



fassada

CURTAIN WALL TECHNOLOGIES



Passion for innovation to classics of tomorrow

Innovation is not something you see every day in a sector as conservative as construction.

An innovation that could cause shockwaves through the industry is even more rare and usually dismissed as fantasy. Incredibly, walls are still being built by laying bricks one on top of the other like Lego blocks, and huge facades continue to be constructed using scaffolding that dates from the time of the ancient Egyptians...

The Fassada DNA is to offer to the market state-of-the-art, outstanding, performing, innovative, worldwide patented technologies based on an engineering philosophy of maximum cost reduction and risk control.

Innovating is critical, but it's not enough. Our high-end aluminium curtain wall technologies are carefully engineered to revolutionise the market. To set a new standard. To eliminate problems and to enable the impossible. To give a real answer to all aspects of climate change and concrete solutions for energy friendly buildings.

We see it simple: doing better, smarter and last but not least significantly more cost effective, having the quote in mind of Garry Kasparov " *At the end of the day, it's all about money*" brings us to our Fassada DNA "*Professionalism and profit in one facade*".

The combination of a long list of global patent protected USP's with a series of unique cash-USP's, huge direct savings in labour cost among others, seems to us the perfect recipe for a disruptive success.

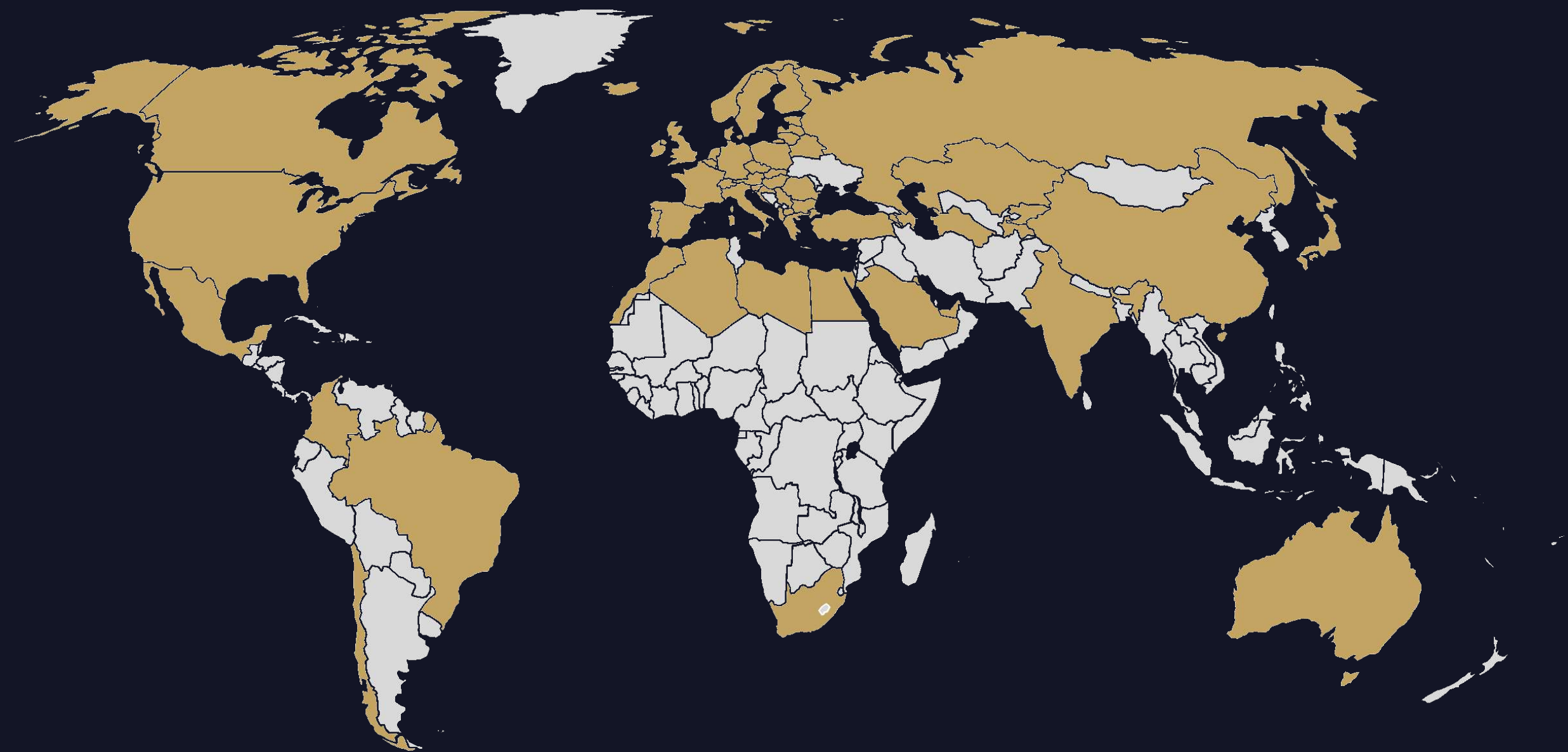
This makes our technologies different, one may even say incomparable. We cherish the incomparable feeling of creating something that endures and co-creates the future.

Enjoy your journey in the present brochure with a grab of our smart solutions.

A stylized, handwritten signature in white ink, consisting of a horizontal line with a large, looping flourish above it.

Eric Claeys, ir. MSc MBA
Founder Fassada Systems BV

*"It is better to believe than to disbelieve,
in so doing you bring everything to the realm of possibility" A.E.*



Patented in over 70 countries

A person is seen from behind, standing in a field of tall grass. Their arms are raised high in the air, reaching towards a bright sun that is low on the horizon, creating a silhouette effect. The sky is a warm, golden-orange color with some light clouds. The overall mood is one of joy, freedom, and connection with nature.

A GODSEND FOR THE ARCHITECT

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M68 MODULAR SG *(structural glazing)*

The past: two types of conventional curtain wall systems

Before Fassada launched the hybrid technologies on the market, there were just two types of curtain wall systems, in particular

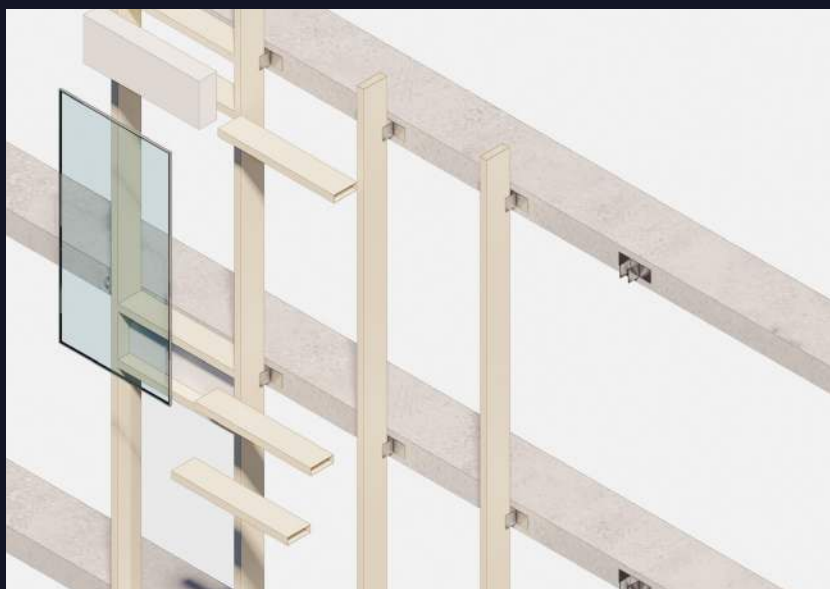
- The stick system
- The unitised system

Stick systems

Stick curtain walls may be defined as non-load-bearing walls, usually suspended in front of structural steel or concrete framing. The term "stick" refers to the factory-cut vertical mullions and horizontal transoms which are transported to the site as loose bars and sticks. However, it is also possible to assemble them into a ladder frame for a quicker site assembly.

In this system the mullions and transoms are installed on aluminium brackets which are anchored to the structure. This creates a grid, in which the glass is placed from the outside and finished with pressure plates to secure the glass mechanically. Caps are fitted on the pressure plates for an aesthetic look. Around 90% of the work is done at the site. The aluminium grid is always visible from the outside.

A stick system has a lower material cost, but the installation requires much more "manpower" than a unitised system. For the installation of this classic system a scaffolding **from outside** is required.

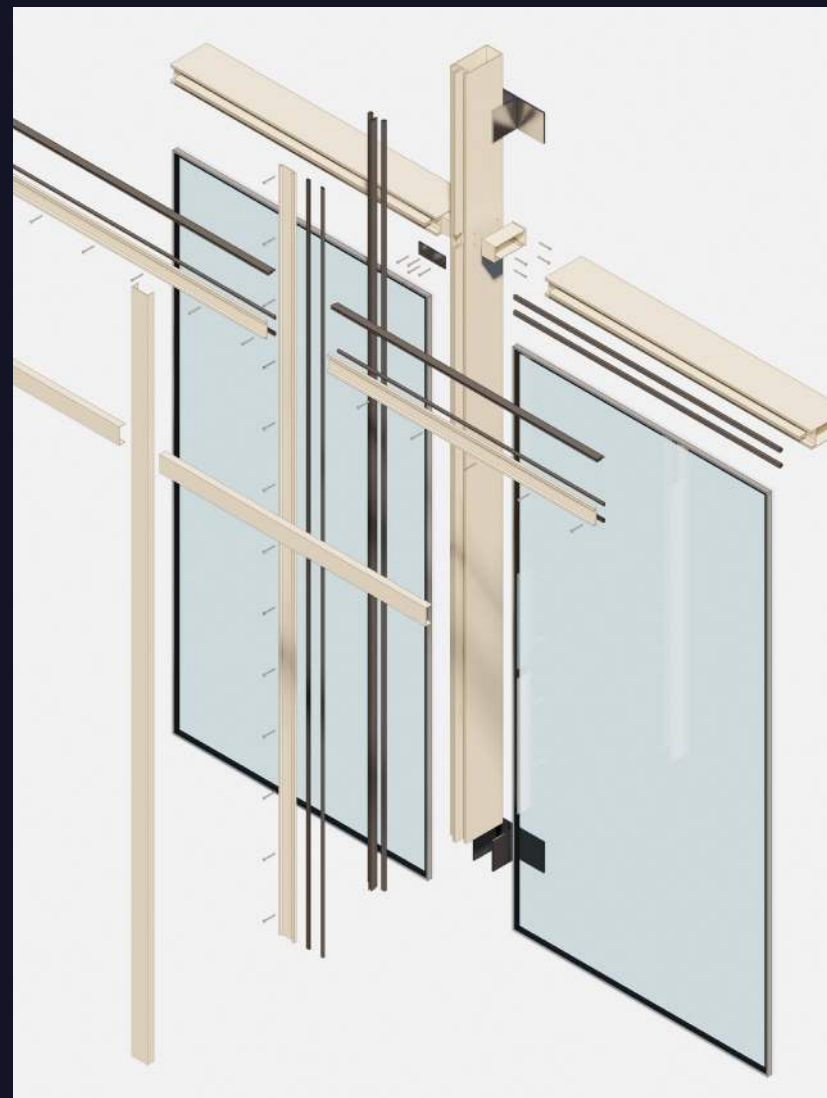


stick system

Unitised / Modular systems

Unitised curtain walls entail factory fabrication and assembly of panels and may include factory glazing. These completed units are hung on the building structure to form the building enclosure. Unitised curtain walls have the advantage of installation speed, lower field installation costs and quality control in a climate controlled inside environment.

In this system aluminium brackets are anchored to the structure after a detailed site survey. The factory fabricated complete unit, spanning the full floor height, is then installed on the brackets. Using this system, around 10% of the work is done at site.



stick system



unitised system

It is a choice to show the aluminium grid on the outside. In case of absence of an aluminium grid, a groove running horizontally & vertically is shown. This is called structural glazing, as the glass is secured with the help of structural sealant. In case aluminium profiles are visible, the glass and infill elements are mechanically secured. This system is most suitable for high rise buildings with huge quantity of glazing. For the installation no scaffoldings are needed, as the installation of the panels are done using a cradle or hoist crane.

History of curtain wall

Innovativeness

Historically, a curtain wall described the set of walls that surrounded and protected the interior of a medieval castle. These walls were frequently connected by a series of towers or mural towers to add strength and provide a better defense of the ground outside the castle, and were connected like a curtain draped between these posts. Additional provisions and buildings were frequently enclosed by such a construction, designed to help a garrison last longer during a siege by enemy forces.

Prior to the mid-20th Century, buildings were constructed with the exterior walls of the building bearing the load of the entire structure. With the advent of the structural concept of shear walls and building cores, the exterior walls of buildings no longer had to sustain high dead loads and could be designed much lighter and more open than the brick and steel facades of the past. This gave way to augmented use of glass as an exterior facade, and the modern day curtain wall was born.

The first curtain walls were prepared with steel mullions, and the glass was attached to the mullions with tape and urethane sealant. An outer cap was installed to hold the glass in place and to protect the integrity of the seals. Aluminium framed wall systems date back to the 1930's, and developed rapidly after World War II when the supply of aluminium became available for non-military use.

Curtain walls differ from store-front systems in the ways they are designed to span multiple floors, and take into consideration design requirements such as thermal expansion and contraction; building sway and movement; water diversion; thermal efficiency for cost-effective heating, cooling and lighting in the building.

Curtain wall systems range from manufacturer's standard catalogue systems to specialized custom walls. Custom walls become more cost competitive with standard systems as the curtain wall area increases. Today, the design complexity and shapes obtainable are nearly limitless. Custom shapes can be designed and contrived with relative ease. Similarly, sealing methods and varieties have evolved over the years and as a result, today's curtain walls are high performance systems which require little maintenance.

The curtain wall industry has witnessed three generations of products.

The **1st generation** refers to those applied from the early to late 1970s, which were stick curtain walls composed of a variety of components assembled on site.



The **2nd generation** refers to those applied from the early 1980s to mid-1990s, the unitised curtain walls. A type of frame-supporting curtain wall composed of modulated panels that are fabricated in factories and delivered to construction sites in one piece for installation. The development of the unitized system of the second generation greatly reduced on site labour.

The **3rd generation** refers to systems applied from the mid-1990s onwards, mostly unitised systems, allowing in daylight to reduce heating costs and creating shading to reduce cooling costs. These are in demand throughout the world due to environmental concerns.

The development of new energy-efficient technologies such as triple-glazed curtain walls and solar-control glass are expected to continue to shape the industry. In addition, the demands of architects continue to influence the industry as many have sought features such as photovoltaic curtain walls as well as glasses of differing colours, sizes, materials, coatings and quality levels.

By prof. dr. ir. Arch. N. Van den Bossche of University of Ghent, a worldwide authority in the field of curtain walls, the Fassada H60-hybrid system has been called the **4th generation** of curtain walls.

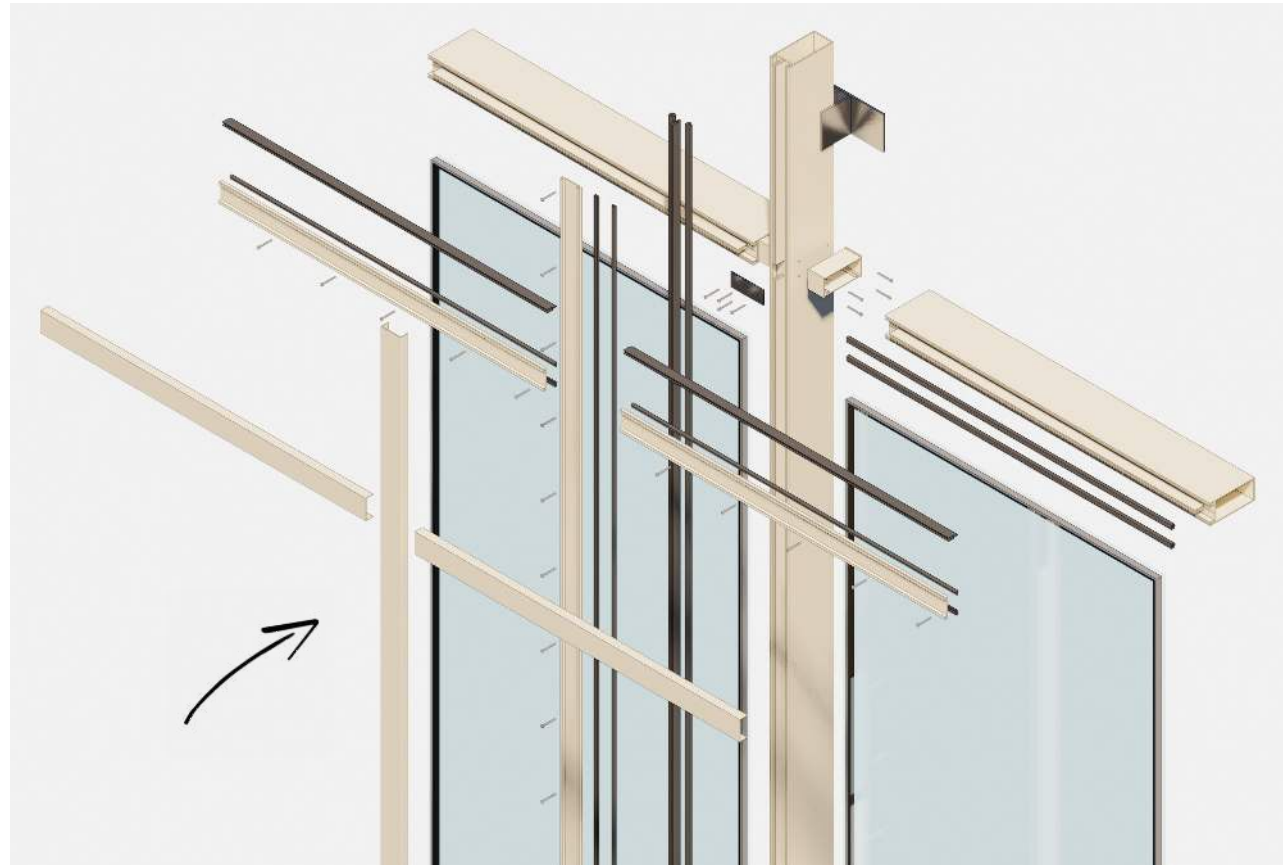
This new disruptive concept managed to combine a never seen reduction of material cost, production and installation time, improvement of technical performances and architectural freedom. This new disruptive concept is captured in patents, which almost all have been granted worldwide.

