Reference	EC230915-02
Date	19/09/2023
Issued By	Ella Petley

Eurobond Panels Structural Performance

Assessment of 175mm Europanel and Rainspan for Cold Clad

Revision 01. 15.09.2023 – First Issue
Revision 02. 19.09.2023 – Revised to account for 600mm top hat spacing for Rainscreen attachment
Revision 03. 06.03.2024 – Deflection checks added – GA
Revision 04. 18.07.2024 – Rainscreen changed - FB

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Euroclad Group Limited
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[redacted]

Introduction and Assumptions

All calculations are based upon:

Section 1
Panel Specification: 175mm Europanel
External Face: 0.70mm
Internal Liner: 0.50mm
Module Width: 1200mm module
Panel bearing: 65mm per panel end

Section 2
Panel Specification: 175mm Rainspan
External Face: 0.70mm
Internal Liner: 0.70mm
Module Width: 1200mm module
Panel bearing: 65mm per panel end

The advice and guidance provided within has been calculated using calculators independently designed for Euroclad Group by the Steel Construction Institute (SCI) and Oxford Brookes University. These calculators were created using physical test data from EN14509 structural testing of Eurobond panels for their CE Marking essential characteristic declared performance.

Euroclad Group Limited is not a professional body and therefore any associated calculations are not covered by PI insurance.

Please note that the Calculation Tool that Eurobond use to calculate the span conditions has been 'SCI Assessed' and fulfils all of the calculation procedures according to the up-to date British / European Standard BS EN14509.

The necessary load safety factors used within the calculation procedures are correct according to BS EN 1991-1-4 and the relevant UK/IE National Annex covering any worst-case wind deviation and pertinent failure modes.

Wind load pressure and suction (Indicatively run by Ella Petley of Euroclad Group Ltd)

Pressure: +0.881 kN/m²
Suction: Zone A -1.239 kN/m² Zone B -0.883 kN/m² Zone C -0.617 kN/m²

Zone A is directly adjacent to each corner of the building with a length of 5.2m.

Zone B is directly adjacent to Zone A with a length of 20.8m.

Zone C is any remaining distance across the elevation.

Spanning Calculations: 175mm Thick Europanel Extra

Following the information provided, please see below for a calculation to show the structural spanning performance of the specified Eurobond panel.

Zone A -1.239 kN/m²

A panel of 4800mm will SINGLE SPAN against wind loads present in Zone A with a minimum of X3 fasteners at each panel end.

Pressure Target (kN/m2)	0.88
Suction Target (kN/m2)	1.24

175mm Europanel Extra 0.5mm liner 1200mm module

Panel Length: 4800mm

	Single Span
Span (m)	**4.80**
Maximum Allowable Pressure (kN/m2)	1.37
Maximum Allowable Suction (kN/m2)	1.51

Assumed bearing at panel end (mm)	65
Assumed thickness of secondary steel (mm)	2

Number of fasteners per panel end	3

As Wind Loads are most severe in Zone A, this panel span will also be suitable for use in Zones B and C.

Note: *Results include necessary load factors and material factors.*
The advice and guidance provided within has been calculated using 'as tested' data utilising SCI Assessed calculation tools.
Please ensure that all calculations are relayed back to the appointed Structural Engineer for review/sign off in line with the site specific requirement.

Spanning Calculations: 175mm Thick Rainspan

Following the information provided, please see below for a calculation to show the structural spanning performance of the specified Eurobond panel.

Zone A -1.239 kN/m²

A panel of 4800mm will SINGLE SPAN against wind loads present in Zone A with a minimum of X4 fasteners at each panel end.

Pressure Target (kN/m2)	0.88
Suction Target (kN/m2)	1.24

175mm Rainspan 0.7mm liner 1200mm module

Panel Length: 4800mm

	Single Span
Span (m)	**4.80**
Maximum Allowable Pressure (kN/m2)	1.37
Maximum Allowable Suction (kN/m2)	1.83

Assumed bearing at panel end (mm)	65
Assumed thickness of secondary steel (mm)	2

Number of fasteners per panel end	4

As Wind Loads are most severe in Zone A, this panel span will also be suitable for use in Zones B and C.

