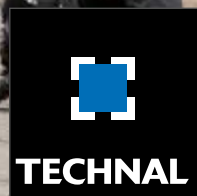


# SPINAL

ADVANCED CURTAIN  
WALLING

**Architect:** Faulkner Browns  
**Photography:** Martine Hamilton

IMAGINE WHAT'S NEXT







# SPINAL

## / THE FACADE OF A LIVING ARCHITECTURE

The SPINAL facade showcases all the expertise of the Technal brand, combining aesthetic, large sizes and interior comfort.

### USEFUL FOR CREATIVITY

**Large dimensions.** SPINAL's 62 mm structure enables you to create maximised glazed surfaces of up to 680 kg and a surface area of 12 m<sup>2</sup>.

**Multi-purpose.** To meet all requirements, numerous exterior aspects can be created, using covers, the asymmetry of the frames, convex or concave angles and faceted construction.

**Openings.** SPINAL can provide concealed openings (parallel, top hung or inward) and can also integrate the SOLEAL range

### USEFUL FOR CONTROLLING HEAT

**Modular.** The fixing bracket is an integral part of SPINAL. It enables installation of external elements such as: brise-soleil, stretched canvas providing thermal and acoustic comfort and controlling solar gain.

**Upgradeable.** SPINAL meets current requirements for reducing energy consumption. Compatible with a Building Management System (BMS), the facade optimises the well-being of occupants in all seasons and helps to reduce greenhouse gases, currently produced in 40% of buildings.

**Bioclimatic.** The double skin enables bioclimatic buildings to be built, with the creation of a buffer space between the facade and the exterior wall. A true link combining technical and aesthetic, and all visual aspects can be created because of its easy integration. This interactivity gives free rein to the most ambitious architectural projects.

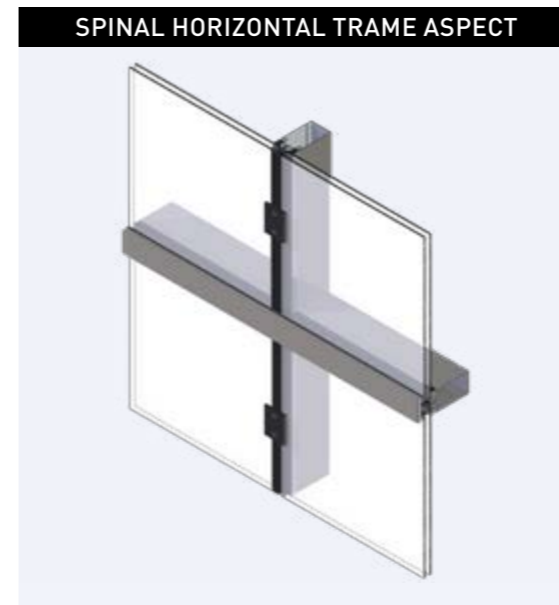
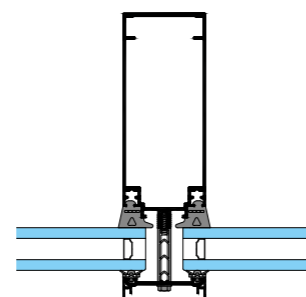
**Labelled.** In its high insulation version, SPINAL facade provides Passive House performances. It has also been designed to meet earthquake protection requirements.

# CONTENTS

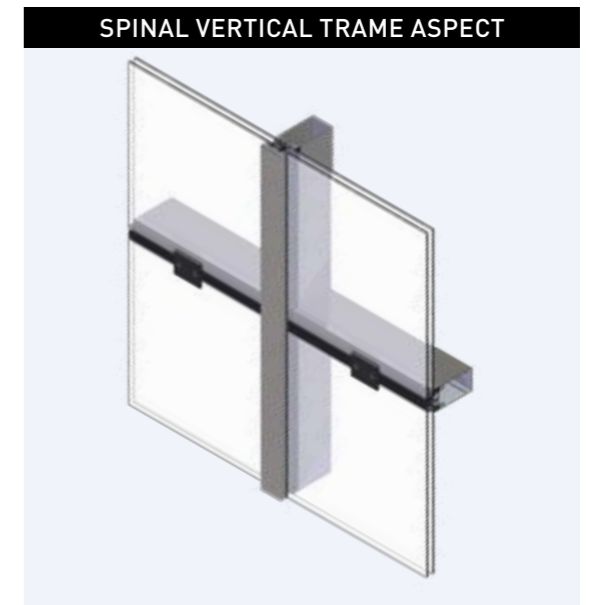
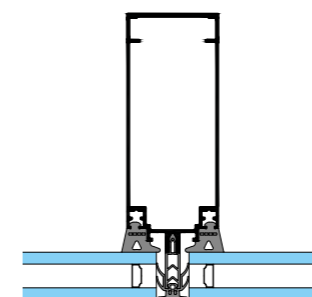
|                                    |    |
|------------------------------------|----|
| / External aesthetic and cladding  | 8  |
| / Building Management System (BMS) | 12 |
| / SPINAL MINIMAL                   | 14 |
| / Integration of openings          | 18 |
| / Fire and burglar resistance      | 20 |
| / Roof-light                       | 22 |
| / Cross-sections                   | 24 |
| / TECHNAL and BIM                  | 28 |
| / Thermal and weather performances | 29 |



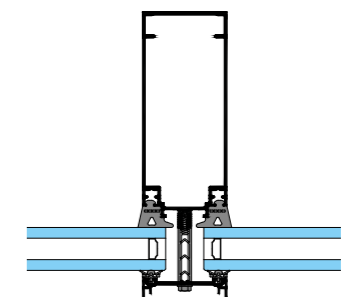
**Infill:** from 5 to 61 mm  
**Façade:**  
 · concave or convex corner from 0° to 10°  
 · convex corner of 90°, 112°, 135° and 157° with pressure plate and angled groove glazing beads  
**Anti-burglary:** RC2, RC3 (Report pending)  
**Concealed openings:** inward and outward opening SSG type



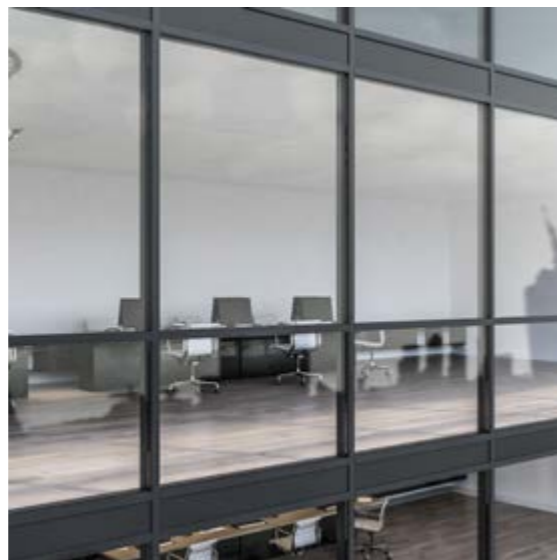
**Infill:** from 5 to 61 mm  
**Façade:** concave or convex corners from 0° to 10°  
**Concealed openings:** inward and outward opening SSG type



