

# EDUCATIONAL BUILDINGS



*“Education is the most powerful weapon which you can use to change the world.”*

/ NELSON MANDELA

## EDITORIAL

/ BY ISABELLE FABBRIO,  
Technical and Product  
Management Director

“We spend most of our lives inside buildings – offices, homes, restaurants... and schools. Educational buildings have a huge impact on the health, thinking and performance of students. They influence their creativity, learning and problem-solving abilities.

Education design of the future must have the needs of the student at its heart. In the campus of the future, the environment adapts to how students want to learn, libraries are the most popular social learning hubs on campus, and grassy lawns host impromptu study sessions. Students have everything they need to learn, study, relax and play – but most importantly, they feel they belong there. Designing spaces that are flexible and community-focused requires a multidisciplinary approach that considers teaching and learning models, the physical campus, future technology, and the students’ entire experience.

From an environmental perspective, concerns for the health and well-being of students—particularly young students—are increasing interest in the improved performance and fabric of school structures. Consequently, more investors, municipalities and states are opting for climate-friendly schools. These are cost-effective constructions that boast low greenhouse gas emissions throughout the entire life cycle.

We offer a wide variety of solutions to meet the requirements of educational buildings in terms of comfort, safety and design. Our products establish a dialogue between the interior and exterior of educational buildings, and our facades revolve around large glass surfaces. Curtain walls, windows and doors, which come in multiple versions, provide adequate answers to the different needs expressed by professionals.

As part of Hydro group, we carry the commitment to sustainable development. As a global supplier of aluminium with activities spanning the entire value chain, Hydro aims to reduce its overall CO<sub>2</sub> emissions by 30% by 2030.”





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# HOW ARCHITECTURE CAN INFLUENCE ACADEMIC SUCCESS

Educational architecture is a powerful tool for stimulating creativity, as well enhancing concentration, motivation, and understanding. whether it's a kindergarten, high school, or university, the environment in which we study directly influences how knowledge is absorbed.

More than other building types, educational facilities have a profound impact on their occupants and the functions of the building, namely teaching and learning. Students in various stages of development are stimulated by light, color, the scale of their surroundings, even the navigational aspects of their school. Students can also react negatively to adverse conditions.

## Four main factors come into play:

- Student and teacher's comfort in terms of light, noise, temperature and air quality
- The aesthetics and design of the premises (harmony of colors, layout of the classroom...)
- Flexibility and modularity of the interior space to allow differentiated activities and the use of digital technology.
- Safety and health of occupants in compliance with a range of regulations and requirements such as emergency lights, building capacity, exit signage, fire safety, escape door, corridor widths, disabled access.

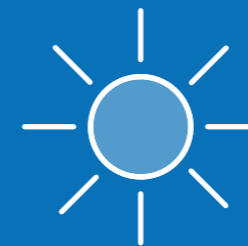
/ In other words, to work well, one must be happy at school, and comfort becomes an essential ingredient.



# 16%

## / CLASSROOM DESIGN IMPACT LEARNING PROGRESS

Differences in the physical characteristics of classrooms explain 16% of the variation in learning progress over a year. *(source: HEAD Project study, 2015)*



# 26%

## / NATURAL LIGHT HAVE A POSITIVE EFFECT ON TEST SCORES

Students with natural lighting in their classrooms score up to 26% higher on tests than their cohorts with little or no natural lighting. *(source: Hale study, 2002)*



# 93%

## / TEMPERATURE AFFECTS THE ATTENTION SPAN AND MEMORY

Test scores average 72% when the classroom is too cold or too hot, and 93% when temperature is controlled. *(source: Science Research Club study)*

# REQUIREMENTS FOR EFFECTIVE EDUCATIONAL PREMISES

## / FLEXIBILITY OF SPACES

Educational buildings should be able to meet the challenge of evolving teaching styles and emerging technologies. At some facilities, programs and schedules vary frequently. Furthermore, instructors have different and evolving training methods. As such, flexibility within the building's design is critical to the success of an enduring teaching program.

## / THERMAL COMFORT

Temperature impacts student's learning ability and also affects numerous other mental and physical activities. Subconsciously, the brain keeps having to adjust to different temperatures to make sure the body is cooperative. Thermal conditions also have an impact on attention span, fatigue and memory. Architects and stakeholders can't ignore it when designing an educational building. **Our solutions are entirely designed with thermal break. They can accommodate very high performance insulation glazing. These features reduce thermal loss and help maintain a comfortable temperature in all seasons.**

## / AESTHETIC AND DESIGN

The importance of the physical appearance of an educational building should not be minimized. An educational building that is attractive and consistent with the design and context of the neighborhood, builds a sense of pride and ownership among students, teachers, and the community. The exterior should complement the neighborhood and reflect the community's values. The interior should enhance the learning process. **Design is our constant concern and part of our DNA. Particular attention is paid to the treatment of color and the offer of various finishes. Finally, the wide variety of handles and accessories offers the possibility to adapt to different styles of architecture.**

## / ACCESSIBILITY & SAFETY

Educational buildings have to comply with accessibility requirements for the disabled, and the design and construction of secure and safe buildings are essential for owners, architects, engineers, project managers, and other stakeholders. In most cases the minimum design criteria for accessibility, as well as fire protection, occupational and natural hazard safety are prescribed within the building codes and standards. **Our threshold for people with disabilities respond to regulations while maintaining waterproofing performance. The height of our handles is adaptable to accessibility needs and easy to maneuver. And our offering includes solutions like PYROAL, a fire protection door which can compartmentalize the spread of flames and fumes, and strengthen heat resistance.**

## / ACOUSTIC INSULATION

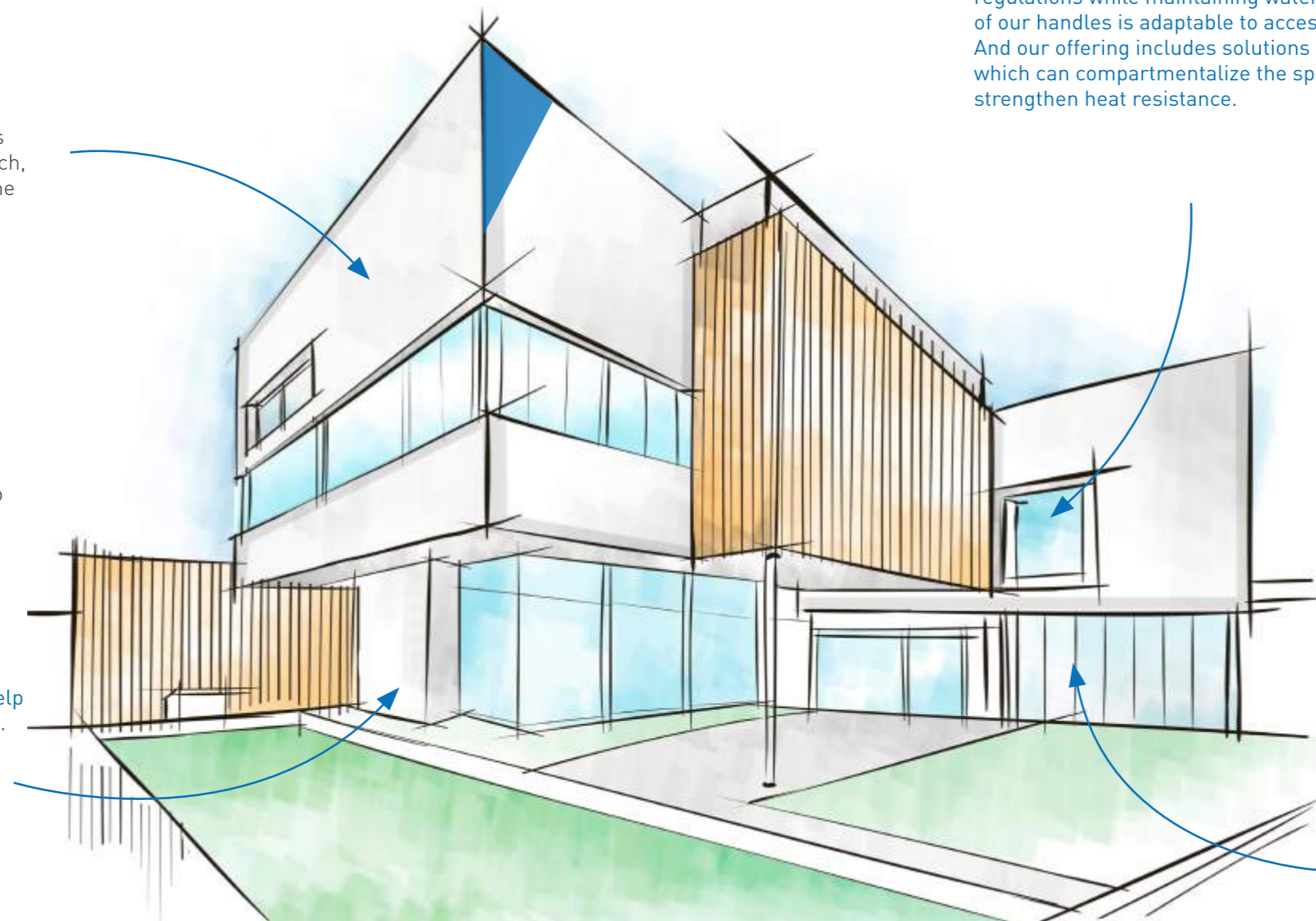
Classroom acoustics are an important, often neglected, aspect of the learning environment. Up to 60% of classroom activities involve speech between teachers and students or between students, indicating the importance of environments that support clear communication. Good classroom acoustics are a basic classroom need, not an accessory, to give all students access to spoken instruction and discussion. **Thanks to their performance, our solutions can significantly reduce noise pollution. Even in a highly exposed situation, they guarantee unprecedented acoustic comfort.**

