

WINDOW SIMULATION REPORT

NFRC 100: Procedure for Determining Fenestration Product U-Factors

NFRC 200: Solar Heat Gain Coefficient and Visible Transmittance

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

REPORT PREPARED FOR:

**Chip Vaughn
Great Land Windows
261 College Road
Fairbanks
Alaska
99701
(907) 479-8437**

REPORT NUMBER:

ILF10003w-b

PRODUCT LINE:

300 Fixed

August 23 , 2010

**Enermodal Engineering Ltd.
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Manufacturer: Great Land Windows

Report Number: ILF10003w-b

Product Line: 300 Fixed

Frame: Fiberglass with Styrofoam

Sash: N/A

Thermal Break: N

Edge of Glass: The glazing is held by a neoprene glazing wedge on the interior edge and foam weatherstripping on the exterior edge.

Glazing: Glazing options are triple, quint, argon and krypton fill.

Spacer: Super Spacer E-class: OF-D; Steel: CS-D

Weatherstripping: N/A

Simulations: Performed using WINDOW 5, and THERM 5.

General: This product line includes the 300 Fixed manufactured by Great Land Windows.
This is a reissued report of ILF701w-i.

Michael Barclay, P.Eng.

Simulator

Michael Barclay, P.Eng.

Simulator in Responsible Charge

WINDOW SIMULATION REPORT

The windows documented in this report were simulated in accordance with the NFRC 100: Procedure for Determining Fenestration Product U-Factors (2010), NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence (2010) and NFRC 500: Procedure for Determining Fenestration Product Condensation Resistance Values (2010).

The windows were simulated using WINDOW 5 and THERM 5 computer programs as specified in NFRC 100 and NFRC 200. The most currently approved spectral data files from NFRC were also used. The WINDOW program models the one-dimensional heat flow through the center-of-glass portion of the window. The THERM program models the two-dimensional heat flow through the frame, edge-of-glass, divider, and divider-edge portions of the window. The input data for both programs is based on manufacturer's specifications. Defaults for material thermal and optical properties are given in the computer programs. When values other than defaults were used, they are documented.

Ratings values included in this report are for submittal 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.

DISCLAIMER:

This window simulation report was generated by Enermodal Engineering Ltd. of Kitchener, ON. The report relates only to the items specified.

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Enermodal Engineering Ltd. and its employees neither endorse nor warrant the suitability of the product simulated. Every effort was taken to accurately model the performance of the windows documented in this report. Because of the large amount of input data and analyses, it is possible that errors or omissions could occur.

Neither Enermodal Engineering Ltd. nor any of its employees shall be responsible for any loss or damage resulting directly or indirectly from any default, error, or omission.

SIMULATION NOTES

- 1 Unless otherwise stated. All continuous hardware that does not create a thermal bridge such as hinges, balances, locks etc. are not modeled.
- 2 This is an "NFRC 100: Procedure for Determining Fenestration Product U-Factors" Certification Report.
- 3 This is an "NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence" Certification Report.
- 4 This is an "NFRC 500: Procedure for Determining Fenestration Product Condensation Resistance Values" Certification Report.
- 5 Unit conversions are performed according to NFRC601.
- 6 All glazing surface emissivities are assumed to be 0.84 unless otherwise stated.
- 7 The gas fill method is single probe with 90% argon and 90% krypton fill.

NFRC - U-Value Baseline Product

Manufacturer: Great Land Windows

Mfr contact: Chip Vaughn

Product line: 300 Fixed

Simulator in Michael Barclay,
Responsible P.Eng.
Charge:

Product Type: FIXD

IA Name:

Frame: Fiberglass with Styrofoam

Report number: ILF10003w-b

Date: 8/23/2010

Revised date:

CPD:

Product Description	272-kry-TC88-kry-TC88-kry-272, bsl	
Glass Thick 1 (in)	0.154	
Glass Thick 2 (in)	0.003	
Glass Thick 3 (in)	0.003	
Glass Thick 4 (in)	0.154	
Glass Thick 5 (in)		
# of Glazing Layers	4	
Surface #2 Emissivity	0.04	
Surface #3 Emissivity	0.13	
Surface #4 Emissivity	0.11	
Surface #5 Emissivity	0.13	
Surface #6 Emissivity	0.11	
Surface #7 Emissivity	0.04	
Surface #8 Emissivity		
Gap 1	0.372	
Gap 2	0.372	
Gap 3	0.372	
Gap 4		
Validation Size	1200 x 1500 mm	
	47.244 x 59.055 in	
Spacer Type	CS-D	
Grid	N	
Gap Fill	Air (10%) / Krypton (90%) Mix	
U-Value	0.17	

ID	Name	No. of Layers	Mode	Tilt	Environmental Conditions	Keff (Btu/h*ft²F)	Overall Thickness (in)	Uval (Btu/h*ft²F)	SHGC	Visible Transmittance
1	cl-arg-TC88-arg-Cl	3	#	90	NFRC 100-2001	0.016	1.364	0.145	0.510	0.650
2	SB60-arg-SB60-arg-Cl	3	#	90	NFRC 100-2001	0.013	1.354	0.124	0.308	0.582
3	cl-kry-TC88-kry-cl-kry-TC88-kry-cl	5	#	90	NFRC 100-2001	0.009	1.360	0.083	0.384	0.472
14	272-kry-TC88-kry-TC88-kry-272	4	#	90	NFRC 100-2002	0.007	1.437	0.070	0.291	0.399

NFRC Simulation Data – Summary

Manufacturer: Great Land Windows
 Series/Model #: 300 Fixed

Spacer: Super Spacer E-class: OF-D; Steel: CS-D

Operator Type: FIXD Sim Lab Code: SEEL
 Model Size: 1200 x 1500 Report number: ILF10003w-b
 Thermal Break: N Date: 8/23/2010
 Revised Date:
 Rating Procedure: 2010

Mfr-Product Code	Product Number	Gap 1 (in)	Gap 2 (in)	Gap Fill 1	Gap Fill 2	Emissivity Surface 2	Emissivity Surface 3	Emissivity Surface 4	Emissivity Surface 5	Tint	Spacer	Grid Type	Grid Size	U-Factor (Btu/h*F ²)	SHGC	VT	*CR
SB60-arg-SB60-arg-Cl, se	0001	0.50	0.50	ARG	ARG	0.03		0.03		CL	OF-D	N		0.16	0.25	0.47	72
cl-arg-TC88-arg-Cl, sl	0002	0.56	0.56	ARG	ARG		0.13	0.11		CL	CS-D	N		0.20	0.41	0.52	62
cl-kry-TC88-kry-cl-kry-TC88-kry-cl, sl	0003	0.25	0.25	KRY	KRY		0.13	0.11		CL	CS-D	N		0.14	0.31	0.38	66

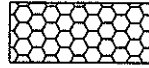
*Note: The Condensation Resistance results obtained from this procedure are for controlled laboratory conditions and do not include the effects of air movement through the specimen, solar radiation, and the thermal bridging that may occur due to the specific design and construction of the fenestration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

APPENDIX A

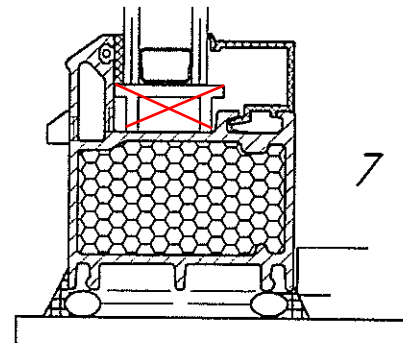
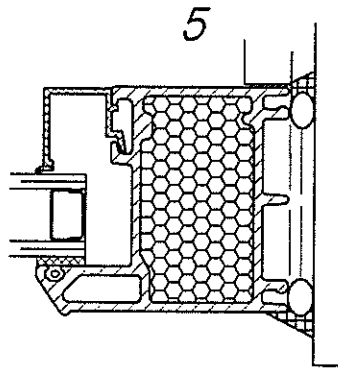
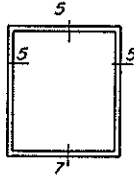
Product Drawings



