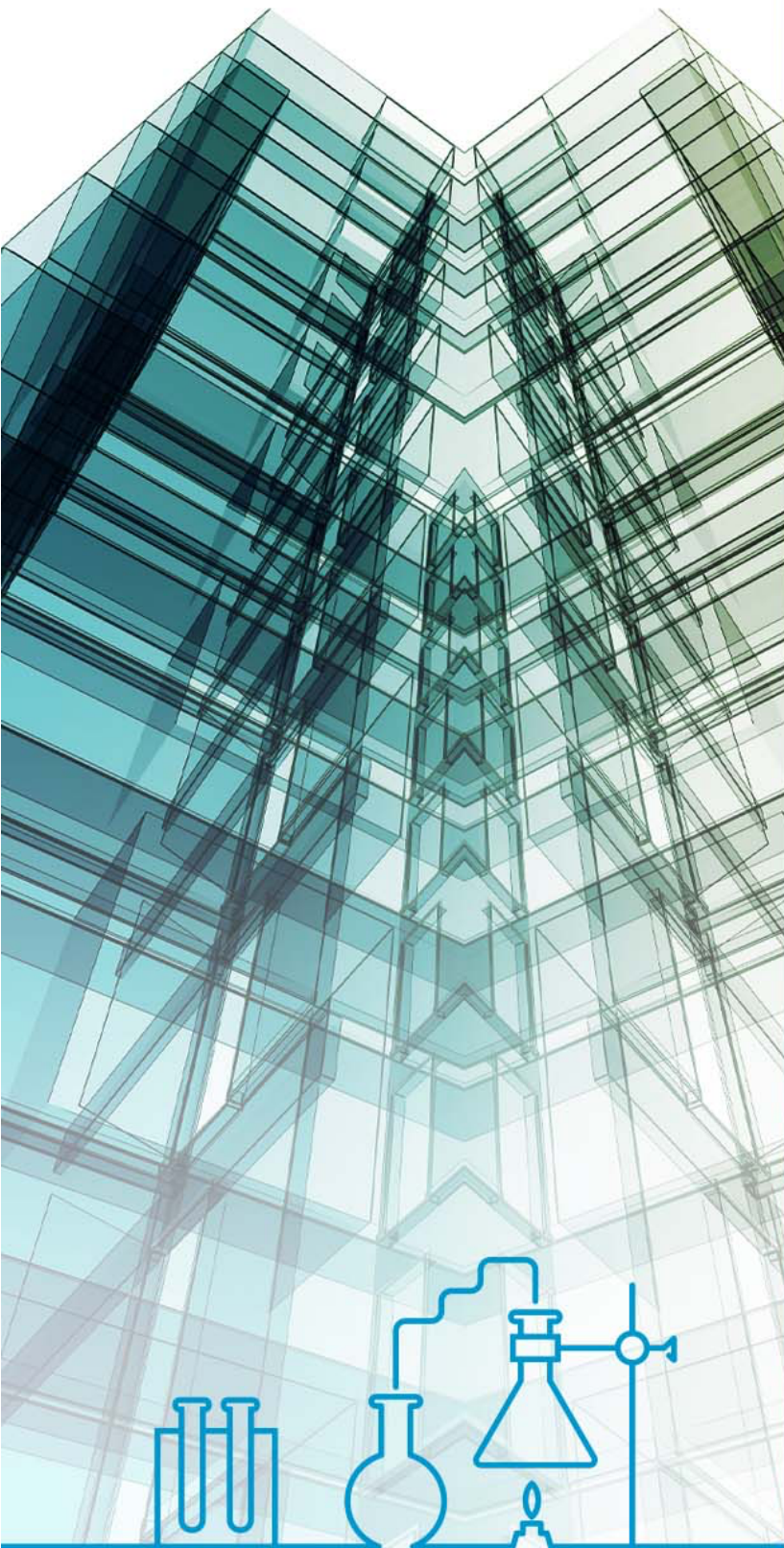




ALU-SELEKTA ALUMINIUM
CLADDING

BUSHFIRE COMPLIANCE
ASSESSMENT AS 3939:2018

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1 EVALUATION

1.1 General

Ignis Labs has been engaged by Modinex to undertake a review of the ALU-SELEKTA aluminium cladding for use in bushfire prone areas up to BAL 29. The compliance will be reviewed in accordance with AS 3959:2018 for BAL 12.5 to BAL 29 and thus compliance with NCC Volume One G5P1, G5D1, G5D2, G5D3, G5D4 Volume Two Clauses H7P5, H7D4. It is considered that the ALU-SELEKTA aluminium cladding is suitable for use within BAL 29 applications when used within a non-combustible wall system having a thickness of not less than 90 mm.