## / NATURAL LIGHT AND SUN SHADING

Good natural light helps to create a sense of physical and mental comfort, and its benefits seem to be more far-reaching than merely being an aid to sight. This owes in part to the soft and diffused quality of natural light, its subtle changing value and colour, which electric lighting does not have. With natural light and sun shading solutions, spendings on electricity are reduced, another strong benefit for the building owner. **LUMEAL innovative design favours natural light (nearly 14% more) and solar inputs.**

## / SUSTAINABILITY and COST SAVINGS

These days, sustainability is an expectation on higher education. A green education building changes the way students, and the surrounding community think about sustainability. Another true benefit of a green building is cost savings as reducing water and energy consumption is not only environmentally friendly, it will also considerably reduce operating expenses. **Many of our products such as GEODE curtain wall and SOLEAL profile sections are made of Hydro CIRCAL®, a premium quality aluminum range comprising at least 75% of recycled aluminum sourced from post-consumption waste, i.e. end-of-life joinery. Hydro CIRCAL® has one of the lowest carbon footprints in the world: 2.3 kg of CO<sub>2</sub>/kg of aluminum.**



# A DESIGN WELL INTEGRATED INTO THE LANDSCAPE

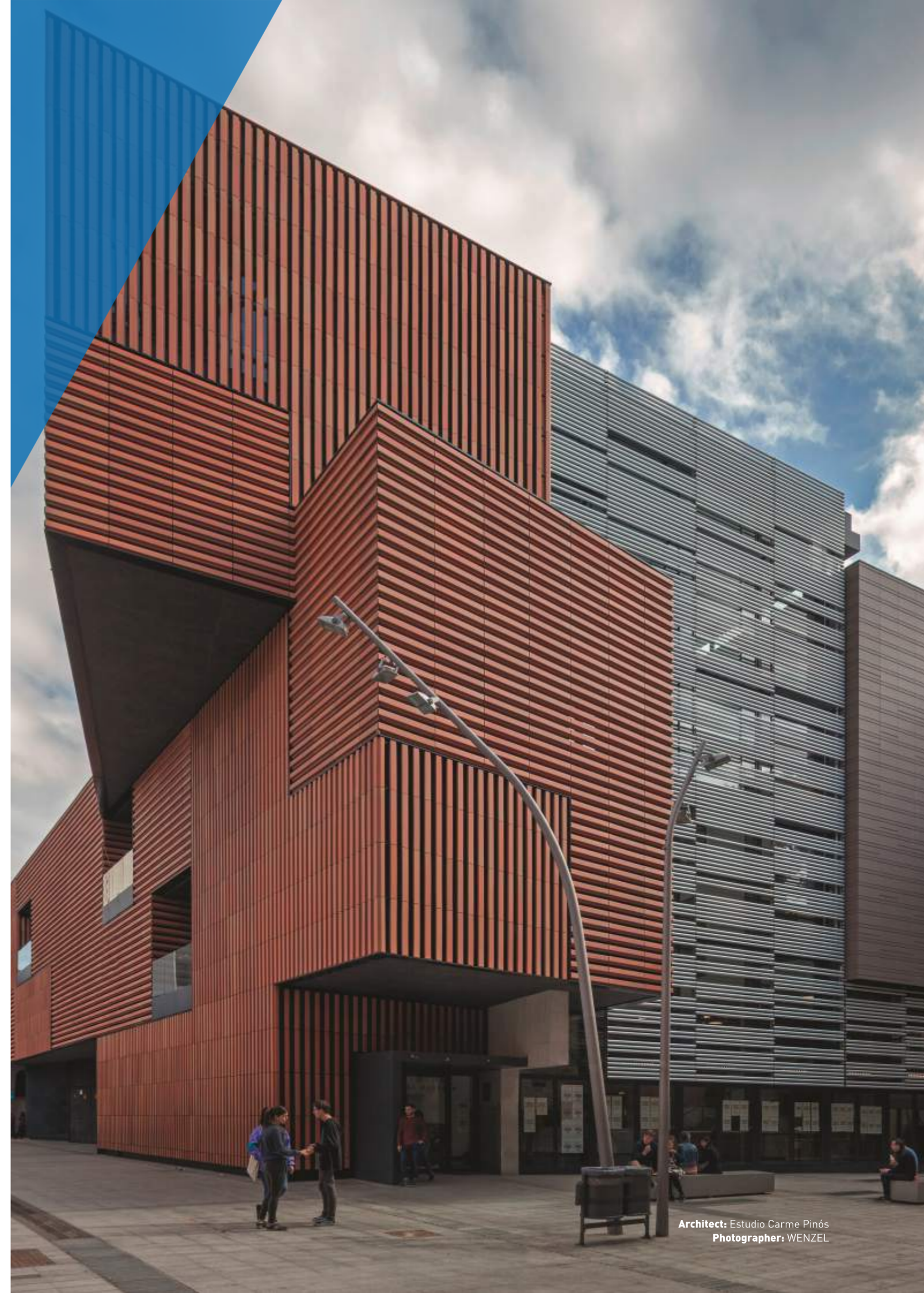
/ ESCOLA MESSANA Barcelona, Spain

**The building consists of 11,000 square meters distributed over six floors, with bright open-plan areas in the multi-purpose classrooms and workshops and terraces. The centre has been teaching art and design since 1929 and comprises a series of shapes in movement that respond to the intention to lighten the building through shadow play, overhangs and staircase changes, in addition to creating areas that directly connect indoors and out.**

The school, which represents an institution for future artisans and designers, is covered with a craft-made, exclusive outsized ceramic material, giving it a singular and emblematic nature. It has a conference room with a separate entrance to host activities open to the public.

The installed window enclosures are in tune with the formal requirements of the building, improving the comfort of those who use it. The installed doors are optimal for large flows of passage while the windows provide high acoustic and thermal performance to the whole.

The work has been awarded a mention in the Discover category of the 2017 Architecture Aluminum TECHNAL Award. The jury highlighted the will to make a city, to relate to the fabric of a historic center with a geometry that also responds to the complexity of the environment, with a facade that is testimony to the activity that the building contains.



