

Aluminium Honeycomb Panels for Lightweight Architectural Envelopes





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**Alucoil** is a Spanish multinational headquartered in Miranda de Ebro (Burgos), specialist in the production of technologically advanced materials for the **building**, **transportation** and **Industrial sectors**.



# **ABOUT US**

Since 1996, **Alucoil** has been manufacturing and transforming the most innovative solutions in aluminium under their prestigious brands, becoming a world leader in technology, innovation and professionalism.

**Alucoil** products bring high added value to their customers, and are organised in 3 large production areas:

- Composite
- Honeycomb
- Solar thermal energy



# larcore® A2

The industrial sectors tirelessly seek new technologies, products and building solutions with which to tackle projects more sustainably, optimising efficiency, improving output and raising performance.

After an exhaustive research and development (R&D) process, at **Alucoil** we have been able to unite the properties inherent in "honeycomb" type structures with our industrial experience in the production of metal structural panels. The result is the **larcore® A2** panel, an innovative aluminium honeycomb panel manufactured by advanced continuous industrial processing.

This product represents an integral solution for various architectural requirements, notable for its suitability for cladding architectural enclosures. It brings significant improvements in terms of rigidity, lightness, fire resistance, recyclability, insulation and energy efficiency.



The **larcore® A2** panel is supplied in thicknesses of 6 to 20 mm, with interior and exterior aluminium skins of 0.5 to 1.0 mm.



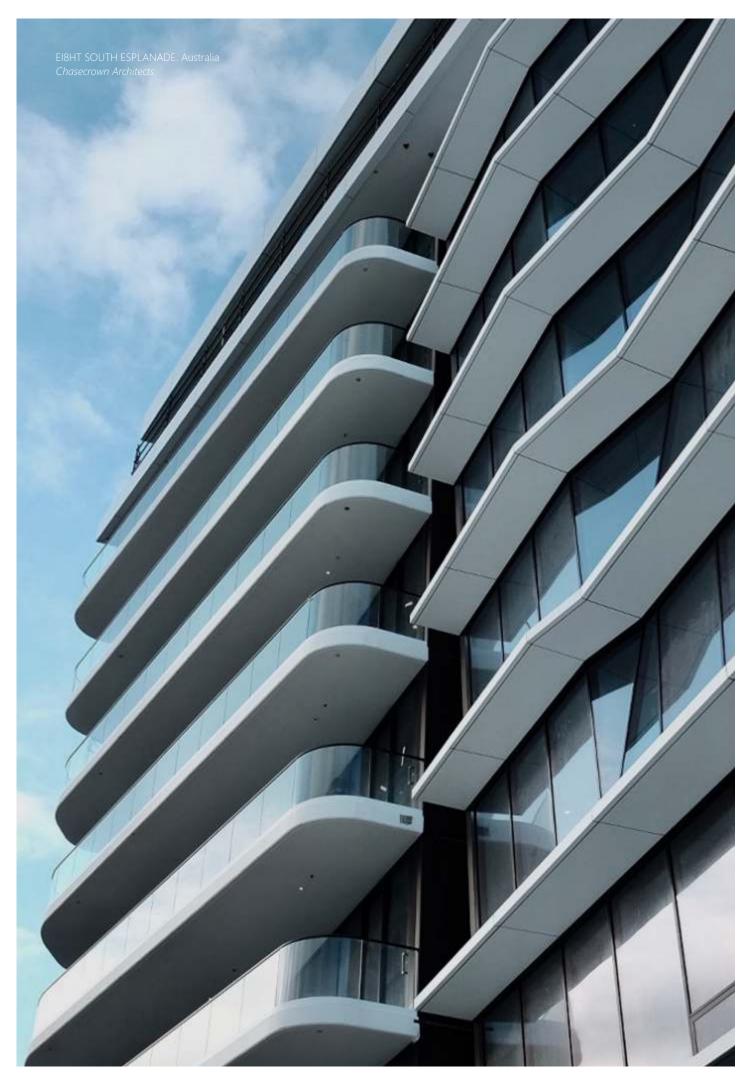


#### MAIN CHARACTERISTICS:

- Fire class A2-s1, d0 according to EN 13501-1.
- Rigidity.
- Flatness.
- Lightness.
- 100% recyclable.
- Manufactured in width up to 2 metres.

The **larcore\* A2** panel can be seen on ventilated façades, floating floors, false ceilings and sun shades.

For this purpose, **Alucoil** has developed 2 proprietary installation systems, one for panels and the other for trays. These systems are marketed under the brand names **Hidetech\* LIGHT** and **Hidetech\* PRO**.



## **FINISHES**

#### **COATING POSSIBILITIES**

#### **PVDF**

(Polyvinylidene Fluoride)

Based on PVDF resins with extraordinary performance. Nominal paint thicknesses:

- a) PVDF 2L Coastal: approx.31µ
- Gloss from 20G to 40G.
- Excellent colour stability, minimal chalking and very good chemical resistance.
- Extraordinary protection against weathering, radiation and atmospheric contaminants.
- Outstanding flexibility when profiled, folded and coiled.

#### DG5

(High Durable Polyester)

Based on HDP resins with nominal paint thicknesses (depending on the colour):

- a) DG5 2L Coastal: approx. 35µ.
- a) DG5 3L Coastal: approx. 55µ.
- a) DG5 2L: approx. 25µ.
- Gloss from 10G to 90G.
- Excellent protection against weathering, UV radiation, and atmospheric contaminants.
- Outstanding hardness and flexibility when profiled, folded, and coiled.

#### fluorlac<sup>®</sup>

(Feve LUMIFLON™ 2 Layers)

Paint based on fluoropolymer resins with a nominal thickness of 30µ (depending on the colour).

- RAL & NCS colour chart available in matte, satin, and gloss finishes.
- Possibility of matching specific colours
- Very small quantities available, orders starting from 75m<sup>2</sup> with immediate delivery within 2-3 weeks.
- Excellent weather resistance and chemical durability.
- Outstanding resistance to abrasion.