The ALU-SELEKTA material is a timber-look aluminium cladding panel with a nominal thickness of 2 mm, and is composed of Aluminium 6063 alloy with a timber-patterned facing. The bare aluminium without the facing has been tested to AS 1530.1:1994 by Ignis Labs, and is deemed non-combustible as detailed in Test Report IGNL-4211-01R dated 26 February 2021. The whole panel has been tested to AS 1530.3:1999 by AWT, achieving an ignitability, spread of flame, heat evolved, and smoke development index of 0, 0, 0, 3 respectively as detailed in Test Report 17-003431 dated 20 July 2017.

Under the provisions of Clause C2D10 (6)(e) of the NCC 2022 Volume 1, a pre-finished metal sheeting may be used wherever a non-combustible material is required, provided the surface has a thickness of less than 1 mm and a spread of flame index of 0. Volume 2 of the NCC 2022 has identical requirements for Class 1 and 10 buildings as detailed under Clause H3D2 (1)(e). The ALU-SELEKTA panels are comprised of a non-combustible aluminium sheet, and the applied facing has a thickness of less than 1 mm and a spread of flame index of 0. As such, it may be used wherever a non-combustible material is required.

It is noted that the NCC establishes bushfire compliance requirements for Class 1, 2, 3 or 10 building associated with a Class 1 building.

AS 3959 is primarily concerned with improving the ability of buildings in designated bushfire-prone areas to better withstand attack from bushfire thus giving a measure of protection to the building occupants (until the fire front passes) as well as to the building itself.

Improving the design and construction of buildings to minimise damage from the effects of bushfire is but one of several measures available to property owners and occupiers to address damage during bushfire. Property owners should be aware that AS 3959 is part of a process that aims to lessen the risk of damage to buildings occurring in the event of the onslaught of bushfire. Other measures of mitigating damage from bushfire fall within the areas of planning, subdivision, siting, landscaping and maintenance.

It should be borne in mind that the measures contained in AS 3959 as well as this advisory note cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature and behaviour of fire, and extreme weather conditions.

1.2 AS 3959 Requirements

BAL 12.5 to BAL 19 | AS 3959:2018 requires the exposed components of an external wall for BAL 12.5 to BAL 19 application to be a non-combustible material fixed externally to a steel or timber framed wall. The ALU-SELEKTA aluminium cladding, having been tested to AS 1530.1 and AS 1530.3 and deemed suitable for use wherever a non-combustible material is required is deemed to meet the requirements for external wall protection up to BAL 19 applications. \

BAL 29 | AS 3959:2018 requires the exposed component of the external wall is to meet the criteria outlined in Clause 7.4.1 of AS 3959. For a non-combustible material, the minimum thickness is required to be 90 mm.



FIGURE 1:

AS 3959 CLAUSE 7.4.1 (A) NON-COMBUSTIBLE EXTERNAL WALL CONSTRUCTION

7.4 WALLS

7.4.1 General

The exposed components of external walls shall be as follows:

- (a) Non-combustible material including the following provided the minimum thickness is 90 mm:
 - (i) Full masonry or masonry veneer walls with an outer leaf of clay, concrete, calcium silicate or natural stone.
 - (ii) Precast or in situ walls of concrete or aerated concrete.
 - (iii) Earth wall including mud brick.

It is considered that a wall system having thickness of not less than 90 mm and comprised of the ALU-SELEKTA aluminium cladding, a non-combustible insulation material, steel framing, and a plasterboard internal lining is equivalent to the requirements of Clause 7.4.1 (a), where all materials are non-combustible, or deemed permissible for use wherever a non-combustible material is required.

Joints | All joints in the surface material are to be sealed, covered, overlapped, backed, or butt jointed.

Junctions | The roof/wall and roof/roof junction shall be sealed either by the use of fascia and eaves linings or by sealing between the top of the wall and the underside of the roof and protected in accordance with Clause 3.6 of AS 3959:2018.