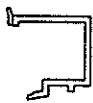
SERIES 300/301 FIXED WINDOW



~~OPTIONAL STYROFOAM~~



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22mm(DOUBLE GLASS)
GLASS STOP(PVC)



5.08mm F.C. 4.06mm F.C. 3.04mm F.C.
GLAZING WEDGE(NEOPRENE)



35mm(TRIPLE GLASS)
GLAZING STOP(ALUMINUM)

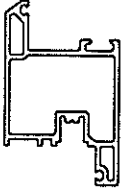
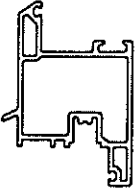
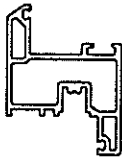
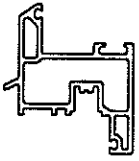
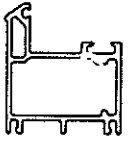
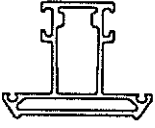
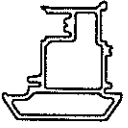
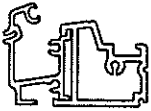




30 Constellation Court
Toronto, Ontario M9W 1K1

PARTS LIST

SERIES 300 & SERIES 301
TILT'N TURN/CASEMENT/AWNING

DR. BY.	
DATE	Feb. 2007
SHEET	1 / 6
300-100	

Parts #	Description	Colour	Price	Comments
301*		Door sash	Not painted	Fiberglass, S/L=
			White	
			Other	
301D*		Door sash with drip deflector	Not painted	Fiberglass, S/L=
			White	
			Other	
302		Window sash	Not painted	Fiberglass, S/L=
			White	
			Other	
302D		Window sash with drip deflector	Not painted	Fiberglass, S/L=
			White	
			Other	
303*		Perimeter frame	Not painted	Fiberglass, S/L=
			White	
			Other	
304		Mullion / Transom	Not painted	Fiberglass, S/L=
			White	
			Other	
305		Astragal (2 leaf opening)	Not painted	Fiberglass, S/L=
			White	
			Other	
308/309		Patio door sill (Alum. / PVC)	Not painted	Alum. / PVC, S/L=
			White	
			Other	
310		Connecting bar (for frame)	JUL 26 2007	PVC, S/L=
311		Glass stop 22mm(7/8")	Not painted	PVC, S/L=
			White	
			Other	

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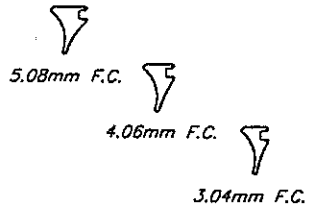







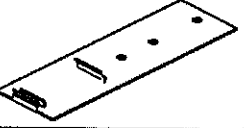
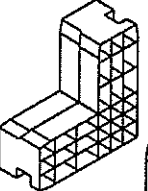
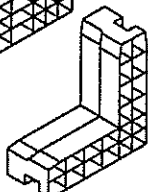
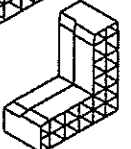
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PARTS LIST