Durability in coastal areas	Durability in coastal areas	Durability in coastal areas
UV resistance	UV resistance	UV resistance
Warranty	Warranty	Warranty
Gloss level	Gloss level	Gloss level
Cleaning	Cleaning	Cleaning

# larcore®A2 6 mm Hidetech® LIGHT

#### Aluminium honeycomb panels for light architectural enclosures with a cassette installation system.

**Alucoil** has developed the **Hidetech® LIGHT** installation system for **6 mm thick larcore® A2** panel. An innovative solution that reduces the substructure on the façade by 30%, but can be fabricated with traditional tools. Extremely light, rigid, non-combustible and with the best flatness on the market.

Certification: EPD® Environmental product declaration

Testing: Large scale test BS 8414-1 & BS 8414-2, with **Hidetech® LIGHT** installation system.

Classifications: Same composition and quantity of adhesive as **larcore**° **A2 14 mm** + **Hidetech**° **PRO** installation system by **Alucoil**, classified **A2-s1**, **d0** according to EN 13501-1.

Protective film

0,7 mm coated aluminium 5005 EN 573-3

Bonding layer

Aluminium honeycomb core

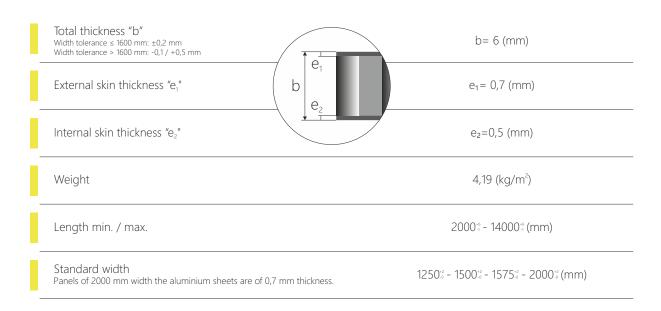
Bonding layer

0,5 aluminium 5005 EN 573-3





#### **DIMENSIONAL CHARACTERISTICS**

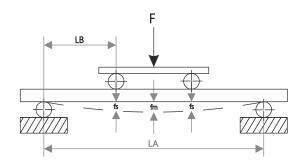


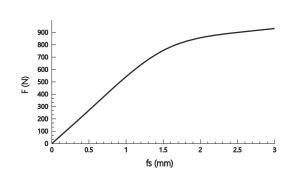


#### MECHANICAL PROPERTIES OF THE PANEL

The purpose of the mechanical values is to be able to compare different product configurations. Specific calculations for each project must be requested to **Alucoil**'s technical department.

#### BENDING TEST ACCORDING TO DIN 53 293





District (EI)	Transversal axis	Longitudinal axis
Rigidity (EI)	2825 (kNcm²/m) DIN 53293	2386 (kNcm²/m) DIN 53293

Acoustic insulation (R<sub>(A)</sub>) 19,54 (dBa) ISO 10140-2

Thermal resistance (R) 0,0068 (m<sup>2</sup>K/W)

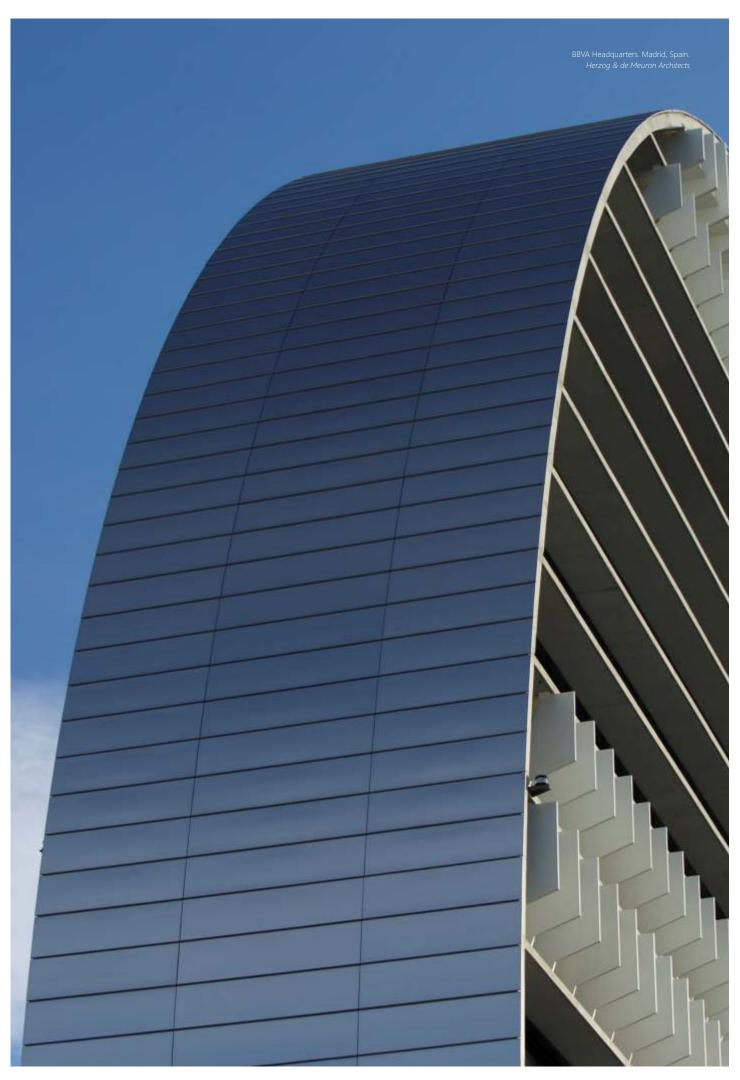


### ALUMINIUM HONEYCOMB CORE PROPERTIES

Aluminium alloy	3005 <sup>(1)</sup> EN 573-3 (1)Other alloy availables
Cell size (C)	1/4 "≈ 6,35 mm
Foil thickness (F)	50μ
Compressive strength	2,20 Mpa DIN 53291
Density (ρ)	56 kg/m³

## COATED ALUMINIUM SKIN PROPERTIES

Modulus of elasticity (E)	7000 (N/mm²)
Ultimate tensile strength ( $R_m$ )	125 < R <sub>m</sub> < 185 (N/mm²)
Yield strength (R <sub>p0,2</sub> )	>80 (N/mm²)
Elongation (A)	>4 (%)
Standard aluminium alloy	5005 <sup>(1)</sup> EN 573-3 (1)Other alloy availables
Aluminium thermal expansion	2,3 mm/m ∆ 100°C



# **Hidetech<sup>®</sup> LIGHT**

Hidetech® LIGHT system for larcore® A2 6 mm honeycomb panel. Architectural ceilings and façades.

