



Low Environmental Impact Composite Panels  
for Lightweight Architectural Envelopes



Bolueta Tower: Bilbao, Spain.  
Varquitectos Arquitectura.

Cover photo:  
Olympic Village Paris 2024.  
Lina Ghotmeh Architecture.  
© Takuji Shimmura.

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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®** operates multiple manufacturing facilities, providing service and exporting its innovative, high-quality products worldwide.

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

Composite

Honeycomb

Solar thermal  
energy



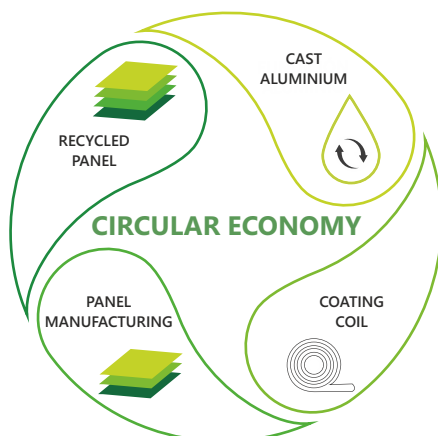
# SUSTAINABILITY

**Alucoil®** considers sustainability a fundamental pillar of its business strategy. The company is dedicated to environmental stewardship through efficient and responsible processes, backed by the most stringent certifications. Its quality management system is certified under **ISO 9001**, while its environmental commitment is validated by the **ISO 14001** certification, ensuring proper management of environmental risks associated with its activities.

**Alucoil®** is a benchmark for sustainability in the aluminium sector. The company holds **Carbon Neutral** and **Zero Waste** certifications, achieving a 98.83% waste recovery rate. This means that **nearly all of its waste is recycled or reused**, reducing the environmental impact of its production to zero.

**Iarson® EVO** panels represent a major advance in sustainability within the industry. These **low-impact composite panels are made with 100% integrated aluminum**, allowing **Alucoil®** to control the entire value chain. The aluminium used in their production comes from recycled scrap and surplus materials, which are melted, rolled into different thicknesses, coated, and transformed back into panels. This process enables their reintegration into the production cycle, reducing raw material consumption and promoting the **Circular Economy**.

Additionally, **Iarson®** has become the first aluminium composite panel worldwide to obtain an **Environmental Product Declaration (EPD) under the international EPD System**. This certification provides detailed information on the product's environmental performance, reinforcing **Alucoil®**'s commitment to transparency and sustainability.





**Alucoil®** has redesigned its prestigious **larson®** product range under the premises of **EcoDesign, Circular Economy** and **Decarbonisation** by reducing CO<sub>2</sub> emissions. This is how **larson® EVO** was born, the new range of products with a lower environmental impact, based on 3 fundamental pillars:

#### Environmental Impact Reduction and Offset

Maximising the use of recyclable and sustainably sourced materials. Each component has been carefully selected to ensure that, at the end of its useful life, it can be reintegrated into new production cycles, reducing the extraction of natural resources and promoting a **circular economy** model. This means a reduction of up to 95% of CO<sub>2</sub> emissions in certain raw materials. All these efforts have been accredited by obtaining the **NEUTRAL CARBON** certification issued by AENOR.

#### GreenTECH technology to optimise resources and eliminate waste

We incorporate advanced technologies in our manufacturing and design processes, reducing waste to zero. The **larson® EVO** manufacturing process has been optimized to significantly reduce its carbon footprint. We employ **clean technologies, renewable energy and advanced techniques** that minimize waste. Every step is designed to be more efficient, less polluting and aligned with global sustainability goals. This includes not only waste minimization in production, but also an innovative approach that ensures that every product can be recovered, recycled and fully reused at the end of its life cycle. **Alucoil®** has obtained the **ZERO WASTE** certificate issued by AENOR, an important milestone that once again accredits **Alucoil®**'s commitment to sustainability.

#### Significant plastic reduction in packaging

We understand that environmental impact comes not only from the product itself, but also from how it is delivered to the customer. That's why we have eliminated and drastically reduced the use of plastics in packaging, opting instead for recycled and compostable materials. We are committed to delivering a sustainable experience from start to finish for all our customers.