SERIES 300 & SERIES 301
TILT'N TURN/CASEMENT/AWNING

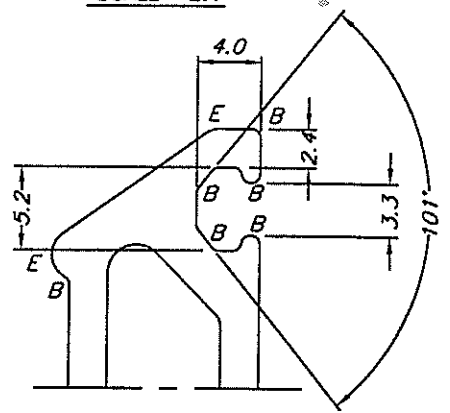
DR. BY.	
DATE	Feb. 2007
SHEET	2 / 6

300-100

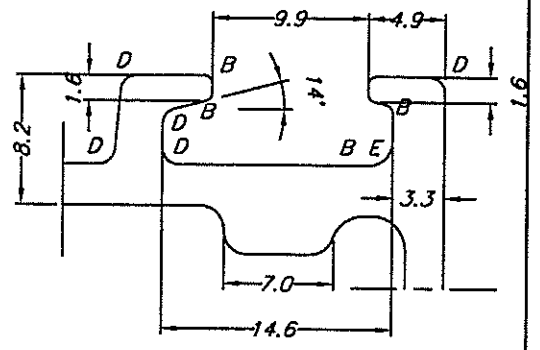
Parts #	Description	Colour	Price	Comments
312		Glass stop 35mm(1 3/8")	Not painted	Aluminum, S/L=
			White	
			Other	
	 5.08mm F.C. 4.06mm F.C. 3.04mm F.C.	Glazing wedge		Neoprene, /roll
313		Air seal plug left or right (for astragal)		PVC, / per carton
315		Door sash riding block		PVC, S/L=
319		Glass setting block		PVC, S/L=
320		Glazing pocket filler		2000'/roll
321		Adhesive glazing tape 1/8" x 1/2"		Neoprene, 100'/roll
113		Bulb-type gasket		Rubber /roll
323		Bulb-type gasket		Rubber /roll
324		Window sash riding block		PVC, S/L=
737B		Strap anchor		Falv. steel, / per carton
325		Door sash shearblock	Report Number: ILF 701W-1	Nylon+30% glass filled /per carton
			JUL 26 2007	
			Enermodal Engineering Ltd.	
326		Window sash shearblock		Nylon+30% glass filled /per carton
327		Perimeter frame shearblock		Nylon+30% glass filled /per carton



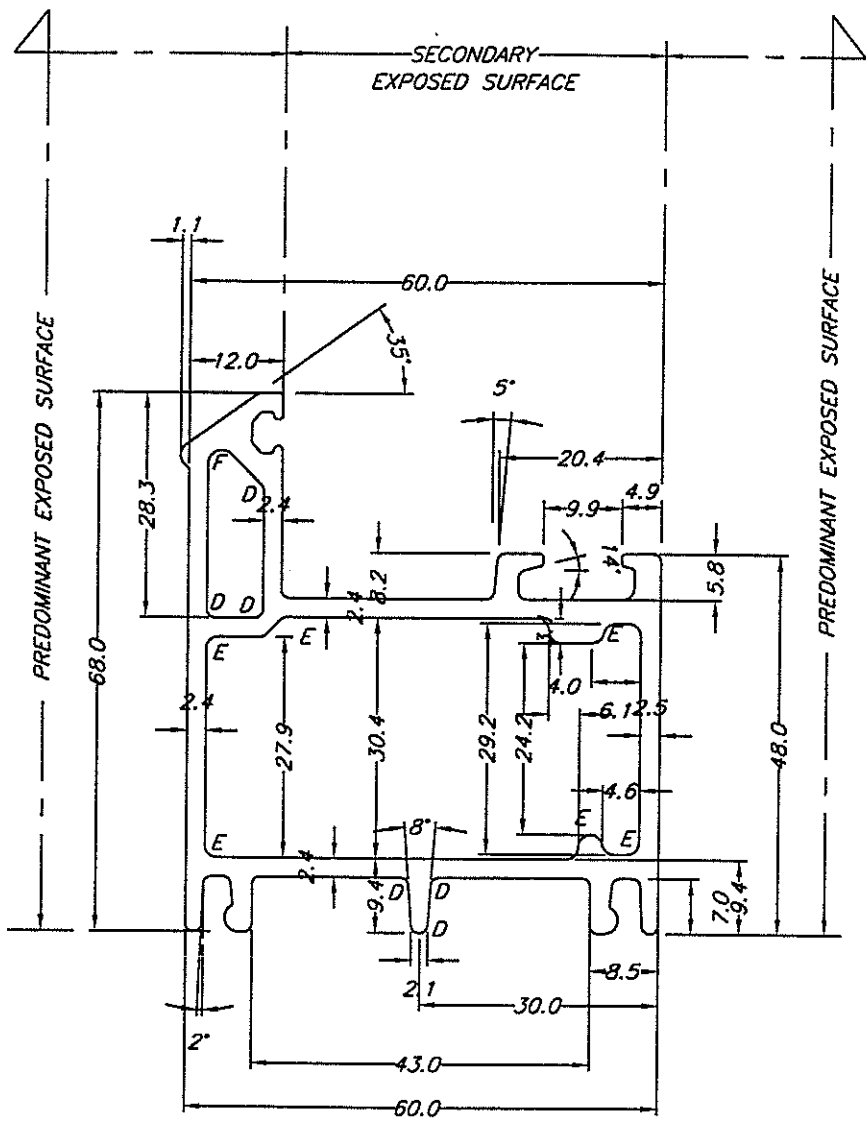
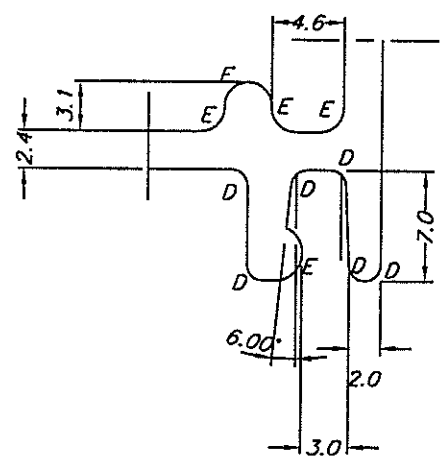
SCALE 2:1



