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## Lonsdale ThermGard Design Guide

#### Introduction

This Design Guide has been produced to assist specifiers and designers by illustrating typical installation details for sloped and vertical patent glazing. It is not exhaustive, but it does illustrate good practice for most applications and all details are in accordance with BS5516 for the design and installation of sloped and vertical patent glazing.

Users of this guide must exercise all reasonable care to ensure that the details and products of Lonsdale Metal Company Limited are suitable for the intended purpose. If in doubt, ask us. Having decided to specify Lonsdale Patent Glazing, to save you valuable drafting time, CAD drawings of typical installation details are available on disk or from our website : www.roofglazing.co.uk

If you require assistance please contact our Technical Department. Lonsdale Metal Company Limited, Millmead Industrial Centre, Mill Mead Road, London. N17 9QU Telephone : 020 8801 4221 Facsimile: 020 8801 1287

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#### Guide to the Selection of Glazing Bars

#### Scope

The data given indicates the maximum unsupported spans for the range of Lonsdale Patent Glazing Bars when subjected to the three combined loading conditions of 800, 1200 and 1800 N/m<sup>2</sup>. They are broadly defined in Table 1 alongside typical site locations for these loadings.

Tables 2 and 3 respectively (pages 4 and 5) give the spans for bars carrying single and double glazing; they cover different double pitch roof angles and vertical glazing.

#### Standards

The data has been calculated using the following Standards :

BS6399:Part 3:1988 British Standard loading for buildings

Code of practice for imposed loads.

BS5516:1991 Code of practice for the design and installation of patent glazing. BSCP3: Chapter V: Part 2:1972 Code of basic data for the design of buildings - wind loads.

#### Loadings

Combinations of wind and snow loadings, together with the self-weight of bars and glass, have been considered in determining the maximum bar spans. Surface and local wind pressure coefficients (the latter relating to the higher loaded areas on the roof edges and wall comers - see the shaded area of fig 1), are both taken into consideration. Likewise, the effects of uniform and asymmetric snow loading are also included.

Fig1 Local high load areas (shaded) on the roof and wall glazing



#### Location and Site Conditions

Table 1

Typical location	Maximum eaves height	Basic wind speed	Dynamic wind	Basic snow loading	Combined wind & snow	
	m	m/s	$N/m^2$	N/m <sup>2</sup>	N/m <sup>2</sup>	
	111	111/3	11/111-	11/111-	11/111-	
City centre	4.0	44	400	400	800	
Outskirts of large city	5.0	46	650	550	1200	
Open country	6.0	50	1250	550	1800	



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#### Guide to the Selection of Glazing Bars - continued

#### Limitations

Tables 2 and 3 (pages 4 and 5 are restricted to :

- Glazed walls and double pitched roofs of rectangular clad buildings of height / width ratios up to 6: 1 and length / width ratios up to 4:1.
- Two edge support of glass on bars spaced at 600mm.
- Single glazing using 6mm polished or 7mm wired cast glass.
- Hermetically sealed double glazed units, with 6mm thick float, toughened or laminated glass in any combination.

#### Failure Conditions

The glazing bar spans given will not fail due to either excessive deflection or stressing of the components, in accordance with the above standards.

#### **Technical Support**

Care should be taken in applying the above data to different site locations, conditions, building size or roof types (including canopies). In such instances, Lonsdale Metal Company will be pleased to give further advice, upon request.

#### ..... Cleaning and Maintenance

Recommended procedures can be found on our website www.roofglazing.co.uk and in BS5516 - Code of practice for the design & installation of sloping and vertical patent glazing. In addition, if materials are coated with an architectural finish e.g. polyester powder paint, advice should be sought from the manufacturers / applicator of the process.

..... Recommended further reading

BS5516 - Code of practice for the design & installation of sloping and vertical patent glazing BS6399:Part 3 - Loading for buildings - Code of practice for imposed loads BS CP3 Chapter V Part 2 - Code of basic data for the design of buildings - Wind loads NBS Specification H10 Patent Glazing



#### Guide to the Selection of Glazing Bars - continued

#### Maximum span between supports (metres)

NB: The overall bar length may exceed these values in order to provide and overhang at the eaves and/or ridge.