These three pillars represent not only a step forward in our industry, but also a firm commitment to sustainable innovation and the well-being of the planet. With **larson® EVO** we are evolving together towards a more balanced and environmentally friendly future.



*Responding to current market needs, setting a standard of environmental responsibility, demonstrating that innovation and sustainability can go hand in hand.*



Manufactured with **ZERO EMISSIONS** and **ZERO WASTE**

**+40%** of **larson® EVO FR** composition is recycled material.

**+70%** of green aluminium equivalent to + 10.000 ton CO<sub>2</sub> avoided/year, compared to primary aluminium.

**+16%** reduction of plastic use.

**+ 6%** reduction of packaging weight directly reducing CO<sub>2</sub> emissions in transport.

***Together, we can make the difference.***

At **Alucoil®** we understand that our responsibility as a manufacturer goes beyond production: it's about leading the change towards a greener future. **larson® EVO** is not just a product, but a testament to our continuous effort to minimise our environmental impact and build a more sustainable tomorrow. Because together, we can make a difference in leading the change. **larson® EVO** is not just a product, but a testament to our continuous effort to minimise our environmental impact and build a more sustainable tomorrow.





**larson® EVO** composite panels for façade cladding provide a combination of aesthetics, resistance and versatility, making them the perfect choice in contemporary construction. Their use gives buildings a modern, elegant appearance, alongside practical benefits in terms of weight, durability and maintenance.

## larson® EVO FR

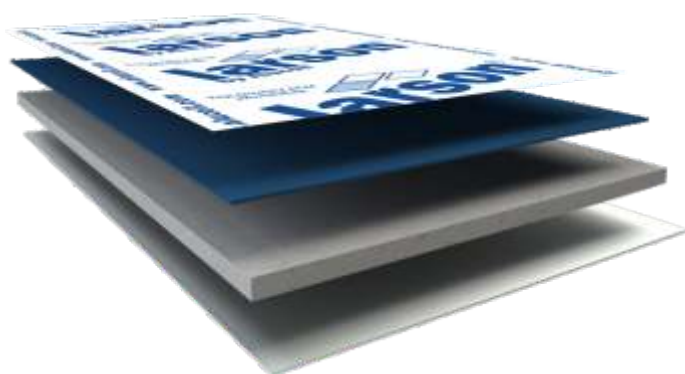
**larson® EVO FR** is the ideal product for architectural façades, as well as other architectural solutions applied to ventilated façades. It is made up of 2 aluminium sheets, joined by an FR mineral core that delays combustion, for a classification B-s1, d0 in accordance with the regulation EN 13501-1.

## larson® EVO A2

**larson® EVO A2** is the new composite panel developed by **Alucoil®** for installation in projects with high fire classification requirements, such as high-occupancy public buildings or very tall constructions. **larson® A2** has obtained the classification A2-s1, d0 in accordance with the EN 13501-1 standard.



Malilla Parque. Valencia, Spain. © Quino Bono Architects.



- Protective film
- Coated aluminium
- Mineral FR/A2 core
- Aluminium with protection primer

The regulations, technical guidelines and building codes regarding the classification and fire protection of each country must always be followed when installing **larson®** panels on buildings. **Alucoil®** has a wide range of products that comply with the requirements of each country. It is the customer's responsibility to demonstrate compliance with the final use of the product and with the building regulations or technical approvals applicable to the installation location.