**Infill:** from 5 to 61 mm  
**Façade:** straight  
**Concealed openings:** inward and outward opening SSG type







# KEY FEATURES AND INNOVATIONS

## AESTHETICISM AND MODULARITY

- Multiple exterior aspects possible:
  - Grid
  - Horizontal or vertical frame
  - Flat pressure plate
  - Smooth toggle façade
- Facetted facade by + or - 10° and 90°, 112°, 135°, 157° angles
- Various shapes available: asymmetric frames and inclined transoms using mullion drainage
- Collection of caps that mark the identity of each facade
- 90° corner post
- Solutions for roof-light
- Concealed drainage with a central seal for panel drainage or mullion drainage

## EXTERNAL CLADDING

- The fixing bracket allows elements to be incorporated onto the outside of the façade for enhanced thermal comfort (management of solar gain):
  - Envelope cladding: variety of decorative elements
  - Modular system (reminder of the max weight: 200 kg/plate)
- Suitable for steel or glued laminated wooden structures bearing loads of up to 250 kg\*
  - \* The junction of the two materials must meet specific requirements please contact us for more information

## INTERIOR AND EXTERIOR OPENINGS

- Interior openings with concealed hardware
- Tilt and turn or turn and tilt (maximum weight by leaf: 160 kg)
- Inward opening (max weight/leaf: 160 kg)
- Concealed open-out windows
- Top-hung opening (max weight/leaf): 120 kg)
- Parallel opening (max weight/leaf): 150 kg)
- Possibility of integrating:
  - SOLEAL windows and sliders
  - SOLEAL 55 and 65 doors
  - TITANE 65 doors
- Fireman access window

## LARGE DIMENSIONS

- Large glazing up to 12 m<sup>2</sup>
- Glazed volume in horizontal and vertical frame, maximum surface = 5.50 m<sup>2</sup>
- Maximum weight per transom: 680 kg (in accordance with the EN 13830 standard and French building regulation 33.1)
- Maximum glazing thickness 61 mm

## THERMAL PERFORMANCES

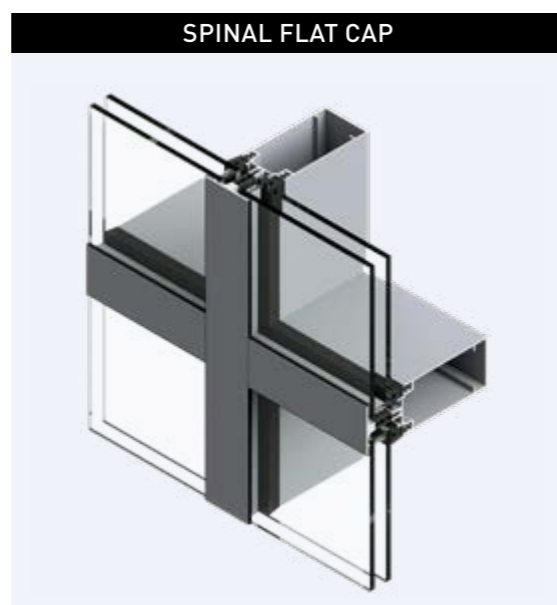
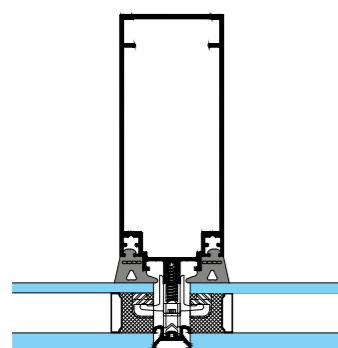
- Technal patented weatherproofing system
- Weather performances:
  - Air permeability: AE 1500 Pa
  - Water tightness: RE 1500 Pa
  - Wind pressure resistance:
    - Service pressure: 1600 Pa
    - Security pressure: 2400 Pa
- Passive House certified in the high thermal insulation version:
  - U<sub>cw</sub> = 0.61 W/m<sup>2</sup>k (glazing U<sub>g</sub> = 0.5)
- Acoustic attenuation on a fully glazed facade: 40 dB (RaTr)
- Burglar resistance: RC2 and RC3 in accordance with the EN 1627-30 standard
- Fire resistance: EI60 in/out
- Impact resistance I5/E5
- Crack-proof part to optimise sound insulation
- High weather-tightness performances, for openings:
  - Air permeability: Class 4
  - Water tightness: E 1500 Pa
  - Resistance to wind pressure: C5
  - Mechanical resistance: Class 3

## INSTALLATION AND ASSEMBLY

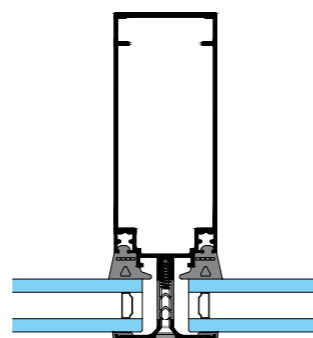
- 3 glazing installation techniques:
  - Linear pressure plates
  - Punctual pressure plates
  - Structural glazing
- Simple and quick to manufacture
- Patented Technal mullion/transom sealing system
- Improved quality of assemblies
- Optimised installation
- Use of membrane for perimeter sealing
- Specially adapted clamping system



**Infill:** from 30 to 53 mm  
**Glazing type:** Structural glazing  
**Façade:** concave or convex corners from +/- 10° convex corners to 90°  
**Concealed openings:** inward and outward opening SSG type



**Infill:** from 5 to 61 mm  
**Façade:** straight  
**Concealed openings:** inward and outward opening SSG type



# SPINAL

/ A DESIGN WITH MULTIPLE POSSIBLE STYLES

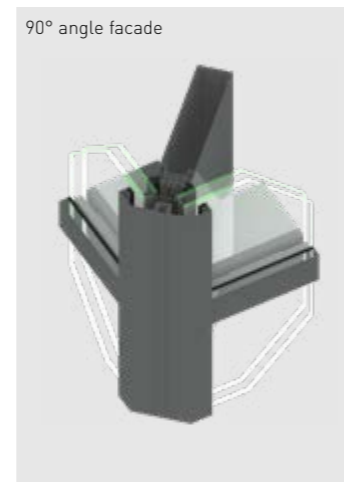
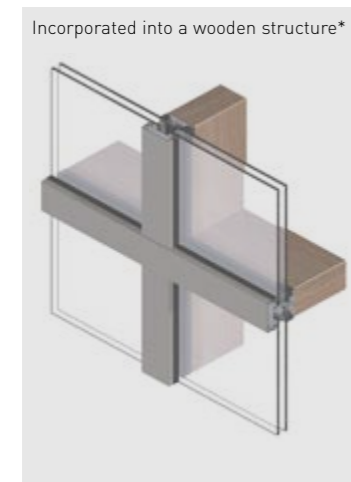
## LARGE DIMENSIONS

Based on the 62 mm module and featuring a patented assembly system, SPINAL curtain walling optimises grids on non-residential buildings, new builds or renovations. It offers large glazed surfaces with dimensions of up to W 3 x H 4 m, which equates to a surface area of 12 m<sup>2</sup>, and weighing up to 680 kg.