#### Single Glazed Bars

Table 2

Combined basic wind &	Glazing Bar	Angle of Glazing relevant to the horizontal					
snow loading							
N/m <sup>2</sup>		15°	22.5°	30°	45°	60°	Vertical
	ALM100/1	3.34	3.44	3.43	3.49	3.49	3.40
	ALM100/2	4.15	4.27	4.26	4.33	4.34	4.23
	ALM100/3	4.67	4.89	4.88	4.96	4.98	4.87
800	ALM100/4	5.33	5.55	5.54	5.64	5.66	5.55
	ALM100/5	Span b	etween s	supports of	on applic	ation	
	ALM100/H6	3.38	3.49	3.48	3.53	3.54	3.44
	ALM100/H7	4.49	4.71	4.70	4.78	4.80	4.69
	ALM100/H8	Span b	etween s	supports (	on applic	cation	
	ALM100/1	2.79	3.03	3.02	3.22	3.17	3.03
	ALM100/2	3.59	3.77	3.75	4.00	3.94	3.76
	ALM100/3	4.04	4.36	4.34	4.60	4.53	4.34
1200	ALM100/4	4.61	4.97	4.95	5.22	5.15	4.94
	ALM100/5	Span b	etween s	upports (	on applic	ation	
	ALM100/H6	2.85	3.06	3.05	3.26	3.21	3.06
	ALM100/H7	3.89	4.20	4.18	4.43	4.37	4.18
	ALM100/H8	Span b	etween s	upports (	on applic	ation	
	ALM100/1	1.90	2.07	2.06	2.37	2.34	2.18
	ALM100/2	2.77	3.02	3.01	3.32	3.30	3.17
	ALM100/3	3.34	3.58	3.57	3.83	3.80	3.66
1800	ALM100/4	3.80	4.08	4.07	4.36	4.32	4.17
	ALM100/5	Span b	etween s	upports (	on applic	ation	
	ALM100/H6	1.94	2.12	2.11	2.43	2.39	2.23
	ALM100/H7	3.16	3.45	3.44	3.69	3.66	3.53



#### Guide to the Selection of Glazing Bars - continued

#### Maximum span between supports (metres)

NB: The overall bar length may exceed these values in order to provide and overhang at the eaves and/or ridge.

#### **Double Glazed Bars**

Table 3

Combined basic wind &	Glazing Bar	Angle of Glazing relevant to the horizontal							
snow loading									
N/m <sup>2</sup>		15°	22.5°	30°	45°	60°	Vertical		
	ALM100/1	2.12	2.07	2.07	2.16	2.22	2.23		
	ALM100/2	3.27	3.19	3.19	3.31	3.35	3.36		
	ALM100/3	3.75	3.71	3.71	3.80	3.85	3.87		
800	ALM100/4	4.26	4.22	4.22	4.31	4.38	4.41		
	ALM100/5	Span between supports on application							
	ALM100/H6	2.17	2.12	2.12	2.21	2.27	2.28		
	ALM100/H7	3.62	3.58	3.58	3.66	3.71	3.73		
	ALM100/H8	Span b	etween s	supports (	on applic	cation			
	ALM100/1	1.70	1.89	1.87	1.89	1.86	1.76		
	ALM100/2	2.63	2.92	2.88	2.90	2.87	2.72		
	ALM100/3	3.30	3.55	3.54	3.55	3.53	3.45		
1200	ALM100/4	3.76	4.04	4.03	4.04	4.02	3.93		
	ALM100/5	Span b	etween s	supports of	on applic	cation	ation		
	ALM100/H6	1.75	1.93	1.91	1.93	1.91	1.81		
	ALM100/H7	3.18	3.42	3.42	3.42	3.40	3.32		
	ALM100/H8	Span b	etween s	supports of	on applic	cation			
	ALM100/1	1.13	1.24	1.23	1.42	1.38	1.26		
	ALM100/2	1.75	1.91	1.90	2.19	2.14	1.95		
	ALM100/3	2.68	2.89	2.88	3.09	3.05	2.91		
1800	ALM100/4	3.06	3.29	3.28	3.52	3.47	3.31		
	ALM100/5	Span b	etween s	supports (	on applic	cation			
	ALM100/H6	1.15	1.26	1.26	1.44	1.41	1.29		
	ALM100/H7	2.59	2.78	2.78	2.98	2.94	2.81		



