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MODINEX
Alu-Selekta

Structural Performance Assessment Report
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TABLE OF CONTENTS

TABLE OF CONTENTS.....	2
1 Compliance Statement	3
2 Introduction	6
2.1 Product Description.....	6
2.2 Elements of Façade System	6
2.3 Limitations and Critical Assumptions.....	7
2.4 Reference Documentation.....	8
2.5 Wind Categories	8
3 Assessment and Results.....	9
3.1. Panel Failure.....	9
3.2. Fastener Failure	10

1 COMPLIANCE STATEMENT

This report details the assessment methodologies and results of assessments into the structural performance of the Modinex Alu-Selekta cladding system. This assessment has been undertaken with the purpose of evaluating the cladding product for use on buildings in wind zones N4, N5, N6, C2, C3 and C4 (to AS4055).

The assessments found that it is most likely that the critical components of the system are the screw fixings rather than the panel itself; therefore, the capacity of the supports/fixings drive the requirement for number of, type of, and spacing of support points. Table 1 below outlines the results of these assessments.

Limitations and assumptions adopted for this assessment of this report are provided in Section 2.3.

The results of this report rely directly on the information, results and limitations set out in the documents listed in Section 2.4.

Table 1: ALU-SELEKTA - Fixing configurations for wind classes N4, N5, N6, C2, C3 and C4

Wind Class	Timber Frame or Steel Frame	
	Panel Zone (>1.2m from external building corner)	Corner Zone (<1.2m from external building corner)
N4	Edge & Intermediate Panel Fixing – 1 / 8g Screw per batten. Screw every panel width at 155/190mm Max. batten spacing at 625mm	Edge & Intermediate Panel Fixing – 1 / 8g Screw per batten. Screw every panel width at 155/190mm Max. batten spacing at 625mm
C2	Edge & Intermediate Panel Fixing – 1 / 8g Screw per batten. Screw every panel width at 155/190mm Max. batten spacing at 625mm	Edge & Intermediate Panel Fixing – 1 / 8g Screw per batten. Screw every panel width at 155/190mm Max. batten spacing at 625mm
N5	Edge & Intermediate Panel Fixing – 1 / 8g Screw per batten. Screw every panel width at 155/190mm Max. batten spacing at 625mm	Edge Panel Fixing – 1 / 8g Screw per batten and at every panel width 155/190mm Intermediate Panel Fixing – 2 / 8g Screw per batten and at every panel width 155/190mm Max. batten spacing at 625mm
C3	Edge & Intermediate Panel Fixing – 1 / 8g Screw per batten. Screw every panel width at 155/190mm Max. batten spacing at 625mm	Edge Panel Fixing – 1 / 8g Screw per batten and at every panel width 155/190mm Intermediate Panel Fixing – 2 / 8g Screw per batten and at every panel width 155/190mm Max. batten spacing at 300mm
N6	Edge & Intermediate Panel Fixing – 1 / 8g Screw per batten. Screw every panel width at 155/190mm Max. batten spacing at 625mm	Edge Panel Fixing – 1 / 8g Screw per batten and at every panel width 155/190mm Intermediate Panel Fixing – 2 / 8g Screw per batten and at every panel width 155/190mm Max. batten spacing at 625mm
C4	Edge & Intermediate Panel Fixing – 1 / 8g Screw per batten. Screw every panel width at 155/190mm Max. batten spacing at 625mm	Edge Panel Fixing – 1 / 8g Screw per batten and at every panel width 155/190mm Intermediate Panel Fixing – 2 / 8g Screw per batten and at every panel width 155/190mm Max. batten spacing at 300mm

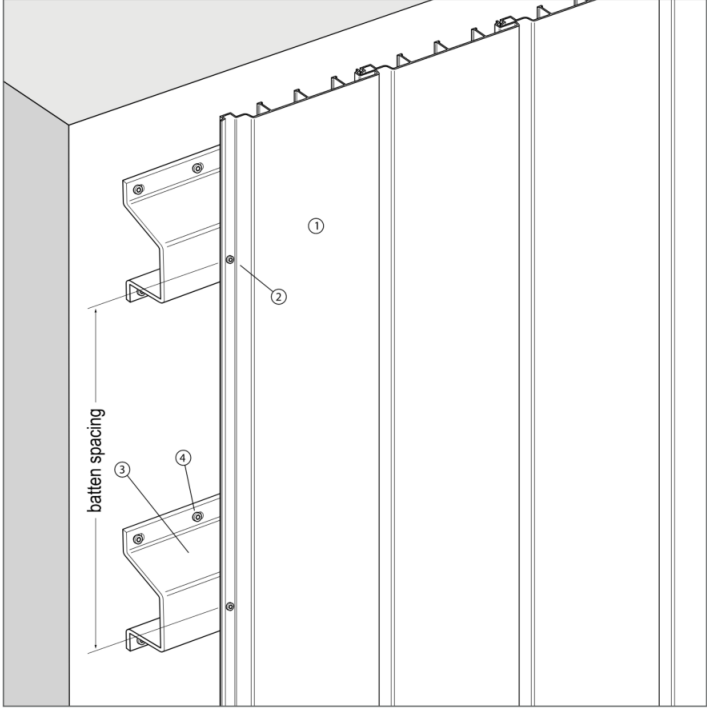


Figure: Typical fixing configuration

2 INTRODUCTION

2.1 Product Description

The following product description is provided:

Alu-Selekta

1. *Alu-Selekta is a high-performance, non-combustible aluminium cladding system with a realistic timber-look finish designed for both commercial and residential facades. Manufactured from robust extruded aluminium and finished with durable powder coat or timber-grain coatings. The extruded profile of the panel is designed to facilitate hidden laps that conceal the fixings of the cladding system.*

2.2 Elements of Façade System

Alu-Selekta Panels

The elements of the façade system which form part of the load path are as follows:

- Aluminium extruded profile cladding; two types:
 - o Alu-Selekta Channel
 - o Alu-Selekta Castellation

Typical panel widths available in 155mm and 190mm dimensions.

- Pan, wafer and hex head self-drilling screws for timber or metal

2.3 Limitations and Critical Assumptions

This report relates only to the structural performance of the Modinex Alu-Selekta panel system under self-weight and out-of-plane loads (i.e. wind) in vertical installation only (i.e. as external wall cladding).

This report does not include the assessment for the following:

- performance of the façade system under imposed loads / impact loads
- for application as a roof or soffit cladding or for instances where the slope of the wall exceeds 15 degrees from the vertical.
- overall weatherproofing, durability or thermal performance of the façade system, as these performance requirements vary based on application.

Refer to Modinex for further information.

The use of this product in cyclonic regions is subject to the limitations set out by the Azuma test reports for performance under cyclic loading (in accordance with AS4040.3).

This report is provided for technical guidance only.

Alu-Selekta Façade Panels

1. The façade panels are to be fixed to a secondary sub-frame comprising of a top hat batten section with thickness of 0.9mm in G2 grade steel.
2. Screws must be compliant with AS3566.1-2002 (Self drilling screws for the building and construction industries Part 1: General requirements and mechanical properties).

	Fixing to steel batten	Fixing to timber
Head type:	Pan, wafer, or hex	Pan, wafer, or hex
Diameter:	4.17mm (#8 gauge) / Min. head diameter of 8mm	4.17mm (#8 gauge) / Min. head diameter of 8mm
Length:	16mm min.	30mm min.

General

3. All screws must be installed in the centre of battens.
4. Timber used for framing of walls must be of timber species groups J1 to J6 (unseasoned) or JD1 to JD5 (seasoned) in accordance with AS1720.1-2010 Table H2.3 and H2.4. This excludes the use of unidentified imported softwood species.
5. Steel used for the framing of walls must be minimum 0.9mm thick, minimum grade G2 steel (i.e. tensile strength >300MPa).
6. The system must be installed with an internal airseal barrier (e.g. sarking or RAB board) which is designed and installed to resist the full internal pressure.

Note: limited testing of these products to resist substantial pressures is available, but it is suggested that sarking (flexible membrane type materials) should not be used in cyclonic wind regions due to the high internal pressures which can result in high wind events – in which case, RAB board products will likely be required.

7. Established limitations on the tolerances of installation set out in the Alu-Selekta façade design and installation manuals, are to be observed and adhered to.
8. The assessment assumes that the timber elements remain structurally adequate and in sound condition and free from deterioration for the duration of the design life of the cladding system.
9. The results of this report and the subsequent recommendations apply only to residential housing construction. Further assessments beyond residential housing construction are to be undertaken as a separate independent engineering assessment.

2.4 Reference Documentation

The following documentation is relied upon to determine the overall performance of the system:

- MODINEX Alu-Selekta Installation Guide, dated July 2025
- MODINEX Alu-Selekta Channel Fact Sheet, dated August 2025

The following standards are applicable to the design of the system:

- AS4055-2012 Wind loads for housing
- AS1664.1-1997 Aluminium Structures
- AS1720.1-2010 Timber structures Part 1: Design methods
- AS3566 Self-drilling screws for the building and construction industries (all parts)
- AS4600-2018 Cold-formed steel structures

2.5 Wind Categories

The three wind categories which are assessed are N4, N5 and N6 in accordance with AS4055. Wind pressures adopted for these categories are as listed below in Table 2.

As noted above in Section 2.3: the system is reliant on an internal air barrier which is designed and installed to resist the full internal wind pressure components, so the external cladding resists only the external component of the wind pressure.