## VARIETY OF SHAPES

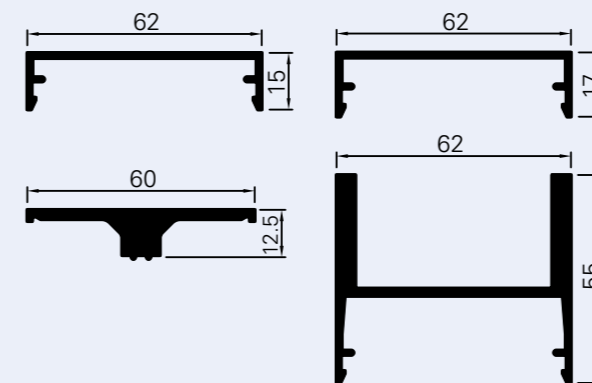
- Visual consistency between the transoms and mullions to create a continuous line
- Possibility of a continuous or asymmetric grid
- Façade can be faceted + or - 10°
- Angles of 112°, 135° or 157° with pressure plates and angled groove glazing beads for creating curved façades
- Structure suitable for wood or steel frames\* for elegant and minimalist architectural solutions that provide user comfort.

\* The junction of the 2 materials must meet specific requirements - please contact us for more information

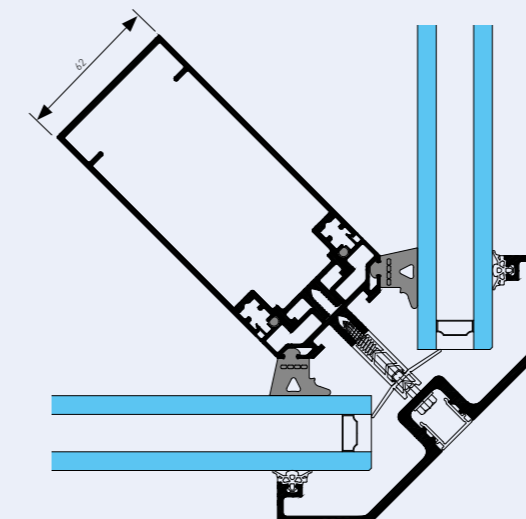


## COLLECTION OF CAPS

Technal offers a complete collection of caps that marks the identity of each facade. A flat and discrete design for providing a crystal clear envelope, in "T" or "U" shapes for accentuating lines. These shapes can also be combined for reinforcing the original character of the building in order to meet the specific requirements of specifiers.



Asymmetrical frame and U type cap



## 90° ANGLE, THIN ALUMINIUM VIEW

With corner post implementation it allows to make 90° angles with less aluminium seen from inside.

They contribute to the fineness of the structure while supporting the construction of large glazed surfaces.

SPINAL also enables 90° convex angles to be created with edge-to-edge glazing in accordance with French building regulation P39 1-1.

# SPINAL

/ CLADDING AND CREATIVITY



Photography: Anne Vacher Productions

## A SOLUTION TO MEET YOUR NEEDS

To meet the diverse requirements of building envelopes and more especially glass façades such as solar control, optimisation of natural light, customisation. Technal has developed fixing brackets which are positioned on the mullion of SPINAL curtain walling and allow for the integration of brise-soleil blades or a stretched canvas solution whilst maintaining the overall performance - a perfect combination of aesthetics and efficiency.

This range enables you to personalise the design and to optimise comfort with a wide choice of solutions: vertical or horizontal sun blinds, fixed or motorised with many possibilities.

## BRISE-SOLEIL : DESIGN AND RESISTANCE

The SUNEAL brise-soleil can be integrated with all aspects of SPINAL curtain walling: grid or vertical frames as well as independent structure. This SUNEAL brise-soleil allows you to customise the design and optimise comfort with a wide choice of solutions: vertical or horizontal, fixed or moveable, manual or motorised brise-soleil. 100 mm and 150 mm fixed blades are adaptable and the multitude of available shapes (ogive, rectangular, louvre or perforated sheets) increase the wall cladding options.

Interior comfort is optimised and you can enjoy warmth from the sun in the winter and solar protection in the summer, as well as energy savings by adjusting the amount of natural light entering the rooms.

## COMPOSITE MEMBRANE: COMFORT AND AESTHETICS

The combination of 2 skilled specialists provides the cladding for the SPINAL façade:

Serge Ferrari, specialist in the creation of flexible and innovative composite materials, and TECHNAL, specialist in aluminium façades.

SOLTIS FT 381 by Serge Ferrari is fixed to the aluminium frame using a press fit gasket, which is an installation solution similar to a unitised façade.

## THERMAL AND VISUAL COMFORT

The wall cladding (brise-soleil or stretched membrane) effectively preserves from the overheating of buildings in summer by preventing thermal radiation from reaching the windows and therefore the inside of the room. It also protects against glare whilst maximising natural light and maintaining the outside view, which has a positive influence on the occupants' health and well-being at work.

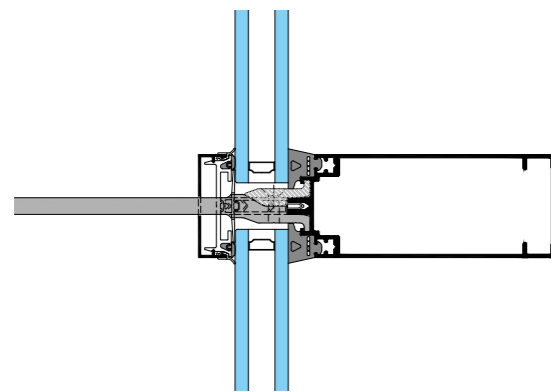
## ARCHITECTURAL CREATIVITY AND RENOVATIONS

SOLTIS FT 381 wall cladding can be easily integrated into a project's design. The various configurations as well as the range of colours available can be distinctive elements of a strong architectural design. In the case of renovations, the lightness of the products and their ease of implementation allows to be quickly installed without any disturbance to the building's occupants.