The need on the market for Fassada hybrid technologies is huge, to give some reasons:

- the financial pressure on facade contractors worldwide, working with minimal margins and high risks. Fassada offers them a maximum risk reduction and maximum cost optimization
- the difficulties worldwide to find skilled workers and installers
- The changes in demands concerning BREEAM and LEED certificates have led investors and contractors to look for performant materials and products.
- The changes in legislation for reduction of energy use, optimising heat gains and losses, are going hand in hand with the possibilities of the Fassada solutions
- Ecological sustainability: keep the ecological footprint as low as possible (material and parts, low non-recyclable waste, no screws, ...)

Innovating is critical, but it's not enough. The Fassada curtain wall technologies are carefully engineered to revolutionise the market. To set a new standard. To eliminate problems and enable the impossible.

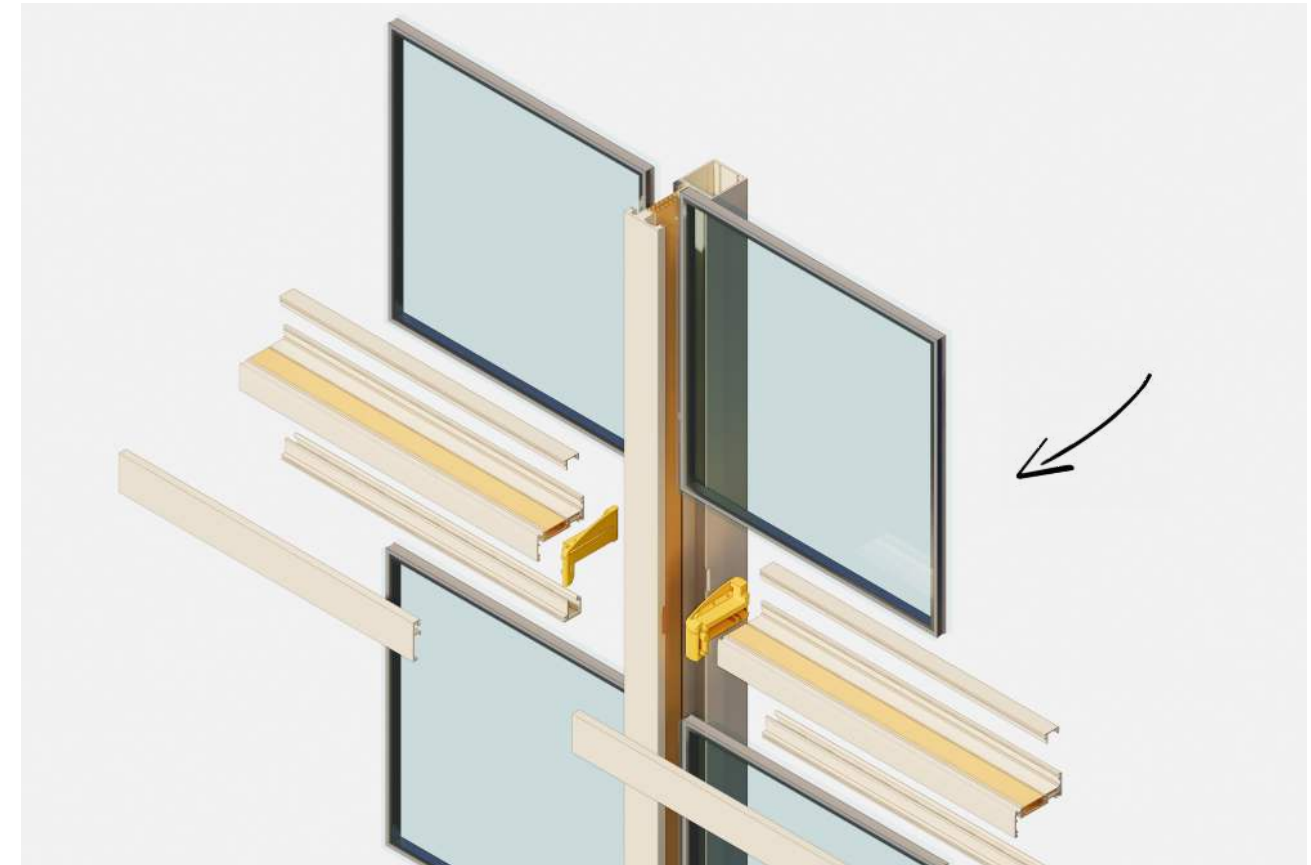
Hybrid facade systems : the 4th generation of curtain walls



Conventional stick systems

Some typical technical features of conventional stick systems :

- Complete installation from **outside** and working from a vertical access platform
- A complex assembly of profiles kept together by screws
- Rigid transom-mullion connection by T-connectors
- An external pressure plate fixed with lots of screws
- Glazing from outside
- Large number of accessories
- In lots of systems water tightness is based on the use of silicone with all known related risks
- U-shaped brackets at the edge of the concrete slab
- Final performance and quality highly depending on the skill level of the installation team and how they did their job



Hybrid curtain wall systems

Some typical technical features of hybrid curtain wall systems :

- Foolproof installation from the **inside** of the building
- Monolithic mullion and transom – classic glazing beads
- Hinge type transom-mullion connection allowing limited rotation and dilatation
- No external pressure plates, no screws
- Real thermal break without punctual thermal bridges by screws
- Glazing and installation of the spandrel panels from inside the building
- No scaffoldings or other vertical access equipment
- Almost no accessories
- 3D-adjustable brackets on top of the concrete slab
- Main part of the installation works are accessible for low or non-skilled workers

We don't ripple the surface. We rock the boat.

At the end of the day, it's all about money

Innovation is about more than engineering — it's about establishing an economic vision. It's about having an in-depth understanding of the problems, costs, and risks in the facade industry. And most of all, it's about developing cutting-edge facade systems to do things smarter, better, easier, and more cost-effective.



No sales, but solutions

We don't sell a product, we provide smart solutions. We eliminate hurdles and help you work smarter, better, easier, faster, and more cost-effective. Because we believe in breaking barriers.

A passion for innovation

Innovating is critical, but it's not enough. Our high-end aluminium curtain wall technologies are carefully engineered to revolutionise the market. To set a new standard. To eliminate problems and enable the impossible.

Passion The distinction between doing and excelling

Groundbreaking novelty is only one element of our holistic philosophy. Cost reduction, risk control, and sustainability are all indispensable parts of the Fassada identity - and so is our passion for grandeur.

Sustainability

We cherish the incomparable feeling of creating something that endures, of co-creating the future. But that also means we must work to preserve our world and its ecosystems. Fassada reduces its ecological footprint at every level, from the development of the product to the streamlining of our organization and logistics.

Each one of us can make a difference. Together, we can make a change.

Perfect match

Rome wasn't built in a day, and neither will your legacy. So yes, we want the best end of the deal—but we want you to have it, too. That's why we foster a symbiotic relationship between the 3 stakeholders: the client, the architect, and the contractor.



One-stop-shop

In everything we do, ecological and social sustainability is at the top of our priority list. In Fassada Systems, our 3 stakeholders find a reliable one-stop-shop for high-end curtain wall solutions that are durable, accessible, and safe to

Here's what's in it for every stakeholder

The client gets

- A low-maintenance solution
- A swift execution
- An outstanding performance
- A bang for their buck

The architect gets

- Unbridled design freedom
- Elegant solutions to execute his vision
- A solid and sustainable canvas
- A blissful lack of technical hiccups

The contractor gets

- Minimal controlled cost
- Minimal technical risk
- Outstanding performance
- A healthy margin for growth

Out-of-the-box thinking is our nature

In order to conceive innovative solutions, one must be able to not only think outside the box, but discard the box entirely. By offering unbridled architectural freedom, unparalleled value for money, and a quick and efficient project lead time, we manage to align the seemingly contradicting interests of client, architect, and contractor.



Innovating isn't just about knowledge. It's about having the skills, creativity, and vision to conceive what has never been done before. Our philosophy will always be about finding state-of-the-art solutions to do things smarter, better, easier, and more cost-effective.

Know your customer

This perfect match between the 3 stakeholders is based on decades of non-stop R&D and collaboration with the academic world. By thoroughly analyzing our stakeholders' varying needs and adopting value-engineering as the foundation of our creation process, we've managed to develop integrated solutions that benefit all.



Deeds, not words

Social sustainability

Innovation is worthless if it's not safe and accessible to implement. After all, who would we be without those executing our vision? Our high-end technology is fit for low-skilled workers. We believe in straightforward, stripped-down solutions that can be implemented by workers from all walks of life.

We do everything in our power to minimize risks. Our systems can easily be installed from the inside of the building, ensuring the safest possible implementation on-site.



To leave our mark on the world, we must first protect it. Words won't lead us anywhere. Sustainability is a mindset, one that seeps into every single decision we make.

Ecological sustainability

Preserving our planet

In everything we do, we aim to leave this world better than we found it.

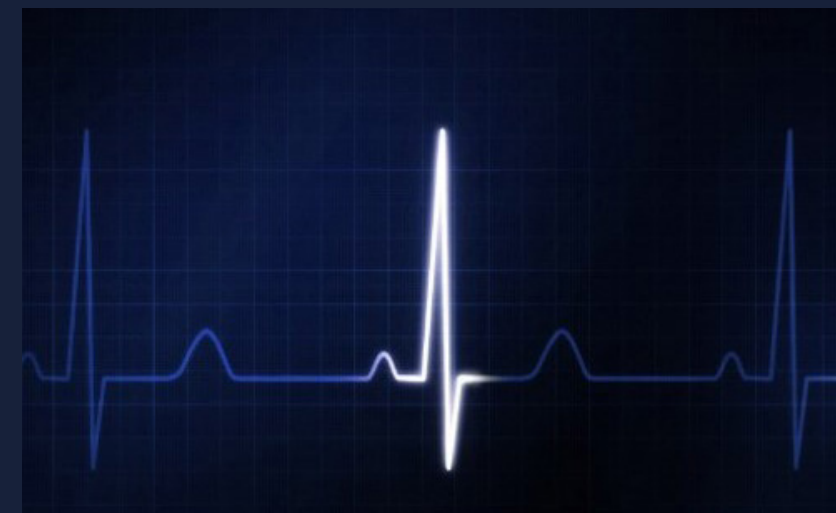
We reduce our ecological footprint. Our natural resources are precious and finite, so we eliminate anything that won't last for centuries to come.

- We reduce the need for accessories of different materials (plastics, stainless steel, etc.) and use environmentally friendly TPE gaskets.
- We never use silicone.
- We soon expect to receive gold label Cradle-to-Cradle certification.



We focus on energy control. We find smart thermal insulation, solar control, and ventilation solutions to tackle the inevitable consequences of our changing climate

- Sun shading
- Smart glazing
- Night cooling
- Best-ever thermal performance of a curtain wall



e-commerce order platform

We've streamlined our business model. We ensure maximum efficiency and eco-friendliness in every layer of our organization.

- We are the first-ever system supplier to set up a fully integrated e-commerce platform for the sales and distribution of customized B2B products.
- The production of our profiles is handled by a one-stop-shop, eliminating the need for in-between transport.
- We don't keep stocks, which further reduces transportation needs and helps us cut back on energy waste.

Professionalism and profit in one facade

Not just innovative, but revolutionary

Through continuous R&D and collaboration with the academic world, Fassada has been able to develop innovative solutions for the facade sector's most common problems. Our cutting-edge solutions are patented worldwide.

Avant-garde solutions

Energy control

Our changing climate reinforces the need for a solid barrier between inside and outside environments. To guarantee exceptional comfort in the buildings we co-create, we offer avant-garde solutions for temperature control.

- **Night cooling**

Our night cooling system provides natural ventilation in the evening, reducing daytime temperatures by up to 3°C.

- **Sun shading**

Our high-end sun shading solutions help to minimize overheating in indoor spaces.

- **Smart glazing**

Our smart glazing windows block the sun's heat and radically reduce solar transmittance.



H60-hybrid & H75-hybrid

Do you favour unitised or stick-built systems? No matter which team you're on—it's a judgment call you'll never have to make again. With six different configurations based on environment, energy conditions, and architectural ambitions, the H60-hybrid symbolizes the system of the future. Easy to install, low-risk, executed in a wink.

- Decimated production and installation times
- Depending on the modulation of the curtain wall
- Production: 12 – 15 min/m²
- Installation of CW grid: 10 – 15 min/hour/man
- Glazing of the CW grid: 8 – 15 m²/hour/man
- Installation usually in teams of 3 people

H75-hybrid is similar to H60-hybrid but having a visible width of 75 mm instead of 60 mm.

Working outside is a thing of the past

True innovation is about simplification. About stripping the process down to its very core. You know what they say—if you can't find an easy way to get it done, you might not understand it well enough.

The installation of the future means...

- No screws or silicone
- No scaffolding
- Fewer accessories
- Fool-proof installation from the inside.

By drastically simplifying our systems, we reduce risk, generate employment for unskilled and low-skilled workers, and heighten efficiency and performance.

"Logic will get you from A to Z, imagination will get you everywhere" — A.E.

M68 modular SG *(structural glazing)*

What's in a name? This modular structural glazing curtain wall system has a visible width of 68mm, including its invisible operable vents. The M68 is the perfect example of Fassada's ASAP formula: we keep things as simple as possible.

- Operable vents can be added by "removing" part of the profile rather than adding another entire profile.
- Mullions and transoms have the same split male-female profiles.
- In case of glass failure: replacement from the inside of the building
- Continuous membrane on top of every row of modules to guarantee a perfect water tightness.
- A limited number of accessories
- Standard solution for double skin wall, whether active or passive

With lower engineering, material, and manufacturing costs, the M68-modular creates a new era for unitized curtain wall systems.

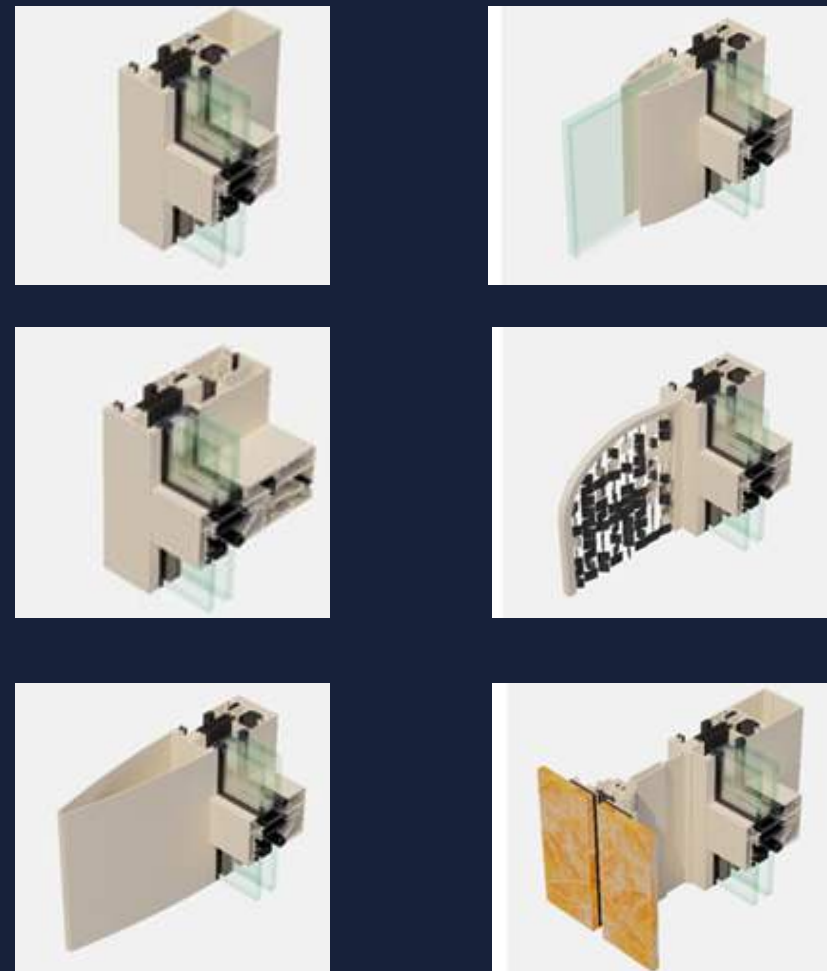
Climate change: the huge impact on curtain walls

The ever increasing demand of energy and harmful CO₂ emission, caused by global warming, necessitate the urgent need of energy conservation particularly in buildings as these are one of the energy consuming sectors. The most vulnerable building parts to heat gain and heat loss are windows that count for substantial cooling and heating load consequently. An enormous amount of electrical energy is being consumed to run air conditioner devices to adjust the temperature of living spaces and inside buildings, while proper glazing technologies and materials can be utilized to reduce the energy consumption.