Architect: Estudió Carme Pinós  
Photographer: WENZEL

### / CHALLENGE

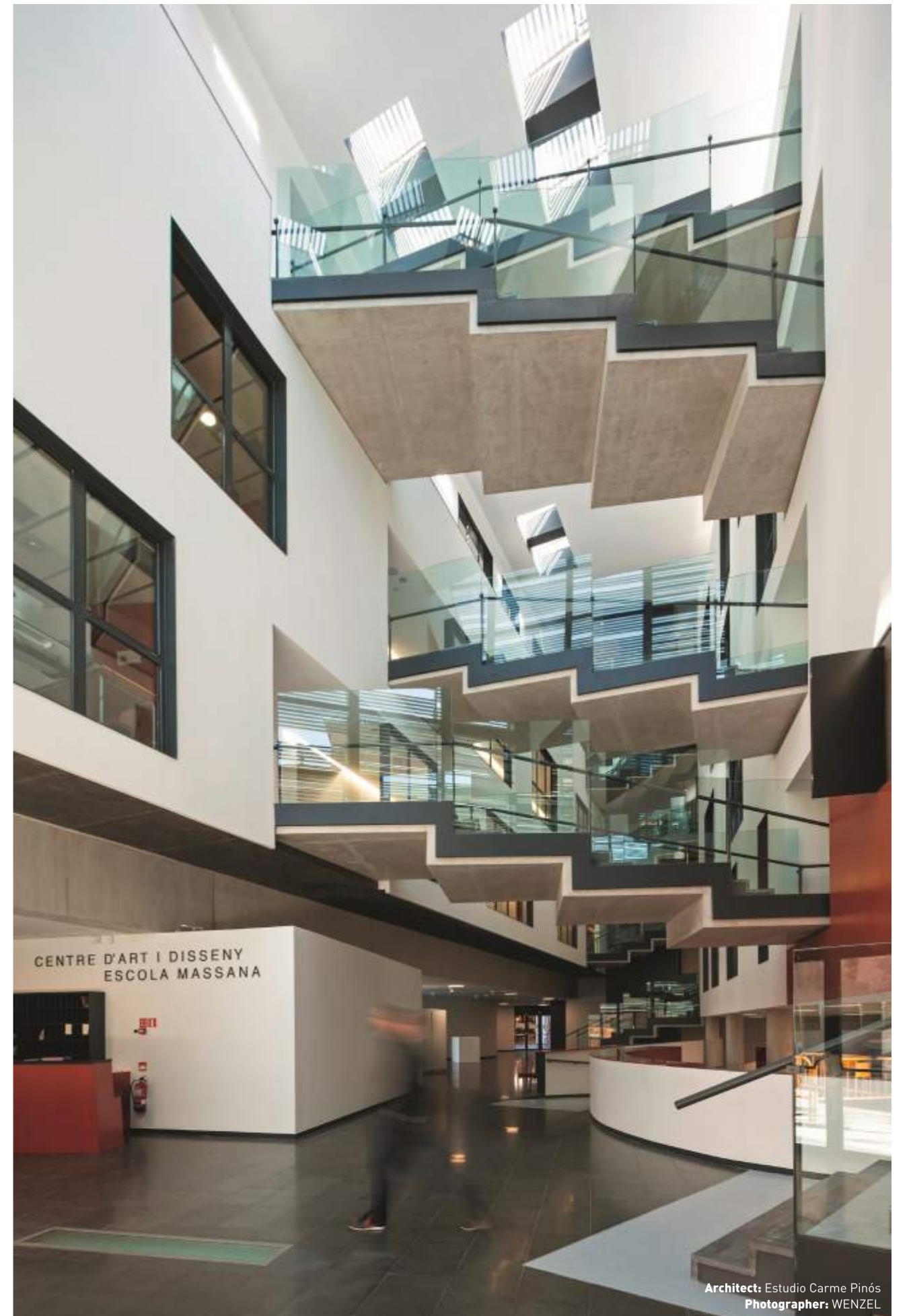
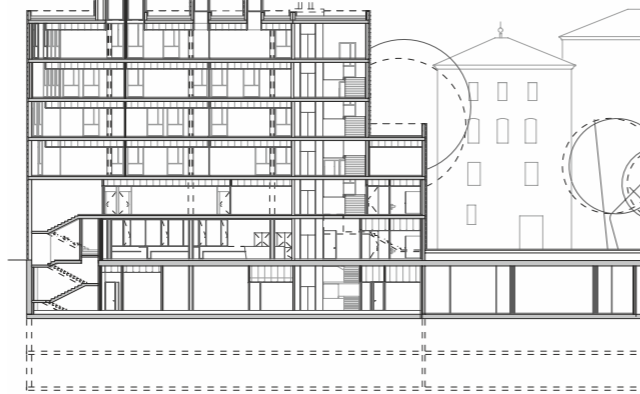
This emblematic institution being located in the heart of Barcelona historical center, the challenge was to integrate this new building without altering the authenticity of this neighborhood.

### / SOLUTION

The architect opted for ceramic slabs to cover the façade, giving it a unique look, extremely well suited to the environment.

### / PRODUCTS

- Casement windows SOLEAL 65 hidden sash, providing aesthetic finesse to the whole building
- SOLEAL doors, bringing natural light into the entry hall and opening the view to the plaza



Architect: Estudio Carme Pinós  
Photographer: WENZEL



# MODERNITY AND HISTORIC CHARM COMBINED

/ UNIVERSITY CENTRE Cahors, France

**The rehabilitation project of the University Centre of Cahors has made it possible to transform a former girls' school dating from 1887 into a mixed facility open to the city and responding to the new challenges of higher education. The 4,000 square meters building was partially emptied to enhance its original composition and adapt it to the new uses of the university.**

The wooden floor was replaced by a concrete floor, and the SOLEAL 65 windows and doors replaced the wooden ones. They bring a contemporary spirit while drawing inspiration from the site's historical regulatory routes. The black aluminium of the joinery, the wood of the ceilings, the natural concrete and the stone walls are raw materials that offer consistency to the project.

Meticulous work has been carried out by the metal builder who manufactured the 74 curved tailor-made windows, so they perfectly

match the existing stone frames. The joineries are designed with concealed openings. The thin width of the profiles is identical to the fixed frames for an overall unit. Their black tint also reinforces the erasure from the outside view. The thermal performance of SOLEAL 65 window, combined with 50 cm thick stone walls, has made it possible to eliminate any additional insulation system. The durability of the walls is ensured and the inertia of the building optimized.

ŒCO Architects has created a glass gallery overlooking the

Garden Court to the west on the ground floor. The GEODE curtain wall stretches over 30 m long and is fitted with 3.5 m high glass panels. Their discreet mullions are hidden behind posts or steel brise-soleil, which bring verticality to the project. The only contemporary extension of this program is an "H" shape, the gallery is the link between the Garden Court and the Honour Court. It opens the shared rooms to the outside and maximizes the fluidity of the ways.



Architect: ŒCO Architects  
Photographer: Kévin Dolmaire



Following a historical research work on the evolution and successive extensions of the building, the architect decided to place the Honour Court at the heart of the project, which over the years has become a vast car park. Emptied of its cars, it has returned to the students through the creation of an elevated wooden square integrating accessibility requirements. The other courtyard is levelled to become a garden gently sloping down.



#### / CHALLENGE

Keep the historical appearance of the building while bringing some modernity and improving energetic performances.

#### / SOLUTION

Renovation and cleaning up of the brick façade. Creation of contemporary spaces with wooden floors, glass galleries, central courtyard and custom-made aluminium windows.

#### / PRODUCTS

- Windows SOLEAL 65 Evolution (minimal sash) replaced the wooden ones, bringing a contemporary spirit
- SOLEAL 65 swing doors
- Façade: GEODE 52 with greed appearance, enhancing external design of the building



# CENTRAL OPEN ZONES FOR SOCIAL EXCHANGES

/ ARCADIA SCHOOL Dubai

Located within Dubai's Jumeirah Triangle, the Arcadia School's campus is a state-of-the-art facility. It was designed in line with the client's aspiration to create a flexible, open-plan learning environment for pupils.



The design concept focused on creating centralized open areas for the main educational block with the age group classrooms wrapping around the central core of the building. Natural light permeates throughout the school enabling visual links from the core of the building out to the periphery corners.

The interior of the Arcadia School's primary campus is designed to reflect the high quality and progressive thinking. The sculptural entrance hub is the center of this community with the library, exhibition space and dining hall providing a large open plan area for flexible learning experiences and functions.

Designed as an educational facility for secondary grade students, the Arcadia Secondary School is a new purpose-built school adjacent to the Preparatory School. The building, which comfortably accommodates up to 800 students, is designed with most ground floor classrooms opening onto open protected spaces to the rear providing children with safe access to play areas from their classrooms.

Classrooms are bright with ample daylight and large corridors creating social spaces for children. Recreational play areas including a soccer field and sports courts, multipurpose hall and swimming pool are set on different levels of the building.

The school is designed in accordance with sustainable practices to create a safe, healthy, comfortable environment in which students and staff find it pleasant to learn and work.



#### / CHALLENGE

Build a well-lit school, with minimal energy consumption and reduced operating cost.

#### / SOLUTION

Judicious choice of building orientation to optimize light intake during the day. Creation of a large sunroof.