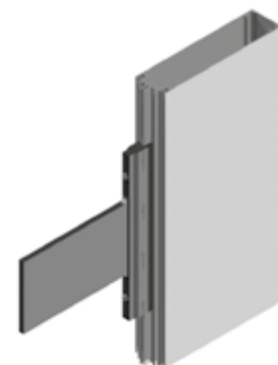
## PERFORMANCES

- Acoustic attenuation in noisy urban environments
- Weather resistance: wind, rain, sleet...
- Reduction of UV radiation and prevention of potential impact on the façade
- 100 % recyclable with the Taxyloop process which has a very low environmental impact and give products a second life.

**Serge Ferrari**



SPINAL curtain walling with integrated bracket



Fixing bracket



Photography: DR Serge Ferrari



# SPINAL

/ OPTIMAL COMFORT WITH BMS  
(BUILDING MANAGEMENT SYSTEM)



Agence d'architecture : Fairhursts

## ENHANCED MANAGEMENT OF THE BUILDING



TECHNAL, in partnership with SOUCHIER, offers a Building Management System (BMS).

This smart system contributes to energy efficiency and interior comfort at any time of the day. It continuously analyses the interior and exterior conditions via sensors placed on the façade (CO<sub>2</sub>, humidity, temperature, etc.). Depending on the data received and the programmed scenarios, the system optimises the configuration of the building's façade: solar protection, opening the windows, lighting, air-conditioning, heating, etc.

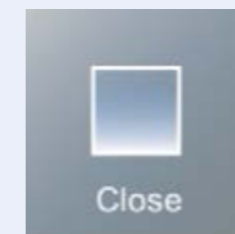
## THREE FEATURES OF BMS WHICH MAKE THE ENVELOPE DYNAMIC

- **Natural ventilation:** The integration of a motorised window controlled by the system renews the air inside the building and helps to maintain a comfortable temperature both day and night.
- **Lighting:** Artificial lights turn on and adjust their intensity depending on the external lighting conditions so as to guarantee visual quality at any time of the day.
- **Solar protection:** Brise-soleil are equipped with motorised blades which are moving with the movement of the sun. The autopilot feature prevents rooms from becoming too hot and protect from direct sun exposure. Blades are available in all sizes and in various shapes to enhance the aesthetics.

## BMS INDICATORS:



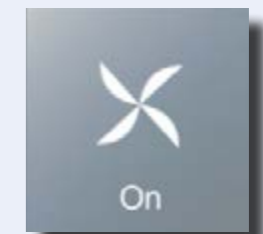
Outdoor temperature



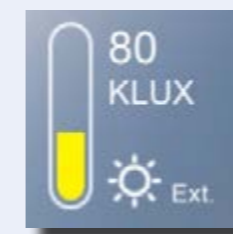
Closed window



Indoor temperature



Building ventilation



Sunlight outdoors



Orientation of the brise-soleil blades



Sunlight indoors

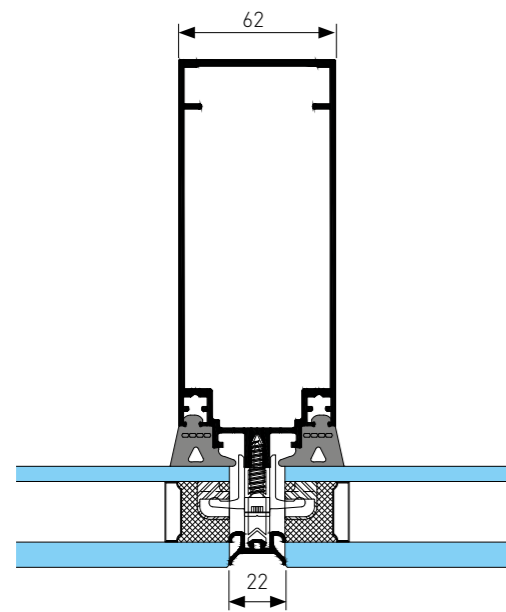


The building's artificial lighting

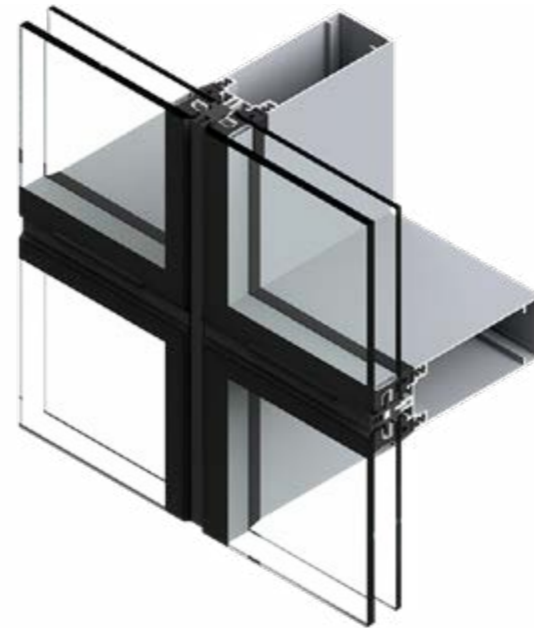
# SPINAL / MINIMAL

## SPINAL MINIMAL STRUCTURAL GLAZING

This solution enables a smooth appearance to the facade to be created without adding an aluminium frame for creating the fixed glazed parts. From the exterior, a 22 mm wide hollow joint leaves the glazed volumes completely visible. Composed of clear or reflective glazing, double or triple glazing, the advantages of Spinal Minimal are its performances and the fineness of the exterior lines.



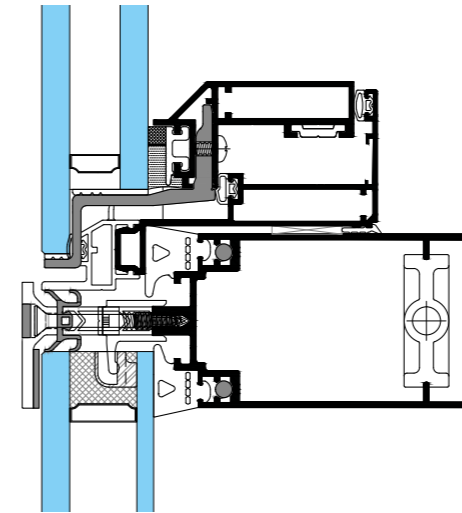
Structural glazing principle



A 90° corner, glazed edge-to-edge, in accordance with the NF DTU 39 P1.1 standard

## INWARD AND OUTWARD OPENING

- Interior openings with concealed hardware: tilt and turn, turn and tilt or inward opening
- Concealed outward openings: top or parallel hung
- The SOLEAL 55 and 65 and TITANE 65 doors
- Fire accesses frame