Knowing this, the everyday increasing energy requirements of the buildings worldwide and the inevitable evolution to green, passive & energy neutral buildings, the strengthening regulations for energy performance conditions and energy management systems (EMS), the performances of the facade need to increase to have better control on the indoor environment independently from the outside climate. As the facade is the barrier between inside and outside climate (controlling heat gain and loss). It is the facade that determines for a large part the performance of the building.

Passive cooling is a building design approach that focuses on heat gain control and heat dissipation in a building in order to improve the indoor thermal comfort with low or no energy consumption. This approach works either by preventing heat from entering the interior by preventing the heat to get to the facade (heat gain prevention) or by removing heat from the building (natural cooling).

The Fassada H60-hybrid offers



The Fassada hybrid solutions and its strenghts to tackle the energy challenges of climate change, cannot be called other than astonishing.

As a matter of fact, most of the effective and cost-efficient solutions require access to the Fassada patented technologies, which implies a wide series of implicit Fassada monopolies of "solar control" for curtain walls.

In **WINTER** period, heat losses need to be minimized. Therefore the insulation value of the facade, expressed by the U-value, needs to be as low as possible.

In **SUMMER** period, the solar control or "keeping the sun out" – expressed by the g-value – is the main issue. There are two ways to keep the sun out :

- External sun shadings
- Smart glazing

The g-value should also be kept as low as possible. Furthermore there is the option of free night cooling, the cooling by ventilation at night trough the facade skin. This cooling is called to be "free" as the temperature of the outside air is lower than inside, creating a cooling capacity by natural ventilation at zero cost.

Winter - thermal performance - the U-value

As mentioned, the cold has to be kept outside, this requires a low U-value which is the indicator of the insulation performance of the facade.

The global thermal performance of a curtain wall depends on

- The insulation performance of the infill elements, e.g. glass
- The thermal performance of the frame, i.e. the curtain wall

Knowing that the H60-hybrid has:

- no screws - knowing that each screw creates a thermal bridge
- the largest polyamide thermal break available on the market
- U-value of less than 0,9 W/m²K or 30% better than the other systems

H60-system U-value is 20 up to 40% lower than a conventional system (U_{cw} = 0,9 W/m²K)

For the same infill elements, a curtain wall constructed with H60 system will per definition have a superior performance than any conventional system.

Summer - solar control - the g-value

Solar control is the key factor to keep the sun out during the summer period. This requires a low g-value.

To minimize the solar heat gains – "keeping the sun out" – the amount of solar radiation that induces overheating in both indoor spaces and buildings' structure need to be reduced. There are only 2 ways to keep the sun out :

- Using exterior sun shadings (vertical slats, horizontal slats or sun shading)
- Installation of special dynamic glass, so-called smart gazing

1. External sunshadings

A properly designed shading system can effectively contribute to minimizing the solar heat gains. Shading both transparent and opaque surfaces of the building envelope will minimize the amount of solar radiation that induces overheating in both indoor spaces and building's structure. By shading the building structure, the heat gain captured through the windows and envelope will be reduced. Therefor one needs to hold the sun before it touches the facade, so sun screens need to be installed on the outside.

In all conventional curtain wall systems, on which one would want to install sun screens, this causes a problem on 3 levels:

- Installation from the outside
- Installation onto the curtain wall means puncture of the aluminium systems, causing perforation of the rain and water screen of the building and creating thermal bridges
- Visually, a box on top, which is unacceptable for all architects
- Maintenance from the outside

H60-hybrid solves these 3 issues in an ingenious way, through the combination of:

- The semi-ventilated configuration – see pictures below
- With the unique feature of the monolithic mullion which allows to fix any kind of external structure – such as sun screens – WITHOUT perforating the rain barrier of the curtain wall, NEITHER creating any thermal bridge.
- With the final result of a state-of-the-art concealed sun screen



Using venetian blinds, the g-value can be reduced to 0,01 !!!! or 20 times less than the best performing solar glass!! Energy control from another era!

Fassada goes even further in offering solutions (see further in this present brochure). Due to the fact that the mullion is monolithic, it can have an unlimited number of shapes. This introduces the "Fins" and "Inverso" solution, offering a sun screen integrated in the curtain wall itself without additional investment but with a maximum result.

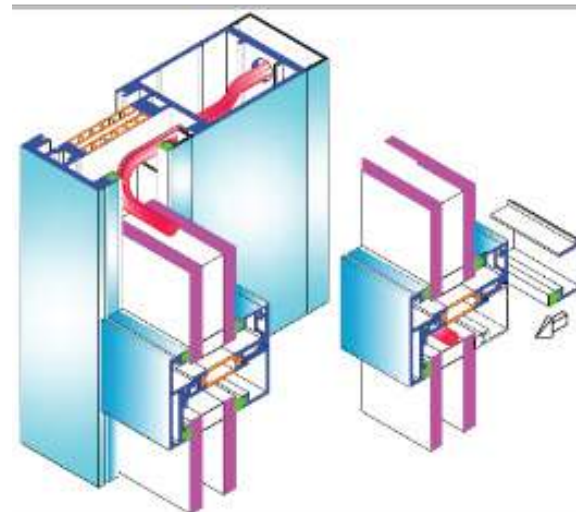


2. Smart glazing

With the advancement of glazing technology, smart glazing is developed to considerably decrease a building's energy demands while improving indoor environment.

Such smart glazing tints the shades of the glass from neutral to grey to deliver sun blocking (down to solar factor of 2% !!), anti-glare protection and privacy – automatically or on demand – while looking as ordinary glass. These products will usher a new era of interactive windows and walls for homes and commercial buildings.

From a technical perspective, it is highly preferable that "smart glazing" is installed from the inside of the building. The main reason is that every smart glass volume is equipped with a data cable. When installed from the outside a puncture has to be made in the curtain wall to channel this cable to the inside of the building to be connected to the Building Management System. Placement from the outside is currently the case with all conventional curtain wall systems. Meaning to get the data cables to the inside, installers need to perforate the rain and water screen of the curtain wall system to get the cables in.



However, the first objective of a curtain wall is to create a wind- and watertight screen between the outside and the inside. A curtain wall can have hundreds, even thousands of glass units. When installed from the outside this implies that all the necessary punctures for smart glazing turn the facade into a "gruyere cheese". This breaches the main function of a curtain wall.

Fassada H60-hybrid is the first and only transom-mullion system worldwide who makes fool proof installation from the inside of the building possible.

Night cooling by natural ventilation

Night cooling refers to the operation of natural ventilation at night in order to purge excess heat and cool the building. A building with sufficient thermal mass, which can be exposed to night-time ventilation, can reduce peak daytime temperatures by 2° to 3° using this strategy.

Night cooling offers the potential to minimize or even avoid the use of mechanical cooling and improve the internal conditions in naturally ventilated buildings. Good control of night cooling is required in order to achieve maximum free cooling whilst avoiding overcooling and subsequent re-heating or thermal discomfort the following day, leading to energy and money savings.

Again the strength of the Fassada hybrid system is shown, due to the monolithic mullion. This allows Fassada to integrate an operable vent in the mullion in an invisible way and benefit from fully automated night cooling, opening to the inside of the building. Creating the perfect air flow. No need for additional investments, for the Fassada hybrid systems it is a standard solution.



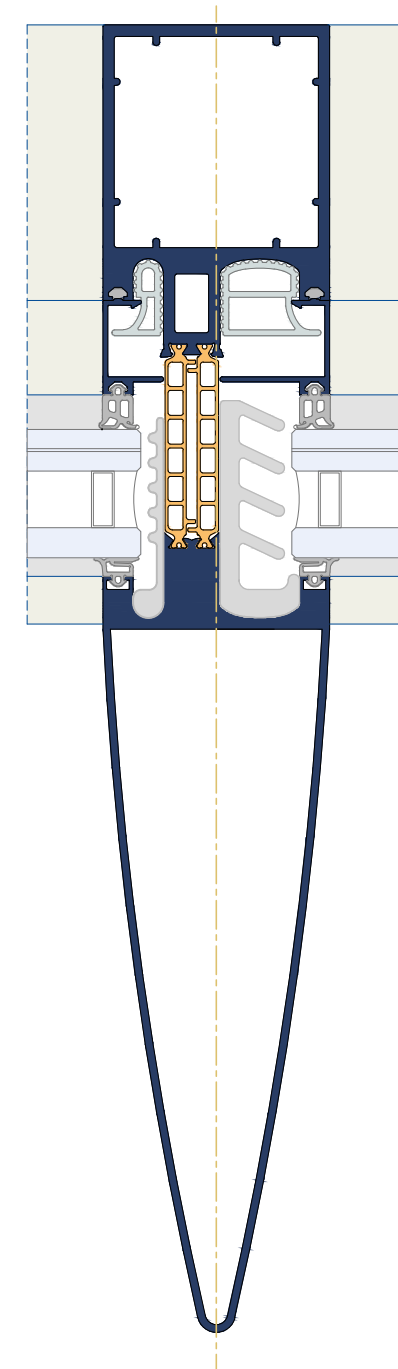
Vertical aluminium louvres

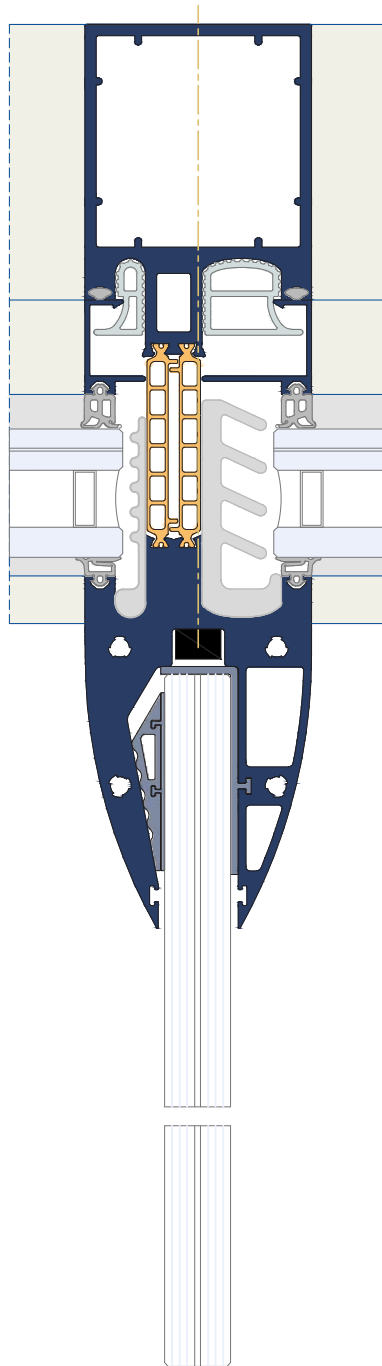
Conventional stick curtain wall

- Issue 1: the depth of the visible cap is very limited due to the unavoidable deformation of the pressure cap, as the mullion is composed by an assembly of profiles kept together by screws (interior tube, pressure plate, and cap,). Larger caps need to be fixed mechanically to a 1st smaller cap, costly as well labour intensive.
- Issue 2: costly installation from outside
- Issue 3: in case of glass replacement, the facade needs to be dismantled completely

Fassada hybrid solution

- Monolithic mullion profile, two benefits :
 - free shape of exterior cap
 - extreme rigidity, high I-value, interior shell could be reduced
- The depth of the louvre cap will have a direct positive impact on the cooling energy savings





Vertical glass fin louvres



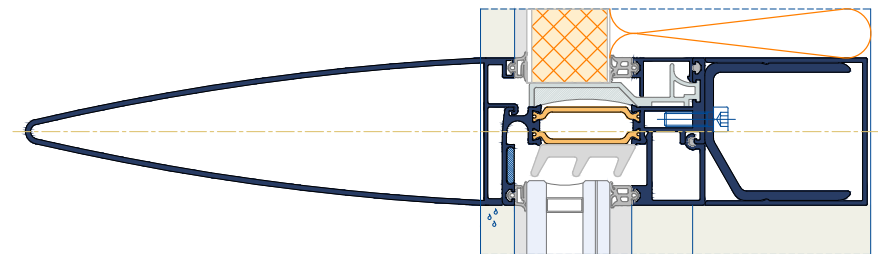
Conventional stick curtain wall

Technically impossible due to principle of pressure cap profile

Fassada hybrid solution

- Perfect solution, no use of silicone, mechanically clamped glass fin
 - Glass fin with double function
 - Structural element
- With coating or smart engineered ceramic frit printing : a perfect sun barrier

Horizontal aluminium louvres

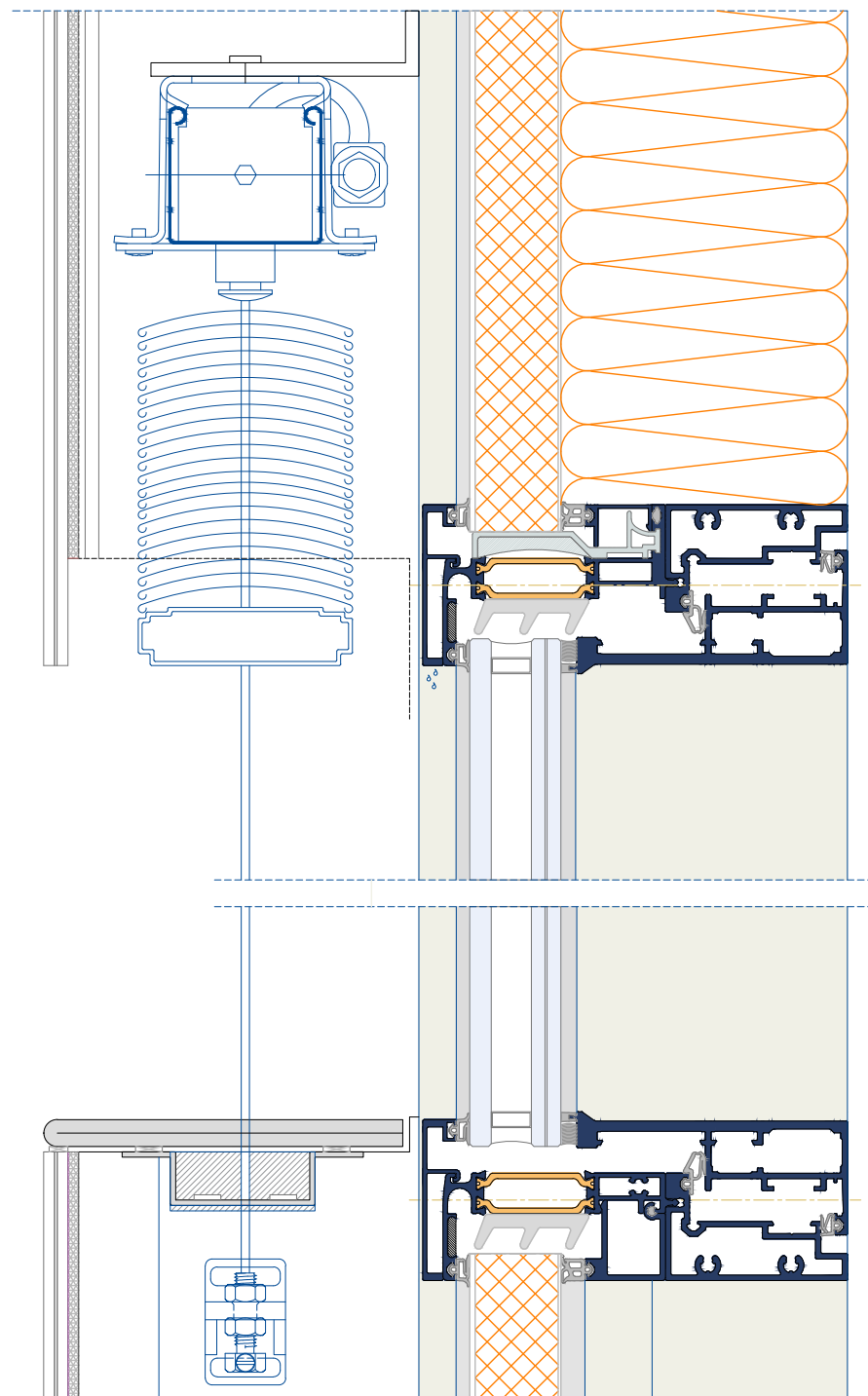


Conventional stick curtain wall

- At level of the transoms : the depth of the visible cap – the louvre – is very limited due to the unavoidable deformation of the pressure cap as the mullion is composed by an assembly of profiles kept together by screws (interior tube, pressure plate, and cap). Larger caps first need to be fixed mechanically to a smaller cap, costly as well labour intensive.
- At other levels: impossible unless perforating the rain shield of the mullion

Fassada hybrid solution

- At level of the transoms : the louvre is part of the exterior cap
- At other levels : easy click system fixed to mullions – installation from inside