Brackets, vertical profiles (mullions), clips and perimeter profile are extruded in aluminum EN AW 6106 T6 alloy, one of the most resistant. System support is based on vertical profiles (mullions) with an asymmetric T-shaped section, connected to the building by L-shaped section brackets.



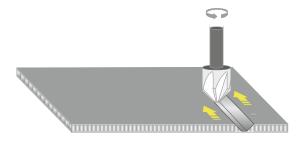
**larcore® A2 6 mm** panel is folded in cassettes. Exposed edges are closed on the perimeter by a profile used for waterproofing the core and for fixing cassettes to mullions. Perimeter profile is connected to cassettes edges using rivets. Those same rivets will also be placed at corners for assuring cassette forming. This perimeter profile has a guide rail for sliding in it special fixing clips. Clips will be placed and screwed against vertical profiles. System movement availability is assured by slotted-holes performed in clips and brackets too, and through the sliding possibility of clips inside the guide rail.

Recommended for use on architectural façades. The installation of the **larcore® A2** panel must guarantee its watertightness.

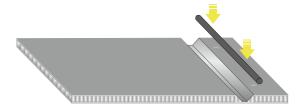


# FORMING OF THE CASSETTE THROUGH CUTTING, MILLING, AND PERIMETER PROFILES

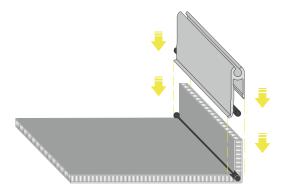
01 Machining of the panel



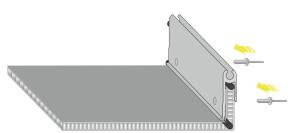
O2 Sealing the panel with cellular cord.



O3 Placement to the LT-4 profile with cellular cords.



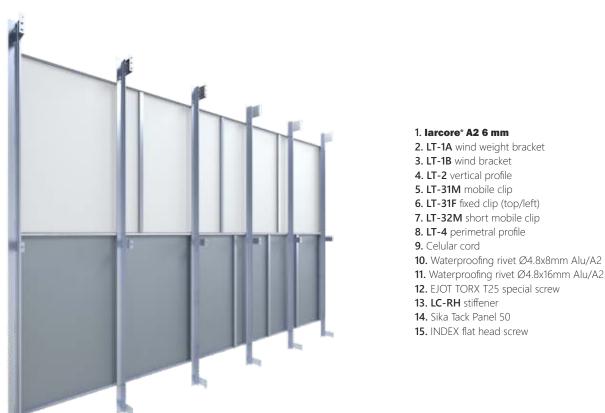
04 Fixing of the rivets.



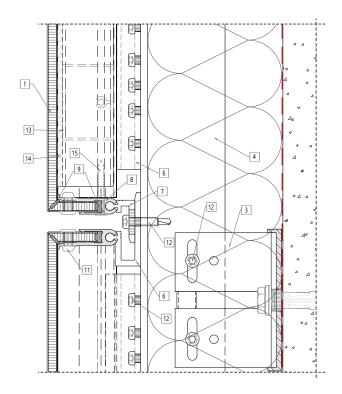


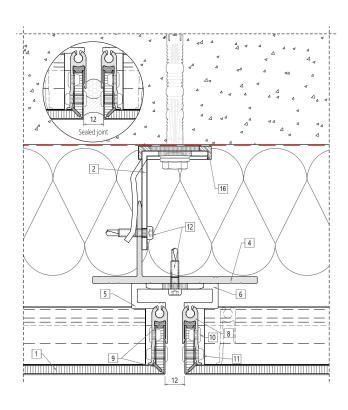
# larcore®A2 6 mm Hidetech® LIGHT

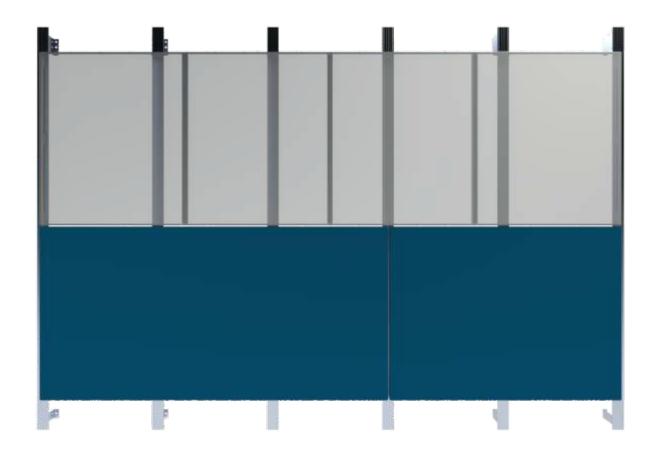
Aluminium honeycomb panels for light architectural enclosures with a cassette installation system.



