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

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REPORT PREPARED FOR:

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

REPORT NUMBER:

ILF10003w-e

PRODUCT LINE:

325 High Profile Fixed

August 23 , 2010

Enermodal Engineering Ltd.
582 Lancaster St. W.
Kitchener ON
N2K 1M3
(519) 743-8777
office@enermodal.com

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Manufacturer:	Great Land Windows
Report Number:	ILF10003w-e
Product Line:	325 High Profile 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 325 High Profile Fixed manufactured by Great Land Windows. This is a reissued report of ILF701w-a.

Michael Barclay

Digitally signed by Michael Barclay
DN: cn=Michael Barclay, o=Enermodal Engineering Ltd., ou=Window Division, email=mbarclay@enermodal.com, c=CA
Date: 2010.08.25 19:53:20 -04'00'

Michael Barclay, P.Eng.

Simulator

Michael Barclay

Digitally signed by Michael Barclay
DN: cn=Michael Barclay, o=Enermodal Engineering Ltd., ou=Window Division, email=mbarclay@enermodal.com, c=CA
Date: 2010.08.25 19:53:27 -04'00'

Michael Barclay, P.Eng.

Simulator in Responsible Charge

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-licenced 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.

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

Product line: 325 High Profile Fixed

Product Type: FIXD

Frame: Fiberglass with Styrofoam

Mfr contact: Chip Vaughn

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

IA Name:

Report number: ILF10003w-e

Date: 8/23/2010

Revised date:

CPD:

Product Description	272-kry-TC88-kry-TC88-kry-272, sl
Glass Thick 1 (in)	0.117
Glass Thick 2 (in)	0.003
Glass Thick 3 (in)	0.003
Glass Thick 4 (in)	0.117
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	0.34
Gap 2	0.38
Gap 3	0.34
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	0.13

ID	Name	No. of Layers	Mode	Tilt	Environmental Conditions	Keff (Btu/h*ft*F)	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	1.302	0.073	0.293	0.402

NFRC Simulation Data – Summary

Manufacturer: Great Land Windows
Series/Model #: 325 High Profile 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-e
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*ft²F)	SHGC	VT	*CR
SB60-arg-SB60-arg-Cl, se	0001	0.50	0.50	ARG	ARG	0.03		0.03		CL	OF-D	N		0.15	0.25	0.46	74
cl-arg-TC88-arg-Cl, sl	0002	0.56	0.56	ARG	ARG		0.13	0.11		CL	CS-D	N		0.18	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		0.13	0.31	0.38	69

*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.

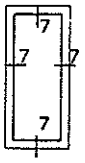
APPENDIX A

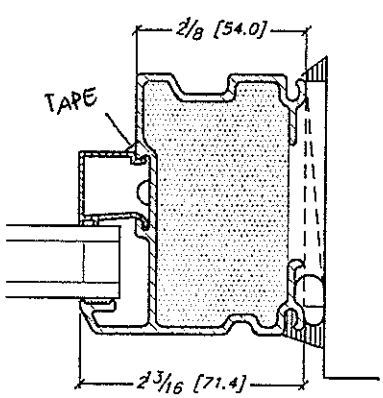
Product Drawings

INLINE FIBERGLASS

SERIES 325 HIGH FIXED WINDOW

STYROFOAM





7
HIGH FIXED FRAME

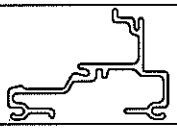
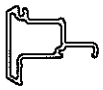
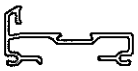
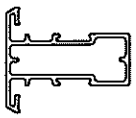
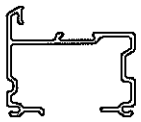
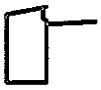
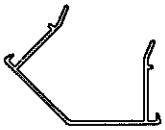
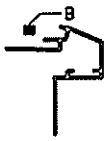
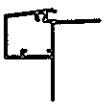
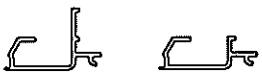
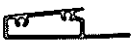
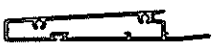
INLINE
FIBERGLASS
30 Constellation Court
Toronto, Ontario M9W 1K1