#### **Technical Summary**

#### Patent Glazing Bars

#### Specification

Glazing Bars, Cappings, Beads and Fittings are extruded aluminium alloy 6063-T6 to BS1474. Fasteners provided are either stainless steel to BS304515 Grade A2 or mild steel bright zinc plated. Gaskets are extruded Thermo Plastic Rubber quality 98625 to BS4255:Part1:1986 Grade C.

#### Performance

All systems are designed to conform with the requirements of BS5516 when installed within the manufacturers recommendations. A guide to maximum spans is given on page 4 of the Design Guide and should be referred to prior to planning an installation.

#### Fixing

Fixing to timber is directly through the channels at the top of the glazing bars with two No. 10 x 1.5 inch bright zinc plated wood screws and a sliding shoe with wood screws at the bottom end. Fixing to metal is with M8 Single Hole Fixing Shoes positively fixed at the top and sliding at the bottom end. Dissimilar metals should be isolated to avoid bi-metallic corrosion

#### Appearance

Materials are supplied Mill Finished as standard. A range of architectural finishes is available including polyester powder coating to BS6496 in standard RAL or BS colour ranges.

#### Ventilation

May be achieved either through GlazaTherm, our top hung roof ventilator, or by casement vents in vertical applications. Various factory fitted opening mechanisms are available including manual, pole or cord operated, electrical, thermostatic or smoke activated controls.

#### Infill

All popular specifications can be accommodated including 6 / 7mm Single Glazing, 24mm and 28mm Double Glazed Sealed Units or 10mm,16mm or 25mm Polycarbonate Sheeting. Other infills should be discussed with our technical department. Double Glazed combinations should feature a suitable "step" to the bottom edge to avoid thermal breaking.

#### **Building Regulations**

Please visit our website www.roofglazing.co.uk for guidance and compliance with the Regulations relating to fire, non-fragility, thermal and air-tightness performance.



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#### **Typical Specification**

See <u>www.roofglazing.co.uk</u> for Quick Specifications which cover most popular typical applications or contact out Technical Support for advice. We recommend you consider the National Building Specification H10 Patent Glazing. If you do not have access to a copy they can be contacted at:-

NBS Services,	
Mansion House Chambers,	
The Close,	Tel: 0191 232 9594
Newcastle upon Tyne NE1 3RE	Fax: 0191 232 5714

#### Typical Specification for Patent Glazing Bars

NB: Italics show where you mu	ust insert the detail relevant to your project
Patent Glazing:	To roof-light over staircase.
Drawing Reference:	Drawing Numbers 123, 124, 125
Supporting Structure:	Timber at ridge, hip, intermediate and eves.
Patent Glazing System:	To BS5516, and as specified in this section.
Manufacture & Reference:	Lonsdale Metal Company Limited, London N17 9QU Telephone: 020 8801 4221 Facsimile : 020 8801 1287 Reference <i>THERMGARD ALM100/2</i>
Туре:	Ventilated internal box-bar rafter with continuous carrier rail, pressure plate, external snap on cover and gasketry.
Glazing Bar:	
Material	Aluminium alloy 6063-T6 to BS1474
Finish	Polyester Powder Paint to BS6496
Colour	White M4A0001
Minimum film thickness	40 microns
Spacing:	Nominally 600mm glazing bar c/c
Slop:	30 degrees
Bottom overhang lap:	75mm
Pane/infilling material(s):	Hermetically silicone-sealed double glazed units consisting of 6.4mm low-e clear laminate inner pane, 16mm argon cavity and 6mm heat soaked clear toughened outer pane with stepped bottom edge,
Incorporated components:	None

Please note : Whilst we are pleased to assist, the above example is given for guidance only. Responsibility remains with Specifiers to exercise all reasonable care ensuring our products are suitable for their requirements and correctly specified.