Note: *Results include necessary load factors and material factors.*
The advice and guidance provided within has been calculated using 'as tested' data utilising SCI Assessed calculation tools.
Please ensure that all calculations are relayed back to the appointed Structural Engineer for review/sign off in line with the site specific requirement.

Deflection: Zone A

L/200

Pressure (kN/m2)	0.881
Suction (kN/m2)	1.239

Panel Length (m)	4.8
Panel Thickness (mm)	175

Results

	Single Span
Span (m)	**4.80**
Maximum Allowable Deflection – L/200 (mm)	**24.00**
Deflection – Pressure (mm)	9.87
Deflection – Suction (mm)	13.05

The rainscreen requires a maximum allowable deflection of L/200. For a 4.8m panel length this is 24mm. Under the maximum wind pressure load acting on the panel (0.881 kN/m²), the panel can be expected to deflect a maximum of 9.87mm. Under the maximum wind suction Loads acting on the panel, it can be expected to deflect a maximum of 13.05mm. Both of these are below 24mm and therefore the Rainspan panels will not exceed the L/200 limitation.

L/360

Pressure (kN/m2)	0.881
Suction (kN/m2)	1.239

Panel Length (m)	4.8
Panel Thickness (mm)	175

Results

	Single Span
Span (m)	**4.80**
Maximum Allowable Deflection – L/360 (mm)	**13.33**
Deflection – Pressure (mm)	9.87
Deflection – Suction (mm)	13.05

The rainscreen requires a maximum allowable deflection of L/360. For a 4.8m panel length this is 24mm. Under the maximum wind pressure load acting on the panel (0.881 kN/m²),

the panel can be expected to deflect a maximum of 9.87mm. Under the maximum wind suction Loads acting on the panel, it can be expected to deflect a maximum of 13.05mm. Both of these are below 24mm and therefore the Rainspan panels will not exceed the L/360 limitation.

Rainscreen 1: Louvre system 17 kg/m²

Rainscreen to Panel Face (Shear & Pull out)

Fastener tensile strength (KN)	0.41	Safe working load into 0.7 mm steel	
Fastener Shear strength (KN)	0.41	Safe working load into 0.7 mm steel	
Horizontal fastener centres (m)	0.50		
Vertical fastener centres (m)	0.45		
Fasteners per m2	4.44		
System Dead load (kg/m2)	17.00		
Live suction loads (KN/m2)	1.24		
Tensile load per fastener (KN)	0.28	SAFE	
Tensile load per fastener (Kg)	28.44		
Shear load per fastener (KN)	0.04	SAFE	
Shear load per fastener (Kg)	3.83		
NEW Combination of shear and tension	0.77	SAFE	

The horizontal distance between fasteners should be a maximum of 500mm providing the vertical distance between fasteners is 450mm. This is based on 4.44 fasteners per m².

The number of fasteners per panel end should be increased to X4.

Appendix

SCI Steel Knowledge

SCI Membership ☐
Technical Information ☐
Construction Solutions ☐
Communications Technology ☐
SCI Assessment ☐

Mr Tim Ashley
Eurobond Laminates Limited
Wentloog Corporate Park
Wentloog
Cardiff
CF3 2ER

20 February 2012

Dear Tim,

Wall Calculation Tool - SCI Assessed

I am writing to confirm that the Wall Calculation Tool (Version 06 and Version 07) has been SCI Assessed and fulfils all of the calculation procedures according to the up-to-date British / European Standard BS EN14509:2006.

The load factors, combination factors and partial safety factors used within the calculation procedures are correct according to BS EN 1990 and the relevant UK National Annex.

The characteristic wrinkling strengths for the steel faces have been obtained through a test programme undertaken by the SCI on behalf of Eurobond in accordance with the BS EN14509. The characteristic wrinkling strength values are utilised within Version 07 of the Wall Calculation Tool (the previous version used conservative theoretical values).

An SCI Assessed certificate for the Wall Calculation Tool (and other tools covered by the assessment) is due to be issued today following the return of a completed licence agreement.