Vents and weepholes | Vents and weepholes are to be protected as per AS 3959:2018 for the respective BAL zone. For BAL 29, with the exception of the provisions of Clause 3.6, vents and weepholes shall be screened with a mesh composed of corrosion-resistant steel, bronze, or aluminium.

1.3 Compliance Structure

A Bushfire Attack Level (BAL) is a means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact. AS 3959:2018 details the construction requirements for building elements in bushfire-prone areas with different BAL ratings. The BAL rating is measured in increments of radiant heat (expressed in kilowatts/m²). The BAL ratings are defined in AS 3959:2018 as follows.

TABLE 1:

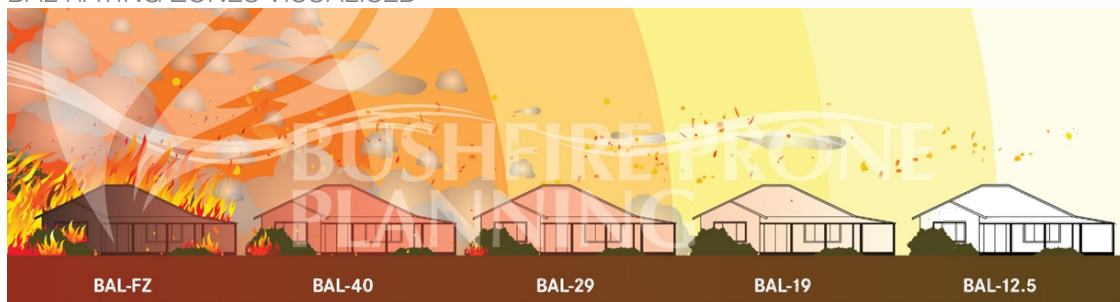
BAL RATING EXPLANATIONS IN ACCORDANCE WITH AS 3959:2018

BAL Rating	Explanation	Construction Requirements
BAL – LOW	There is insufficient risk to warrant any specific construction requirements but there is still some risk.	Section 4 of AS 3959:2018
BAL – 12.5	There is a risk of ember attack. The construction elements are expected to be exposed to a heat flux not greater than 12.5 kW/ m ²	Section 5 of AS 3959:2018
BAL – 19	There is a risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to radiant heat.	Section 6 of AS 3959:2018
BAL – 29	There is an increased risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level of radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 29 kW/ m ²	Section 7 of AS 3959:2018



BAL – 40	There is a much increased risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux not greater than 40 kW/ m²	Section 8 of AS 3959:2018
BAL – FZ	There is an extremely high risk of ember attack and burning debris ignited by windborne embers, and a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux greater than 40 kW/ m²	Section 9 of AS 3959:2018

FIGURE 2:
BAL RATING ZONES VISUALISED



In accordance with AS 3959 Clause 3.4, the construction requirements specified for a particular BAL shall be acceptable for a lower level.

Compliance for decking structures in accordance with AS 3959 is achieved through a Deemed-to-Satisfy process. The National Construction Code establishes the Performance Requirement for construction in bushfire prone areas as follows:

FIGURE 3:
NCC BCA VOLUME 1 CLASS 2 TO 9 BUILDINGS PERFORMANCE REQUIREMENT

G5P1 Bushfire resistance

[2019: GP5.1]

A building that is constructed in a *designated bushfire prone area* must be designed and constructed to—

- (a) reduce the risk of ignition from a *design bushfire* with an annual exceedance probability not more than 1:100 years, or 1:200 years for a Class 9 building; and
- (b) take account of the assessed duration and intensity of the *fire actions* of the *design bushfire*; and
- (c) be designed to prevent internal ignition of the building and its contents; and
- (d) maintain the structural integrity of the building for the duration of the *design bushfire*.

Applications

G5P1 applies in a *designated bushfire prone area* to—

- (a) a Class 2 or 3 building; and
- (b) a Class 9a *health-care building*; and
- (c) a Class 9b—
 - (i) *early childhood centre*; and
 - (ii) primary or secondary *school*; and
- (d) a Class 9c *residential care building*; and
- (e) a Class 10a building or deck immediately adjacent or connected to a building of a type listed in (a) to (d).