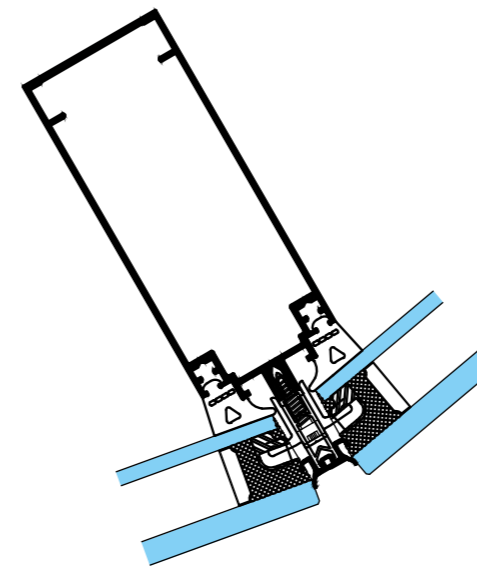


Outward opening



## FACETTED FACADE

- Concave or convex corners of +/- 10°
- Flat partition with recess junction of 22 mm



Facetted facade, 10° convex corner





# SPINAL

## / OPENINGS INTEGRATION: EFFICIENCY AND DISCRETION

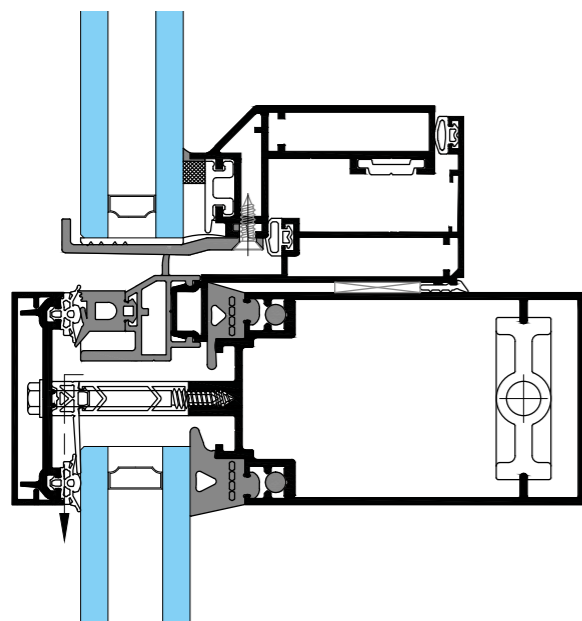
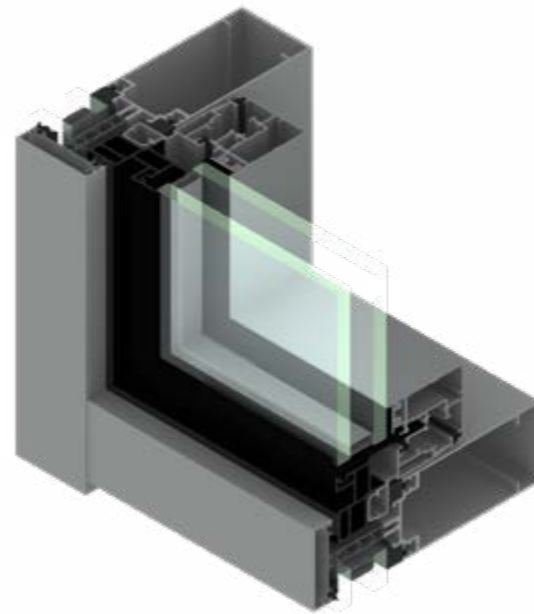
### INTERIOR AND EXTERIOR OPENINGS

Concealed windows specially designed for SPINAL façade allowing inward openings (side hung, tilt and turn or turn and tilt) or outward openings (top hung or parallel). Innovative solution of fixed frames with thermal barrier created, enabling juxtaposition of 2 openings side by side or in alternation with a fixe frame.

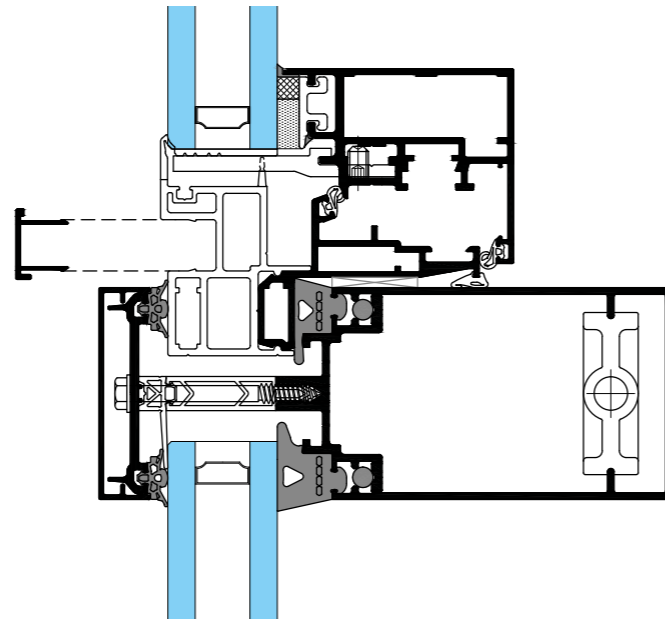
The concealed opening aspect is made by using SSG type openings.

Integration is possible with grid, horizontal aspect and flat cap exterior designs. Inward opening thermal break is available in grey or black, with hollow bottom for a subtle efficiency.

Powder coated or anodised, an aluminium cover clipped in the hollow bottom of the frame allows to outline, as desired, openings edges.



Top hung frame, and parallel opening,  
structure with horizontal frame aspect



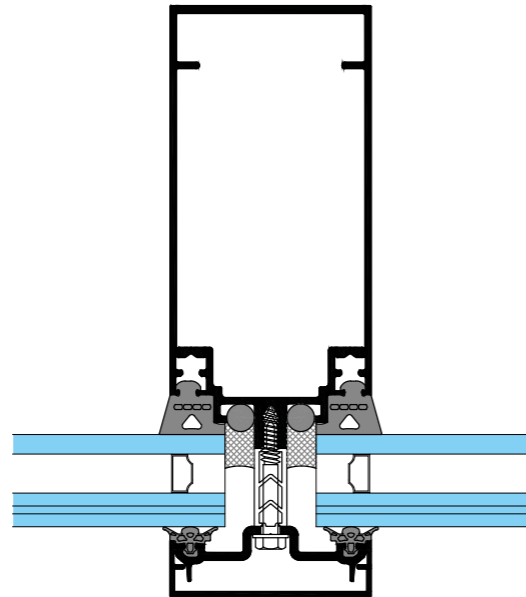
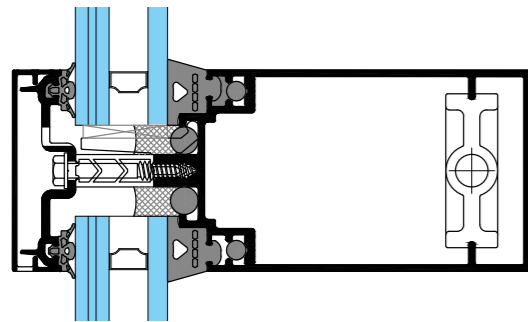
Inward opening, aluminium clip on  
trim option