### **CONSTRUCTION DETAILS**





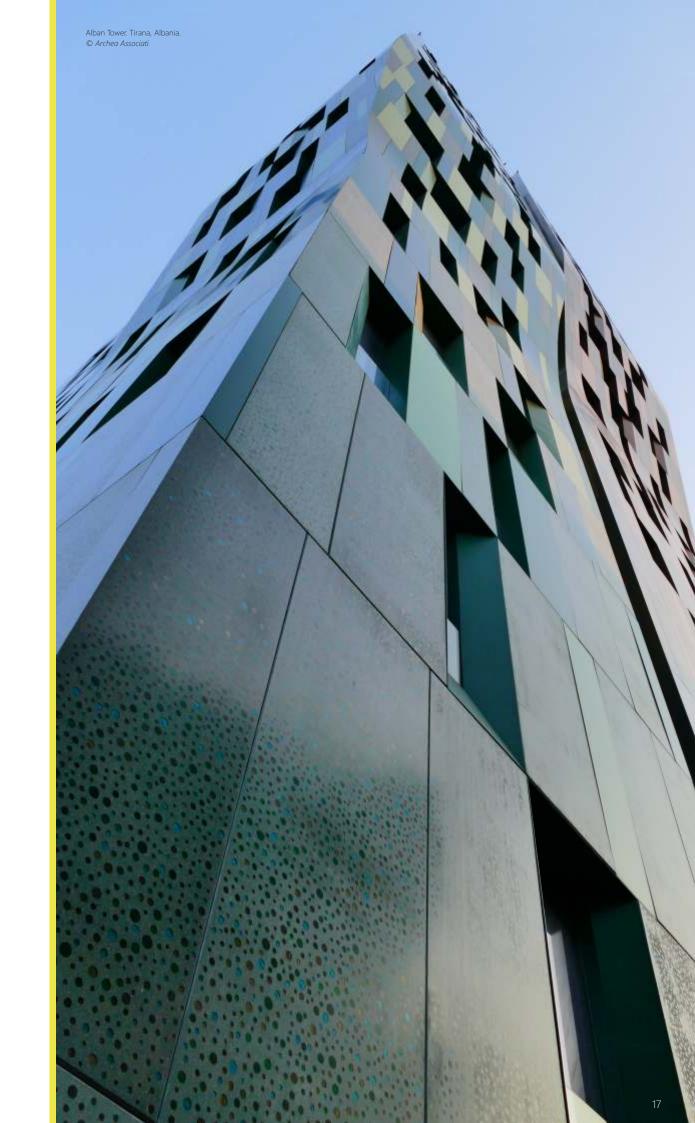


### **ACCESSORIES OF THE SYSTEM**









# larcore A2 14 mm Hidetech PRO

#### Aluminium honeycomb panels for light architectural enclosures with a panel installation system.

For those who demand a perfect flat panel solution with a very high rigidity, **Alucoil** has developed the **Hidetech® PRO** system from **larcore® A2 14 mm** panels with a total thickness of 14 mm. A proposal based on clips that fix the edged panels to a very reduced substructure. A new concept that is extraordinarily light, non-combustible and with perfect flatness.

Panel with EPD® certificate (Environmental Product Declaration).

#### Fire classification A2-s1, d0<sup>(1)</sup> EN 13501-1

<sup>(1)</sup>Not specifically tested under EN 13501-1. Same adhesive quantity and composition than larcore® A2 14 mm + Alucoil's Hidetech® installation system, classified A2-s1, d0 EN 13501-1.

Protective film

1,0 mm coated aluminium 5005 EN 573-3

Bonding layer

Aluminium honeycomb core

Bonding layer

1,0 mm aluminium 5754 EN 573-3





#### **DIMENSIONAL CHARACTERISTICS**

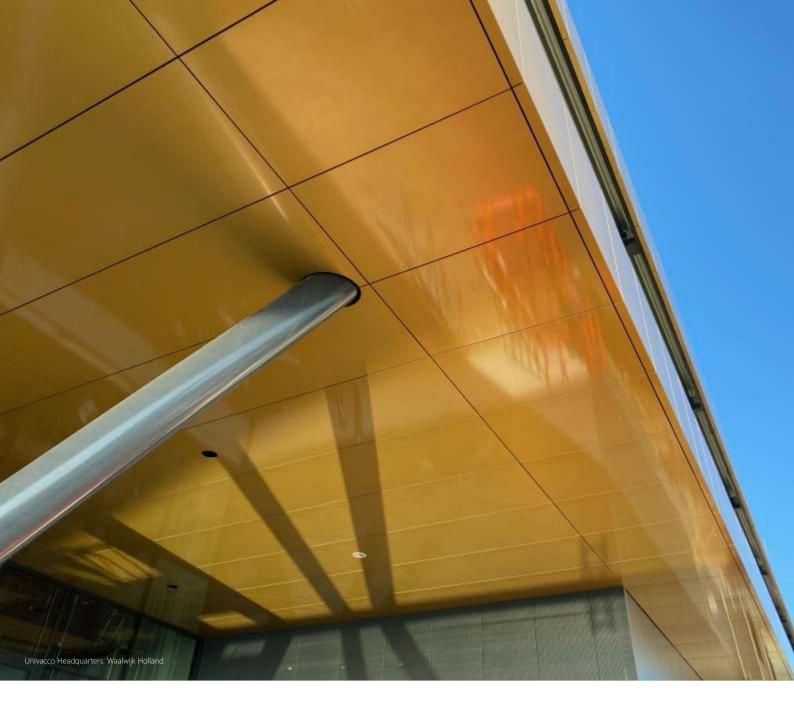
Total thickness "b"  Tolerance ±0,2 mm	b= 14 (mm)
External skin thickness "e <sub>1</sub> "	b e <sub>1</sub> = 1,0 (mm)
Internal skin thickness "e <sub>2</sub> "	e <sub>2</sub> =1,0 (mm)
Weight	6,75 (kg/m²)
Length min. / max.	2000 <sup>-6</sup> - 14000 <sup>-6</sup> (mm)
Standard width	1250 <sup>-2</sup> - 1500 <sup>-2</sup> - 1575 <sup>-2</sup> - 2000 <sup>-2</sup> (mm)



### MECHANICAL PROPERTIES OF THE PANEL

The purpose of the mechanical values is to be able to compare different product configurations. Specific calculations for each project must be requested to **Alucoil**'s technical department.