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ALM1005 ALM1	00/5 profile	11
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BOTSLIDEFIXM Botto	m slide fixing detail to timber	12
ALM100WF ALM1	00/WF	13
ENDBAR End b	ar	13
ALM100DG28 ALM1	00 (DG28)	13
ALM100H6 ALM1	00/H6 Heritage profile	14
ALM100H7 ALM1	00/H7 Heritage profile	14
ALM100H8 ALM1	00/H8 Heritage profile	15
ALM10HWF ALM1	00/HWF Heritage profile	15
THE11MY Top fi	xing to metal	16
THE11TY Top fi	xing to timber	16
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THE12TY Eaves	detail to timber	17
THE13MY Roof	vallev gutter detail aluminium or galvanised steel	18
THE13TY Roof	valley gutter detail timber lead-lined	19
THE14Y Parag	pet	20
22Y Glass	iointing	20
THE18MY Ridge	/ hip detail to metal	21
THE18TY Ridge	/ hip detail to timber	22
THE21MY Intern	nediate roof detail to metal	23
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\*GlazaTherm – For 24 – 28mm Double Glazed Units or 25mm polycarbonate



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Lonsdales' answer to achieving thermal break roof glazing, slim internal box design provides elegant and clean lines to any structure. ThermGard is compliant with the latest Building Regulations in relation to thermal and air-tightness performance.

- Thermal break design.
- Ventilated internal box-rafter design to minimise the risk of condensation.

. . . . . . . . . . . .

- Choice of box rafter to suit short and long spans.
- Neat continuous pressure plates and snap-on covers providing invisible fixings and low profile appearance.
- Optional period timber style aluminium box-rafter and capping for heritage buildings.

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ALM100/1 Profile CAD Code ALM1001

ALM100/2 Profile CAD Code ALM1002







Scale of all profiles 1:1



ALM100/4 Profile CAD Code ALM1004







. . . . . .

#### ALM100/5 Profile CAD Code ALM1005





## Bottom slide fixing detail to metal CAD Code BOTSLIDEFIXM







Available to special order only - minimum charge applies.



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Available to special order only - minimum charge applies.



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Roof valley gutter detail aluminium or galvanised steel CAD Code THE13MY





Roof valley gutter detail timber lead-lined CAD Code THE13TY



















Intermediate roof detail to metal CAD Code THE21MY







Intermediate roof detail to timber CAD Code THE21TY



SLIDING SHOE AT INTERMEDIATE PURLIN, CAN BE FIXED TO TIMBER. WITH 2 No. No. 10 WOODSCREWS AT 60 C/CTS LONSDALE BOX SECTION SPANS BETWEEN SUPPORTS AND IS FACTORY FITTED OR POSITIVELY FIXED ON SITE LONSDALE THERMGARD SERIES GLAZING BAR