# PROPERTIES

## COATED ALUMINIUM PROPERTIES

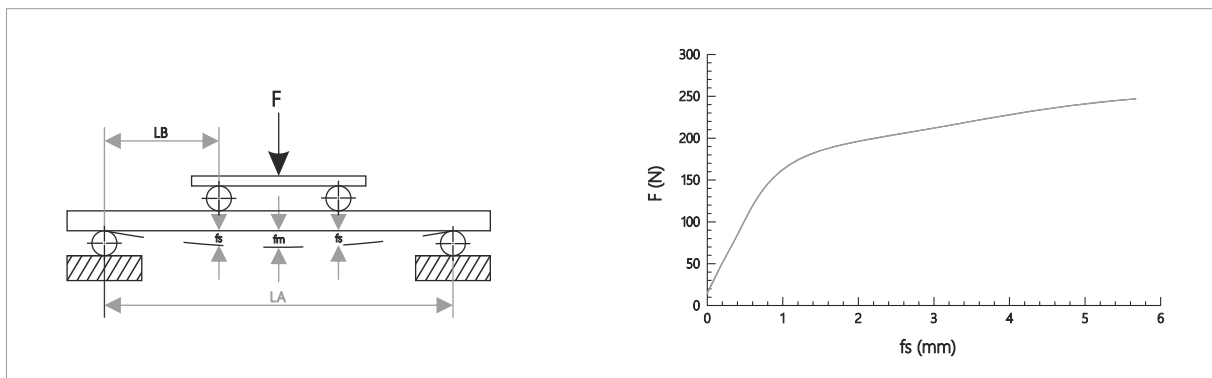
|                                             | <div>  </div> |                                                 |  | INTERNAL FACE OPTION<br>AVAILABLE ON REQUEST    |
|---------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------|--|-------------------------------------------------|
|                                             | External face alloy<br>(5005 EN 573-3)                                                         | Internal face alloy<br>(3105 EN 573-3)          |  | Internal face alloy<br>(5005 EN 573-3)          |
| Modulus of elasticity (E)                   | 70000 (N/mm <sup>2</sup> )                                                                     | 70000 (N/mm <sup>2</sup> )                      |  | 70000 (N/mm <sup>2</sup> )                      |
| Ultimate tensile strength (R <sub>m</sub> ) | 125 < R <sub>m</sub> < 185 (N/mm <sup>2</sup> )                                                | 150 < R <sub>m</sub> < 200 (N/mm <sup>2</sup> ) |  | 125 < R <sub>m</sub> < 185 (N/mm <sup>2</sup> ) |
| Elasticity limit (R <sub>p0.2</sub> )       | > 80 (N/mm <sup>2</sup> )                                                                      | > 120 (N/mm <sup>2</sup> )                      |  | > 80 (N/mm <sup>2</sup> )                       |
| Elongation (A)                              | > 3 (%)                                                                                        | > 4 (%)                                         |  | > 3 (%)                                         |
| Aluminium thermal expansion                 | 2,3 mm/m Δ 100°C                                                                               | 2,3 mm/m Δ 100°C                                |  | 2,3 mm/m Δ 100°C                                |

## MECHANICAL PROPERTIES

### larson<sup>®</sup> FR/A2

|                                       |                             |
|---------------------------------------|-----------------------------|
| Moment of inertia (I)<br>(panel 4 mm) | 3070 (mm <sup>4</sup> /m)   |
| Rigidity (EI)<br>(panel 4 mm)         | 2150 (kNcm <sup>2</sup> /m) |

### Bending test according to DIN 53 293





Busan Bank Suyeong, Busan, South Korea.

## DIMENSIONAL CHARACTERISTICS OF THE PANEL

|                     | <b>larson<sup>EO</sup> FR</b>            | <b>larson<sup>EO</sup> A2</b> |
|---------------------|------------------------------------------|-------------------------------|
| Panel thickness     | 3 / 4 / 6 (mm)                           | 4 (mm)                        |
| Panel weight        | 6,14 / 7,78 / 11,06 (kg/m <sup>2</sup> ) | 8,25 (kg/m <sup>2</sup> )     |
| Aluminium thickness | 0,5 (mm)                                 | 0,5 (mm)                      |
| Min. / max. length  | 2000 - 8000 (mm)                         | 2000 - 8000 (mm)              |
| Standard width      | 1000 / 1250 / 1500 (mm)                  | 1250 / 1500 (mm)              |

# MACHINING

The advanced manufacturing process of **larson® EVO** composite panels creates an extremely tight adhesion between the different layers and coats. Every test carried out on our products achieve at least double the recommended parameters according to several standards. Thanks to the perfect bond between the different layers of **larson® EVO** composite panels, they have an immense capacity to allow multiple types of machining and manipulation . All works detailed below shall be carried out at temperatures over 10°C.

**CUTTING - ROUTING - BENDING AND FOLDING - PERFORATION - CURVING**

## STEPS

01



Cutting and routing of the panel.

02



Folding the upper and bottom edges of the cassettes to 90°.