PARTS LIST

SERIES 325 CASEMENT/AWNING/FIXED

DR. BY.	
DATE	Oct.2006
SHEET	1 / 4

325-100

PART NUMBER	COMPONENT	DESCRIPTION	PRICE		
			NOT PAINTED	STANDARD COLOUR	CUSTOM COLOUR
101		VENT FRAME			
102		VENT			
103		FIXED FRAME			
104		MULLION AND TRANSOM			
105		HIGH FIXED FRAME duplicates dimensions of frame with vent			
109		COVER TRIM			
110		BRICK MOULD			
111		45° BAY CORNER			
112A		BRICK MOULD B – 3/16 BUTYL TAPE			
112B		BRICK MOULD NAILING FIN			
–		ALIGNING CORNER			
113		ANCHOR SPACER SASH FRAME FIXED FRAME			
114		1 5/8" UNIVERSAL FRAME EXTENDER (ALUM.)			
115		3 1/4" UNIVERSAL FRAME EXTENDER (ALUM.)			

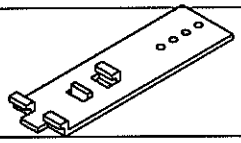
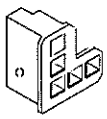
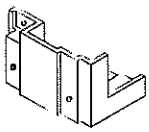
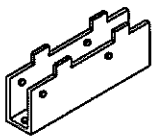
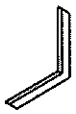
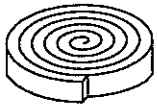
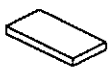
INLINE FIBERGLASS
30 Constellation Court
Toronto, Ontario M9W 1K1