#### / PRODUCTS

- Curtain Wall - Geode MX
- Windows - Soleal FY
- Doors - Soleal PY
- Sliders - Galene GTi



*In addition to aesthetics, comfort is without a doubt the most important factor.*

/ AVINASH KUMAR

## EXPERT STATEMENT

/ AVINASH KUMAR Senior architect from Godwin Austen Johnson

### **What elements need to be considered when designing a school?**

*"In addition to aesthetics, comfort is without a doubt the most important factor. To create a comfortable school, one must pay close attention to temperature control and light. Typically, high glazing is used on the North side and it's important to avoid large windows on the South side to optimize natural day light and limit electricity consumption. Sustainability is another important aspect, not only for the environment but to reduce energy expenditures."*

### **What did Arcadia School's owner specifically request for their project?**

*"We have worked several times in the past for this client. Light has always been an essential element for them. Their schools must be well lit, and with minimal energy consumption and maintenance cost."*

### **What actions did you take to meet this request?**

*"The orientation of the building was key. The fact that most of the glazing is oriented on the north side, with no direct sunshine, was a big help to control light and temperature. We also created a large sunroof to provide lots of natural light intake."*

### **What was your main challenge?**

*"Arcadia School is not a typical school. The teaching method is based on "blended learning", an approach to*

*education that combines online educational materials and opportunities for interaction. Social gathering and exchanges are essential to such a learning approach. For that reason, we designed corridors and classrooms opening to a large atrium, resulting in small cluster of students meeting in peripheric areas.*

*The 20 meters high skyroof at the main entry was a technical challenge, as it required a strong structure with steel beams and custom-made profiles. But in the end, we succeeded in creating a comfortable, well-lit school with open areas, where both pupils and teachers can learn and teach in the best conditions."*

### **Which aluminium joinery solutions did you choose and why?**

*Our customer aspired to own a school with contemporary architectural design, compliant with the performance requirements. But most importantly, our client wished to have the most sophisticated international primary and secondary school in the region.*

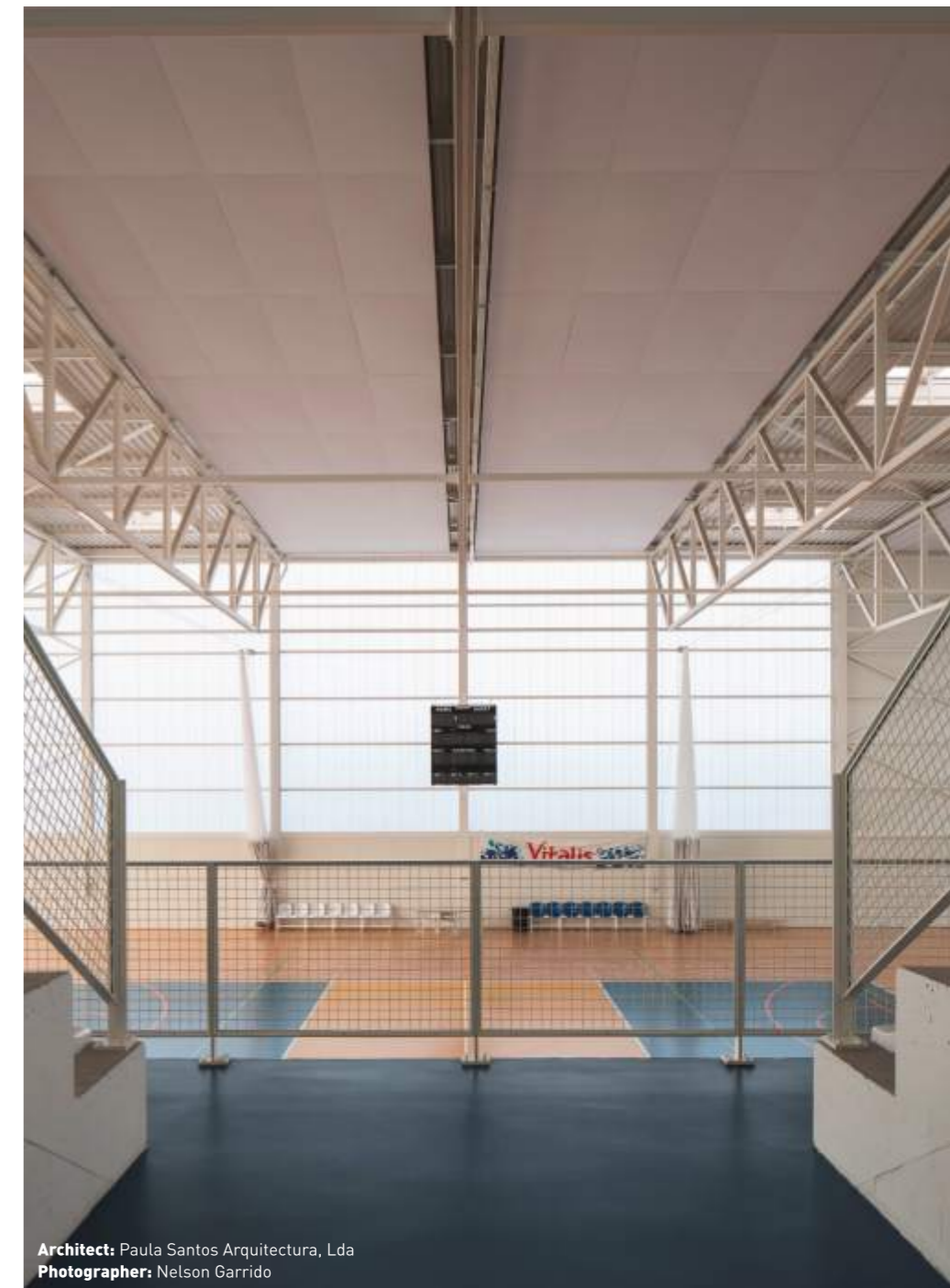
*The design of windows, doors and façade had to be neat and minimal. And it was essential to choose solutions with high thermal efficiency, directly impacting cooling loads required for the building, an important factor to regulate temperature on the school premises. So for this project, we chose GEODE MX curtain wall with concealed top hung vent, SOLEAL doors and GALENE GTi lift and slide panoramic sliding window.*

Avinash Kumar is a senior architect from Godwin Austen Johnson, one of the largest and longest-established architecture and design firm in the Emirates.

Avinash is part of the team dedicated to educational buildings and was involved in many projects, from design to execution. He played a major role in handling the construction of Arcadia schools in Dubai.

Based on his expertise, Avinash shared some interesting information about the Arcadia School project, as well as educational buildings in general.





Architect: Paula Santos Arquitectura, Lda  
 Photographer: Nelson Garrido

# NATURAL LIGHT AND TRANSPARENCY FROM HEAD TO TOE

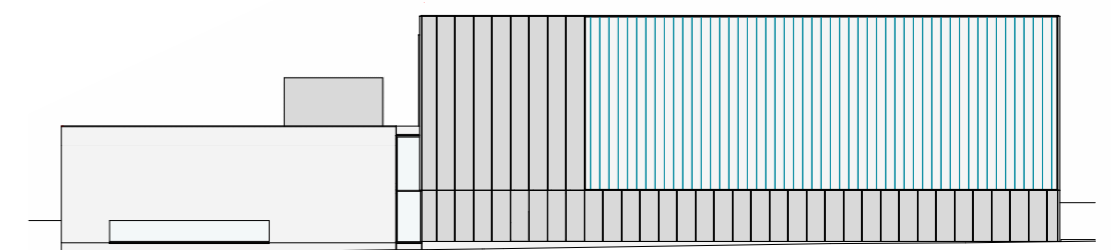
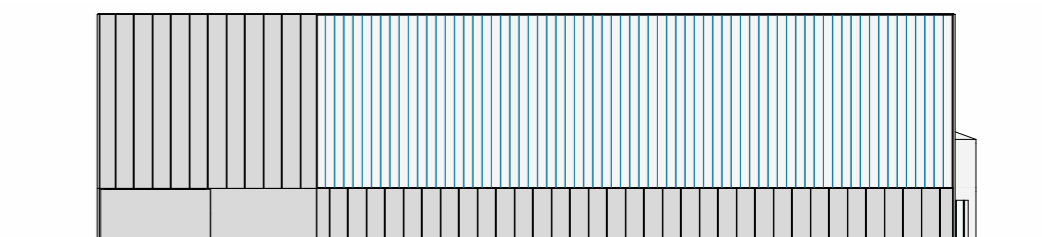
/ AEFANOR SPORTS CENTRE Matosinhos, Portugal

**The school is built on a site totaling 13,000 square meters and can accommodate up to 700 students. The sports facility is built on the southeast site corner, with a sports hall, a 25m swimming pool and two ballet studios.**