03



Folding the side edges and the triangular parts of the cassettes to 90°.

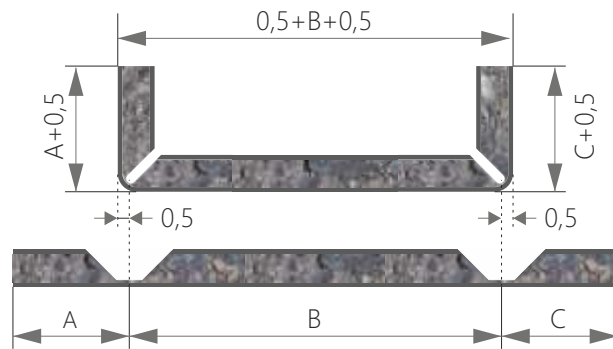
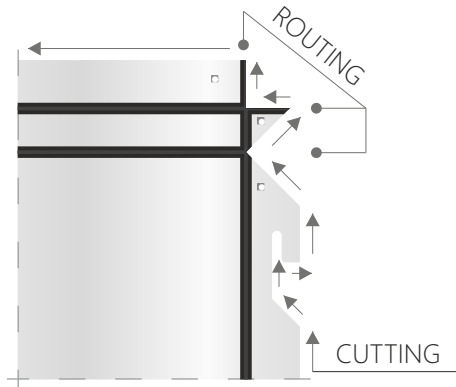
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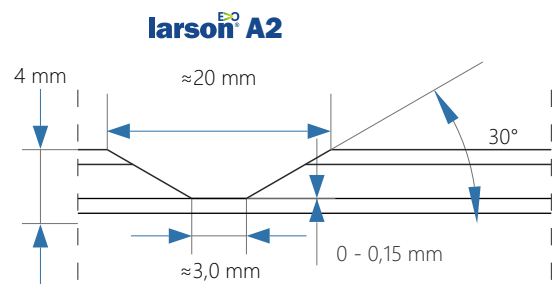
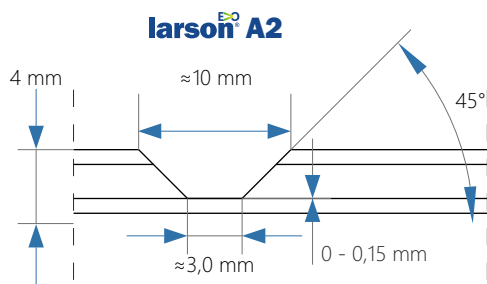
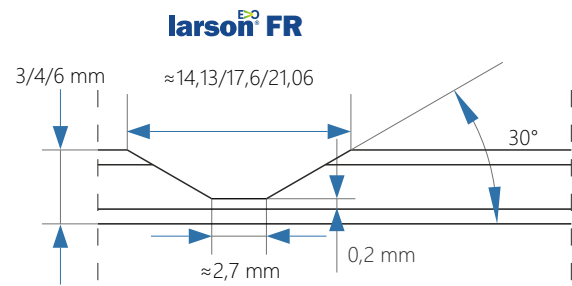
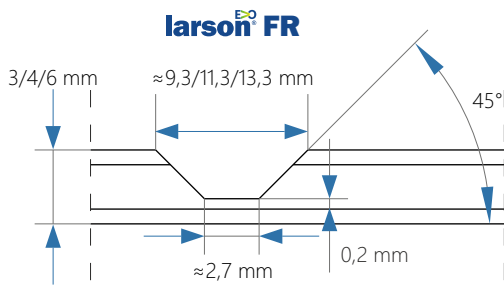
Folding the upper edge against the edges folded previously.



# REAL DIMENSIONS AND DISTANCE BETWEEN ROUTINGS



## T-bend > 2



BOSTON Airport Terminal E, United States - © Luis Vidal + Architects.

# 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®

(FEVE LUMIFLON™ BICAPA)

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 100 m² with immediate delivery within 3-4 weeks.
- Weathering, ageing and abrasion resistance for outdoor use.
- **NEW fluorlac®** Antigraffiti

Durability in coastal areas



UV resistance



Warranty



Gloss level



Cleaning



Durability in coastal areas



UV resistance



Warranty



Gloss level



Cleaning



Durability in coastal areas



UV resistance



Warranty



Gloss level



Cleaning





## larson® METALS

**larson® METALS** is the range of composite panels by **Alucoil®** in which the sheets of metal that form the panel can be **stainless steel, copper, brass or zinc**.