Rigidity (EI)	Extra rigid premium panel for use with <b>Hidetech® PRO</b> system. All necessary calculations are provided by our technical department.
Acoustic insulation (R <sub>(A)</sub> )	21,56 (dBa) ISO 10140-2
Thermal resistance (R)	0,0086 (m²K/W)



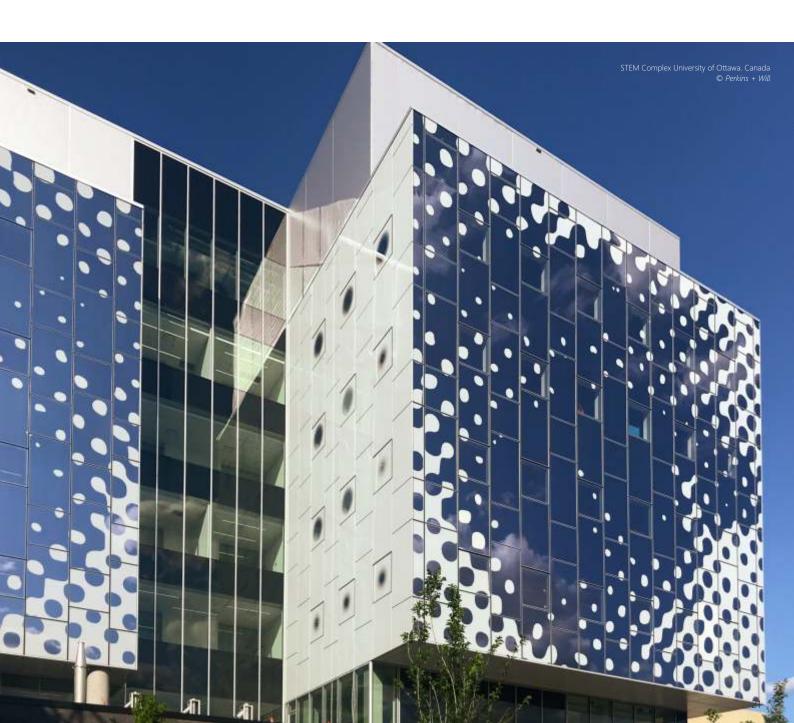
## COATED ALUMINIUM SKIN PROPERTIES

Aluminium alloy a) External skin b) Internal skin	a) 5005 <sup>(1)</sup> EN 573-3 b) 5754 <sup>(1)</sup> EN 573-3
Modulus of elasticity (E) External and internal skin	7000 (N/mm²)
Ultimate tensile strength $(R_m)$ a) External skin b) Internal skin	a) 125 <r<sub>m&lt;185 (N/mm²) b) &gt;280 (N/mm²)</r<sub>
Yield strength (R <sub>p0,2</sub> ) a) External skin b) Internal skin	a) >80 (N/mm²) b) >220 (N/mm²)
Elongation (A) External and internal skin	>4 (%)
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<sup>&</sup>lt;sup>(1)</sup>Other alloy availables

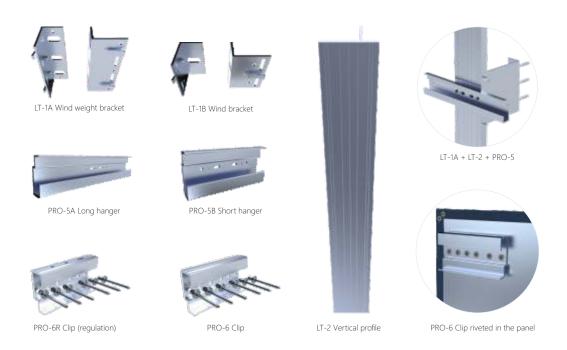
### **ALUMINIUM HONEYCOMB CORE PROPERTIES**

Aluminium alloy	3005 <sup>th</sup> EN 573-3 the alloy availables
Cell size (C)	1/4 "≈ 6,35 mm
Foil thickness (F)	50µ
Compressive strength	2,20 Mpa DIN 53291
Density (p)	56 kg/m³



# **Hidetech® PRO**

**Hidetech® PRO** installation system allows installing **larcore® A2** panels with a total thickness of 14 mm. These panels must be edged around the perimeter to ensure their sealing and they will be hung to the vertical profiles of the system by means of aluminum hangers that are mechanically fixed by rivets on the internal face of the panel.

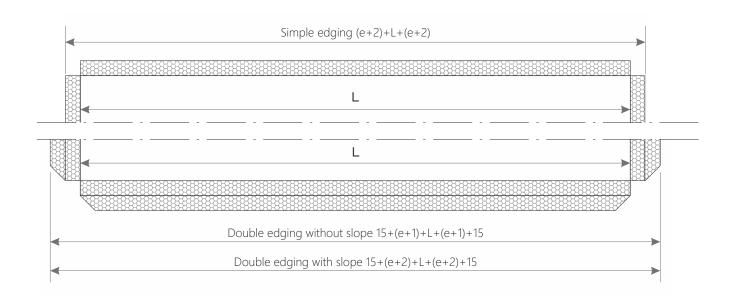


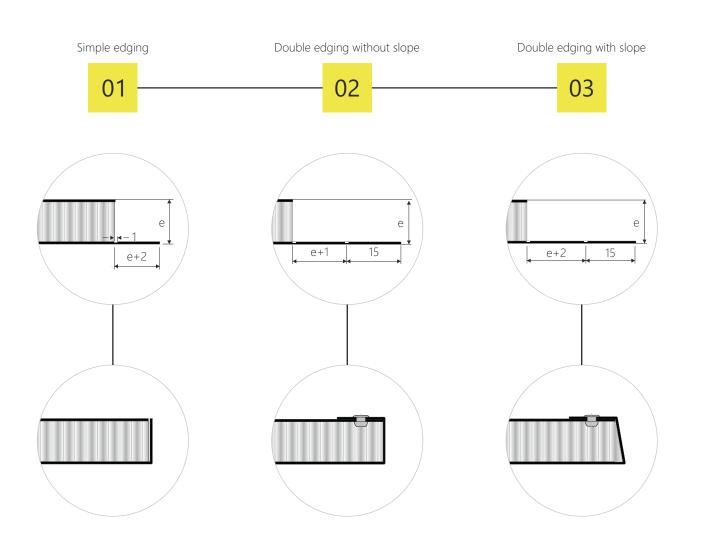
Recommended for use on architectural façades. The installation of the **larcore® A2** panel must guarantee its watertightness