PARTS LIST

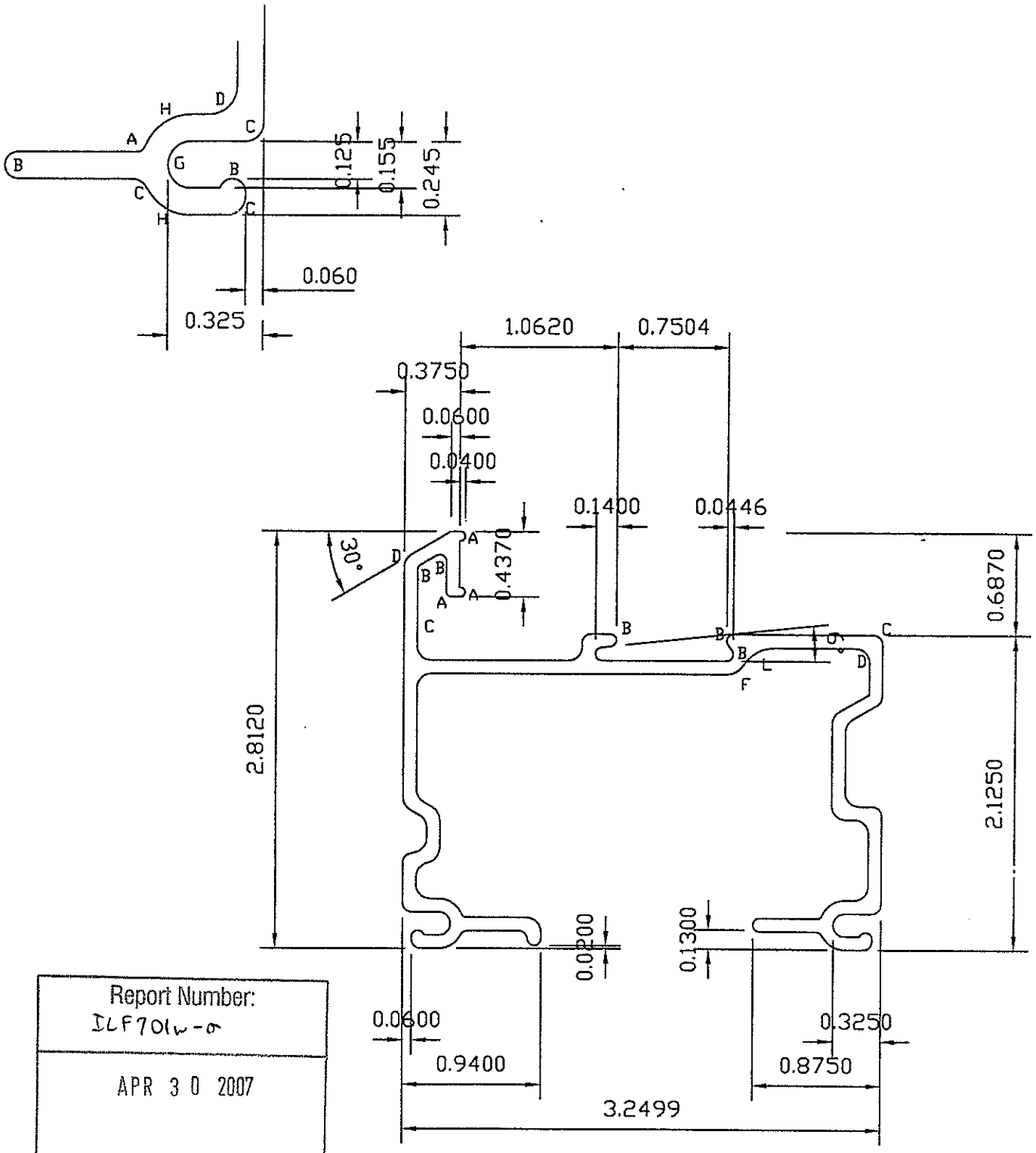
SERIES 325 CASEMENT/AWNING/FIXED

DR. BY:	
DATE	Oct.2006
SHEET	2 / 4

325-100

PART NUMBER	COMPONENT	DESCRIPTION	PRICE		
			PAINTED	STANDARD COLOUR	CUSTOM COLOUR
116	 PVC	COUPLING BAR (INTERIOR ONLY)			
116 FG	 FIBERGLASS	COUPLING BAR (EXTERIOR & INTERIOR)			
117	 PVC	BAY COUPLING BAR (INTERIOR)			
118	 PVC OR ALUM.	GLASS STOP for 22mm (7/8")glass			
119		EXTERIOR GASKET			
120		INTERIOR GASKET			
122		SNAP–ON ANCHOR			
123		VENT SHEARBLOCK			
124		FRAME SHEARBLOCK			
125		COMMON MULLION OR TRANSOM SHEARBLOCK			
126		FRAME ALIGNMENT CLIP			
127A 127B		GLAZING ADAPTER FOR TRIPLE GLASS (1 3/8")			
GL–TAPE		3.2 (1/8") FOAM GLAZING TAPE			
948		DRYWALL ADAPTER A) 3/8" B) 1/2"			
719		SETTING BLOCK a) 3/16 X 1 X 2 " (used on 102,105) b) 3/16 X 1 1/4 X 2 " (used on 103,105)			