The sports hall, with a painted white steel structure is covered with translucent polycarbonate panels. The swimming pool and the ballet studios were designed

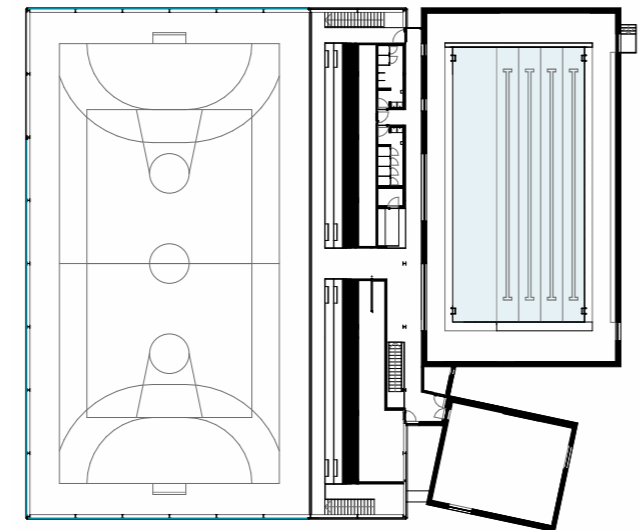
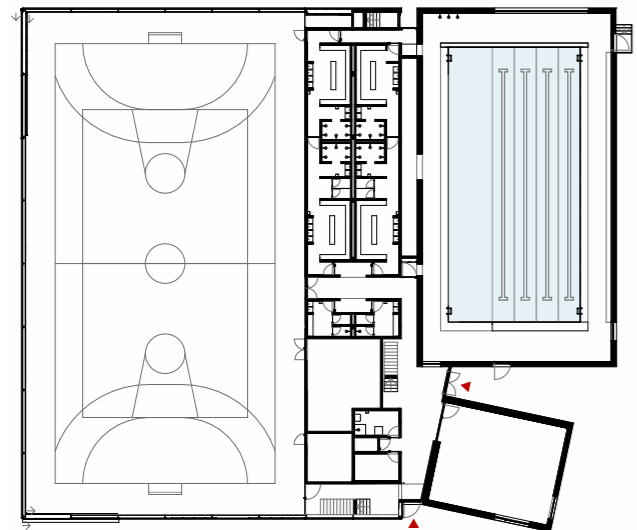
in concrete, with a brut appearance. These are enclosed volumes, with a controlled sun light and a withdrawn ambient, protected from the exterior.

The exterior spaces - the patios, sheltered playground, gardens, and the sports field - were spread throughout the campus, allowing a perceptible landscape design from the building interior views.





Architect: Paula Santos Arquitectura, Lda  
Photographer: Nelson Garrido



With a complex brief, the private school for 700 students is built on a site totaling 13,000 square meters. Facing East and West, the school building is set on a longitudinal shape, with three floors. The building has a variable depth, so it could be adjusted to the irregular shaped site. This width transitions are possible through a curved facade design.

Through the triple-height entrance hall, students may access all the different school spaces:

- The multi-purpose hall and auditorium, on ground level, with distinguishable volumes and distinct building materials
- The classrooms on the upper floors, with vertical solar shading blades, offering direct solar light protection from east and west
- The library and study areas

#### / CHALLENGE

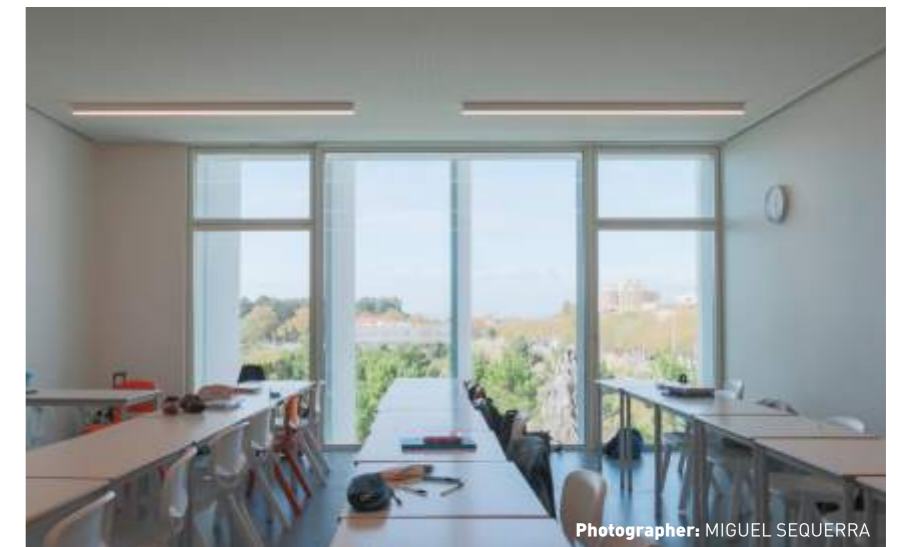
The irregular shape of the site was a challenge. And it was necessary to provide natural light intake and create an intimate feel inside.

#### / SOLUTION

The architect designed a long shape construction with large dimensions windows.

#### / PRODUCTS

- Slider LUMEAL XXL
- Curtain wall GEODE
- Windows and doors SOLEAL



Photographer: MIGUEL SEQUERRA



Photographer: MIGUEL SEQUERRA

# AN EDUCATIONAL EXAMPLE OF SUSTAINABLE DESIGN

/ HORTEN SCHOOL Horten, Norway

Large areas of glass, plenty of daylight and open views are the foundations of the greenest school in Norway. Thanks to the use of natural materials and bold environmental choices the award-winning building that houses the Horten high school sets the standard for the future.

The building has four floors, a basement, and a rooftop utility room – an arrangement that meets many of the requirements for logistics, layout and access. It was also important to preserve a feeling of closeness to the park outside.

There was a desire to draw the neighboring park into the building and create a strong sense of connection with the natural surroundings of the school. This was achieved by linking up with paths from the historic area of the park so that they continue right through the building. The school opens into the park in a way that makes the building feel inclusive and open. “The street winds through the building and connects us to the rest of the park,” says Brox-Nilsen from LINK Arkitektur.

Horten High School meets both passive-house and energy-positive building standards. The building has 3,700 square meters of solar panels, 13 geothermal wells, water-based heating and impressive levels of insulation in the walls and ceilings. Strict requirements for toxin levels, transport emissions, recycling efficiency and draught-proofing meant that all materials had to be evaluated carefully.

“We thought a lot about how we could achieve this. There were only a few other buildings we could use for reference, and this one had to meet considerably higher demands than any technical standard. One such

question was what material should we use if we can't use concrete? We ended up with solid wood,” says Brox-Nilsen.

The palette of materials is based on environmentally friendly choices, starting with the exterior walls, floors and main staircase – all of which are built of wood. Inside, oak and oak parquet are used. Outside, the architect has chosen untreated ore-pine. The wood makes a striking contrast with the large areas of glass supported by recyclable aluminium profiles. The result is a compact and warm building with wonderful light

“The glass façades provide lots of daylight and open views. You can orient yourself in relation to your surroundings at any time and feel in touch with the landscape around the school.” says architect Grethe Brox-Nilsen from LINK Arkitektur.

“It was a challenge to make full use of daylight and the views in such a compact building, especially for classrooms and other utility spaces that face the atrium,” Brox-Nilsen admits.

The answer was to create balconies on the upper floors



on one side of the atrium. The idea is that every part of the building should lead to the atrium, which is also the main common space in the school. Each department in the school is just steps from this space, which makes it easy to orient oneself and helps create a sense of community.

#### Using BIM to design the school

Building Information Modeling (BIM) was used during the design of the school. BIM creates digital 3D models of buildings and makes it possible to visualize, plan, do calculations and coordinate the building process. It also improves and simplifies collaboration between multidisciplinary teams.

“With BIM, we used a composite model to check for clashes between the different structures, and the model was also used to get a visual overview in 3D,” says Brox-Nilsen. “We then set up workstations at the construction site so the model could be examined in detail.”

At the school, the atrium is known as the “heart room.” It is a large, open space designed to welcome students and teachers – everyone. It also serves as the building's main artery.

“One of the key visions for the school was to create this space where students would feel comfortable

#### / CHALLENGE

Create a comfortable and sustainable building and a strong sense of connection with the natural surroundings of the school

#### / SOLUTION

Strengthened glazing and facade insulation. Use environmentally friendly materials such as wood for the interior, and joineries made of Hydro CIRCAL aluminium. Create a central atrium.