Venetian blinds in semi-ventilated facade

Conventional stick curtain wall

Technically impossible

Fassada hybrid solution

- Blinds in lifted position hidden behind the opaque cladding, whatever material it might be
- No coated vision glass required anymore and g-value down to 0,01



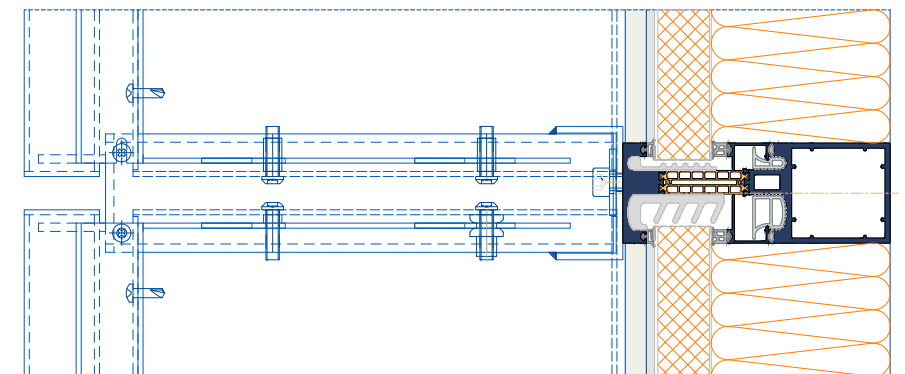
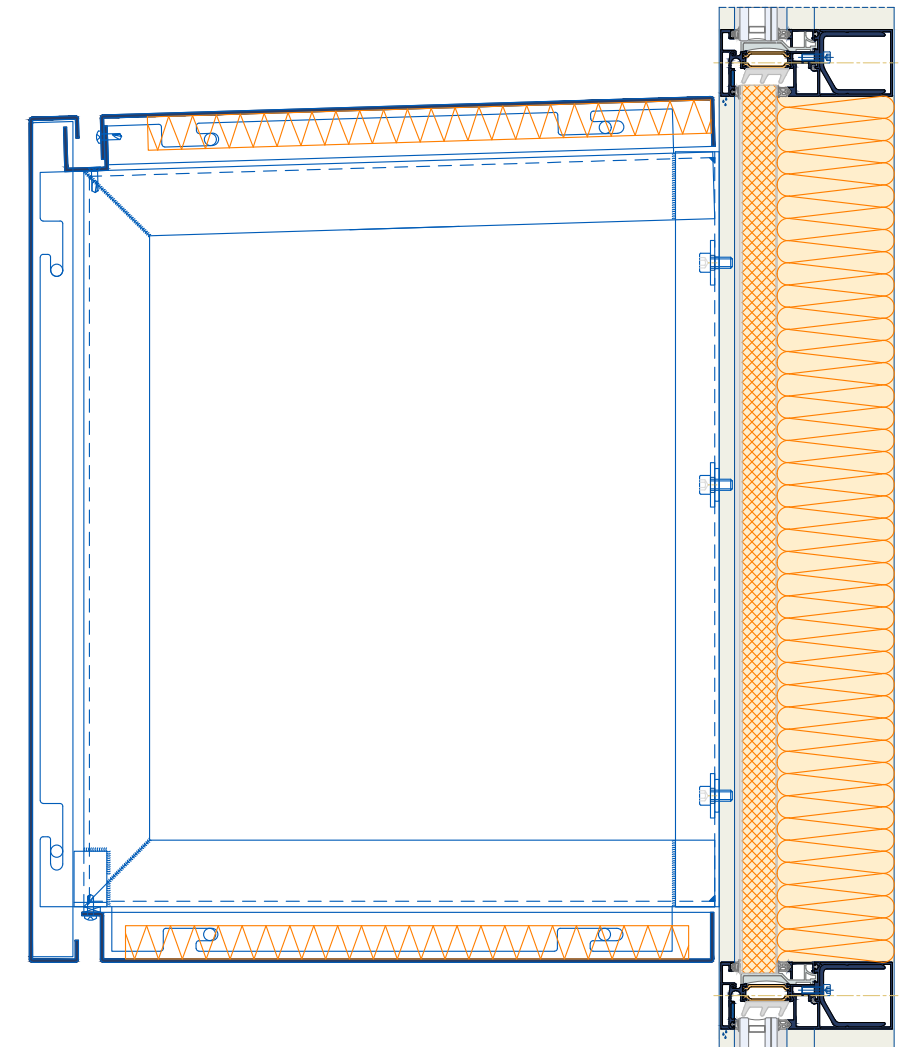
External structures

Conventional stick curtain wall

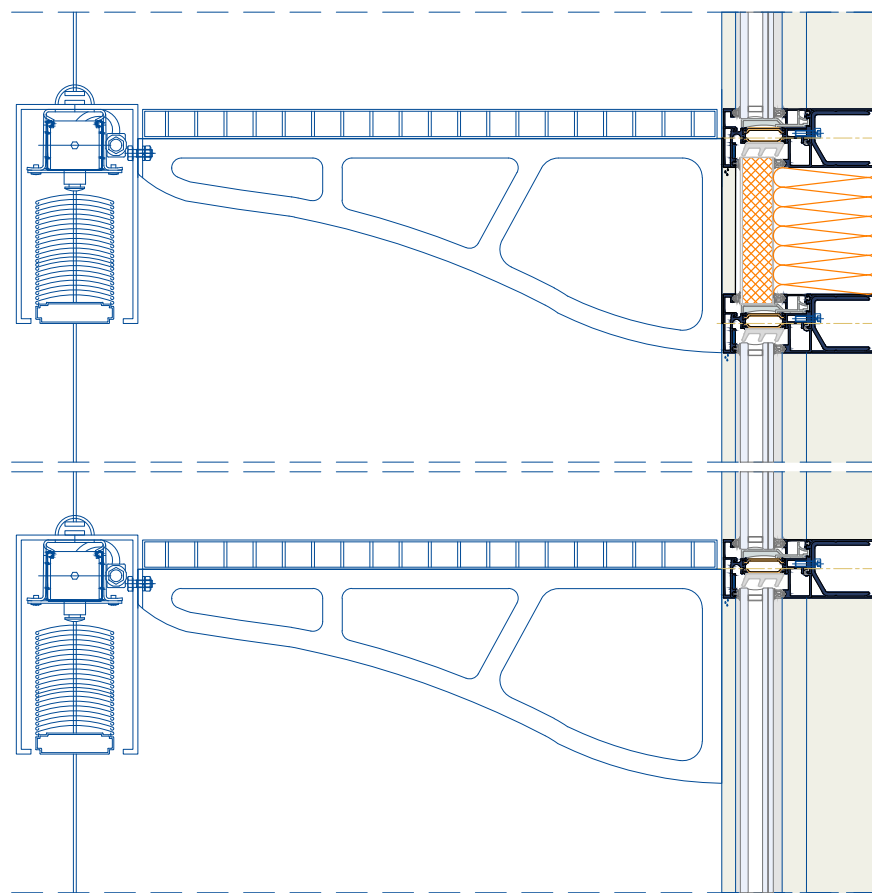
- Technically impossible (unless perforating the water screen shield of the curtain wall and installation from outside)
- Technically impossible to install external structures directly to the facade system. These structures need to be supported by the building structure, perforating the water screen shield of the entire facade, while also requiring installation from outside.

Fassada hybrid solution

- Almost unlimited solutions as the mullion is an insulated, monolithic profile (not assembled on site with profile, interior mullion, pressure profile, screws, exterior cap). Any specific device can easily be inserted in the mullion in the workshop. Such a device allows the fixation of any kind of additional external structures, such as louvres, neon lighting, walkways,... without any risk for the water tightness and without any problem of execution on site.
- Maximal shear load of 10 N/mm, in case of higher loads, the load transfer is realised by a M8-bolt in between the thermal breaks to interior shell of mullion



Sunscreen with walkways (between screen and glass plane)



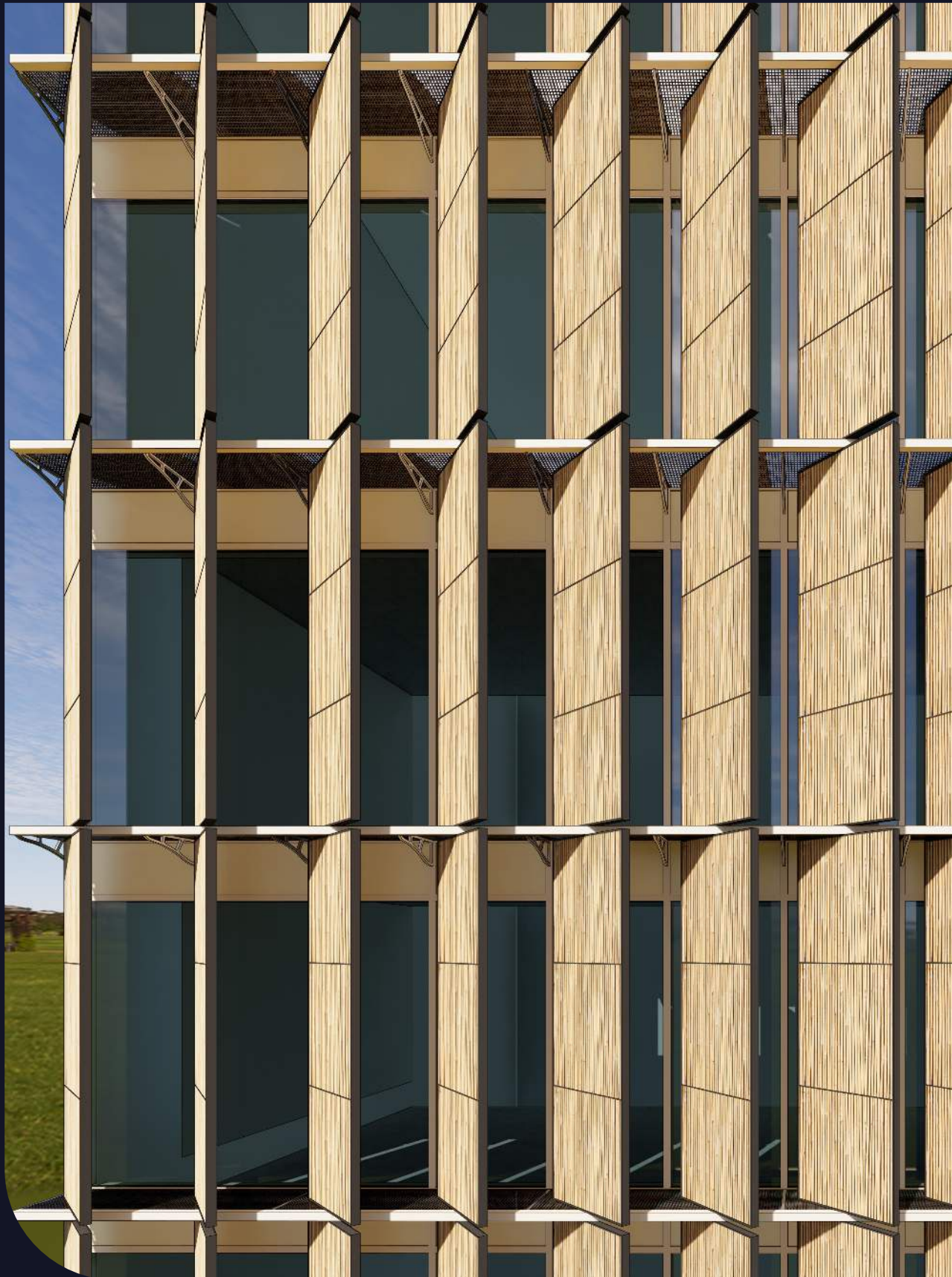
Conventional stick curtain wall

Technically impossible

Fassada hybrid solution

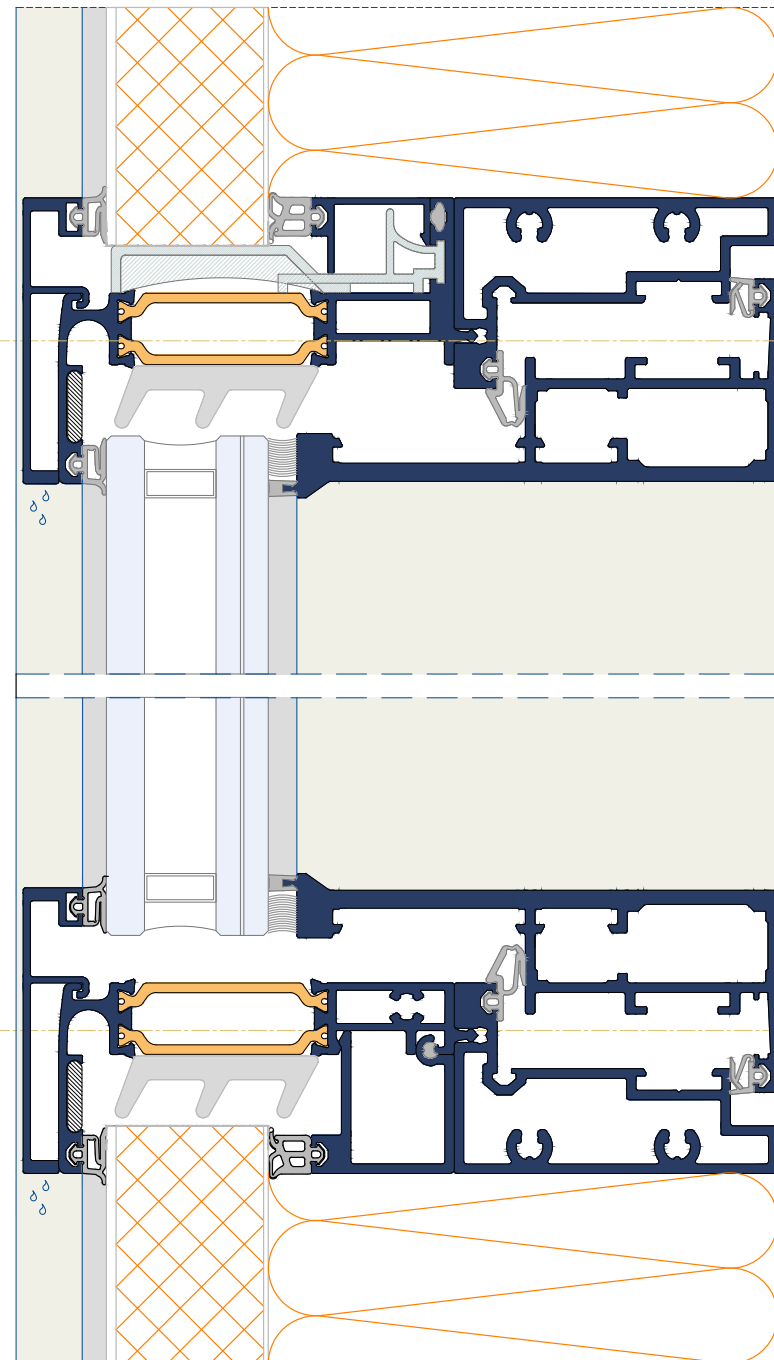
- The same advantages as external structures
- For the sunscreen itself, almost unlimited options for materials are possible, such as bamboo, synthetic materials, coloured metal ring meshes,...