A = .031
B = .045
C = .062
D = .093
E = .125
F = .135
G = .155
H = .170
I = .187
J = .200
K = .225
L = .250
M

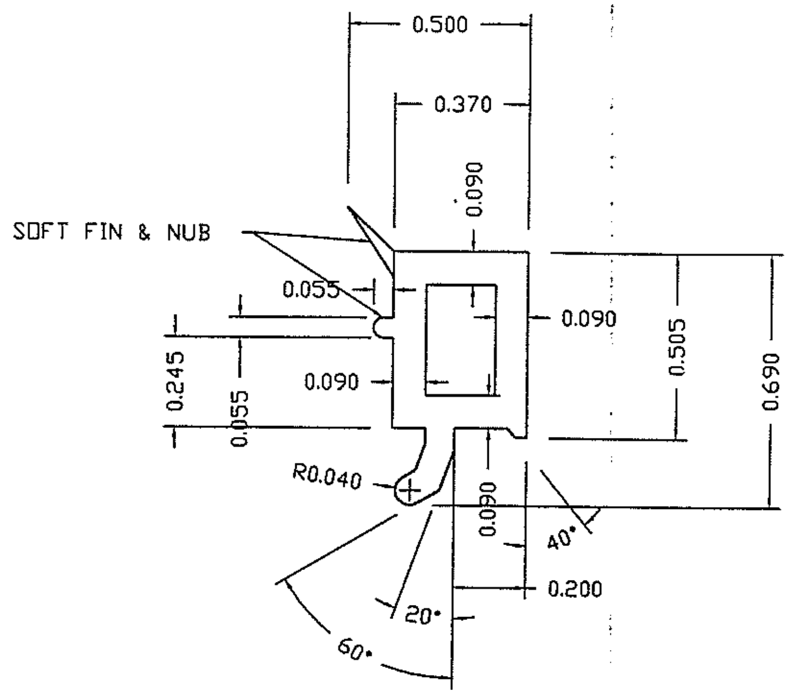


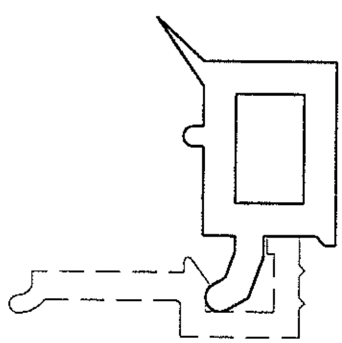
Report Number:
ILF701w-a

APR 30 2007

Enermodal Engineering Ltd.

A	.031	INLINE FIBERGLASS LTD.		CUSTOMER 0			DESCRIPTION HIGH FRAME	
B	.045							
C	.060	DWG # 105	CUSTOMER DWG # 0		DATE 17 MAR 94	TOL. 0	SCALE FULL SIZE	
D	.093							
E	.125	WEIGHT kg/m 0	AREA mm2 0	PERIM. mm 0	WALL THK. mm 2.29	DRWN BY LJP	MAT'L FIBERGLASS	
F	.135							
G	.155	WEIGHT lb/ft .611	AREA in2 1.066	PERIM. in 22.527	WALL THK. in .090	CHK'D BY 0	DIRECT# \325	
H	.170	REV.	DATE	NOTES	REV.	DATE	NOTES	
I	.187	1	19OCT1994	PROFILE REVISED	0	0	0	
J	.200	0	0	0	0	0	0	



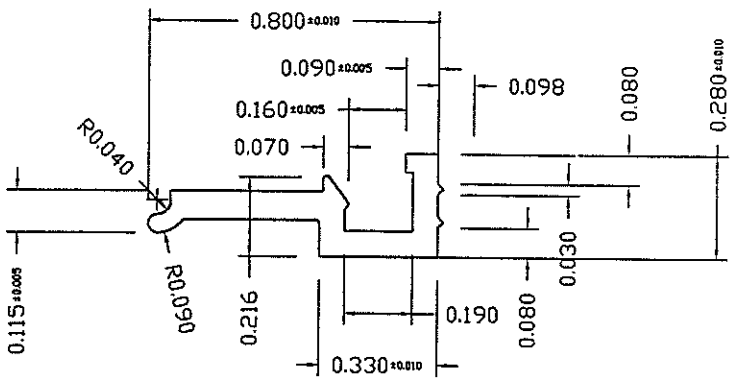


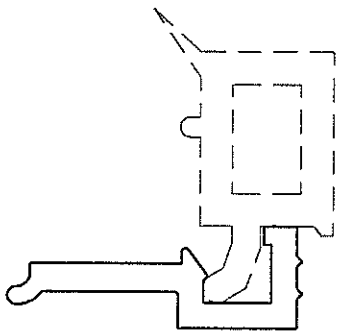
Report Number
ILF7016-0
APR 30 2007
Enermodal Engineering Ltd.