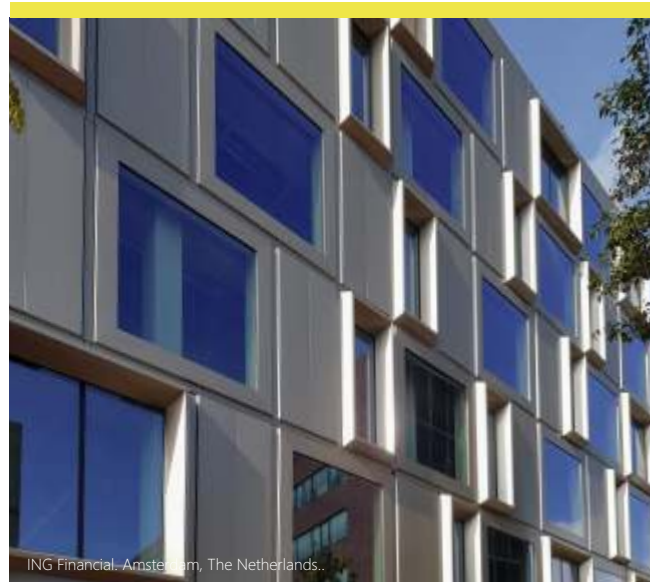
Aquarium. Gijón (Spain). A. Planchuelo Architect

## larson® ILLUSIONS

This is the range of composite panels by **Alucoil®** where the sheets of metal have finishes with unique effects such as: Holo & Sparkling, Anodized Look, Alunatural & Mirror, Design Wood, Concrete, Stone, Marble, Textured Rough, and Textured Fine.



Hotel Paxton. Barcelona (Spain).  
G4:group Architect.  
Pictures provided by TECALUM SISTEMES.



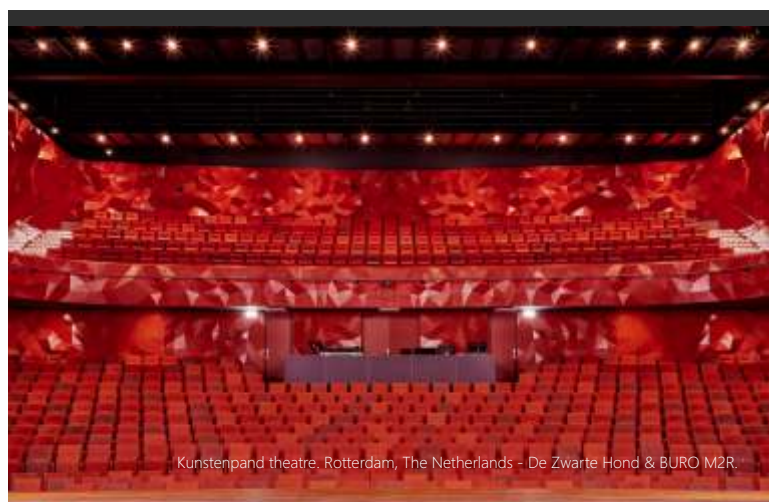
ING Financial. Amsterdam, The Netherlands..

## SHAPES

**larson® EVO** panels allow a multitude of shapes, even 3D, or an even more attractive, exceptional façade.



Data center Labège. Toulouse, France - Atelier Rec Architecture.



Kunstenpand theatre. Rotterdam, The Netherlands - De Zwarte Hond & BURO M2R.

# PERFORATED

The ability to perforate and warrant **larson® FR** metal composite panels is a reality, opening up design possibilities unimaginable until now with a plethora of perforation combinations at your disposal. Whether by CNC or punching processes, **Alucoil®** offers the possibility to utilize round, square, triangular, star, and many other shapes in different perforation sizes and patterns. As well as its use for wall cladding, the use of perforated composite panels for internal applications is a clear commitment to modern design. A warranty requires prior analysis of project specifics by **Alucoil®** and is limited to panels manufactured in Miranda de Ebro.