Bamboo as pivoting panels



Metal mesh as a curtain screen





Fully concealed turn & tilt

Conventional stick curtain wall

- Technically impossible (unless for just horizontal window strips without spandrel elements)

Fassada hybrid solution

- Fully concealed perfect solution with such stiffness of the vent that locking clams are not required anymore



Fully concealed pantograph to the inside

Conventional stick curtain wall

- Technically impossible

Fassada hybrid solution

- Fully concealed perfect solution

Night cooling

Conventional stick curtain wall

- Technically impossible

Fassada hybrid solution

- The combination of a tilt vent with an actuator connected with the BMS system makes a perfect cost free night cooling system without adding any kind of architecturally undesirable ventilation grills or similar



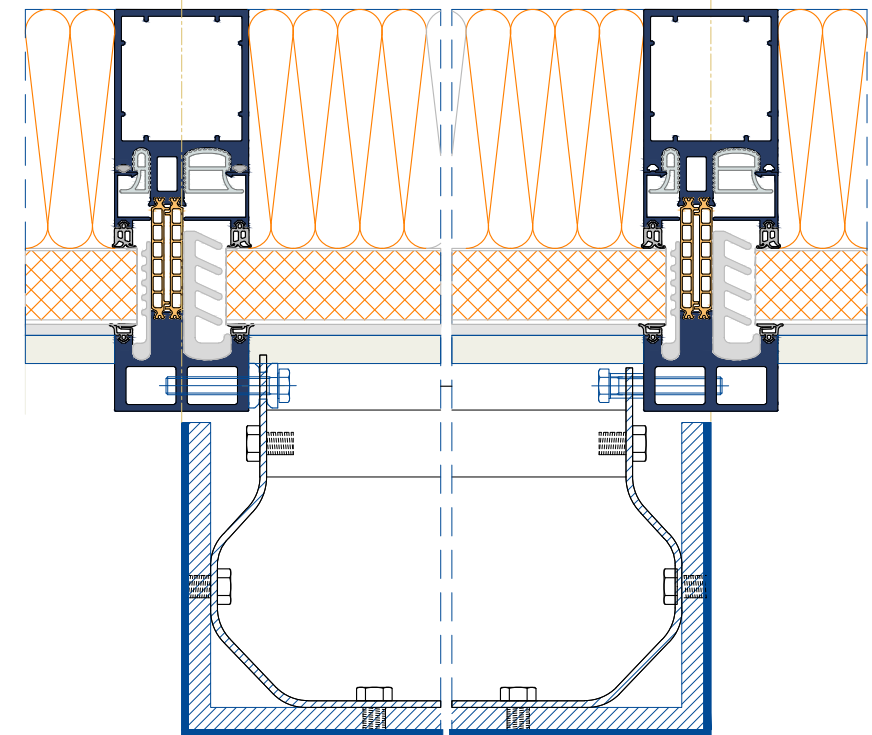
Natural stone

Conventional stick curtain wall

Technically impossible

Fassada hybrid solution

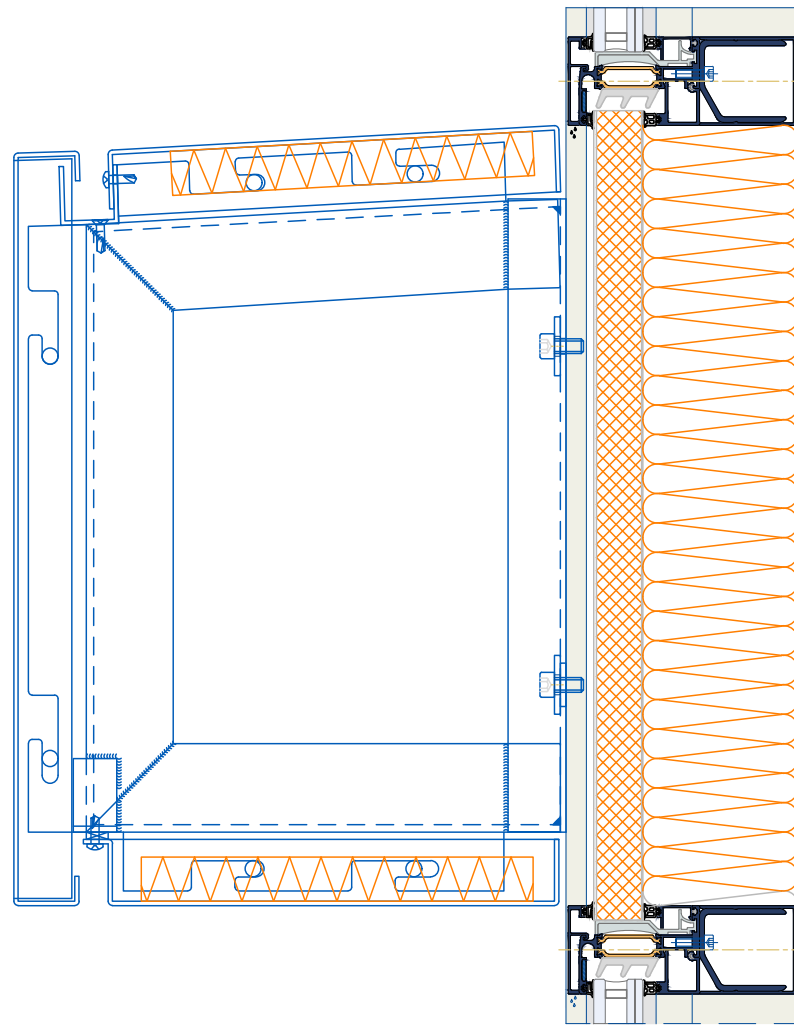
- As well for massive natural stone as for light weight stone panels backed with a carrier board
- No perforation of the rain and air screen shield, no epdm flashings
- No supplementary support structure needed, as the mullion is functioning as the structure to hang the stone on
- Less technical risk
- Tolerances reduced to the absolute minimum
- Installation time 4 times less
- ...



Aluminium cassettes

Conventional stick curtain wall

Technically impossible

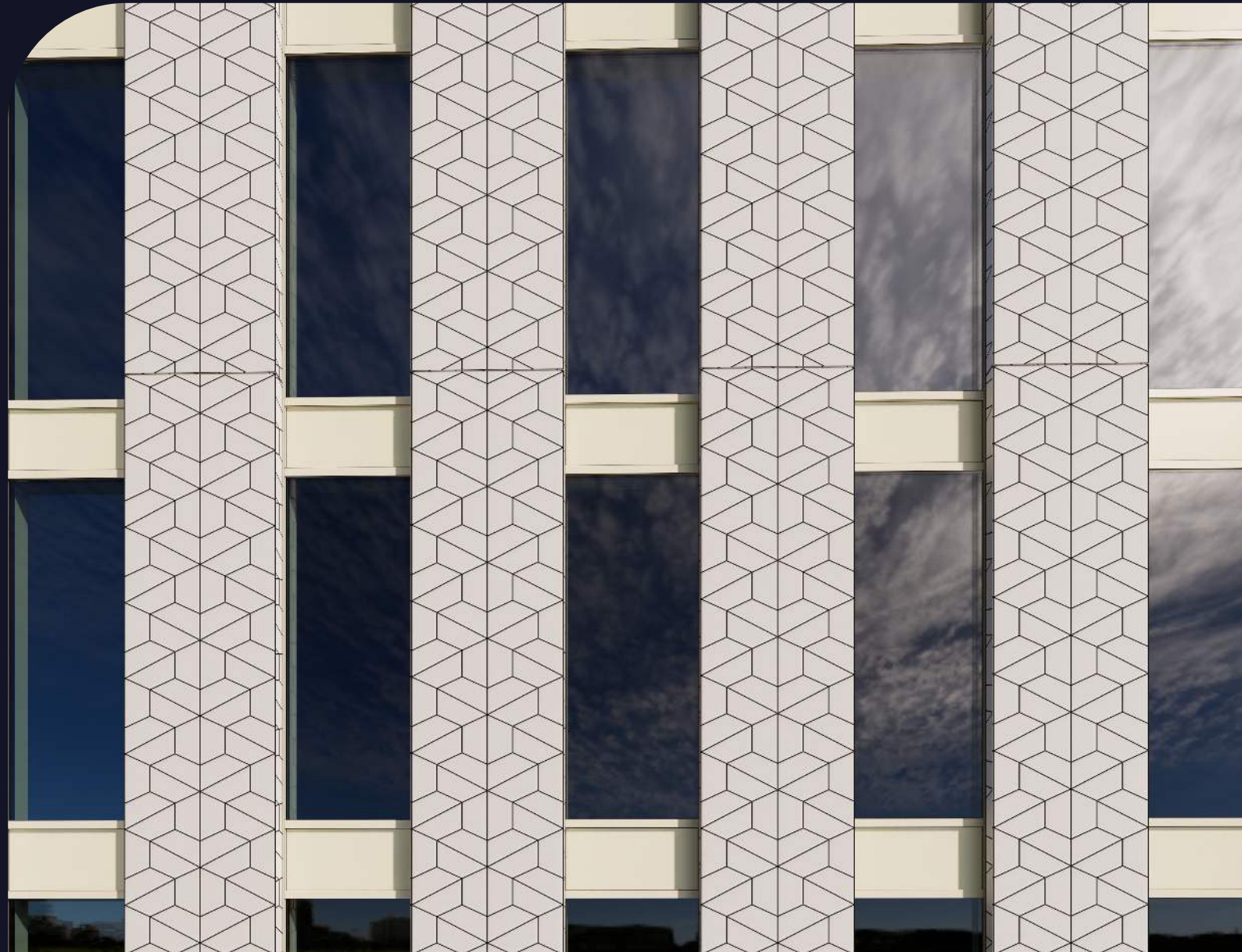


Fassada hybrid solution

- For all shapes of aluminium cassette cladding
- No perforation of the rain and air screen shield, no epdm flashings
- No supplementary support structure, as the mullion is functioning as the structure to hang on the stone
- Less technical risk
- Tolerances reduced to the absolute minimum
- Installation time 4 times less
- ...



GRC panels

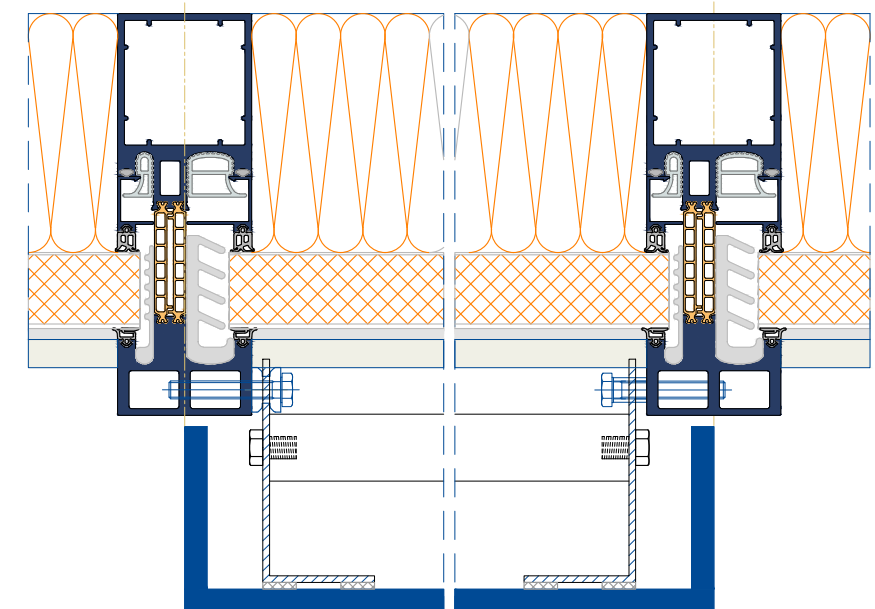


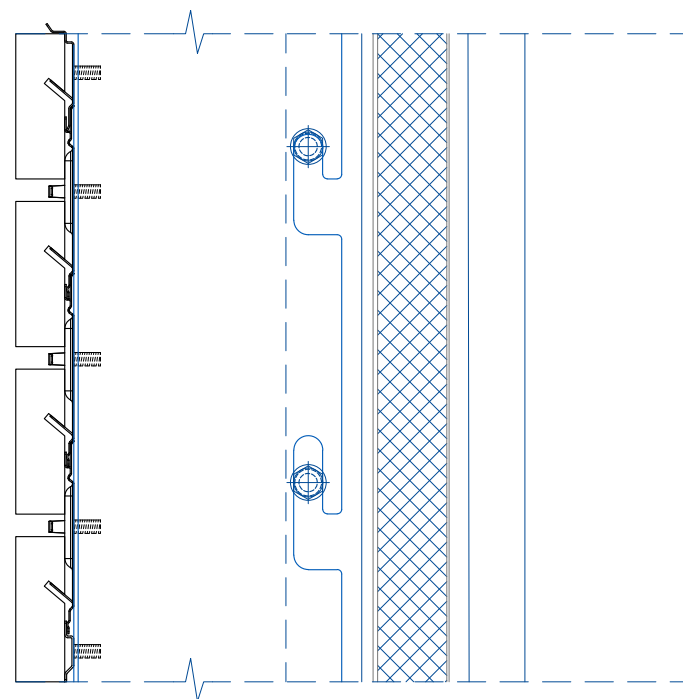
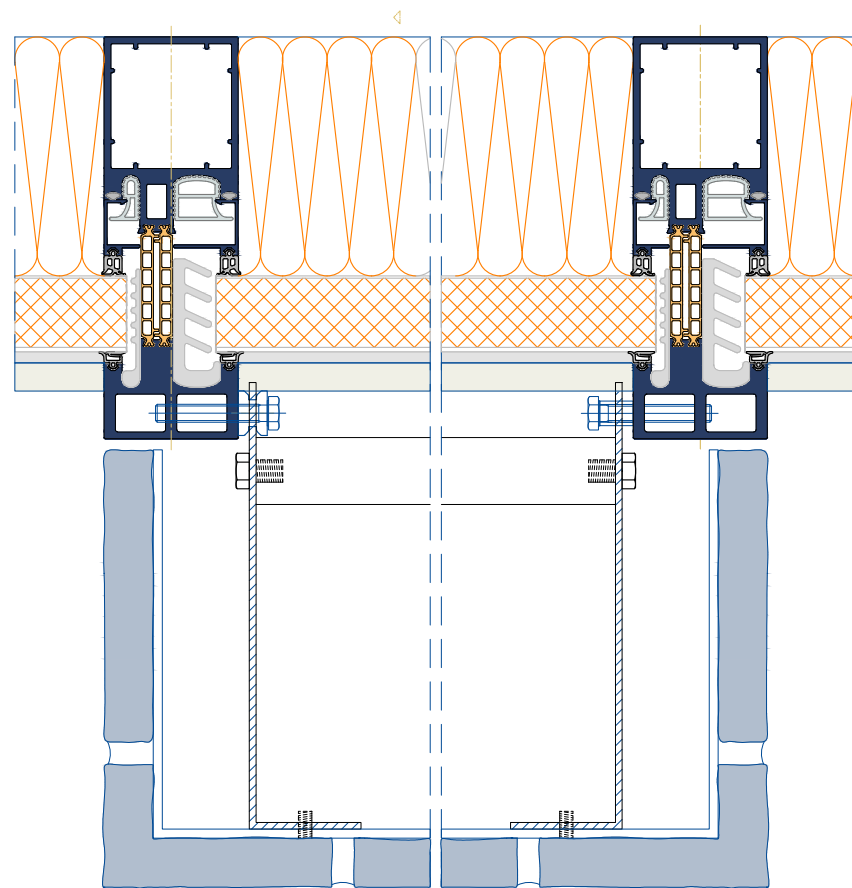
Conventional stick curtain wall

Technically impossible

Fassada hybrid solution

- For all shapes of GRC panels
- No perforation of the rain and air screen shield, no epdm flashings
- No supplementary support structure, as the mullion is functioning as the structure to hang on the stone
- Less technical risk
- Tolerances reduced to the absolute minimum
- Installation time 4 times less
- ...





Brick stone slips

Conventional stick curtain wall

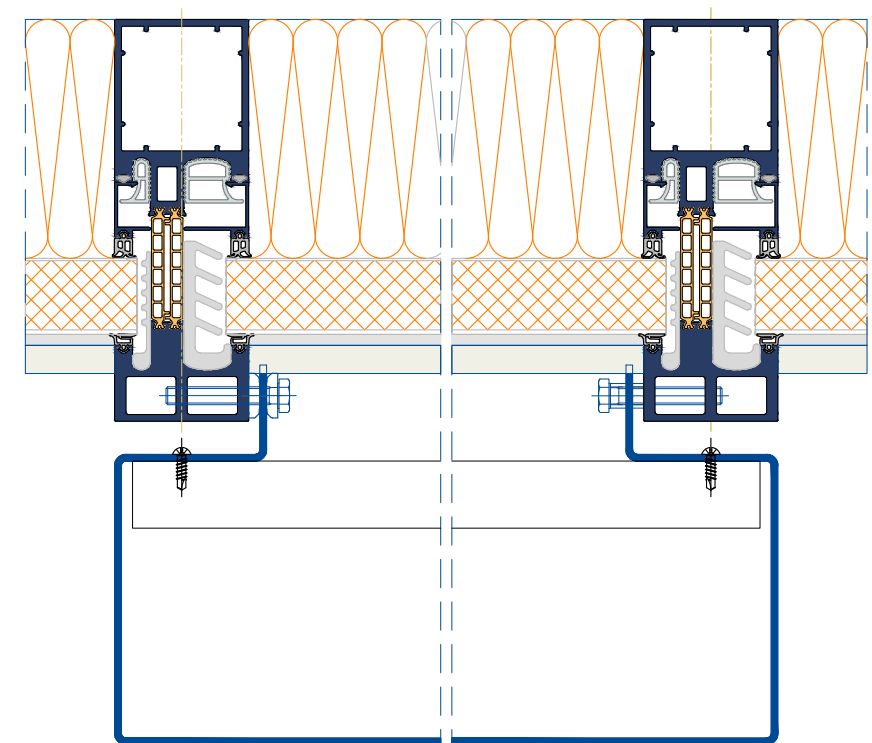
Technically impossible

Fassada hybrid solution

Almost unlimited number of materials such as ceramics, wood, copper, stainless steel, bamboo, synthetic and composite materials, brick stone strips,...