FULL SIZE

UNMARKED WALL THICKNESS: 0.080
UNMARKED RADII: 0.010
MATERIAL: PVC
PROFILE AREA: 0.1477 SQ. IN.
WT/LIN FT:

ITEM.	QTY.	DWG.NO./CAT.NO.			DESCRIPTION	MATERIAL	
INLINE FIBERGLASS 30 Constellation Court Toronto, Ontario M9W 1K1		SHEET 1/1			GLAZING ADAPTER (FOR 1 3/8" GLASS)	DR. BY.	R.N.
		NO.	REVISION	DATE		DATE	Mar.97
		1.	K.C.	Sep.06		SCALE	
						#127A	





FULL SIZE

Report Number:
ILF701w-a
APR 30 2007
Enermodal Engineering Ltd.

UNMARKED WALL THICKNESS: 0.070
UNMARKED RADII: 0.010
MATERIAL: PVC
PROFILE AREA: 0.0836 SQ. IN.
WT/LIN FT:

ITEM.	QTY.	DWG.NO./CAT.NO.	DESCRIPTION	MATERIAL

INLINE FIBERGLASS
30 Constellation Court
Toronto, Ontario M9W 1K1

SHEET 1/1

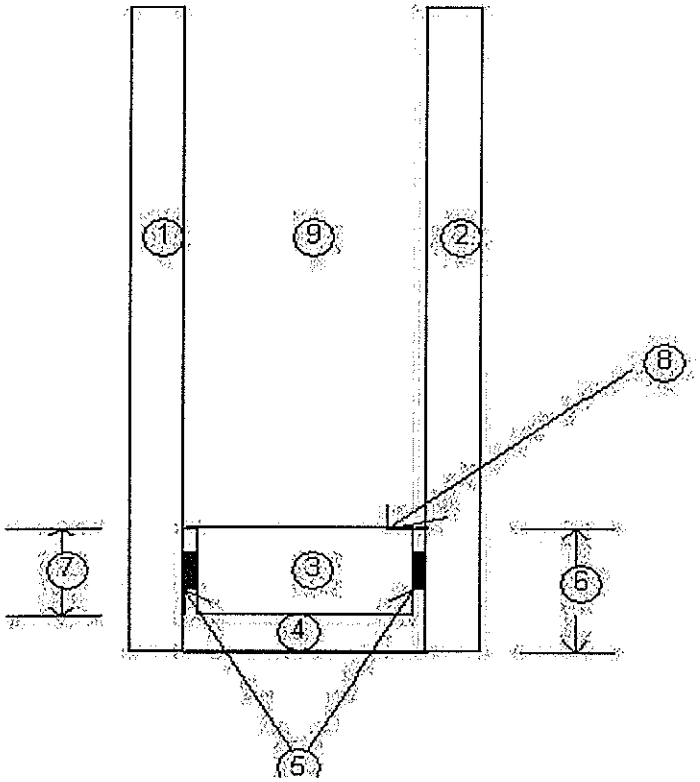
NO.	REVISION	DATE
1.	K.C.	Sep.06

GLAZING ADAPTER
(FOR 1 3/8" GLASS)