SCALE 2:1



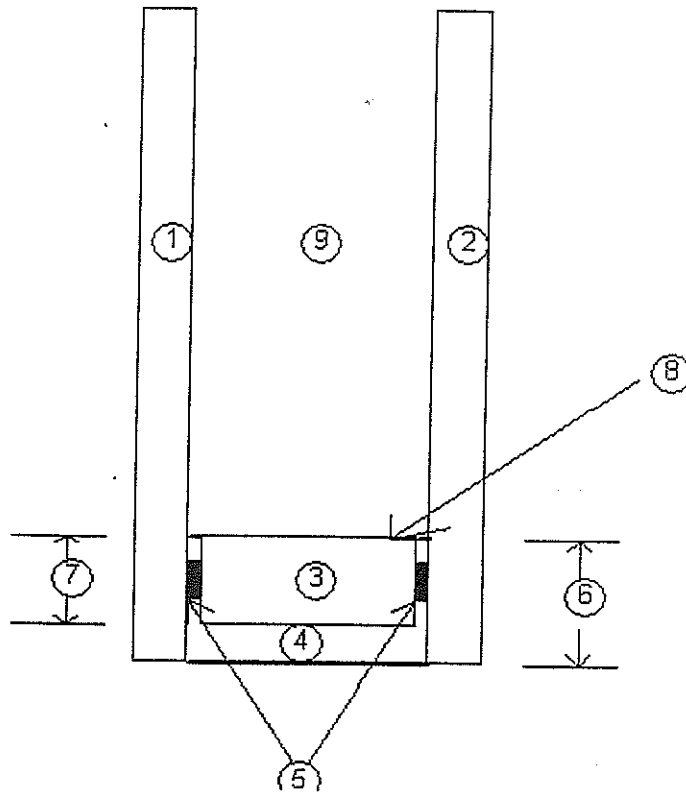
SCALE 2:1



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A	0.25	CUSTOMER		INLINE FIBERGLASS		DESCRIPTION	
B	0.50	Inline Fiberglass Ltd.		O.K. TEAM		FRAME	
C	0.75	DWG #		DATE		TOL.	
D	1.00	303		01.Oct..'99		SCALE 1:1	
E	1.50	WEIGHT	AREA	PERIM.	WALL	DRWN	MAT'L
F	1.75	kg/m	mm ² 923.9	mm 476.6	THK. mm 2.4	BY R.N.	Fiberglass
G	2.00	WEIGHT	AREA	PERIM.	WALL	CHK'D	DIRECT#
		lb/ft	in ²	in	THK. in (.095)	BY M.P.	/300N
H	2.50	REV.	DATE	NOTES	REV.	DATE	NOTES
		3.00	1.	Oct.13.'99			