#### / PRODUCTS

- Glass facades (available with Hydro CIRCAL, containing at least 75% recycled post-consumer scrap)
- Aluminium fire doors
- Fixed internal aluminium windows



and which would discourage exclusion,” says Runar Bekkhus, who represents the developer, Vestfold Municipality.

The atrium has dedicated zones for socializing and working. The large glass façades that form the entrances from the East and West give the entire school a transparent and inviting impression. A large oak staircase provides vertical communication within the atrium.

At the same time, using such large expanses of glass as well as a glazed roof presented a challenge in keeping CO<sub>2</sub> emissions low. One consequence was that an extra five centimeters of insulation had to be added to the outer walls. It would have been difficult to create the large glass façades without the insulating properties of the aluminium profiles.

### World-class sustainability

Horten High School was designed with sustainability as a fundamental priority. This guided everything from the choice of materials and energy solutions, to recycling

waste during construction. The overall result was a reduction in greenhouse gas emissions of at least 40% compared to a reference building.

Bekkhus says that a lot of effort was put into recycling waste during construction. “We even cut open vacuum bags and sorted the contents,” he says.

Horten High School won a 2019 BREEAM Award for public sector projects. BREEAM is the world’s leading environmental classification system for construction. The award confirms that the new school is the greenest in Norway.

“It’s important to understand how architecture affects the environment. We were totally committed to sustainability on this project. It also means we created something that will last for generations,” says Brox-Nilsen.





Architect: Bond Bryan  
Photographer: John Kees Photography

# INDUSTRIAL ARCHITECTURE REVISITED

/ NATIONAL COLLEGE FOR ADVANCED TRANSPORT & INFRASTRUCTURE Doncaster, England

**One college, two campuses and architectural aluminium systems specified across both. This jointly procured contract for the National College for Advanced Transport & Infrastructure features aluminium curtain walling, windows and doors, delivering a coordinated design approach and real visual interest at two, architecturally very different, world-class training facilities in Birmingham and Doncaster.**

Working on the Doncaster campus, Bond Bryan Associate Mark Dobbs, explains: "The design brief and overall priority was to create buildings that generate a revived sense of excitement around the rail industry to attract the next generation of engineers."

"Maximizing daylighting, through the façade design and use of rooflights, lightwells and atria, was also a priority, as well as minimizing summer cooling requirements with the use of solar control glazing and adoption of natural ventilation where possible."

## Saw-tooth glazed façade defines multi award-winning Doncaster campus

The 7,600 m<sup>2</sup>, three-storey landmark, Doncaster campus has been inspired by the city's former train sheds - large industrial Victorian buildings.

The facility features up to 2,500 m<sup>2</sup> of architectural aluminium systems finished in an anthracite grey. Following the outline of a traditional saw-tooth, the roofline forms the building's defining architecture.

The front and rear screens, both 700 m<sup>2</sup>, feature dual raked head curtain walling manufactured using MX52 toggle glazed, capless, structural curtain wall system cut at an angle to both sides to create the impressive saw tooth effect.

Illuminating the spacious 1,900 m<sup>2</sup> engineering workshop area, the curtain wall is recessed behind the cladding and brise soleil.

Each façade's flush appearance is maintained with the introduction of structurally bonded frameless top hung opening vents, which include automatic



actuators. Adding to the façade design, insulated non-vision glass ceramic panels have been inserted.

Internally, MX52 capped curtain walling has been used to create large internal glazed screens that assist further with natural daylighting and allow light to flood through the building.

Constructed using a high-performance neutral glass, most panels were mechanically lifted into place using either mobile elevation platforms or, for the larger units, mobile cranes. Installation was undertaken over a six-month duration.

Throughout the building, SOLEAL PY 55 thermally broken pivot doors have also been installed featuring a standard jamb and header bar as well as anti-finger trap stiles for safety. The PY 55 is specifically developed for areas of heavy use like this environment.

#### / CHALLENGE

Create a building that generates a revived sense of excitement around the rail industry to attract the next generation of engineers

#### / SOLUTION

Following the outline of a traditional saw-tooth, the roofline forms the building's defining architecture.

#### / PRODUCTS

- Doors SOLEAL PY
- Curtain wall GEODE MX52



# A STATE-OF-THE ART TEACHING AND RESEARCH FACILITY

/ UNIVERSITY OF CENTRAL LANCASHIRE Preston, England

**As a key part of the masterplan for the Preston campus, the Engineering Innovation Centre is providing the university and Lancashire based manufacturers with state-of-the-art teaching and research facilities. It is expected to help train an extra 500 graduates, including an increased number of female students, gaining degrees in subjects such as mechanical, energy technologies and aerospace engineering.**

The fabricator base has made full use of the SPINAL MX62 curtain walling system's performance and aesthetic capabilities in meeting the challenges of a landmark university building, located in the centre of Preston.

Designed by SimpsonHaugh & Partners architectural practice, the Engineering Innovation Centre is being built for the University of Central Lancashire by BAM Construction, a major player in the education sector.

Throughout the project Dorteck, the architectural glazing specialist, faced a number of technical challenges including; the building's proximity to a very busy roundabout, the floor to floor heights, physical security, and the expected levels of solar gain; as well as design detailing requirements.

In addition to achieving high levels of thermal insulation, being fabricated from aluminium, the SPINAL MX curtain wall is a fully recyclable system,

helping the building to achieve a BREEAM rating of Excellent.

The Project Manager for BAM Construction, Simon Atkinson, commented: "We proposed the use of the SPINAL MX curtain wall system as part of our value engineering proposal for the project. It offers the best value for money in terms of its cost and performance while meeting the aesthetic requirements. This is in fact a continuation of the successful partnership, helping to build our reputation in delivering education sector projects."

Partner in charge of the project for SimpsonHaugh, Ben Simpson, added: "This has been a demanding project, but the system along with Dorteck's experience has enabled us to meet all of our design aspirations for the elevations. We are on site regularly and the building is looking very good."



## / CHALLENGE

The building's proximity to a very busy roundabout, the floor to floor heights, physical security, and the expected levels of solar gain; as well as design detailing requirements

## / SOLUTION

High levels of thermal and acoustic insulation curtain wall, also a fully recyclable system

## / PRODUCTS

- SPINAL MY62 curtain wall



Architect: SimpsonHaugh & Partners  
Photographer: John Kees Photography



## WORKING TO CREATE GREENER BUILDINGS

**In 2018, the industry accounted for 39% of the world's energy and process-related carbon dioxide emissions. Legislation is forcing the building and construction industry to bring down its greenhouse gas emissions, and quickly. Consequently, building systems suppliers are being asked to adjust and accept a new role. Because not only do they need to develop technically advanced systems that are built to last, they need to manufacture such systems with the lowest-possible carbon footprint. And they need to be able to prove that they themselves are sustainable suppliers.**



In a sustainable future, our continued success will depend on our ability to offer systems that combine top performance with a low carbon footprint. It will also depend on its ability to become a sustainable supplier. In this work, collaboration will be key, both with customers as well as with suppliers.

As a fully integrated aluminium company, Hydro has been attacking this challenge from all parts of the value chain, and for several years now. It has addressed the mining of bauxite and refining of alumina, the production of primary aluminium, the high-tech sorting of post-consumer scrap and development of low-carbon aluminium alloys, and the commercialization of sustainable building systems.

Acknowledging that change needs first to occur internally, so we have imposed sustainability targets and have identified several inside-out actions divided into:

- **Greener metal sourcing.**  
Hydro CIRCAL®, Hydro REDUXA®, low-carbon remelted aluminium
- **Greener components sourcing.**  
Recyclable, bio-sourced, low-carbon accessories
- **Greener production and sites.**  
Energy used, water, waste and fumes treatment
- **Greener transport and packaging.**  
Less packaging, transport route optimization
- **Greener workplace.**  
Commuting and travel, IT and data

**Aluminium is key to zero-energy buildings**

Lightweight and infinitely recyclable, aluminium is increasingly the material of choice. It accommodates growth while constraining carbon emissions.

**Among the greenest aluminium in the world**

Producing some of the aluminium with the lowest carbon footprint in the world, Hydro wants to make sure that this attractive metal is made available to consumers who care about the sustainability of the products they use.

Hydro CIRCAL® is the most attractive alloy available to the building market, in terms of carbon footprint. Its footprint of 2.3 kg CO2 per kg of aluminium is more than three times lower than the primary aluminium average in Europe and more than six times lower than the global average.