Table 2: Wind pressure classes

Wind class	Pressure zone	ULS design wind speed ($V_{h,u}$)	External pressure		Internal pressure	
			Coefficient ($K_L \times C_{pe}$)	Pressure	Coefficient (C_{pi})	Pressure
N4 / C2	Corner	39 m/s	-1.30 / +0.70	-2.90 kPa / + 1.56 kPa	-0.30 / +0.20	-0.67 kPa / + 0.45 kPa
	General		-0.65 / +0.70	-1.45 kPa / + 1.56 kPa		
N5 / C3	Corner	47 m/s	-1.30 / +0.70	-4.27 kPa / + 2.30 kPa	-0.30 / +0.20	-0.99 kPa / + 0.66 kPa
	General		-0.65 / +0.70	-2.14 kPa / + 2.30 kPa		
N6 / C4	Corner	55 m/s	-1.30 / +0.70	-5.77 kPa / + 3.11 kPa	-0.30 / +0.20	-1.33 kPa / + 0.89 kPa
	General		-0.65 / +0.70	-2.88 kPa / + 3.11 kPa		

3 ASSESSMENT AND RESULTS

Two potential failure modes are considered which may limit the ability of the façade panels to perform its function as an external wall cladding:

1. Failure of the cladding product itself, through flexural failure under wind load
2. Failure of the fixings of the cladding screws

3.1. Panel Failure

The assessed bending strength based on an aluminium material with an alloy and temper of 6063-T5 (as per AS1664.1 Table 3.3(A)). This is assessed to be 104.5MPa based on the limited span of the panel.

The performance of the panel is assessed considering the maximum span between batten supports for each wind class (625mm).

Wind class	Pressure zone	Pressure	Max. panel span / batten spacing	Bending moment (kNm per m)	Approx. bending stress
N4 / C2	Corner	-2.90 kPa	625 mm	0.142 kNm / m	17.5 MPa
	General	-1.45 kPa	625 mm	0.071 kNm / m	8.7 MPa
N5	Corner	-4.27 kPa	625 mm	0.208 kNm / m	25.7 MPa
	General	-2.14 kPa	625 mm	0.104 kNm / m	12.9 MPa
C3	Corner	-4.27 kPa	300 mm	0.048 kNm / m	5.9 MPa
	General	-2.14 kPa	625 mm	0.104 kNm / m	12.9 MPa
N6	Corner	-5.77 kPa	625 mm	0.282 kNm / m	34.7 MPa
	General	-2.88 kPa	625 mm	0.141 kNm / m	17.3 MPa
C4	Corner	-5.77 kPa	300 mm	0.065 kNm / m	8.0 MPa
	General	-2.88 kPa	625 mm	0.141 kNm / m	17.3 MPa
Max:					34.7 MPa

Therefore, in the worst-case, the product reserves a safety factor of: $SF = \frac{104.5MPa}{34.7MPa} = 3.01$

As this exceeds a reasonable safety factor of 3, it is not considered likely that failure would be observed in the panel itself – instead failure would be more likely to occur at the fixings.

3.2. Fastener Failure

The capacity of the fasteners are determined in accordance with the relevant standards and codes for fixing to timber and steel.

	Fixing to steel batten (screws)	Fixing to timber (screws)
Diameter:	4.17 mm	4.17 mm
Length:	16.0 mm	16.0 mm
Embedment / substrate thickness:	0.9 mm	30 mm
Substrate strength:	$F_{tu} > 300$ MPa (Grade G2)	23 N/mm
Pullout:	0.48 kN (first principles)	0.53 kN (first principles)
Head diameter:	Min. 8mm	Min. 8.2mm
Fixture thickness:	2 mm aluminium (6063-T5 alloy and temper)	2 mm aluminium
Pullover:	0.53 kN (first principles)	0.50 kN (first principles)

Therefore, the capacity of the screw connection is taken as: Screw in steel batten: 0.48kN

Following the rules set out above, the load reaction on each support point can be determined:

Wind class	Pressure zone	Pressure	Width between fixings	Load to end fixings	Load to intermediate fixings
N4 / C2	Corner	-2.90 kPa	155 mm / 190mm	0.129 kN	0.430 kN
	General	-1.45 kPa	155 mm / 190mm	0.065 kN	0.215 kN
N5	Corner	-4.27 kPa	155 mm / 190mm	0.190 kN	<u>0.634 kN*</u>
	General	-2.14 kPa	155 mm / 190mm	0.095 kN	0.318 kN
C3	Corner	-4.27 kPa	155 mm / 190mm	0.091 kN (300mm batten spacing)	0.304 kN (300mm batten spacing)
	General	-2.14 kPa	155 mm / 190mm	0.095 kN	0.318 kN
N6	Corner	-5.77 kPa	155 mm / 190mm	0.257 kN	<u>0.856 kN*</u>
	General	-2.88 kPa	155 mm / 190mm	0.128 kN	0.428 kN
C4	Corner	-5.77 kPa	155 mm / 190mm	0.123 kN (300mm batten spacing)	0.411 kN (300mm batten spacing)
	General	-2.88 kPa	155 mm / 190mm	0.128 kN	0.428 kN
Max.:				0.257 kN	0.856 kN
Capacity:				0.480 kN	0.960 kN*
Result:				PASS	PASS

- width between fixings based on type of Alu-Selekta panel selected. Load to end fixings based on worst case 190mm width.

- unless noted otherwise, batten spacing is at max. 625mm.

*capacity of 2 screws installed at each intermediate fixing for N5, corner and N6 corner zones only.