# SECURITY

/ BURGLARY RESISTANCE

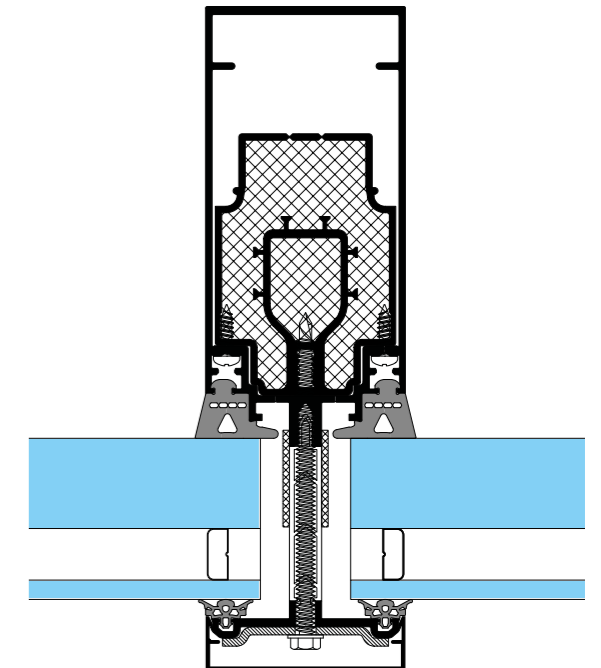
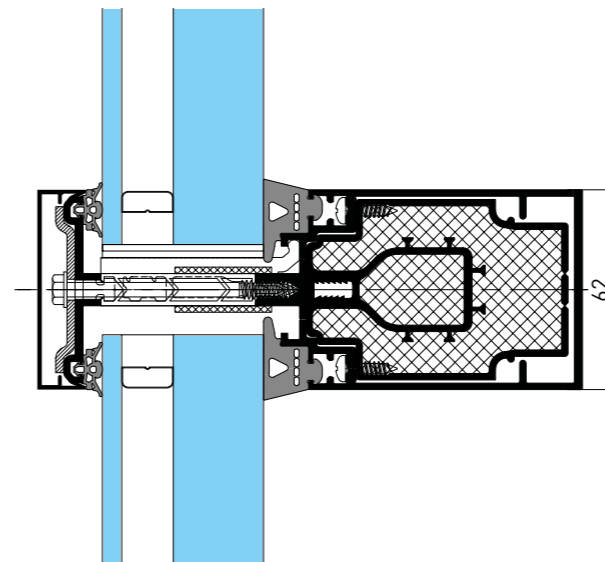
Façade SPINAL grid aspect is burglary resistant according to the EN 1628 -2011, EN1629 - 2011 and EN 1630 -2011 standards.  
 Ideal for car dealerships, banks, jewellers, luxury brands, police stations, etc.  
 - Resistance class level 3\* with glazing P5A  
 - Resistance class level 2\* with glazing P4A  
 \*PV certification report on going



# SECURITY

/ FIRE RESISTANCE

The Spinal fire resistance version enables curtain wall-type facades with grid aspect to be created with an exceptional fire resistance, EI 60. With an insulating profile in the tubular reinforcement enables the stability of the structure with 1 hour's interior or exterior exposure to flames to be combined with a simplicity of installation.  
 Tests carried out in accordance with the EN 1364-3 fire standard: 2014 with Vetrotech Saint-Gobain's Contraflam® and AGC's Pyrobel glazing.





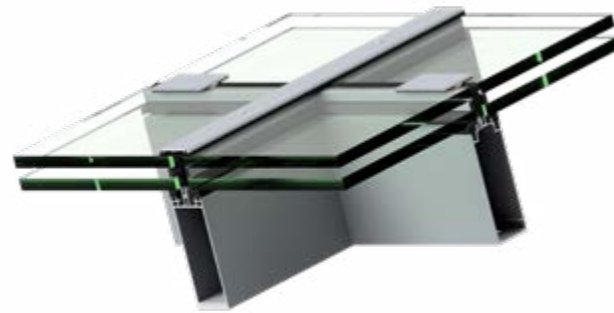
# SPINAL

## / ROOF LIGHT

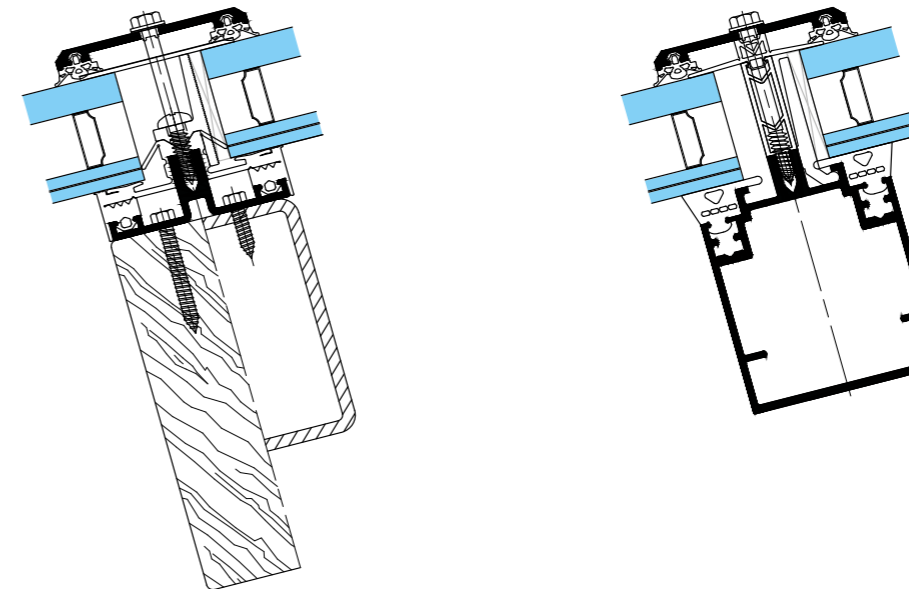
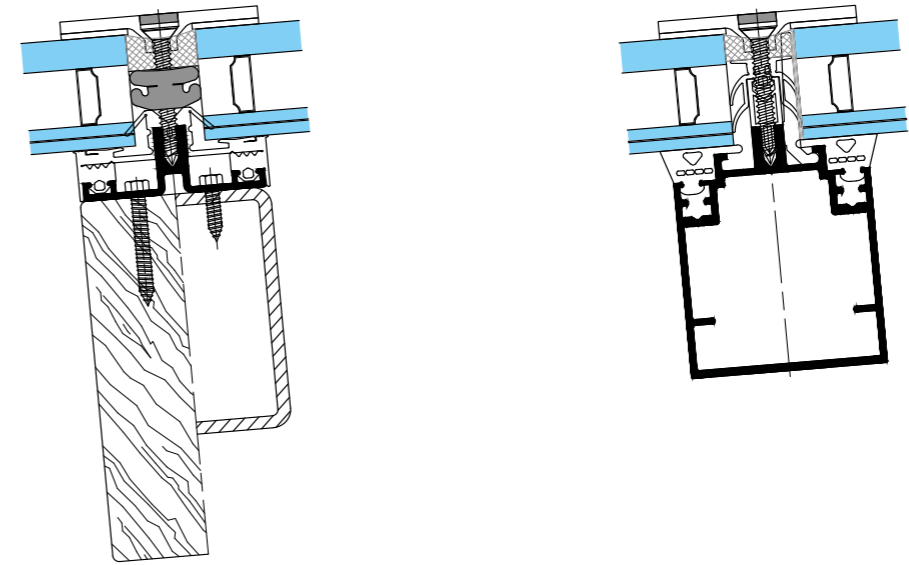
### MAIN FEATURES