### **DIFFERENT TYPES OF EDGING PANELS**

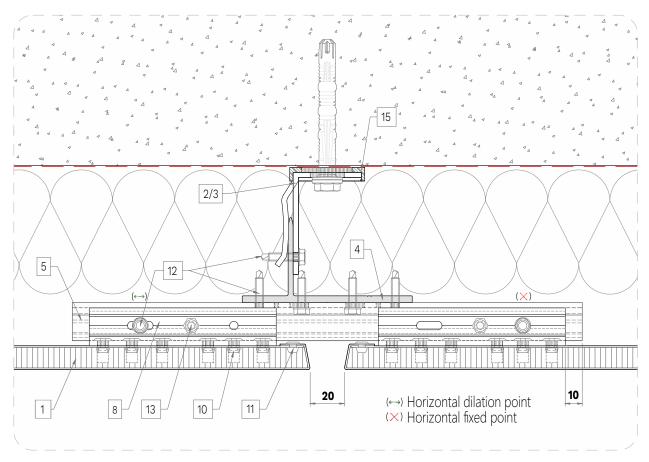




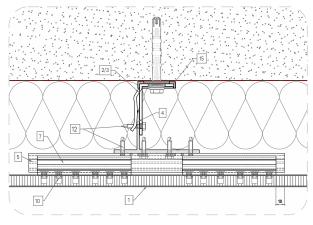
# larcore®A2 14 mm Hidetech® PRO

Aluminium honeycomb panels for light architectural enclosures with a panel installation system.

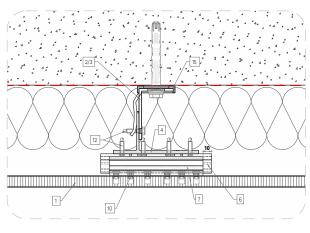
- 1. larcore® A2 14 mm
- 2. LT-1A wind weight bracket
- 3. LT-1B wind bracket
- 4. LT-2 vertical profile
- 5. PRO-5A long hanger
- **6. PRO-5B** short hanger
- 7. PRO-6 standard clip
- 8. PRO-6R regulation clip
- 9. DOWSIL™ 7092 silicone
- **10.** Hidefix 64090 rivet
- 11. NeoSpeed Ø4.8x5.8mm (ref. 57121-14805) rivet
- 12. DIN 7504-K Ø4.8x22mm A2/50
- 13. DIN 933 M5x12mm A2/50
- 14. SikaTack Panel 50
- 15. LT-0A/B thermal break
- 16. Aluminium plate 2-3 mm



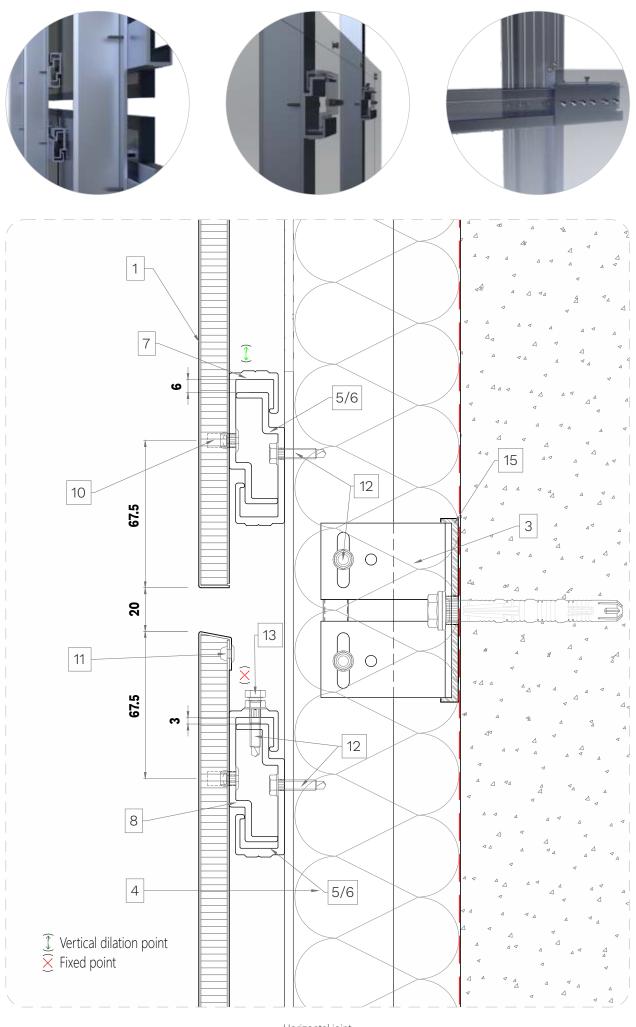
Vertical joint



Intermediate long hanger

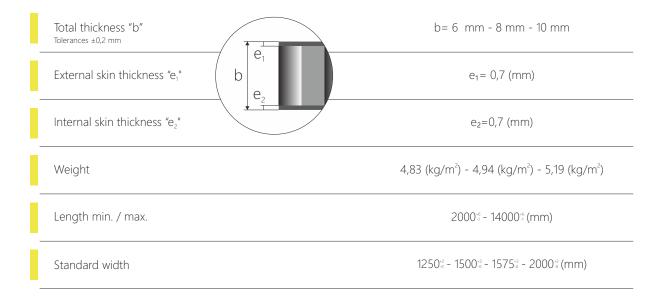


Intermediate short hanger



Horizontal joint

# larcore A2 8 mm - 10 mm - 14 mm



## larcore A2 20 mm

Total thickness "b" Tolerances ±0,2 mm	b= 20 (mm)
External skin thickness " $e_1$ " $b$ $e_2$	e <sub>1</sub> = 1,0 (mm)
Internal skin thickness "e <sub>2</sub> "	e <sub>2</sub> =1,0 (mm)
Weight	7,05 (kg/m²)
Length min. / max.	2000 <sup>-6</sup> - 14000 <sup>-6</sup> (mm)
Standard width	1250 <sup>-2</sup> - 1500 <sup>-2</sup> - 1575 <sup>-2</sup> - 2000 <sup>-2</sup> (mm)