This alloy contains no less than 75% post-consumer scrap, taken from dismantled windows and facades. Hydro CIRCAL® is verified by DNV GL and confirmed by an Environmental Product Declaration (EPD).

Meanwhile, Hydro REDUXA® – a primary aluminium product – offers a carbon footprint of maximum 4.0 kg CO2 per kg of aluminium. This alloy, too, has been verified by DNV GL and confirmed by an EPD.

Hydro has achieved this low footprint for Hydro REDUXA® by using the same source of bauxite and alumina and by utilizing improved-efficiency smelters based on hydroelectric power. Other contributing factors are the improved sourcing of anodes and full control on the steps where it sources the cold metal.



**Certified aluminium makes a difference**

More and more consumers, companies and public procurers are making purchase decisions using sustainability criteria. For this, objective labels, standards or certificates are a useful aid because they indicate under which environmental and social standards the products were produced.

We work continuously to lower our own emissions, increase recycling and help our customers develop products that enable CO2 savings – among others. In order to do so we have obtained the following certifications for parts of our production, and continuously work to roll this out across our business.



*The leading multi-attribute, multi-industry science-based standard for verifying products for the circular economy with integration of beneficial Environment, Social and Governance features.*



*Independent certification scheme covering the entire value chain of aluminium to address sustainability challenges from a Environment, Social and Governance issues perspective.*

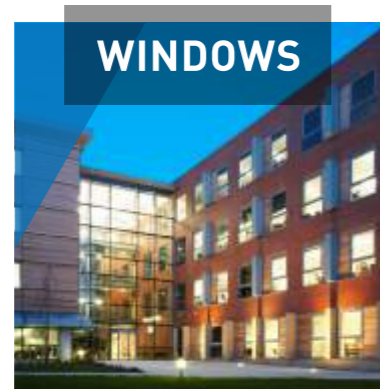
# OUR OFFERING

/ A wide range of products and solutions suited to your needs ...



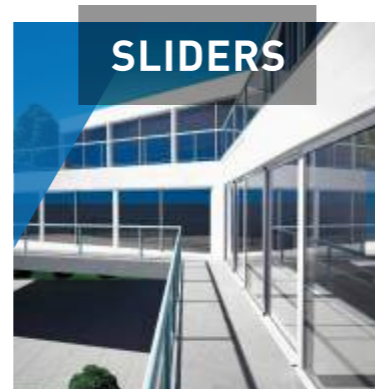
## FACADES

TENTAL  
SPINAL  
GEODE



## WINDOWS

LUMEAL  
SOLEAL  
SAFETYLINE



## SLIDERS

LUMEAL  
SOLEAL  
GALENE  
TIGAL



## DOORS

AMBIAL  
SOLEAL  
TITANE



## SOLAR SHADING

NOTEAL  
SUNEAL



## BALUSTRADES

GYPSE



## SAFETY

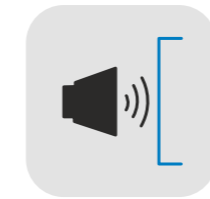
PYROAL  
COBALT



## PARTITIONS

TECHNAL SYSTEM  
OPALE

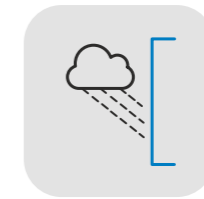
... featuring assets complying with the requirements of educational buildings



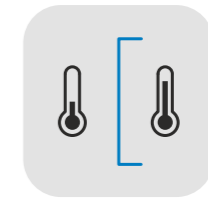
ACOUSTIC



AIR  
PERMEABILITY



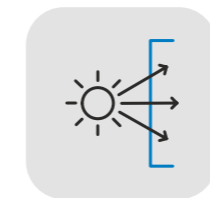
WATER  
TIGHTNESS



THERMAL  
ISOLATION



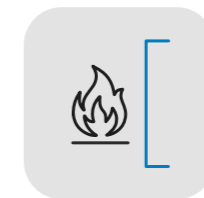
WIND  
RESISTANCE



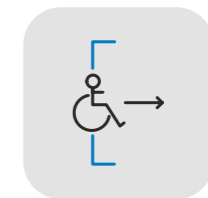
LIGHT  
CONTROL



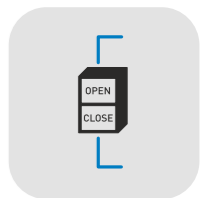
SECURITY



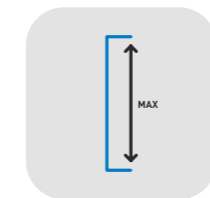
FIRE  
RESISTANCE



DISABLED  
ACCESS



MOTORZATION



LARGE  
DIMENSIONS

## ABOUT TECHNAL

Imagination makes the world go round. At TECHNAL, it's our driving force and way of doing things. It allows us to move forward, innovate and inspire. Where others just see a window, we see cutting-edge technology that benefits both the users and the environment. We see the future.

The TECHNAL brand from Hydro was created over 60 years ago and is a pioneering international specialist in architectural aluminium systems. We have established an unrivalled reputation for innovative and

inspiring design solutions, building up a portfolio of impressive award-winning projects.

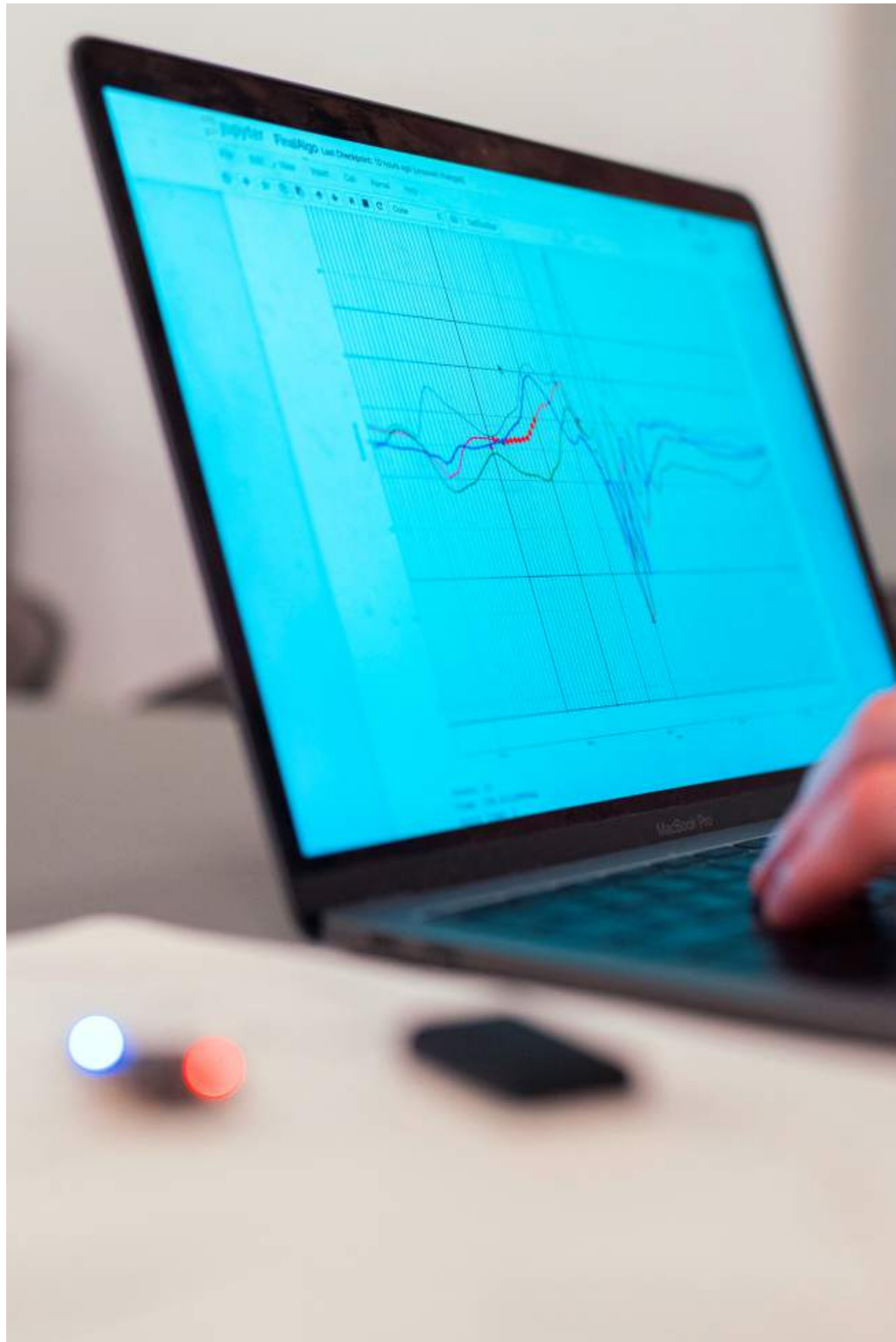
Our aluminium building solutions have been used to create purpose-designed facades, windows and doors for diverse sectors of commercial and residential buildings. We have a clear understanding of the requirements of architects, contractors, developers, fabricators and occupiers which enables us to develop an innovative, technically advanced and flexible product portfolio.