FIGURE 4:

NCC BCA VOLUME 2 CLASS 1 AND 10 BUILDINGS PERFORMANCE REQUIREMENT

H7P5 Buildings in bushfire prone areas

[2019: P2.7.5]

A Class 1 building or a Class 10a building or deck associated with a Class 1 building that is constructed in a *designated bushfire prone area* must be designed and constructed to—

- (a) reduce the risk of ignition from a *design bushfire* with an annual exceedance probability not more than 1:50 years; and
- (b) take account of the assessed duration and intensity of the *fire actions* of the *design bushfire*; and
- (c) be designed to prevent internal ignition of the building and its contents; and
- (d) maintain the structural integrity of the building for the duration of the *design bushfire*.

The Deemed-to-Satisfy requirements of the National Construction Code establishes that compliance is achieved when the building is constructed in accordance with the requirements of AS 3959.

FIGURE 5:

NCC BCA VOLUME 1 CLASS 2 TO 9 BUILDINGS DEEMED TO SATISFY PROVISION

G5D3 Protection — residential buildings

[2019: G5.2]

In a *designated bushfire prone area* the following must comply with AS 3959:

- (a) A Class 2 or 3 building.
- (b) A Class 10a building or deck immediately adjacent or connected to a Class 2 or 3 building.

FIGURE 6:

NCC BCA VOLUME 2 CLASS 1 AND 10 BUILDINGS DEEMED TO SATISFY PROVISION

H7D4 Construction in bushfire prone areas

[2019: 3.10.5]

- (1) The requirements of (2) only apply in a *designated bushfire prone area*.
- (2) *Performance Requirement H7P5* is satisfied for a Class 1 building, or a Class 10a building or deck associated with a Class 1 building, if it is constructed in accordance with—
 - (a) AS 3959; or
 - (b) NASH Standard – Steel Framed Construction in Bushfire Areas.

This assessment considers compliance with the Deemed-to-Satisfy provisions of the National Construction Code through satisfying the requirements of AS 3959.

1.4 AS 3959 Compliance

The criteria for external walls under BAL 29 are established within Section 7 of AS 3959. The relevant requirements for external walls for BAL 29 applications are as follows:

- External exposed components of walls are to be non-combustible materials having a minimum thickness of 90 mm
- Joints are to be covered, sealed, overlapped, backed, or butt jointed.
- Vents and weepholes are to be screened with a mesh made of corrosion-resistant steel, bronze or aluminium.
- Penetrations and services through the external wall shall be sealed to prevent openings greater than 2 mm.
- The roof/wall and roof/roof junction shall be sealed either by the use of fascia and eaves linings or by sealing between the top of the wall and the underside of the roof and protected in accordance with Clause 3.6 of AS 3959.

wall system having thickness of not less than 90 mm and comprised of the ALU-SELEKTA aluminium cladding, a non-combustible insulation material, steel framing, and a plasterboard internal lining is equivalent to the requirements of Clause 7.4.1 (a), where all materials are non-combustible, or deemed permissible for use wherever a non-combustible material is required.



The ALU-SELEKTA aluminium cladding, when used within a wall system comprised of other non-combustible materials and having a thickness of not less than 90 mm, meets the requirements of Clause 7.4.1 (1) and is suitable for use as an external wall up to BAL 29. It must be fixed externally to the steel or timber frame of the wall. For BAL 12.5 and BAL 19 applications, the ALU-SELEKTA aluminium cladding, being deemed suitable for use wherever a non-combustible material is required, is deemed to provide sufficient protection provided it is fixed externally to a steel or timber frame.

Installation | Where the panels are used in a bushfire application, they must be installed in accordance with the ALU-SELEKTA installation instructions and the relevant BAL requirements of AS 3959.

Joints | All joints in the surface material are to be sealed, covered, overlapped, backed, or butt jointed.

Junctions | The roof/wall and roof/roof junction shall be sealed either by the use of fascia and eaves linings or by sealing between the top of the wall and the underside of the roof and protected in accordance with Clause 3.6 of AS 3959:2018.

Vents and weepholes | Vents and weepholes are to be protected as per AS 3959:2018 for the respective BAL zone. For BAL 29, with the exception of the provisions of Clause 3.6, vents and weepholes shall be screened with a mesh composed of corrosion-resistant steel, bronze, or aluminium.

2 CONCLUSION

The ALU-SELEKTA aluminium cladding when used within a wall system comprised of other non-combustible materials and having a thickness of not less than 90 mm meets the requirements for use as an external wall system in applications up to BAL 29 in accordance with AS 3959:2018. It is required to be installed in accordance with the requirements of AS 3959:2018 for the relevant application.