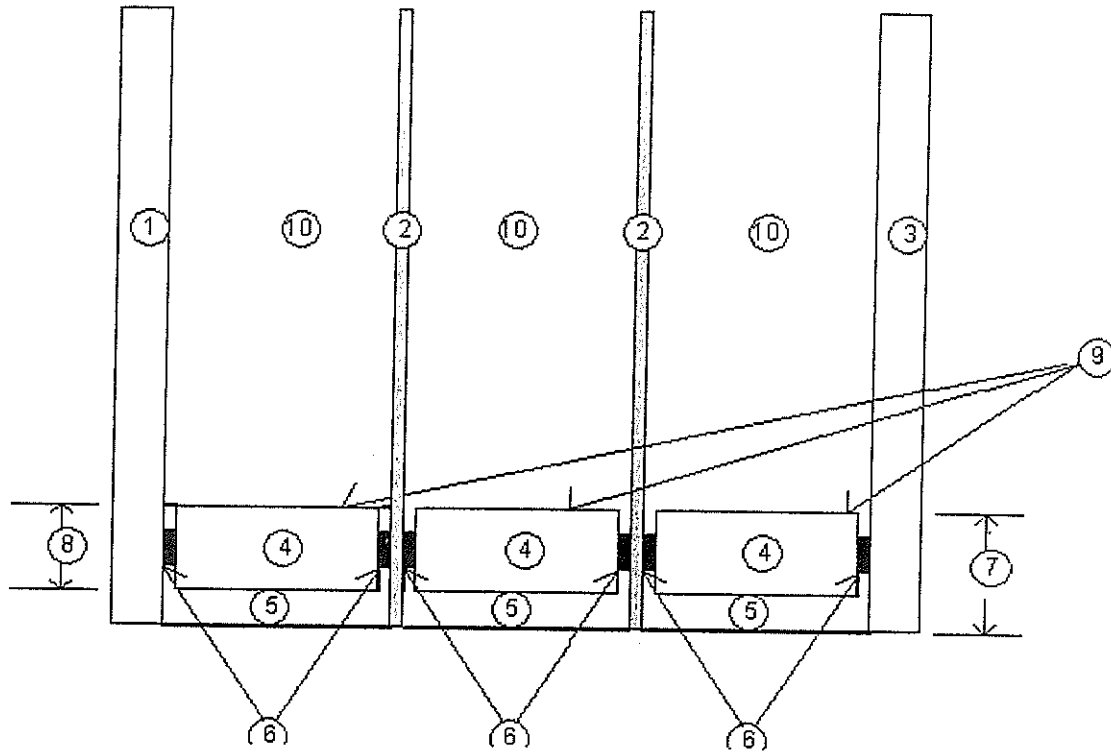
Edge of Glass Detail [Super Spacer] (double glazing)



Location	Detail	Description	Size
1	Glass Type	as per option	3 mil
2	Glass Type	as per option	3mil
3	Dessicant	Molecular Sieve Type 3A	
4	2nd Seal	Polysulfide or Polyurethane	N/A
5	Primary Seal	Structural acrylic side adhesive	N/A
6	Bite		9.5 mil
7	Spacer Height	EdgeTech "E" class Superspacer	4.75 mil
8	Spacer Type	EdgeTech "E" class Superspacer	7.1 mil
9	Gas Fill	95% Argon, 5% Air	or 100 % Air as per option

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Edge of Glass Detail (Double Heat Mirror)