#### **MECHANICAL PROPERTIES**

#### Rigidity (EI) DIN 53293

larcore® A2 8 mm Aluminium thickness: 0,7 mm	<b>Transversal axis</b> 9421 (kNcm²/m)	<b>Longitudinal axis</b> 7217 (kNcm²/m)
larcore® A2 10 mm Aluminium thickness: 0,7 mm	24458 (kNcm²/m)	22519 (kNcm²/m)
larcore® A2 14 mm Aluminium thickness: 0,7 mm	49915 (kNcm²/m)	45958 (kNcm²/m)
larcore® A2 20 mm Aluminium thickness: 1,0 mm	143868 (kNcm²/m)	121726 (kNcm²/m)

The purpose of the mechanical values is to be able to compare different product configurations. Specific calculations for each project must be requested to the **Alucoil** technical department.

The properties of the coated aluminium and the aluminium honeycomb core are the same as those of the larcore\* A2 6 mm

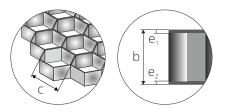
To access further details, please request the product technical datasheet or visit **www.alucoil.com** 

# larcore® A2 Metals ZINC

#### Aluminium honeycomb panels with ZINC skins for light architectural enclosures

Aluminium honeycomb core panel with zinc sheets manufactured in 15 mm total thickness and with 7 differents colour finishes: slate, red, blue, ébano, brown, green and gold





Protective film

**0,5 mm zinc** Z1 (>99,995)% EN 988, Z1 EN 1179

Bonding layer

Aluminium honeycomb core

Bonding layer

**0,5 mm zinc** Z1 (>99,995)% EN 988, Z1 EN 1179

#### **DIMENSIONAL AND MECHANICAL PROPERTIES**

Total thickness "b" Tolerances ±0,2 mm	b= 15 (mm)
External skin thickness "e <sub>1</sub> "	b e <sub>1</sub> e <sub>2</sub>
Internal skin thickness "e <sub>2</sub> "	e <sub>2</sub> =0,5 (mm)
Weight	8,66 (kg/m²)
District (FI)	Transversal / Longitudinal (DIN 53293)
Rigidity (EI)	86221 / 57653 (kNcm²/m)
Standard width	1000 <sup>-2</sup> (mm)
Length min. / max.	2000 <sup>-6</sup> - 14000 <sup>-6</sup> (mm)

The purpose of the mechanical values is to be able to compare different product configurations. Specific calculations for each project must be requested to **Alucoi**l's technical department.



## PROPERTIES OF THE ZINC SKIN

Zinc alloy	Z1 (>99,995%) EN 988, Z1 EN 1179
Ultimate tensile strength $(R_m)$	>150 (N/mm²)
Yield strength (R <sub>p0,2</sub> )	>8110 (N/mm²)
Elongation (A)	>35 (%)
Finishes	Slate, Red, Blue, Ebony, Brown, Green and Gold.



## **SUN SHADES**

#### Integrating sun shades into architectural projects

The **larcore®** A2 panel is the ideal product for making sun shades of buildings, as it is lightweight, rigid and slim. Large elements can be made with panels of thicknesses between 20 and 40 mm.

Sun shades add a touch of sophistication to a building's façade, creating a dynamic interaction between light and shade that completely transforms the perception of space. Installing sun shades on the buildings is not just about aesthetics, they also improve the comfort and well-being of those who live in or use the spaces. As they provide shade and reduce excessive heat, they help keep the interior environment cooler and more comfortable, boosting the productivity and enjoyment of the users.

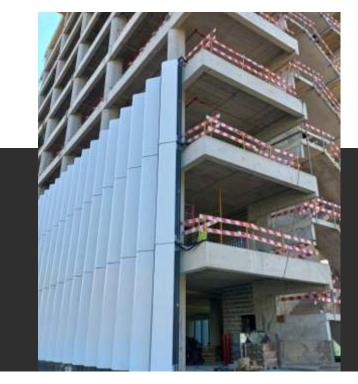


**Alucoil®**, as a company committed to sustainability, is constantly seeking solutions that minimise the environmental impact of its projects. Sun shades are powerful allies in this mission, as they reduce the thermal load on buildings and reduce the need for artificial cooling.

One of the benefits of using the **larcore\* A2** panel in sun shades is the versatility it provides in terms of design and functionality. From fixed sun shades, which add a sculptural element to the façade, to mobile sun shade systems\* that are adjusted automatically to adapt to the changing weather conditions, the possibilities are infinite. The integration of sun shades in architectural projects is more than an aesthetic choice; it is a strategic decision that improves the comfort, efficiency and sustainability of the building.

\*Motor system not supplied by Alucoil\*.