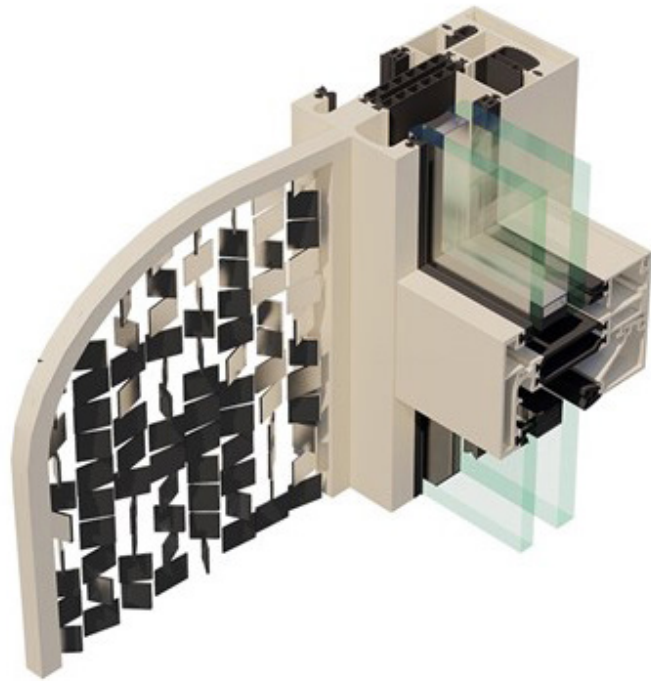
Copper



Dynamic facade

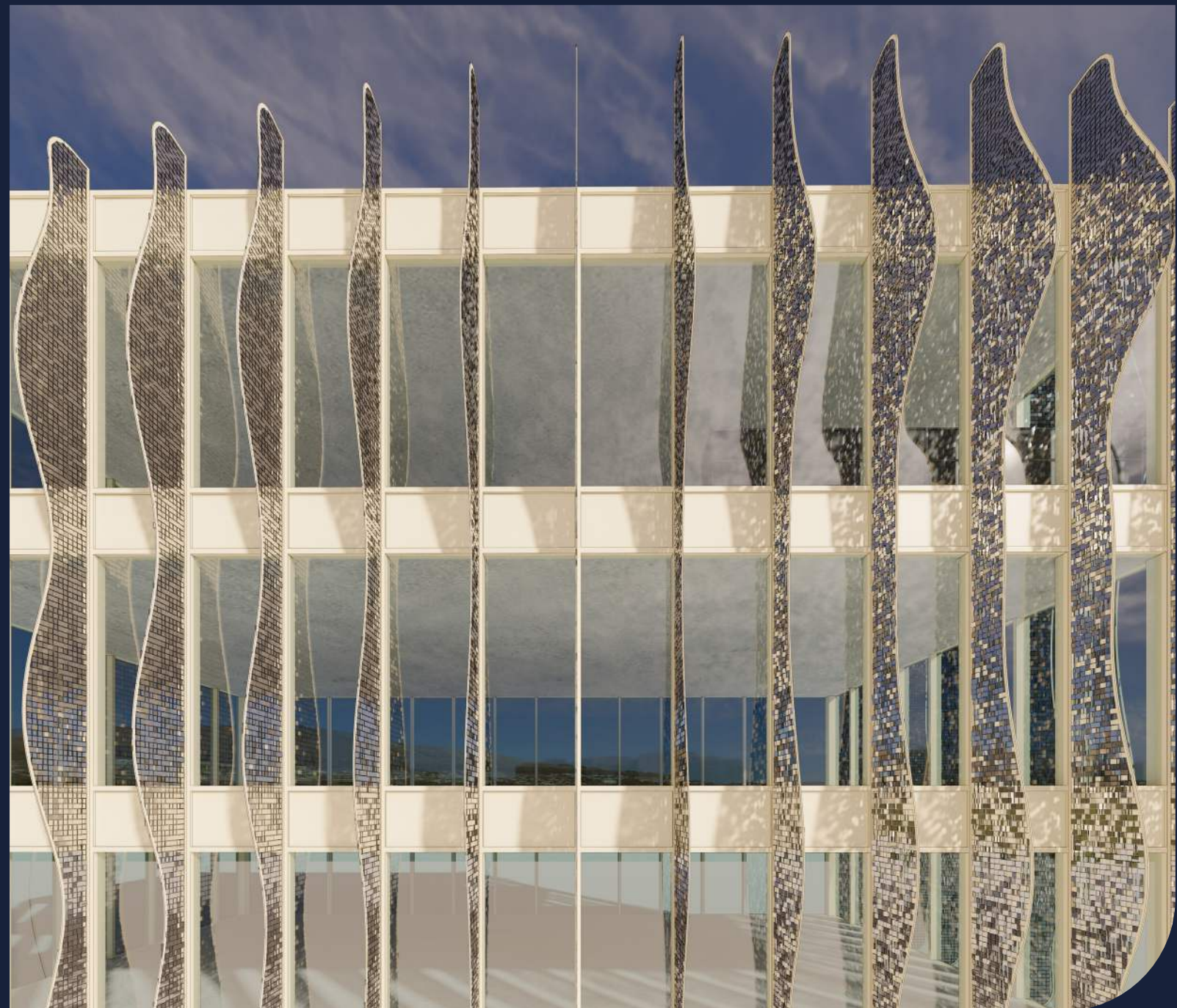
Conventional stick curtain wall

Technically impossible (as glazing needs to be installed from inside)



Fassada hybrid solution

- Engineered and executed as a fin element with kinetic elements as shape morphing wind-responsive facade construction
- In combination with clear, uncoated glazing, a unique control system for sustainable architectural design



Free shape of profiles

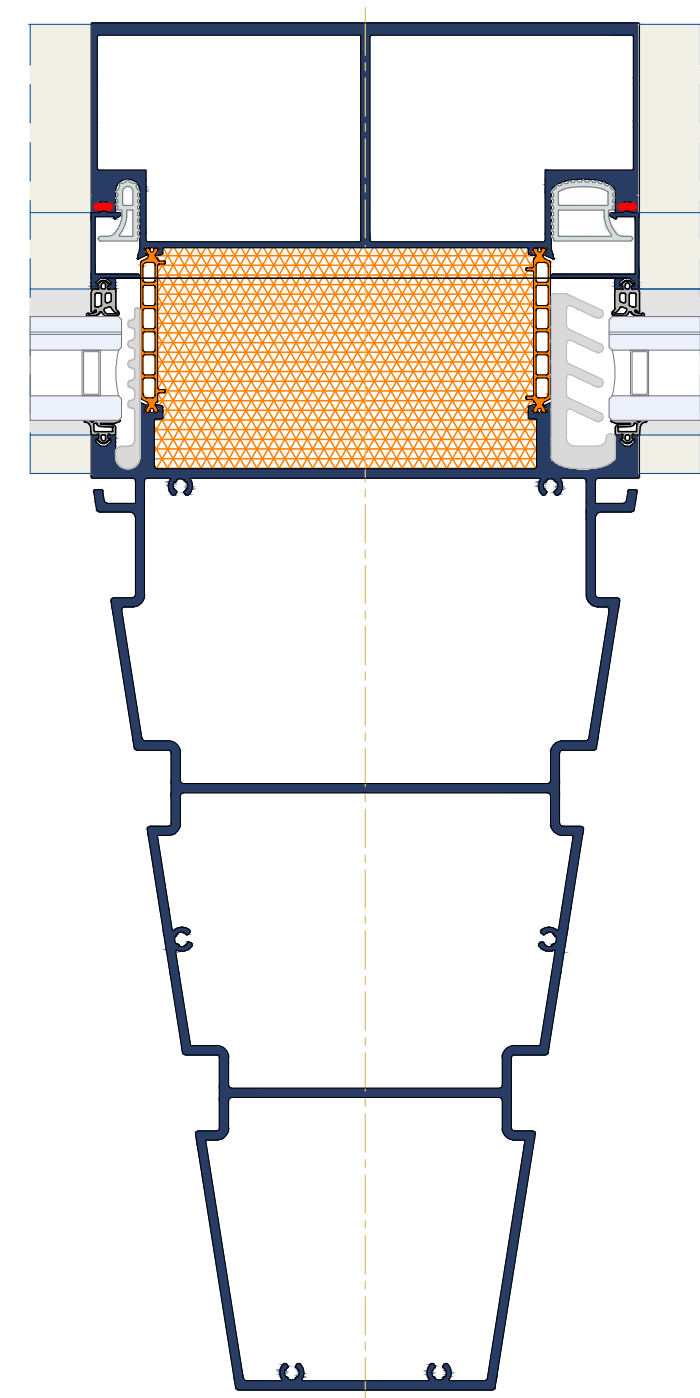
Conventional stick curtain wall

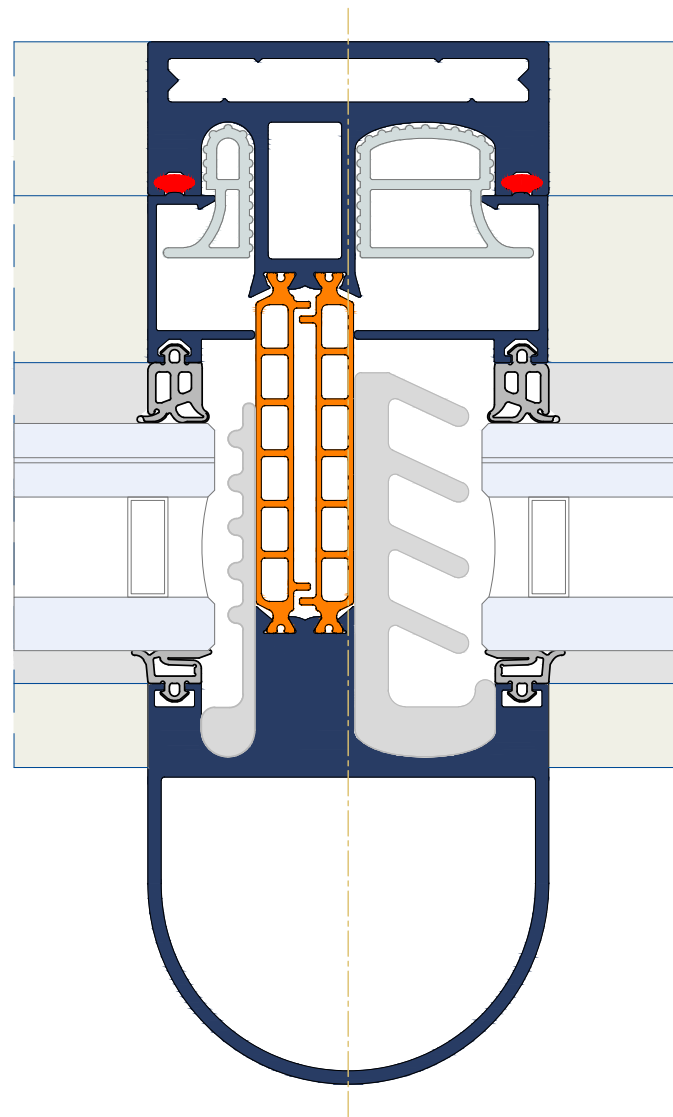
Limited for 2 reasons:

- the external pressure plate fixed with screws
- the composed non-monolithic mullion

Fassada hybrid solution

Almost unlimited (just the "internal" part, the chamber of pressure equalization of the system needs to stay untouched)





No deep tube section at mullion inside

Conventional stick curtain wall

Technically impossible (as composed screwed mullion, with the interior shell being the structural element)

Fassada hybrid solution

- As the mullion is monolithic, thanks to the real thermal break (not screwed), the structural element of the mullion can be at the outside (also in other materials than aluminium)
- Significant gain of surface along the perimeter of the building (approx. 1 – 2 m²/10 meter, which implies an important financial profit for the investor)



Seismic zones

Conventional stick curtain wall

Technically impossible (rigid transom – mullion connections)

Fassada hybrid solution

Considering the specifics of the transom-mullion semi-flexible hinge connection and the fact that the TPE endpieces are fully blocked in the grooves of the mullions, the hybrid technology is suitable for use in seismic areas



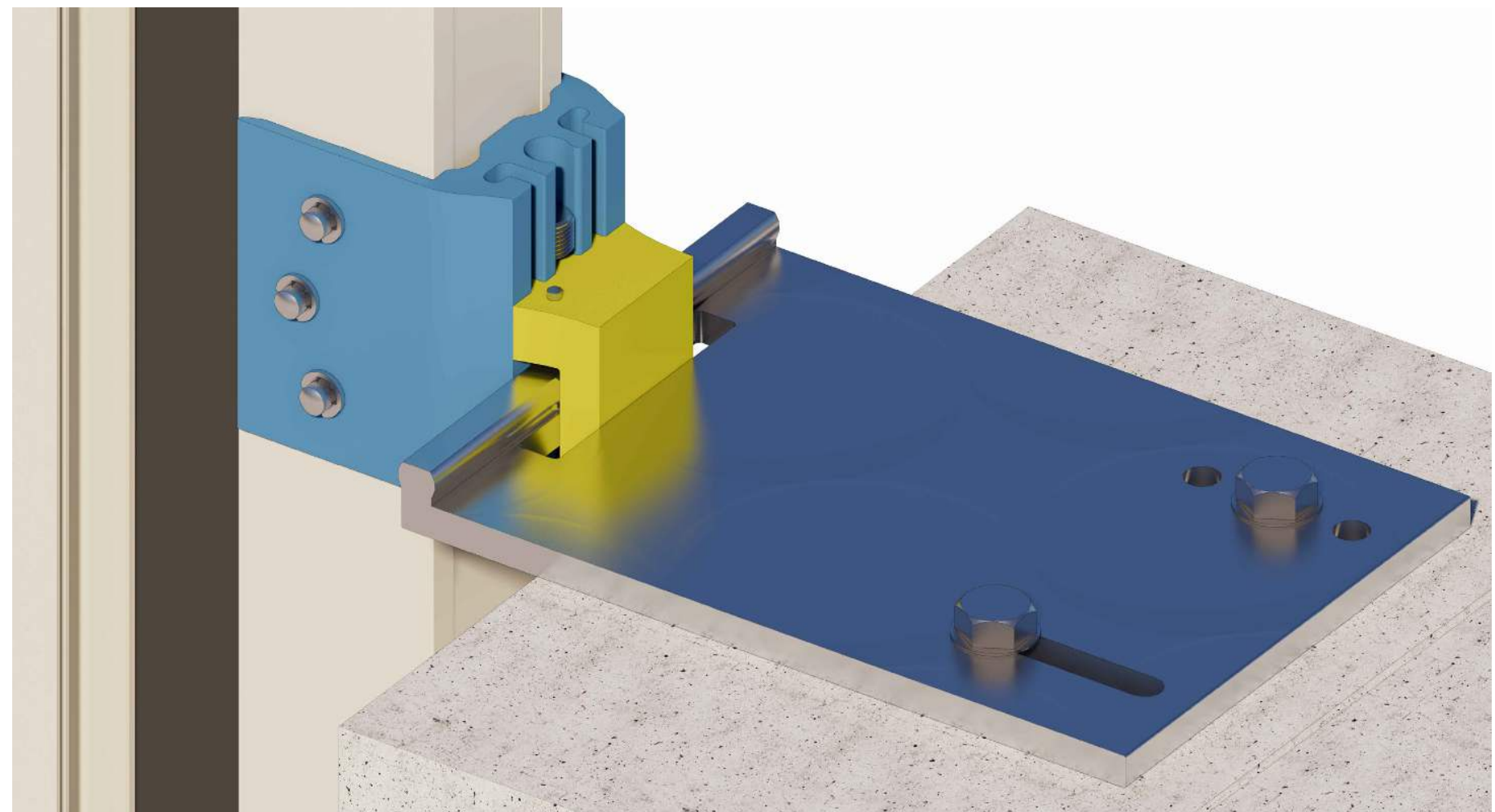
Telescopic brackets

Conventional stick curtain wall

Technically impossible

Fassada hybrid solution

Considering the – worrying – evolution towards very slim construction structures, the need of specially engineered brackets which are able to deal with deformations of several cm will not be just a nice to have but a must



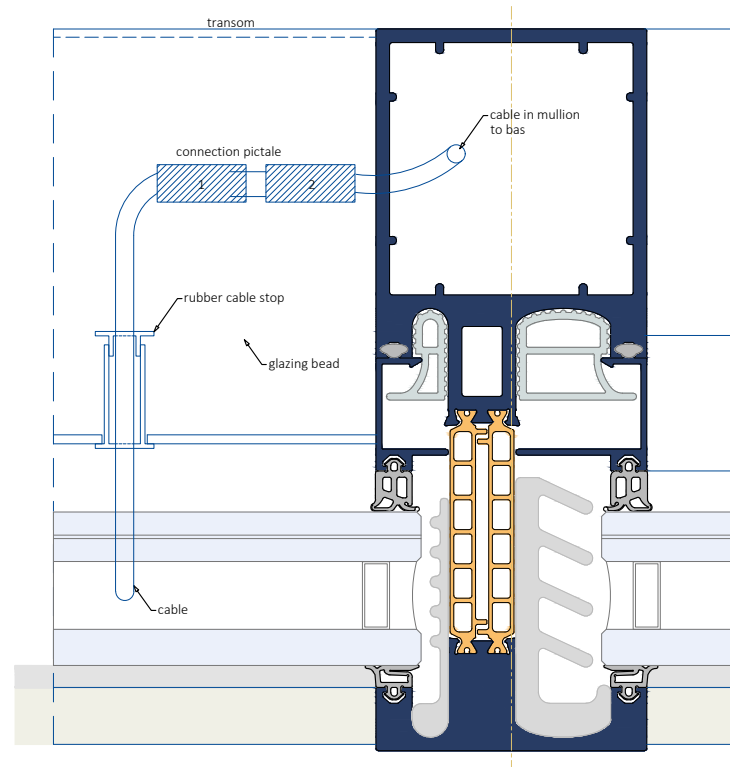
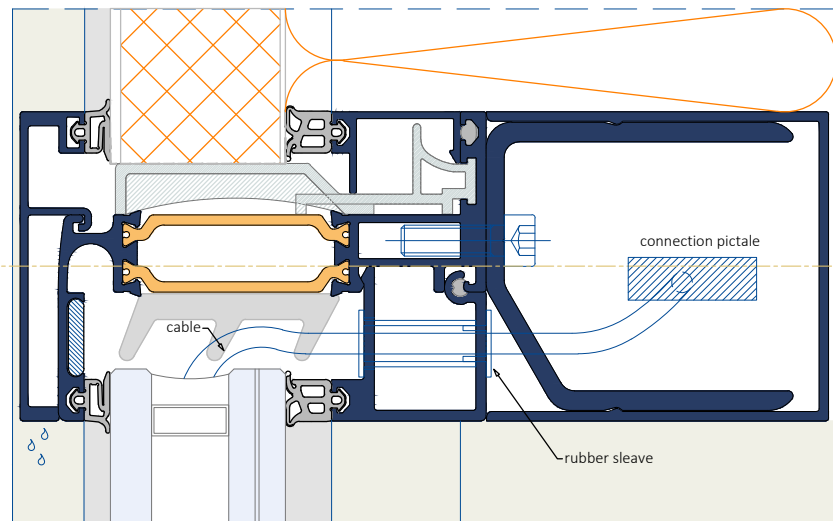
Smart glazing

Conventional stick curtain wall

- In any conventional system, drilling holes in the mullion to allow passage for cables to the inside of the building is a must. These holes need and can only be sealed using silicone.
- The curtain wall would face a catastrophe for its prior and main function: creating an air- and water-tight shield between the outside and the inside of a building.