Installation of the structure according to the Eurocode NF - EN 1990 / EN 13830 regulations and the RAGE rules published by the French market.

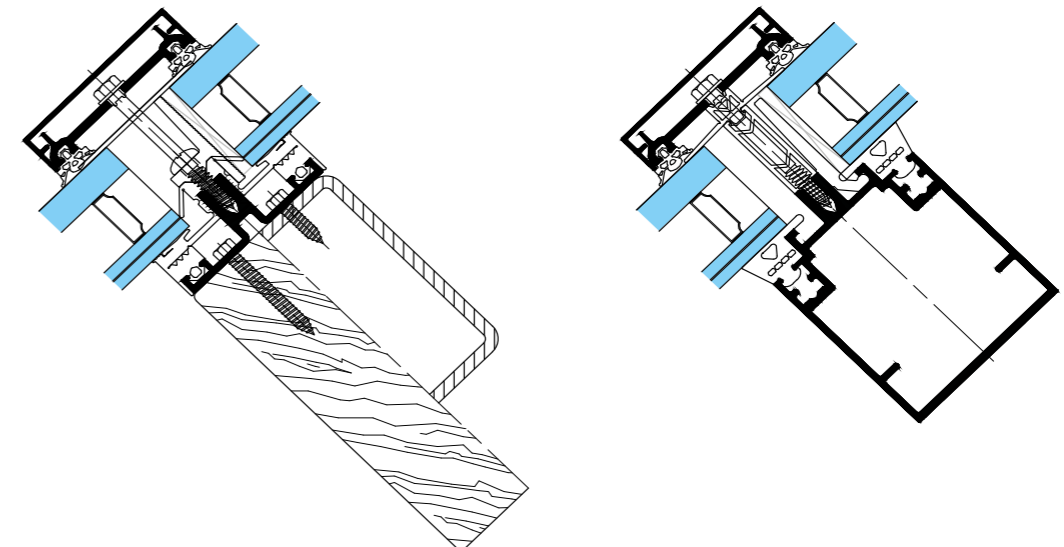
- External appearance:
  - Grid aspect: up to 15° (27%)
  - Vertical frame aspect: up to 7° (12.3%)
- Possibility to add outward openings
- Low slope solution with minimum 5° (8.7%), according to the French regulations of DTU NF 39P1-2.
- Outer sealing provided by a double lip gasket on the aluminium structure and butyl strip on a wood or steel structure.
- Drainage following the principle of penetrating transom or integral joint by tiling.
- Glazing infill:
  - Wood/steel structure: 21 to 55 mm
  - Aluminium Structure: 13 to 53 mm
- Maximum weight by glazing elements:
  - Wood/steel structure: 250 Kg
  - Aluminium Structure: 580 Kg