# QUALITY

### **CERTIFICATIONS**

TYPE OF CERTIFICATE	AREA OF APPLICATION	CERTIFICATE
ENVIRONMENTAL	International	EPD® Environmental product declaration: larcore* A2 6 mm 0,7/0,5 larcore* A2 14 mm 0,7/0,7 larcore* A2 14 mm 1,0/1,0
PRODUCT WITH INSTALLATION SYSTEM	Australia	CODEMARK larcore® A2 6 mm (0,7/0,5) "Cm40198"
STSTEIVI	USA	INTERTEK larcore° <b>A2 14 mm</b> (0,7/0,7)/(1,0/1,0) "SDReport 46046"
	Ukraine	UA-TR Building reglament Ukraine larcore* A2 8 mm (0,7/0,7) "UA-TR.042.17.18"
FIRE TEST AND CLASSIFICATIONS	Australia New Zealand	Methods for fire tests on building materials, components and structures. Part 1: Combustibility test for materials Iarcore* A2 6 mm NOT COMBUSTIBLE according to AS 1530.1.
		Methods for fire tests on building materials, components and structures simultaneous determination of ignitability, flame propagation, heat release and smoke release.  - larcore* A2 6 mm according to ASNZS 1530.3.
	USA Canada	Standard Test Method for Surface Burning Characteristics of Building Materials.  - larcore® A2 25 mm according to ASTM E84-15b.  Standard Test Method for Determining Ignition Temperature of Plastics.  - larcore® A2 14 mm according to ASTM D1929.  Standard test method for the determination of combustility parameters of building materials using an oxygen consumption calorimeter (CONE CALORIMETER).  - larcore® A2 14 mm according to ASTM E84.  Standard test method for the determination of combustility parameters of building materials using an oxygen consumption calorimeter (CONE CALORIMETER).  - larcore® A2 14 mm according to CANULC S135.
LARGE-SCALE FIRE TESTING AND CLASSIFICATIONS	United Kingdom	Fire performance of external cladding systems. Test method for non-loadbearing external cladding systems fixed to and supported by a structural steel frame.  - larcore® A2 6 mm with Hidetech® LIGHT system has passed the BR 135 criteria tested according to BS 8414-2.
		Fire classification of construction products and building elements.  - larcore* A2 range, from 8 mm till 20 mm thickness, Hidetech* PRO system, A2-s1, d0 according to EN 13501-1.  - larcore* A2 6 mm Hidetech* LIGHT system, A2-s1, d0 according to EN 13501-1.
	USA	Full-scale fire test. Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components.  - larcore® A2 14 mm with Hidetech® PRO system. PASSED according to NFPA 285.
	Canada	Standard Method of Fire Test of Exterior Wall Assemblies.  - larcore® A2 14 mm PASSED according to CANULC S134.  (larcore A2 14 mm 0.7/0.7) is ULC-S135 compliant to be used in noncombustible construction as defined by theNational Building Code of Canada.

## **SUSTAINABILITY**

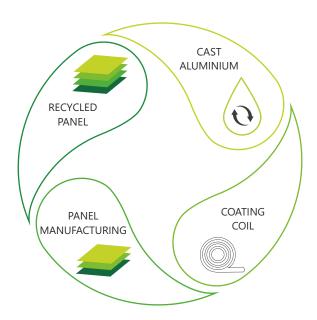
Alucoil's procedures are certified in accordance with the standards ISO 9001, that guarantees quality management systems, and ISO 14001, that backs Alucoil's commitment to environmental preservation through the management of environmental risks linked to their activities. In addition, the quality of Alucoil products is backed by the most stringent international certifications and regulations, always exceeding the standards.

**Alucoil's** manufacture can be considered **ecofriendly** as none of **Alucoil's** processes emits greenhouse gases, the waste aluminium is separated and recycled correctly so it can be reused within the circular economy.

**larcore**° **A2** is a 100% recyclable and ecoefficient aluminium honeycomb panel. Both its external skins and its core are 100% aluminium, so it is easily and infinitely recyclable.

Manufactured in a continuous process with state-of-the-art technology, unique on a world level, **larcore® A2** panels are the material of the future thanks to their **properties of lightness**, **rigidity**, **large dimensions and high recyclability**. These panels also have the EPD certificate accrediting their low environmental impact and the commitment to the environment.











**Alucoil** has a website where the client can find out about the main projects completed. It is a showroom for projects and the available finishes, where you can consult the material, colour, year of construction and the architect of the project, as well as the exact location. In addition, it offers the client a virtual introduction to the range of finishes and colours available from **Alucoil**, as well as the new developments that are constantly being made in the different paint qualities available.



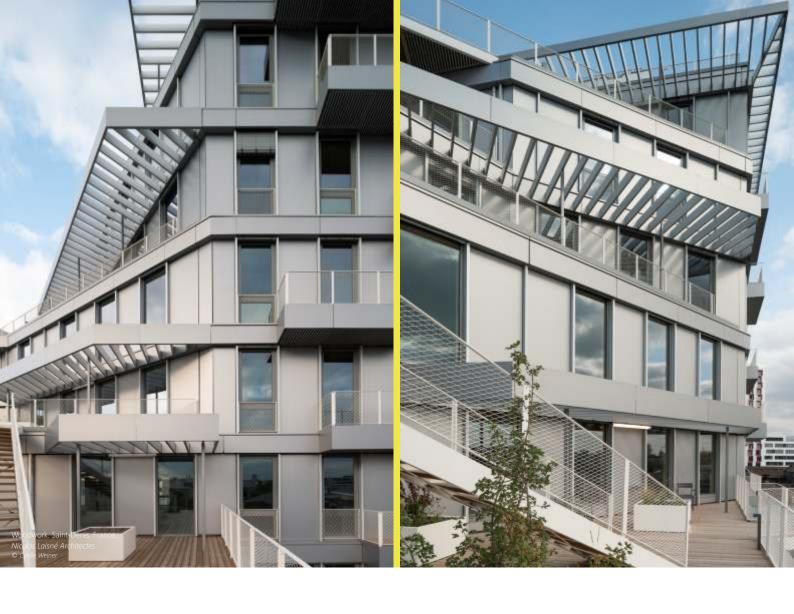




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Polígono Industrial de Bayas Calle Ircio, Parcelas R68 - R74 09200 Miranda de Ebro (SPAIN) +34 947 333 320 info@alucoil.com