CONDITIONS AND LIMITATIONS

This assessment report does not provide an endorsement by Ignis Labs Pty Ltd of the actual product evaluated.

The conclusions of this assessment may be used to directly assess fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazards under all conditions.

Because of the nature of fire testing, and the consequent difficulty in quantifying the uncertainty of measurement, it is not possible to provide a stated degree of accuracy. The inherent variability in test procedures, materials and methods of construction, and installation may lead to variations in performance between elements of similar construction.

The assessment can therefore only relate to the actual prototype test specimens, testing conditions and methodology described in the referenced documents, and does not imply any performance abilities of constructions of subsequent manufacture.

This assessment is based on information and experience available at the time of preparation. The published procedures for the conduct of tests and the assessment of test results are the subject of constant review and improvement and it is recommended that this report is reviewed on or, before, the stated expiry date.

This report is prepared in good faith and with due care for information purposes only, and should not be relied upon as providing any warranty or guarantee. In particular, attention is drawn to the nature of the inspection and investigations undertaken and the limitations these impose in determining with accuracy the state of the building, its services or equipment and life safety.

Ignis Labs' involvement in the Project is limited to the role outlined in our 'Scope of Service' of the quote. This report reflects that role.

Any reliance on, or use of, this report for purposes outside the scope of service is at the user's own risk.

Ignis Labs shall not be held liable for any loss or damage resulting from any defect of the building or its services or equipment or for any non-compliance of the building or its services or equipment with any legislative or operational requirement, whether or not such defect or non-compliance is referred to or reported upon in this report, unless such defect or non-compliance should have been apparent to a competent engineer undertaking the evaluation of the type undertaken for the purpose of preparation of this report.

Ignis Labs has carefully reviewed and applied to the best of our ability the requirements of local Legislation, the current NCC and the Australian Fire Engineering Guidelines. Any changes to the reference documents including the NCC should warrant a review of this report.

This report is provided to the client at their request to evaluate the product performance under fire safety performance analysis. Ignis Labs provides no warranty that this report will be approved by building authorities, future legislation or changes to the building code that would impact this evaluation where a deemed to satisfy solution may be required, further evaluation is needed or be subject to a fire order or new legislation for its design.

Ignis has relied upon the information provided by the client such as the architectural plans, building photos and construction detail. Ignis has not audited these documents or the building and assumes the information provided by the client on these documents is accurate. Ignis cannot provide any warranty that our report accuracy is maintained should the information provided have errors.

AUTHORISER EXPERIENCE

Benjamin is a well-known and respected fire safety engineer in Australia known for his work on occupant life safety studies, design and application of fire safety systems for occupant life protection as well as establishing Australia's first multi-function private fire safety testing and research facility, Ignis Labs, in the Canberra region. Ignis Labs is accredited with the National Association of Testing Authorities (NATA) accreditation number 20534. With over 20 years experience in fire safety, Benjamin combines knowledge of industry review and regulation matters with experience in fire-safety engineering to provide expert advice. With a Masters of Fire Safety Engineering and Graduate Diploma in Bushfire Engineering from the University of Western Sydney as well as a Bachelor of Engineering from the University of Technology, Sydney. In 2012, Benjamin established Ignis Solutions, a fire safety engineering consultancy, and in 2017 established Ignis Labs, an accredited fire safety test and research facility. Benjamin continues to be the Chief Executive Officer of Ignis Labs. Benjamin is responsible for managing Ignis Group as their Chief Executive Officer, overseeing test projects, internal research studies as well as private client research studies, client liaison, compiling BCA fire safety audits, performance solutions reports, computer modelling of fire scenarios and product compliance evaluation. Prior to establishing the Ignis Group, Benjamin has consulted on a wide range of projects including reviewing and auditing performance based designs with Australia's largest fire brigade (Fire and Rescue NSW) as their senior fire engineer. Benjamin received the highest civilian award, the meritorious service award, for his work with Fire and Rescue NSW in the evaluation of performance based designs and advancements in fire service involvement in building designs. Benjamin has completed several hundred performance based designs on a wide range of projects such as infrastructure, assembly, residential, commercial, industrial as well as high-rise buildings throughout Australia.

This report has been prepared by Benjamin Hughes-Brown, Chartered Professional Fire Safety Engineer. This advice can be considered as a certificate from professional engineer in accordance with Clause A5G3 (1)(e) of BCA 2022 Volume One and Two.

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