## COMPUTER SCIENCE AT THE SERVICE OF ARCHITECTURE

Always striving to better support its partners, TECHNAL offers a complete range of software solutions as well as training adapted to individual needs.





# THE ACOUSTIC PERFORMANCE EVALUATION SOFTWARE

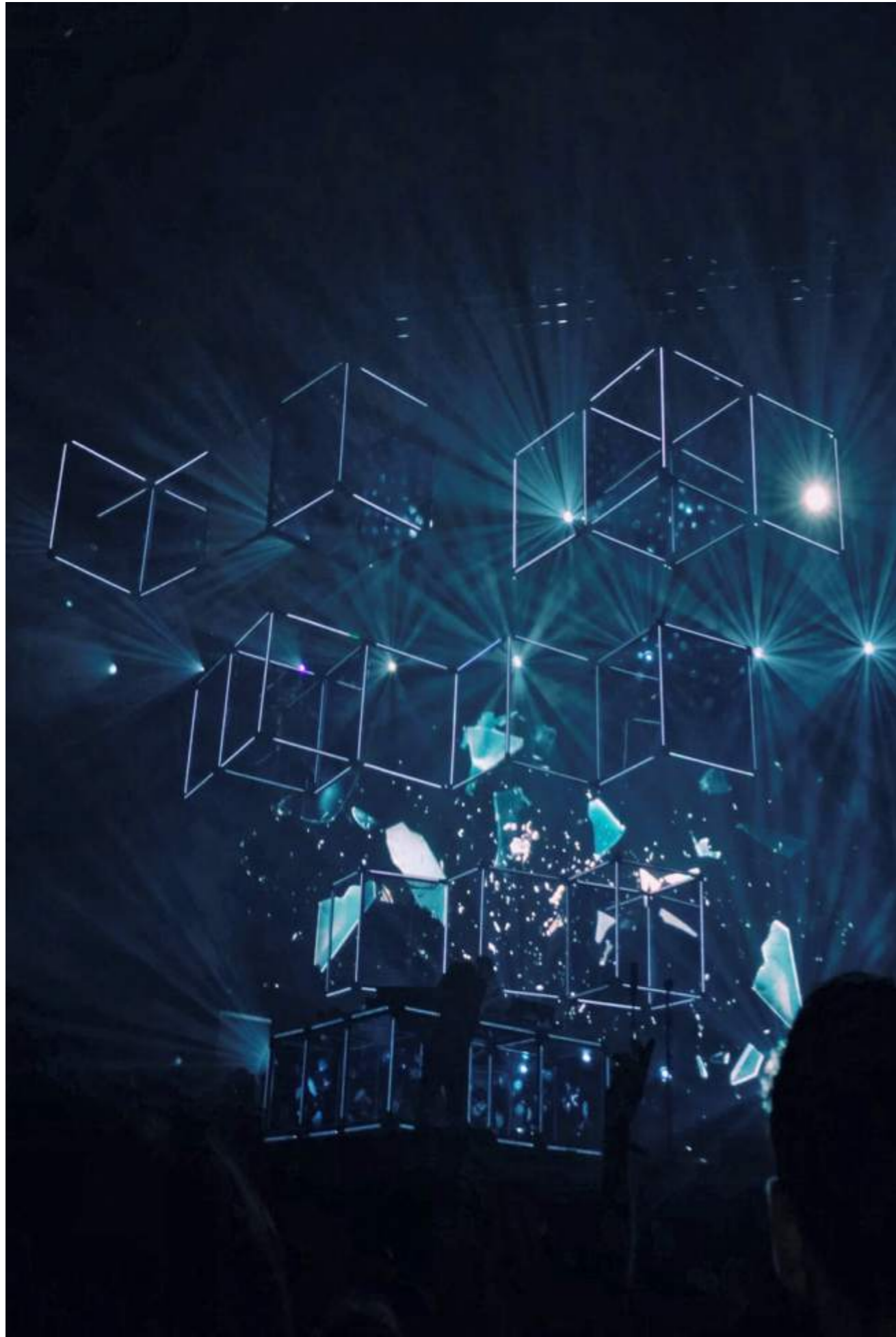
## TechAcoustic<sup>®</sup> by Technal



Reliable, TechAcoustic<sup>®</sup> is the only tool on the market that can ensure, regardless of the composition (size and glazing), an evaluation accuracy of more or less 1 dB, the equivalent of a laboratory test.

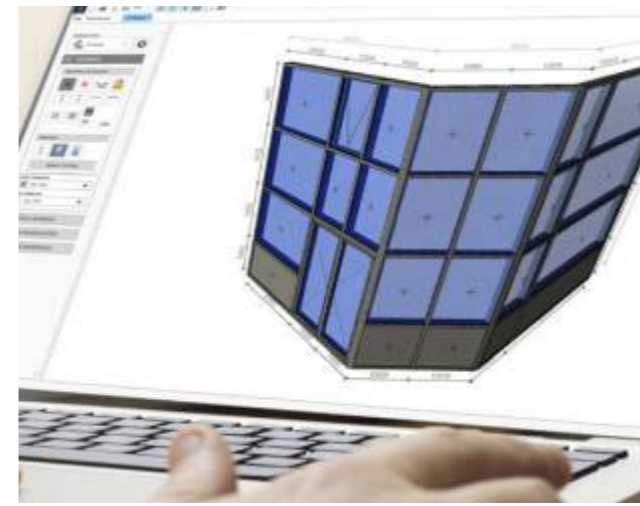
Benefits are time and cost savings for the owners and metal builders who get, in a few clicks, the performance of their choice. This advanced software also performs exact models on complex projects and large joineries.

- **Cost optimisation:**  
Help with choosing the most appropriate range and glazing to achieve the desired levels of acoustic performance. It is no longer necessary to choose over-performing and expensive glazing.
- **Ease of use:**  
Thanks to its intuitive and ergonomic interface, you don't need to be an expert in acoustics to evaluate the performance of a window.
- **Scope of application:**  
With TECHACOUSTIC, you can obtain the acoustic performance of the joinery regardless of the size or type of infill, and also in the case of a complex units (several opening and fixed sections), and always with the same degree of accuracy.
- **Accuracy:**  
The complexity of the computational algorithms guarantees a result with an accuracy of +/- 1 dB, which is similar to the results obtained in other laboratories.
- **Speed of evaluation:**  
It takes just a few clicks to define the joinery to be evaluated and the result is instantaneous.



# BIM OBJECT CONFIGURATOR FOR TECHNAL ALUMINIUM JOINERIES

## Tech3D<sup>®</sup> BIM by Technal



Tech3D<sup>®</sup> is an innovative and simple sketching tool which has been specially designed for architects and specifiers, saving time to produce 2D, 3D drawings and 3D renders for architectural aluminium façade designs. They can be integrated in your BIM project.

- **Create:**  
Easy formatting of your concepts and ideas by incorporating the TECHNAL range. Simple creation of renderings from the very early stages of the project.
- **Visualize:**  
Quickly visualize the product in realistic proportions with a significant level of detail. Offering both internal and external views, the different configurations and options can be evaluated and developed.
- **Communicate:**  
Compatible with all CAD tools used by architects (2D and 3D drawings can be imported and exported). Possibility of integrating your SketchUp projects into Tech3D to add a TECHNAL product according to the 3D volumetry defined upstream. 2D elevation drawings can be imported as models to create 3D renderings and can also be exported for use in most CAD software on the market, such as Autocad<sup>®</sup>, Bentley<sup>®</sup>, Archicad<sup>®</sup> and ADT<sup>®</sup>. 3D rendering can be exported in various formats for use with Sketchup<sup>®</sup>, Autodesk 3Ds Studio Max<sup>®</sup>, Revit<sup>®</sup>, Archicad<sup>®</sup> and meet the 3D modelling needs of the BIM digital model.



IMAGINE WHAT'S NEXT

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