Fassada hybrid solution

- No perforation of the curtain wall mullions
- No silicone: installation independent from the weather conditions
- No risk for air and/or water leakages and infiltration
- Installation from the inside: independent from the weather conditions
- Installation from the inside: perfect quality control for BMS system
- The cable connectors are situated at the inside of the building and not in a wet glazing pocket of the curtain wall
- In case of broken glass: replacement from the inside and not costly pose/depose working from scaffoldings at the outside
- In case of technical failure of the cable or connector system: inspection and repair from the inside of the building and not costly working from scaffoldings at the outside



H60-hybrid integrated heating and cooling (IHC) (planned for 2022)

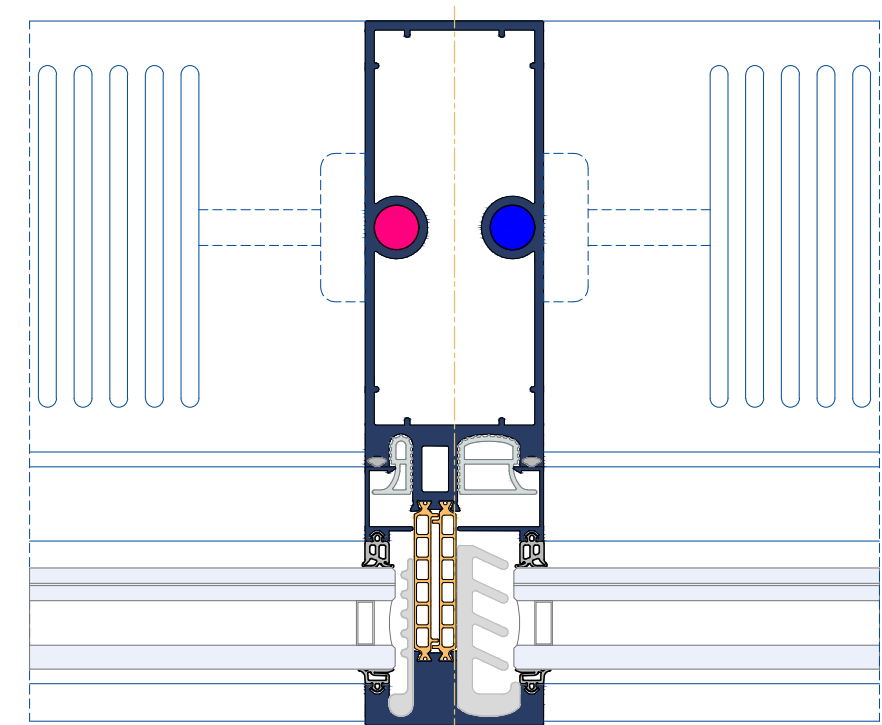
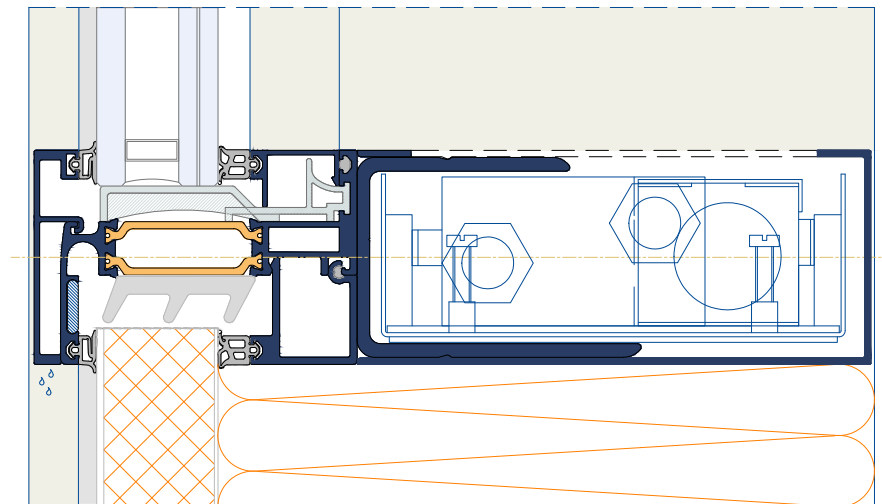
Conventional stick curtain wall

Technically impossible as installation and accessibility from inside are required



Fassada hybrid solution

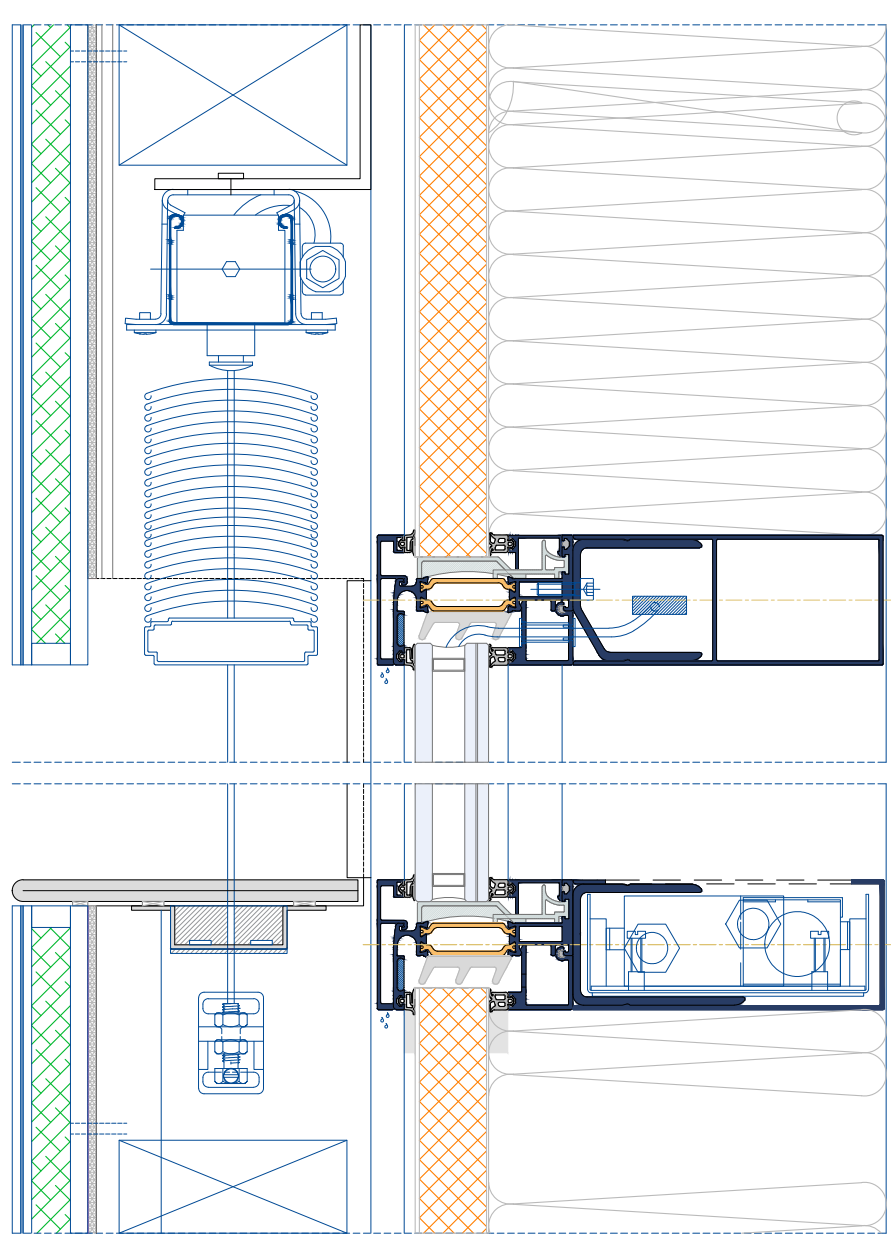
Dynamic modeling showed that the capacity of cooling/heating system can be reduced by about 50%, energy consumption by even more than 50%



H60-hybrid Bio reactor and algae leaves (BRL) *(planned for 2022)*

Conventional stick curtain wall

Technically impossible as installation and accessibility from inside are required



Fassada hybrid solution

The summum of the near future :

- g-value of 0,01 thanks to integrated sun screens hidden behind the opaque panel
- U-value of approx. 0,6 W/m²K
- Bio leaves with bio reactor in opaque zones for the conversion of CO₂ into O₂
- Transparent solar panel glazing generating electricity
- Integrated heating & cooling reducing capacity by 50% and consumption by even more than 50%



H60-hybrid green wall (GW)



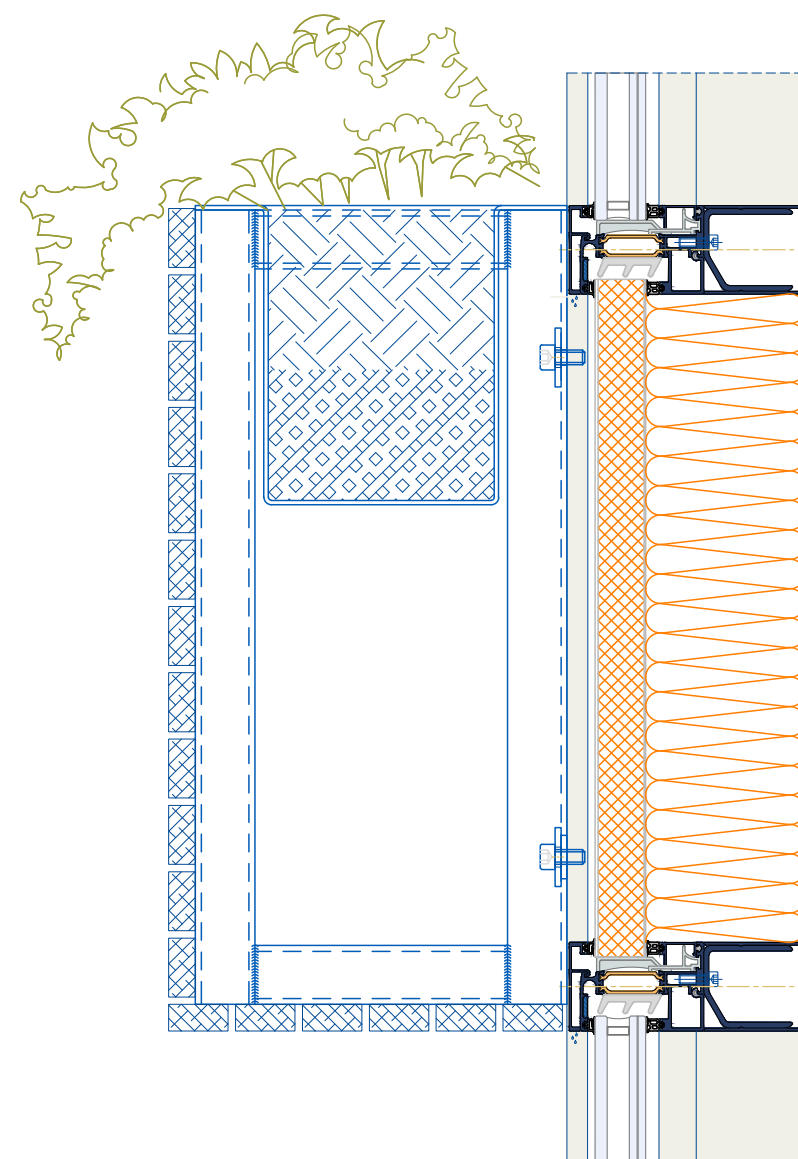


Conventional stick curtain wall

Technically impossible

Fassada hybrid solution

Irrigated plant boxes as "external structures" in the opaque zones of the curtain wall

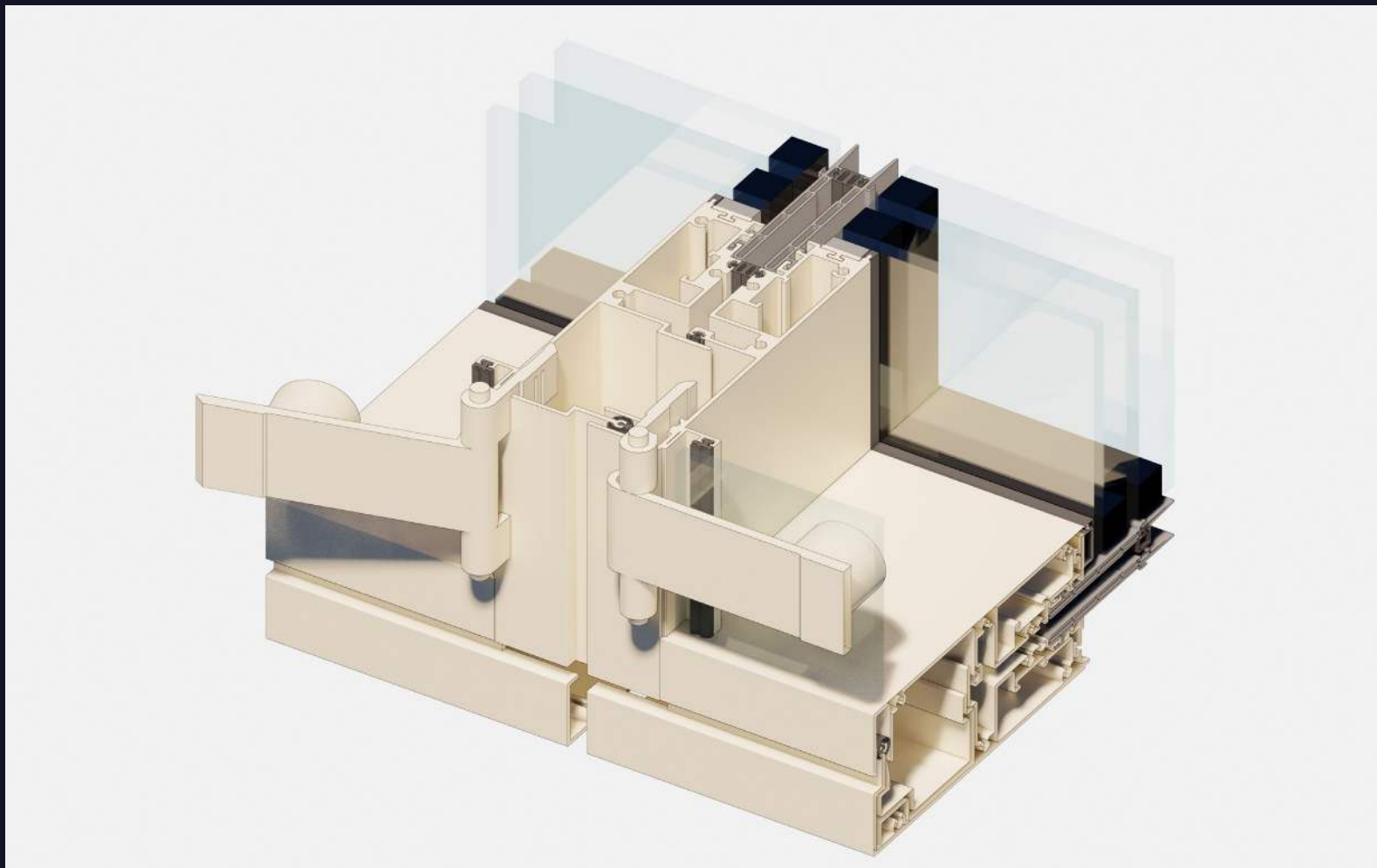


Double skin facades

When the architecture requires structural glazing (no visible exterior caps), it is Fassada policy to always work with a unitised curtain wall system. As structural glazing implies the silicone gluing of the glass units on the aluminium frames, this operation should always take place in the workshops under controlled conditions. Thus for Fassada there is only one option – from as well a technical as an economical point of view – to apply a prefabricated unitized curtain wall system.