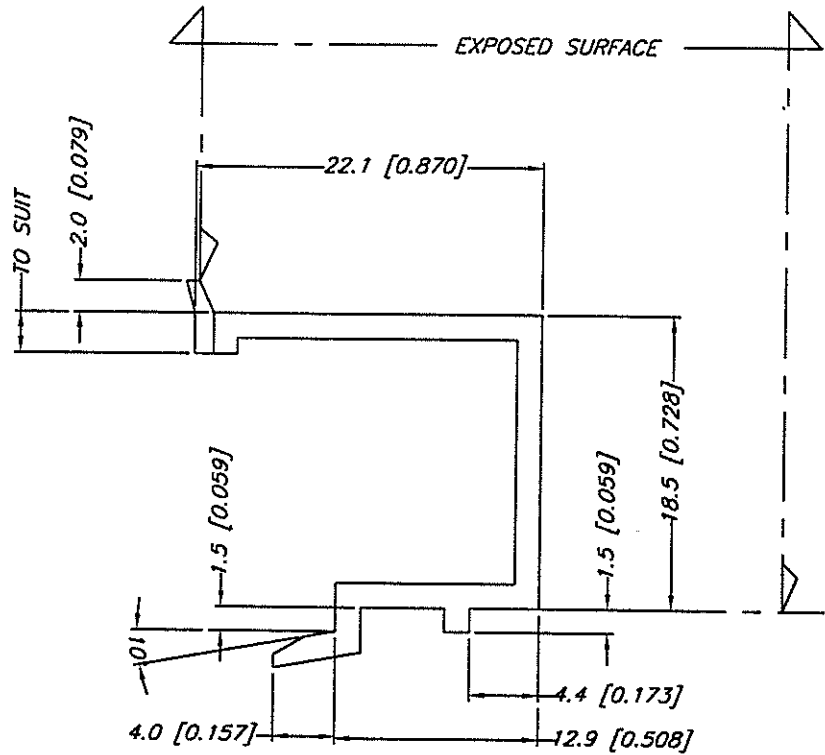


Location	Detail	Description	Size
1	Glass Type	clear	3 mil
2	Heat Mirror Type	HMTC88	.076 mil
3	Glass Type	clear	3 mil
4	Desiccant	Molecular Sieve Type 3A	
5	2nd Seal	Polyurethane (PRC)	
6	Primary Seal	P.I.B. (Polyisobutylene)	0.5 mil
7	Bite		12.7 mil
8	Spacer Height	allmetal steel	7.9 mil
9	Spacer Type	allmetal steel	
10	Gas Fill	Krypton 95% , 5% air	

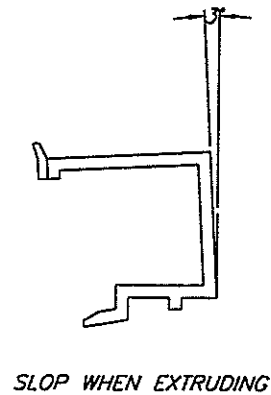
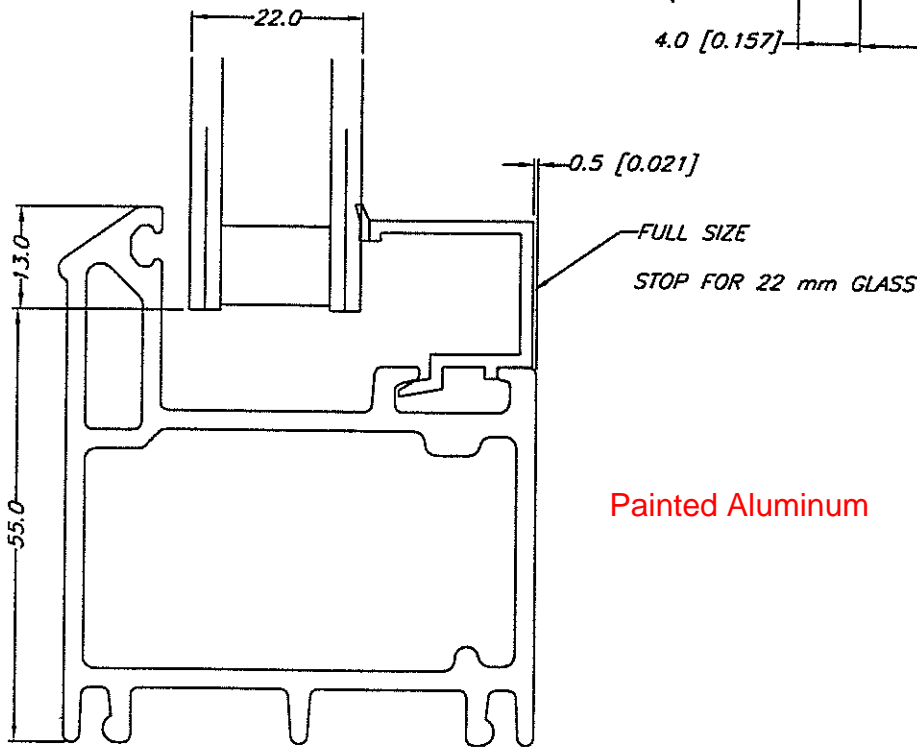
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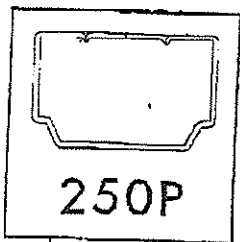
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A	0.25	Inline Fiberglass Ltd.				CUSTOMER		DESCRIPTION	
B	0.50	311				CUSTOMER		PVC	
C	0.75	16.Mar.'00				DATE		TOL	
D	1.00	91.6				PERIM. mm		SCALE 1 : 1	
E	1.50	120.1				WALL THK. mm		DRWN BY R.N.	
F	1.75	120.1				WALL THK. in		CHK'D BY M.P.	
G	2.00	/300N				DIRECT#			
H	2.50	REV.				DATE		NOTES	
I	3.00	REV.				DATE		NOTES	