Vertical head fixing to metal CAD Code THE24MY





Vertical jamb to brickwork CAD Code THE26Y











Vertical intermediate detail CAD Code THE29Y





Application













#### GlazaTherm

#### Sizing matrix

#### Approximate Geometric Free Air Area m<sup>2</sup> Based upon open actuator stroke lengths 300mm and 550mm

Length	Width Wmm**						
L mm*	600	700	800	900	1000	1100	1200
600	0.28	0.31	0.34	0.37	0.40	0.43	0.46
	0.50	0.56	0.61	0.67	0.72	0.78	0.83
700	0.31	0.34	0.37	0.40	0.43	0.46	0.49
	0.56	0.62	0.67	0.73	0.78	0.84	0.89
800	0.34	0.37	0.40	0.43	0.46	0.49	0.52
	0.61	0.67	0.72	0.78	0.83	0.89	0.94
900	0.37	0.40	0.43	0.46	0.49	0.52	0.55
	0.67	0.73	0.78	0.84	0.89	0.95	1.00
1000	0.40	0.43	0.46	0.49	0.52	0.55	0.58
	0.72	0.78	0.83	0.89	0.94	1.00	1.05
1100	0.43	0.46	0.49	0.52	0.55	0.58	0.61
	0.78	0.84	0.89	0.95	1.00	1.06	1.11
1200	0.46	0.49	0.52	0.55	0.58	0.61	0.64
	0.83	0.89	0.94	1.00	1.05	1.11	1.16
1500	0.55	0.58	0.61	0.64	0.67	0.70	0.73
	1.00	1.06	1.11	1.17	1.22	1.28	1.33
1800	0.64	0.67	0.70	0.73	0.76	0.79	0.82
	1.16	1.22	1.27	1.33	1.38	1.44	1.49
2000	0.70	0.73	0.76	0.79	0.82	0.85	0.88
	1.27	1.33	1.38	1.44	1.49	1.55	1.60
2400	0.82	0.85	0.88				
	1.49	1.55	1.60				

\* Dimension L mm = overall fixed frame length – see drawings on page 37.

\*\*Dimension W mm = overall fixed frame width – see drawings on pages 38.

Side hung vents are restricted to 1.20m<sup>2</sup> (Width x Length) with a maximum overall fixed frame length of 1800mm.

## IF THE SIZE REQUIRED IS OUTSIDE THE BOUNDRIES OF THE ABOVE MATRIX PLEASE CONTACT OUR SALES OFFICE.

Please note : Whilst we are pleased to assist, the above example is given for guidance only. Responsibility remains with Specifiers to exercise all reasonable care ensuring our products are suitable for their requirements and correctly specified.

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GlazaTherm – suitable for 24 – 28mm Double Glazed Units or 25mm polycarbonate



#### Top hung roof ventilator



When ordering GlazaTherm to fit other manufacturers glazing bars or sloped 4-edge support systems, please specify fixed frame width and length. See notes below.

- GlazaTherm inserts between most patent glazing bars, sloped curtain walling and ٠ conservatory roof systems currently available.
- Suitable for single glazing, sealed double glazed units and Polycarbonate sheeting. •
- Standard size 610mm x 915mm. Please contact our Sales Office for details of non-• standard sizes.
- Manufactured from extruded aluminium alloy 6063-T6 sections supplied mill finish as • standard and thermally broken with polyamides extrusions.
- Polyester powder paint finishes available in a wide range of colours.
- Various factory-fitted opening mechanisms, including pole, cord, thermostatic, ٠ electric and smoke actuators.
- Complies with BS5516 when used within manufacturers recommendations. •

#### Dimensions required when ordering please state:

0/A Fixed Frame Length (Dimension L - refer drawings on page 37) 0/A Fixed Frame Width (Dimension W - refer drawings on page 38)



Sectional views

L-L = 0/A Fixed Frame Length - Dimension L W-W = 0/A Fixed Frame Width - Dimension W



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## GlazaTherm Top and bottom detail two edge support Patent Glazing CAD Code GLAZ1PG



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### GlazaTherm

## Side rail into Patent Glazing bar or sloping curtain walling

CAD Code LAZ2PGCW



## GlazaTherm Bottom detail into typical curtain wall transom CAD Code GLAZ3CW

28mm Ventilator Sections





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## GlazaTherm Vent detail with glass above

CAD Code GLAZ5PG



Scale of view 1:2

# Head detail into typical C/W transom

CAD Code GLAZ4CW







#### Research & Development

Lonsdale has made a very significant investment in research and development to bring you the products set out in this publication. Lonsdale's intention is to continue to invest to stay at the fore front of its Industry and bring its customers products with unrivalled technological advancements and standards. We reserve the right to make changes without prior notification to achieve these aims.

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February 2009