Some features of the M68 modular SG :

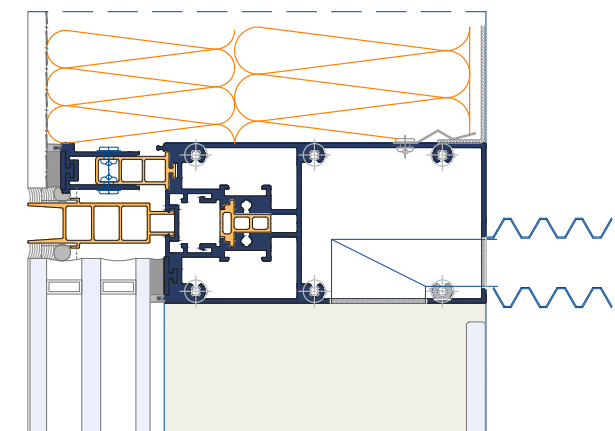
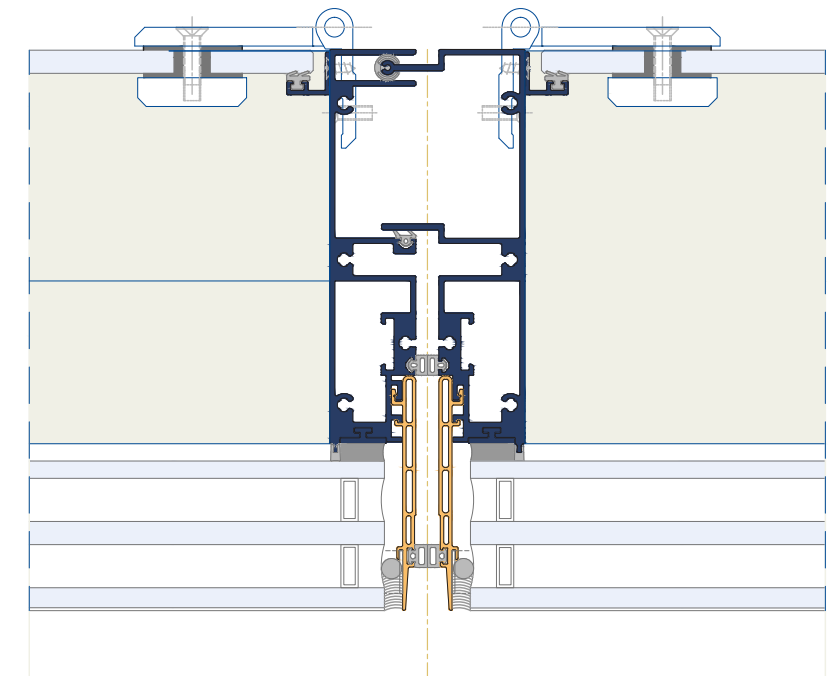
- Exceptional slim visible width of just 68 mm, concealed operable vents included
- Concealed operable vent of type "top hung" or "pantograph"
- Decimated number of accessories
- Outstanding thermal performances

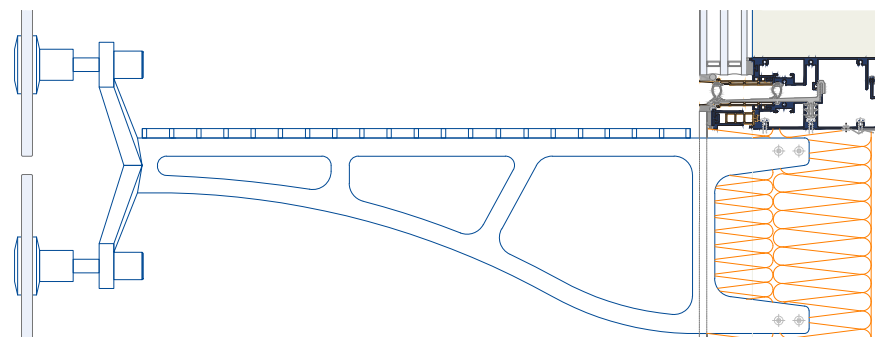


Active ventilated facade

The active ventilation is very easy to be integrated by an interior skin of single glazing and a mechanically extracted cavity.

In combination with an engineered sun shade, performance of U-value of less than $0,8 \text{ W/m}^2\text{K}$ and g-value of $0,12 \text{ W/m}^2\text{K}$ can be obtained.





Passive ventilated facade

Foolproof installation of the complete double skin facade from inside the building.

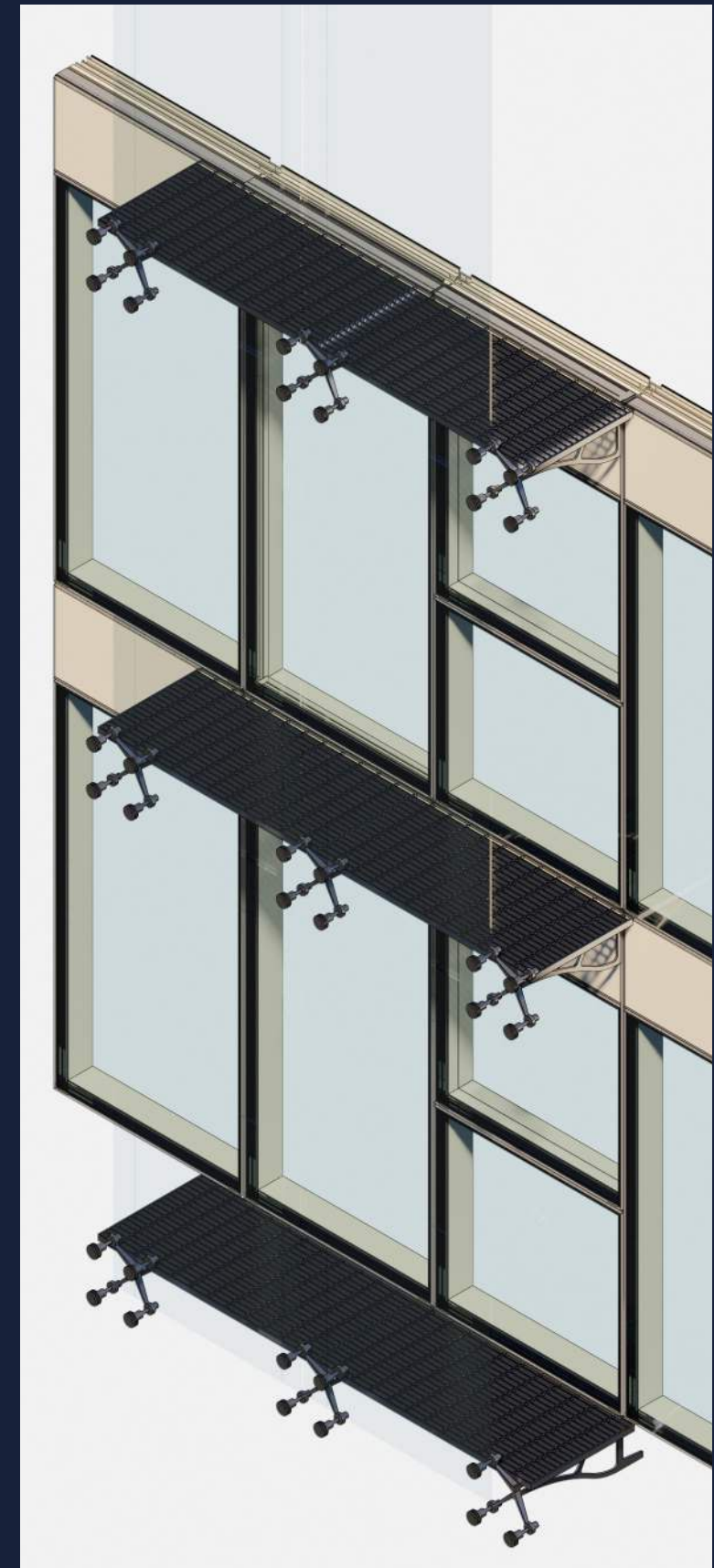
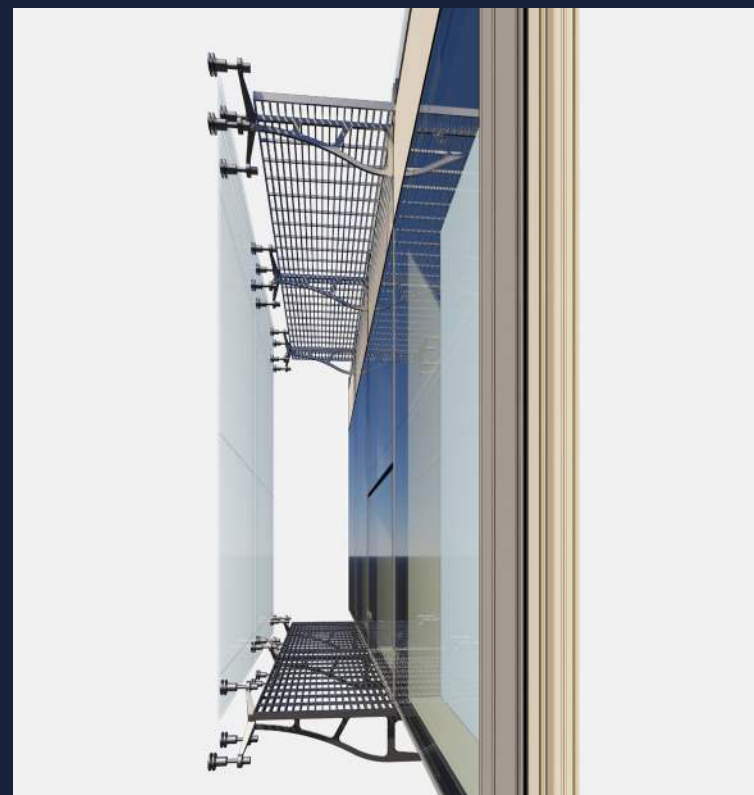
In the basic concept, the outer skin is a single glazing shield.

This single glazing skin can be executed in different ways, such as bolted spider glazing (see next drawings), horizontal or vertical clamped glazing or others.

The glass skin can also be replaced by a sun shading device, such as venetian blinds or a metal mesh curtain (see also hybrid wall).

The width of the naturally ventilated cavity depends on the requested space for cleaning, but usually between 0,50 and 0,60 m.

In combination with a well-engineered sun shading system, performance of U-value of less than 0,6 W/m²K and g-value of 0,02 W/m²K can be obtained.

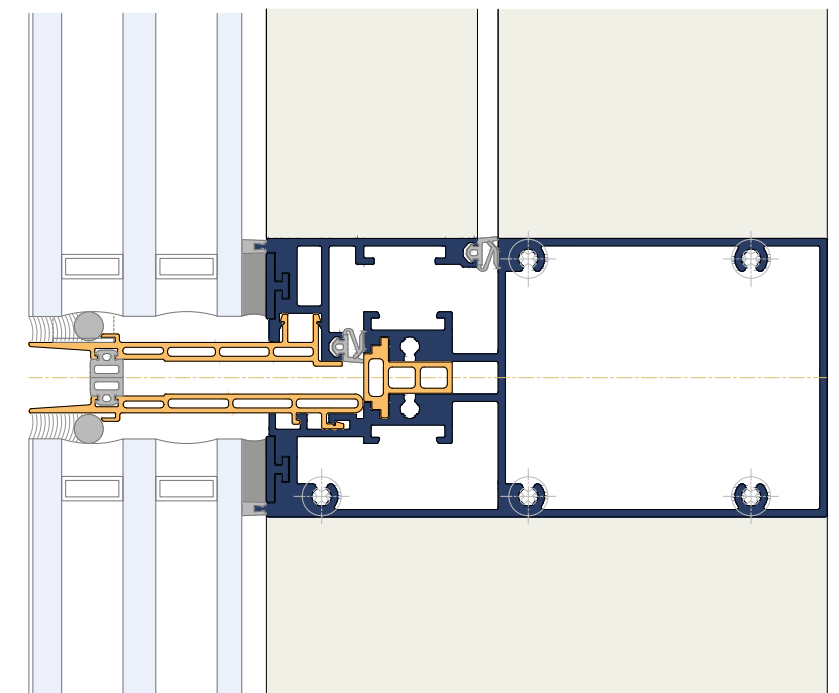
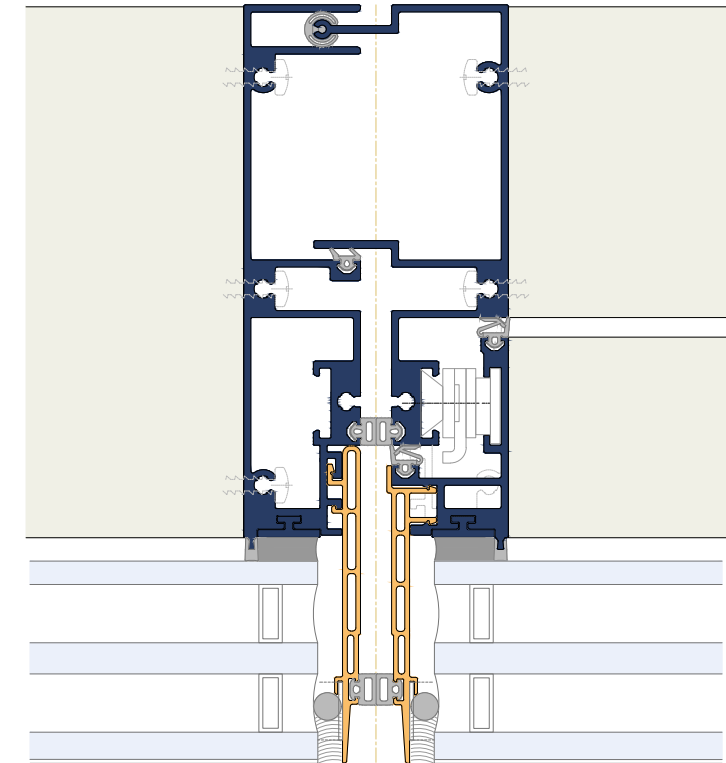


Operable vents

Fully concealed top hung window

Within the total visible width of 68 mm, the top hung vent is fully integrated and concealed.

If preferred, the top hung window can be replaced by a pantograph vent.

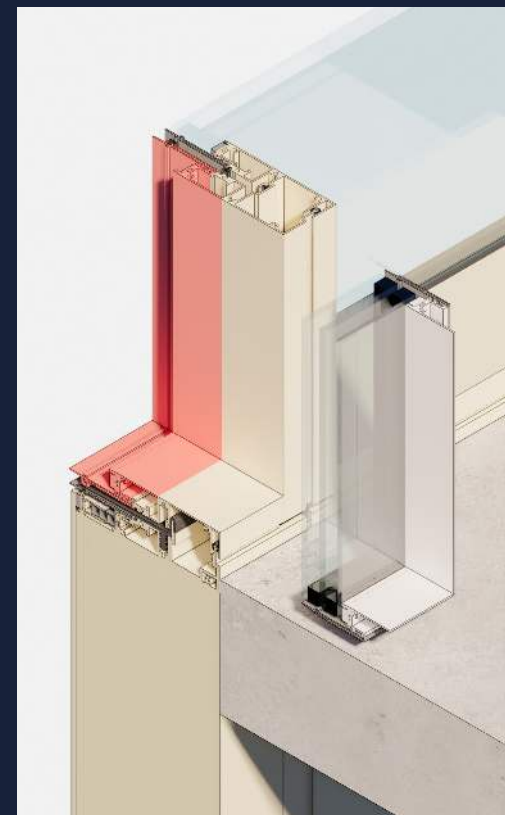
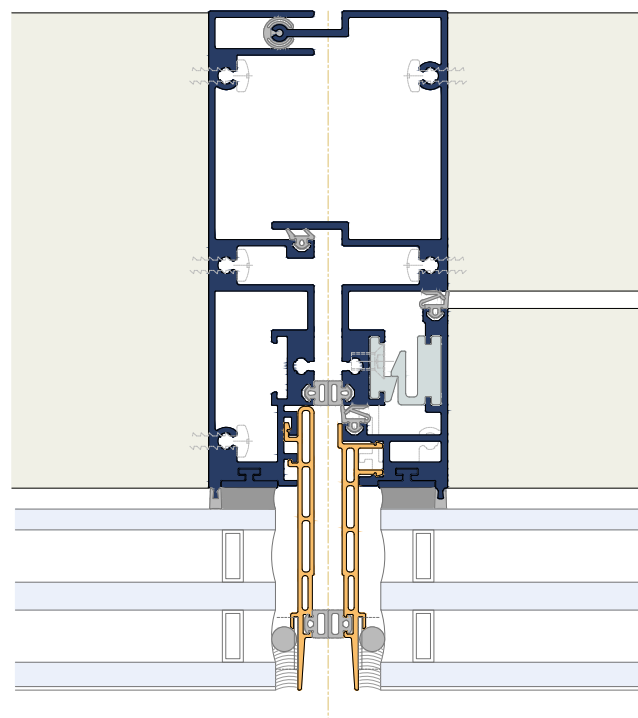


Replacement of broken glass from the inside

Patented solution to replace a broken glass from the inside of the building.

Following steps for the replacement of the broken glass :

- Placing pistons on the broken glass
- With the help of a caliber, the fixed aluminium frame around the perimeter of the broken glass is milled away. This milling takes place at the edge of the gasket nuts in the mullions and transoms
- Remove the broken glass & frame
- The installation of the PVC clips against the profiles of the frame all around the opening
- Placing the pistons against the new DGU, which is structurally glued on a frame, similar to the one of an operable vent. The frame is also provided by duck bill clips on its perimeter
- Bring the frame with a double twist move to the outside and pull back in first with the lower edge on the PVC clips installed on the lower transom
- A quick fast move to the inside, rotating around the lower edge and the frame is clipped in the frame of the unit





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fassada

Passion, the distinction between doing and excelling