Steel - for heat mirror

Att: Khet

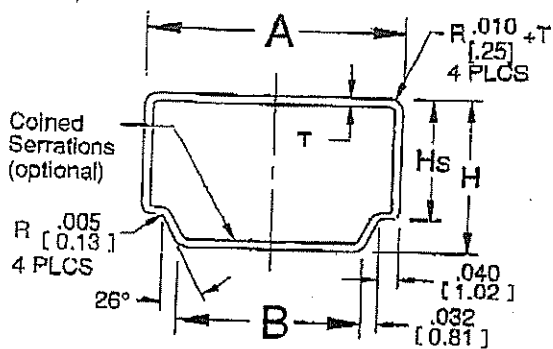


250P

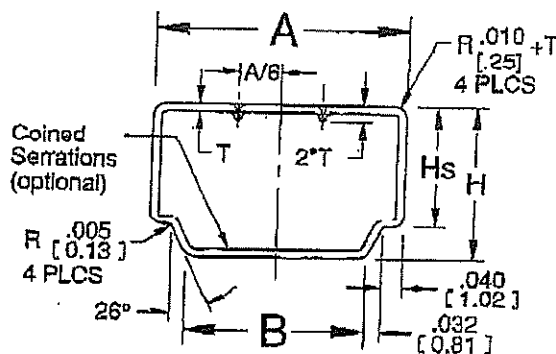
ALLMETAL®

250P Air Spacer

This is in EG Steel



Zippered
(all sizes)



Perforated
(1/4" [6.5mm] and wider)

Tolerance: All dimensions $\pm .005$ [.13mm] unless otherwise specified

Material	H		Hs		T	
	IN	MM	IN	MM	IN	MM
.008" [20mm] Hi-Q Steel	.302	7.67	.240	6.10	.008	.20
.010" [25mm] Anodized Aluminum	.305	7.75	.244	6.20	.010	.25
.012" [30mm] Hi-Q Steel	.307	7.80	.246	6.25	.012	.30
.014" [36mm] EG Steel	.311	7.90	.248	6.30	.014	.36
.014" [36mm] Anodized Aluminum	.311	7.90	.248	6.30	.014	.36
.015" [38mm] Black Steel	.313	7.95	.249	6.32	.015	.38
.016" [41mm] Anodized Aluminum	.315	8.00	.250	6.35	.016	.41
.016" [41mm] Mill Finish Aluminum	.315	8.00	.250	6.35	.016	.41
.0185" [47mm] Mill Finish Aluminum	.320	8.13	.252	6.40	.019	.47

Notes:

1. Dimensions are in decimal inches; dimensions in [] brackets are in mm.
2. Available with serrations at no extra charge on inside of Aluminum spacer at location indicated above; not recommended for spacer to be used for bending.
3. Material tolerances can be found on Material Specifications Data page (ii).
4. Thermal properties can be found on Thermal Performance Data page (iii).

Report Number:

ILF 701W-n

AUG 01 2007

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