DR. BY.	R.N.
DATE	Mar.97
SCALE	

#127B

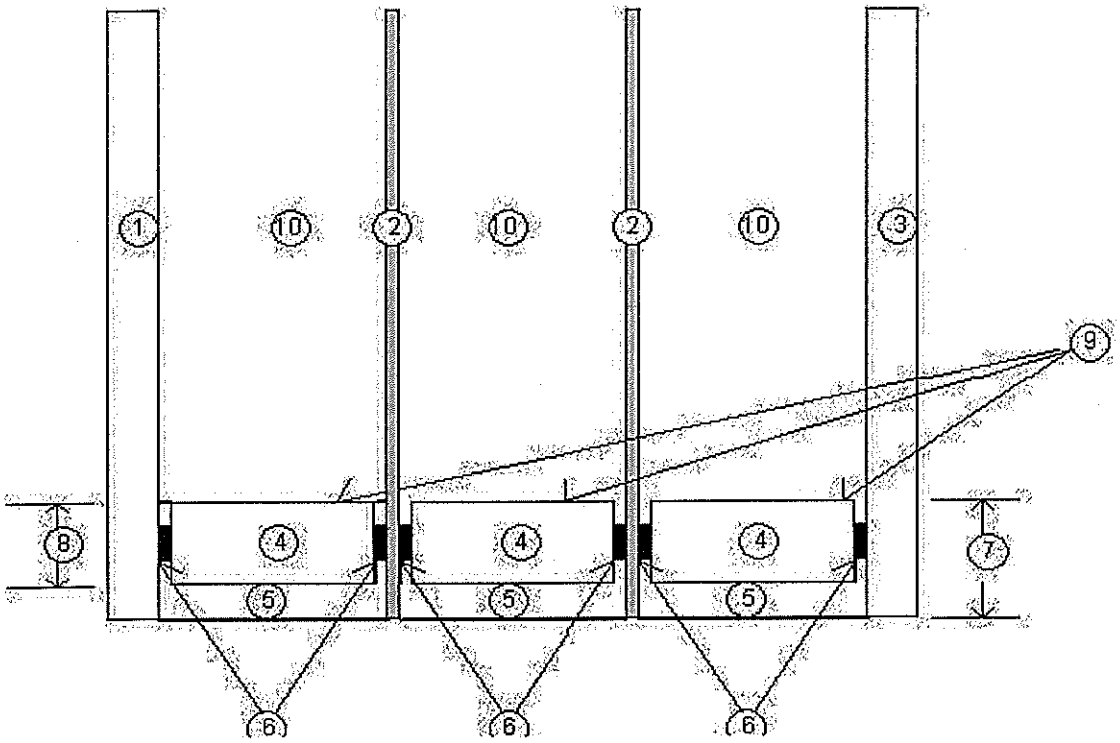
Edge of Glass Detail [Super Spacer] (double glaze)



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	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

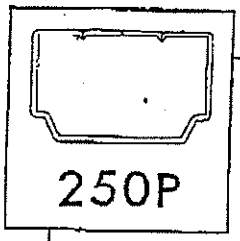
Report Number:
ILF10003w-a
APR 30 2007
Enermodal Engineering Ltd.

Edge of Glass Detail (Double Heat Mirror)



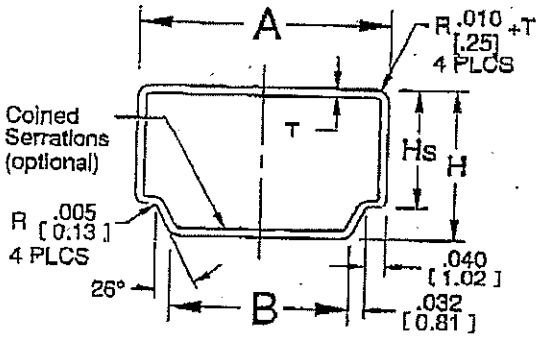
Location	Detail	Description	Size
1	Glass Type	clear	3 mil
2	Heat Mirror Type	HMTC88	.076 mil
3	Glass Type	clear	3 mil
4	Dessicant	Molecular Sieve Type 3A	
5	2nd Seal	Polyurethane (PRC)	
6	Primary Seal	P.I.B. (Polyisobutylene)	0.5 mil
7	Bite		12.7 mil
8	Spacer Height	allmetal steel	7.9 mil
9	Spacer Type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

STEEL SPACER BAR for HEAT MIRROR

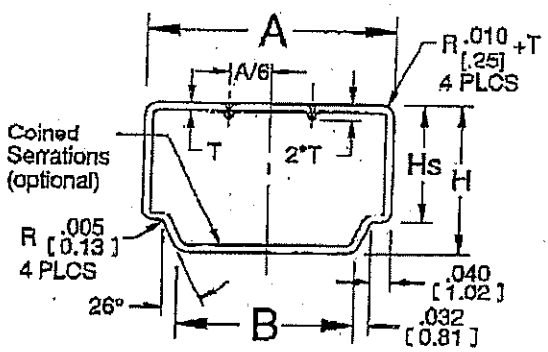


ALLMETAL®

250P Air Spacer



Zippered
(all sizes)



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

Tolerance: All dimensions ±.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).

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Enermodal Engineering Ltd.