Yours sincerely,

[redacted]

Martin Heywood
Associate Director

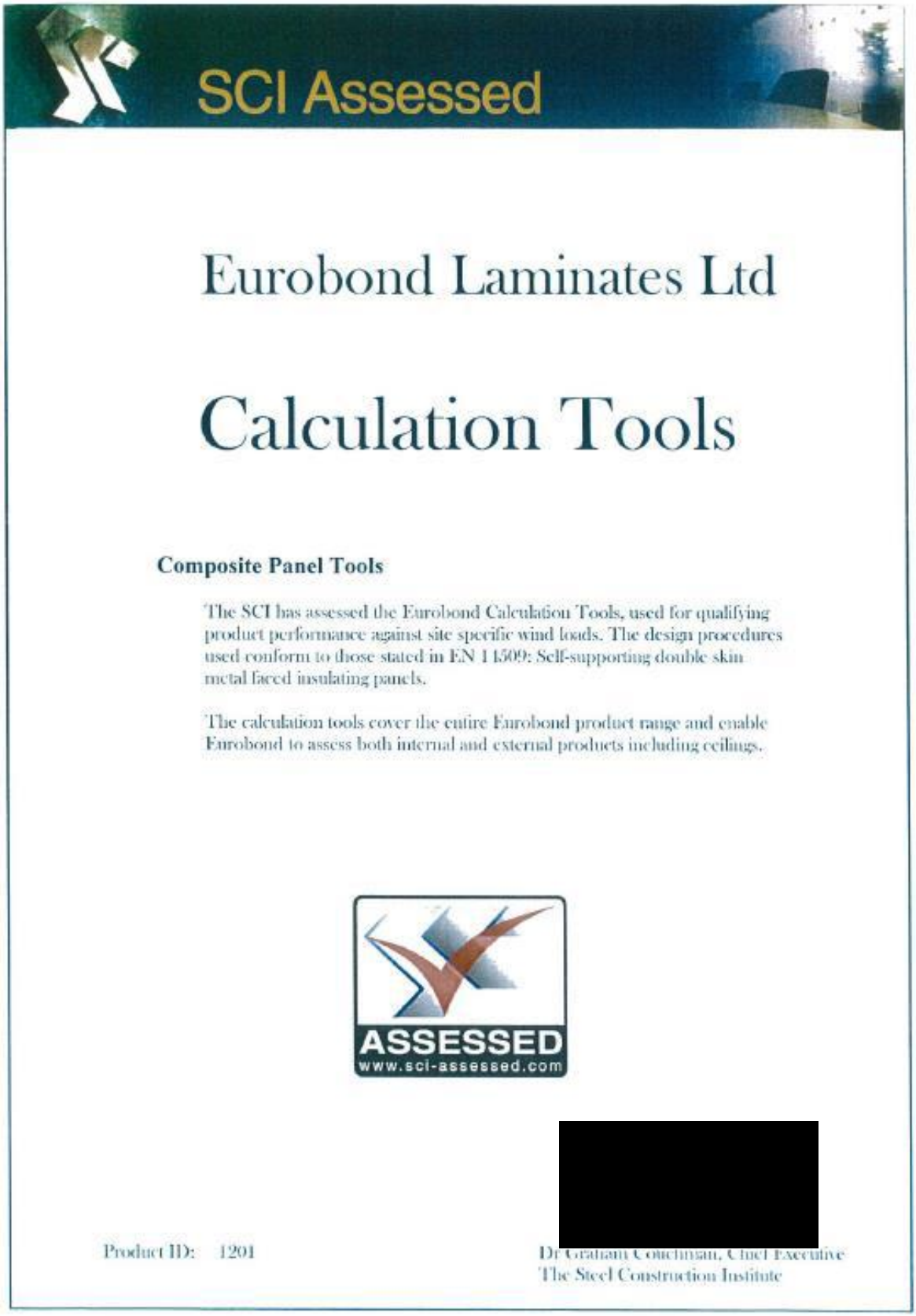
[redacted]

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Letter - External Wall Calculation Tool - SCI Assessed.doc

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http://www.steelbiz.org

Registered No. 1916698



SCI Assessed

Eurobond Laminates Ltd

Calculation Tools

Composite Panel Tools

The SCI has assessed the Eurobond Calculation Tools, used for qualifying product performance against site specific wind loads. The design procedures used conform to those stated in EN 14509: Self-supporting double skin metal faced insulating panels.

The calculation tools cover the entire Eurobond product range and enable Eurobond to assess both internal and external products including ceilings.

ASSESSED
www.sci-assessed.com

[redacted]

Product ID: 1201

Dr Graham Couchman, Chief Executive
The Steel Construction Institute