## PROPERTIES:

- High quality 5005 series aluminum alloy .
- Corrosion resistant pretreated metals.
- Exceptional bond strength.
- Double sided coated panels - Perforated façade panels.
- One-sided coated panels - Perforated interior ceiling panels.
- Multiple perforation patterns.



CFA Centre de Formation à Lagord, France.



Experimentarium, Copenhagen, Denmark - CEBRA Architecture.



## #HASHTAG

**larson® EVO** coated panels with **digital technology for surface printing** in standard finishes such as imitation brickwork, stone, cement, mineral, forest, metal and mesh.

**"Pick your idea and we'll build it"**, Unlimited finish options for *"ad hoc"* projects, with detailed studies in each case.



BEFORE



AFTER

# INSTALLATION SYSTEMS

**Alucoil®** offers several installation systems for composite panels recognized under the CE marking, being the first company in the world to obtain that designation.

**Alucoil®** has several installation systems tested with **larson®** panels:

- **LCH-1, LC-2** and **LC-4/LC-6** for installation of the cassettes.
- **LC-9** (glued) and **riveted system** for installation of the panels.

**T-cassettes & LCH-1**  
Cassettes installation system



**T-LC-4 / LC-6 & LC-4 / LC-6**  
Cassettes installation system



**T-RIVETED & RIVETED**  
Panels installation system



# QUALITY

## CERTIFICATES / TEST

| TYPE OF CERTIFICATE              | AREA OF APPLICATION | CERTIFICATE                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Company                          | International       | Carbon neutrality - <b>Alucoil*</b>                                                                                                                                                                                                                                                                                                                  |
|                                  | International       | Zero waste - <b>Alucoil*</b>                                                                                                                                                                                                                                                                                                                         |
| Environmental                    | International       | EPD® Environmental product declaration - <b>larson* FR</b>                                                                                                                                                                                                                                                                                           |
| Product with installation system | European Union      | ETA 14/100 European technical assessment CE MARK <b>larson* FR</b> + LCH-1 system                                                                                                                                                                                                                                                                    |
|                                  | Spain               | DIT PLUS 405P/15 Documento de idoneidad técnica <b>larson* FR</b> + LCH-1 system                                                                                                                                                                                                                                                                     |
|                                  | Germany             | U MARK Z-10.3-808 → <b>larson* FR</b> + Riveted system                                                                                                                                                                                                                                                                                               |
|                                  | France              | QB 64-79 & QB 142-153 → <b>larson* FR/A2</b><br>Avis technique 2.2/11-1469_V5_issued 30/10/2023 → <b>larson* FR/A2</b><br>Avis technique 2.2/21-1820_V2_issued 12/01/2024 → <b>larson* FR/A2</b><br>Avis technique 2.2/14-1643_V4_issued 20/03/2024 → <b>larson* FR/A2</b><br>Avis technique 2.2/23-1856_V1_issued 20/03/2024 → <b>larson* FR/A2</b> |
| Product                          | European Union      | ETA 18/0712 European technical assessment CE MARK - <b>larson* A2</b>                                                                                                                                                                                                                                                                                |
|                                  | USA and Canada      | ETL SDRReport 29779 - <b>larson* FR</b>                                                                                                                                                                                                                                                                                                              |
|                                  | Switzerland         | VKF 30224 - <b>larson* FR</b><br>VKF 30219 - <b>larson* A2</b>                                                                                                                                                                                                                                                                                       |
|                                  | Ukraine             | UA.BR. 042,012-20 - <b>larson* FR</b>                                                                                                                                                                                                                                                                                                                |



| TEST                                                                                                               | larson* FR         | larson* A2                                                        |
|--------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------|
| Salt spray chamber test (CNS)<br><small>*4000 hours / UNE EN ISO 9227 / <b>Alucoil*</b>'s lab</small>              | NON-DELAMINATION   | NON-DELAMINATION                                                  |
| Initial adherence PEELING TEST<br><small><b>Alucoil*</b>'s lab</small>                                             | 600 - 700 (N/25mm) | 500 - 600 (N/25mm)                                                |
| Loss of adhesion after 4000 hours in CNS<br><small>*PEELING TEST / UNE EN ISO 9227 / <b>Alucoil*</b>'s lab</small> | 0% - 10%           | Consult for use in extreme humidity environments or near the sea. |
| Core heating value<br><small>*UNE EN ISO 1716 / <b>Alucoil*</b>'s lab</small>                                      | 12,91 MJ/kg        | 1,74 MJ/kg                                                        |

