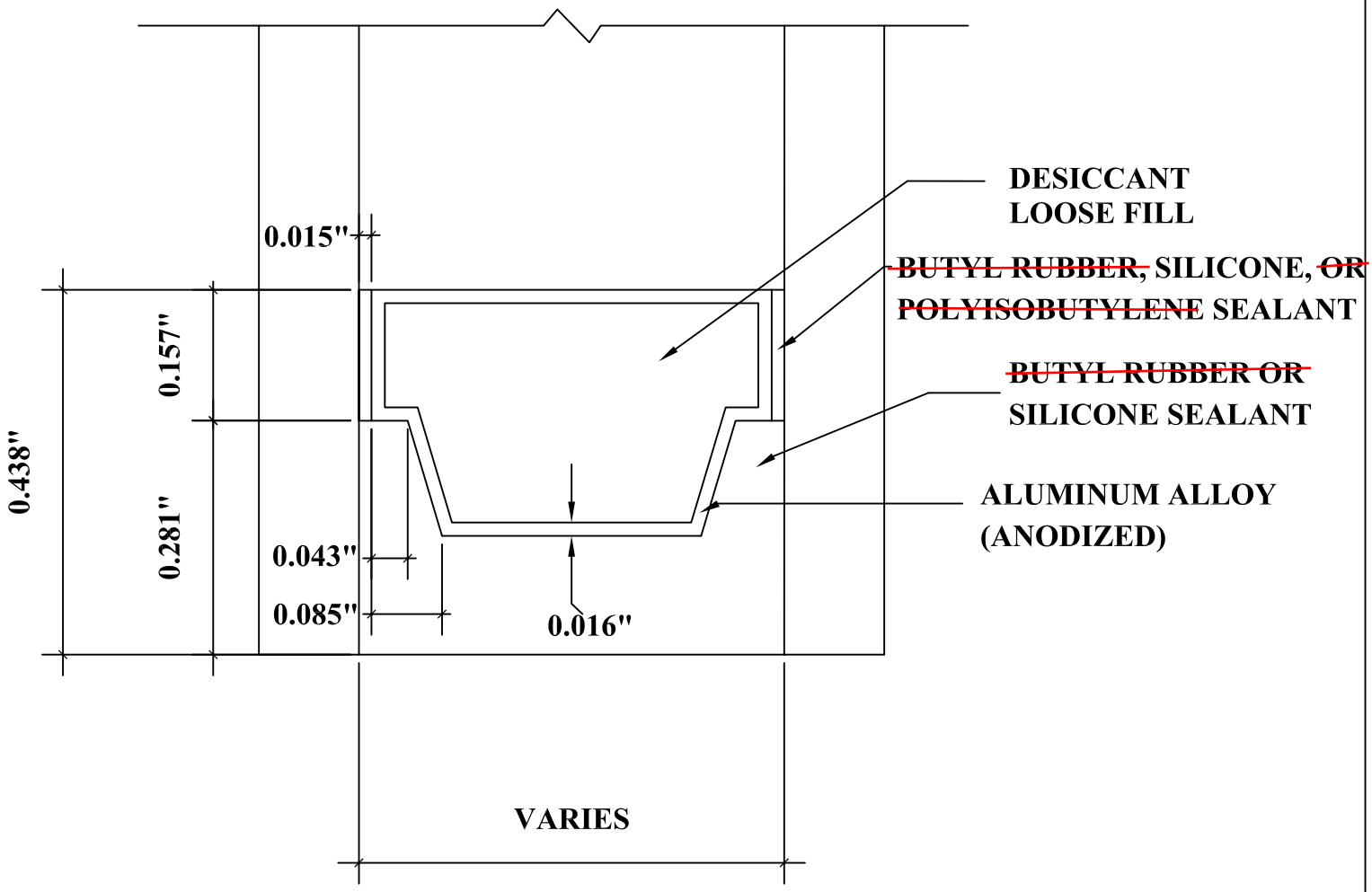
RW451

ATI

Report # B6092-116-45

Date 2/3/2012

Simulator Eric Bakke



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