# FULL-SCALE FIRE TESTING

Building fires are potentially dangerous events. Although they usually begin locally (rooms, apartments), if propagation is quick the fire can extend rapidly throughout the whole building. **This propagation is very much affected by the façade:** if it is well designed, it will prevent the fire from spreading rapidly and enable users to evacuate the building and the emergency services to reach the site to extinguish the fire.

This good performance of the façade cladding requires an in-depth study prior to its installation on the building. For this purpose, a multitude of tests are conducted under different standards, and on different scales. Generally small-scale tests, with weaker fires, are used to CLASSIFY how the different components of a façade react to fire. That is, they measure the contribution these products have to the fire. But it is **the large-scale tests that more accurately simulate the behaviour a façade will have against a real fire.**

A large-scale fire test consists of using a prototype of a complete façade (inner face, insulation, air cavity, outer face, cavity barriers, etc.) with large dimensions (3-5 metres wide x 6-10 metres high) to apply a real-life fire scenario (3-5.5 MW). The propagation of the fire is monitored visually and using thermocouples (sensors that measure temperature) installed in the prototype. The test usually lasts 30 minutes for the fire itself and a further 30 minutes of observation.

If after the standard time the façade has passed all the fault criteria indicated in the corresponding procedure, we can be certain that its performance in a real fire will be very good and the fire will propagate slowly.

Depending on the country and the regulations, there are different large-scale tests. For the products **Iarson® FR**, **Alucoil®** has successfully passed the following:

- **BS 8414-1 y BS 8414-2** (under the classification criteria of the standard BRE 135 (United Kingdom).
- **NFPA 285** (USA).
- **LEPIR 2** (France).
- **CAN ULC S134** (Canada).



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## FIRE TESTS

## CLASSIFICATIONS

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| European Union | Fire classification of construction products and building elements<br><b>larson® FR</b> with riveted & cassette systems B-s1, d0 according to EN 13501-1.<br><b>larson® A2</b> with riveted & cassette systems A2-s1, d0 according to EN 13501-1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| United Kingdom | Full-scale Fire performance of external cladding systems<br><b>larson® FR</b> with riveted system, according to BS 8414-1, BR 135 passed.<br><b>larson® A2</b> with cassettes system, according to BS 8414-2, BR 135 passed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| France         | Full-scale fire test LEPiR II<br><b>larson® FR &amp; larson® A2</b> with riveted & cassettes suspended systems, according to LEPiR II.<br>Reaction to fire tests. Heat release, smoke production and mass loss rate. Part 1: Heat release rate (cone calorimeter method) and smoke production rate (dynamic measurement). Amendment 1.<br><b>larson® FR</b> . PASSED according to ISO 5660-1.                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Czech Republic | Fire behaviour<br><b>larson® FR</b> according to CSN 73 0863.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| USA and Canada | Full scale fire test<br>Standard fire test method for evaluation of fire propagation characteristics o exterior wall assemblies containing combustible components.<br><b>larson® FR</b> with EVO system, according to NFPA 285.<br>Standard test method for surface burning characteristics of building materials.<br><b>larson® FR</b> according to ASTM E84-12c.<br>Full scale standard method of fire test of exterior wall assemblies.<br><b>larson® FR</b> 6 mm, according to CAN ULC S134.92.<br>Product evaluation <b>larson® FR</b> new system against fire compliance [OK].<br><b>larson® FR</b> 4 & 6 mm, according to CAN ULC S134.<br>Standard method of test for surface burning characteristics of building materials and assemblie.<br><b>larson® FR</b> 6 mm, according to CAN ULC S102-10.ue po |



**Alucoil® Design**

Grupo Alibérico

Endless Architectural Design Possibilities

**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.



Clarion Royal Christiania Hotel - Oslo, Norway.  
LUND+SLAATO Architects.



Bolueta Tower. Bilbao, Spain. Varquitectos



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