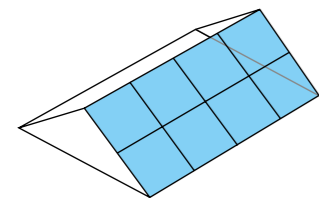
GRID ASPECT



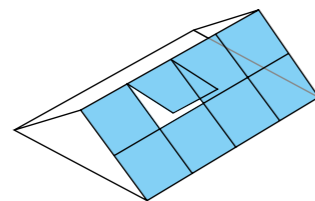
VERTICAL FRAME ASPECT



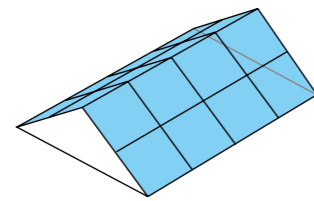
### CONFIGURATIONS



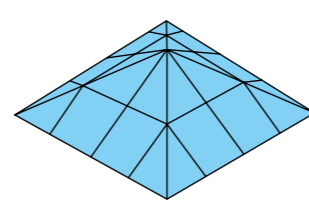
Single pitch



Single pitch with opening vent

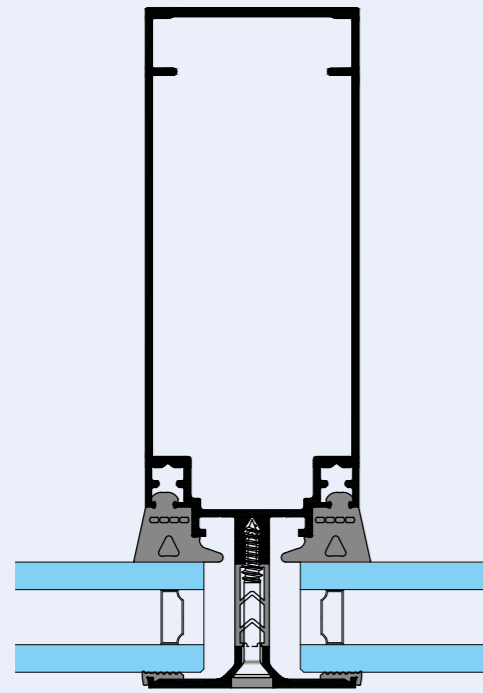


Double pitch

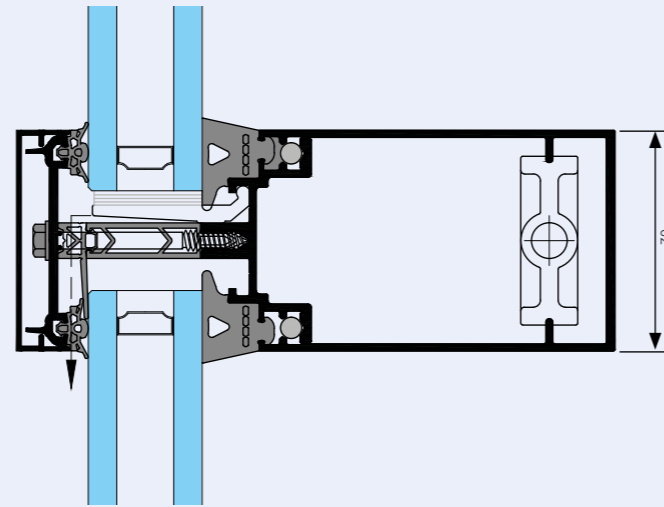


Pyramid

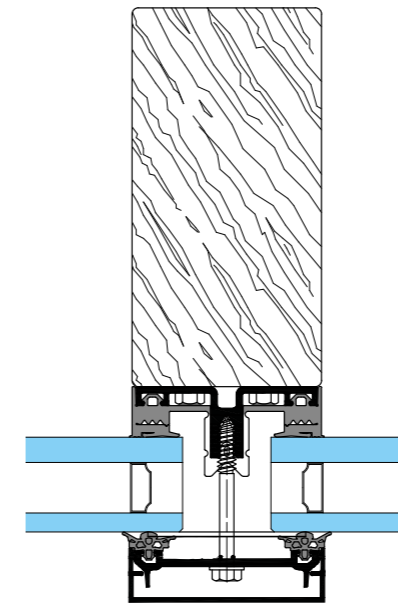
# CROSS-SECTIONS



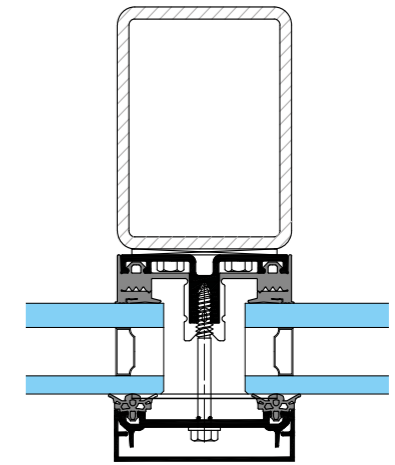
Flat cap pressure plate



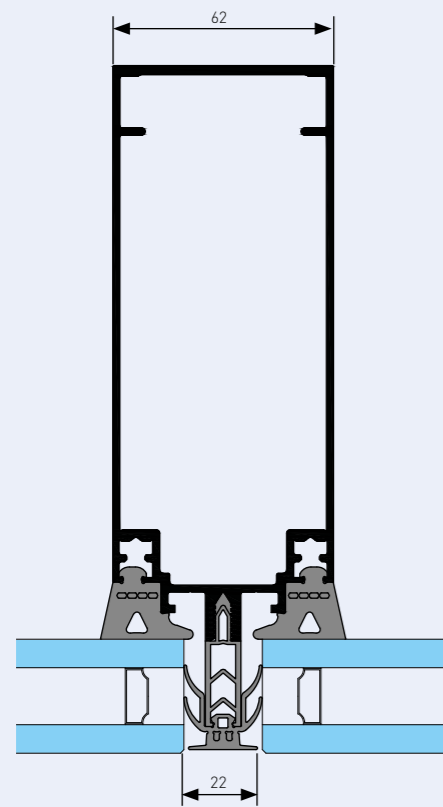
Linear pressure plate, concealed drainage



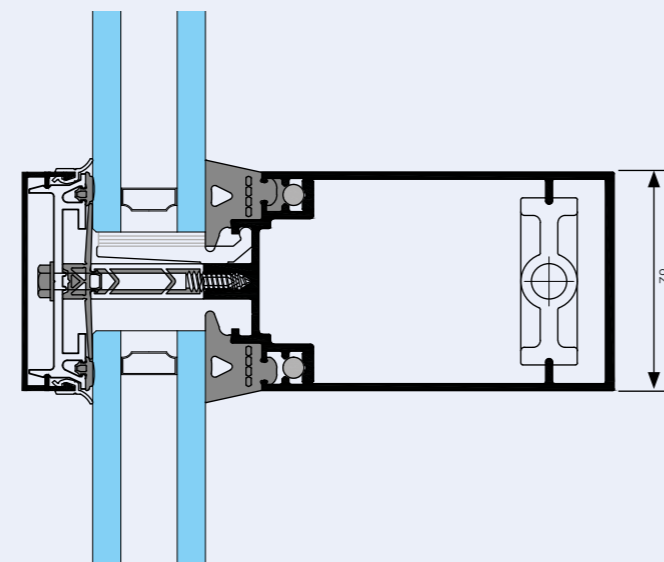
Wooden structure  
The junction of the 2 materials must meet specific requirements - contact us



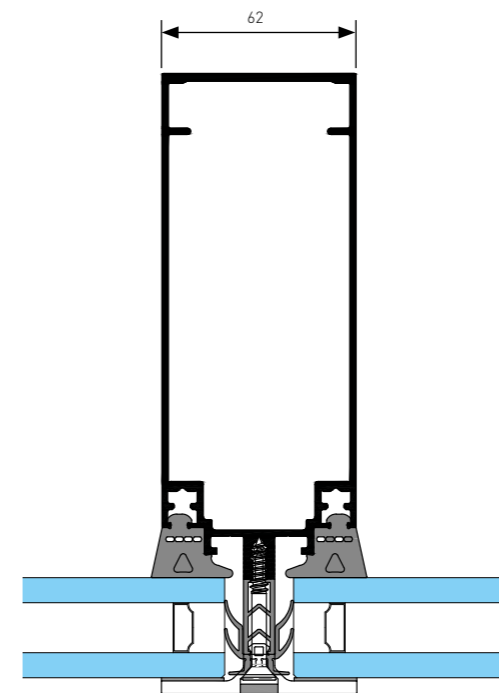
Steel structure  
The junction of the 2 materials must meet specific requirements - contact us



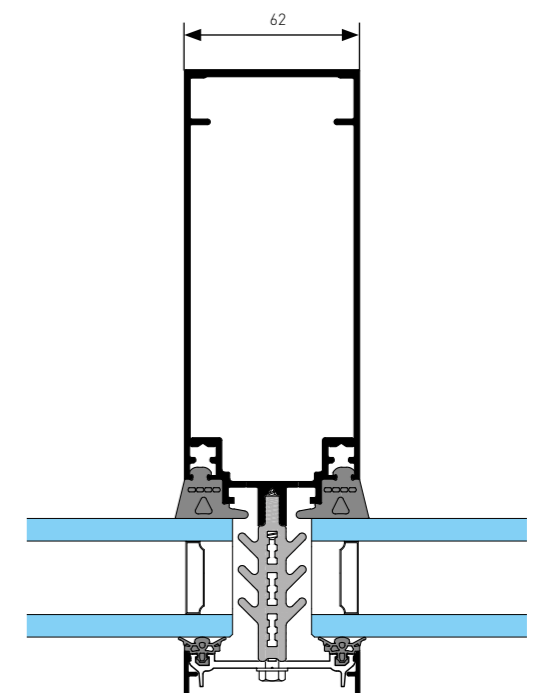
Horizontal trame



Punctual pressure plate



Horizontal trame compliant with new regulations in force

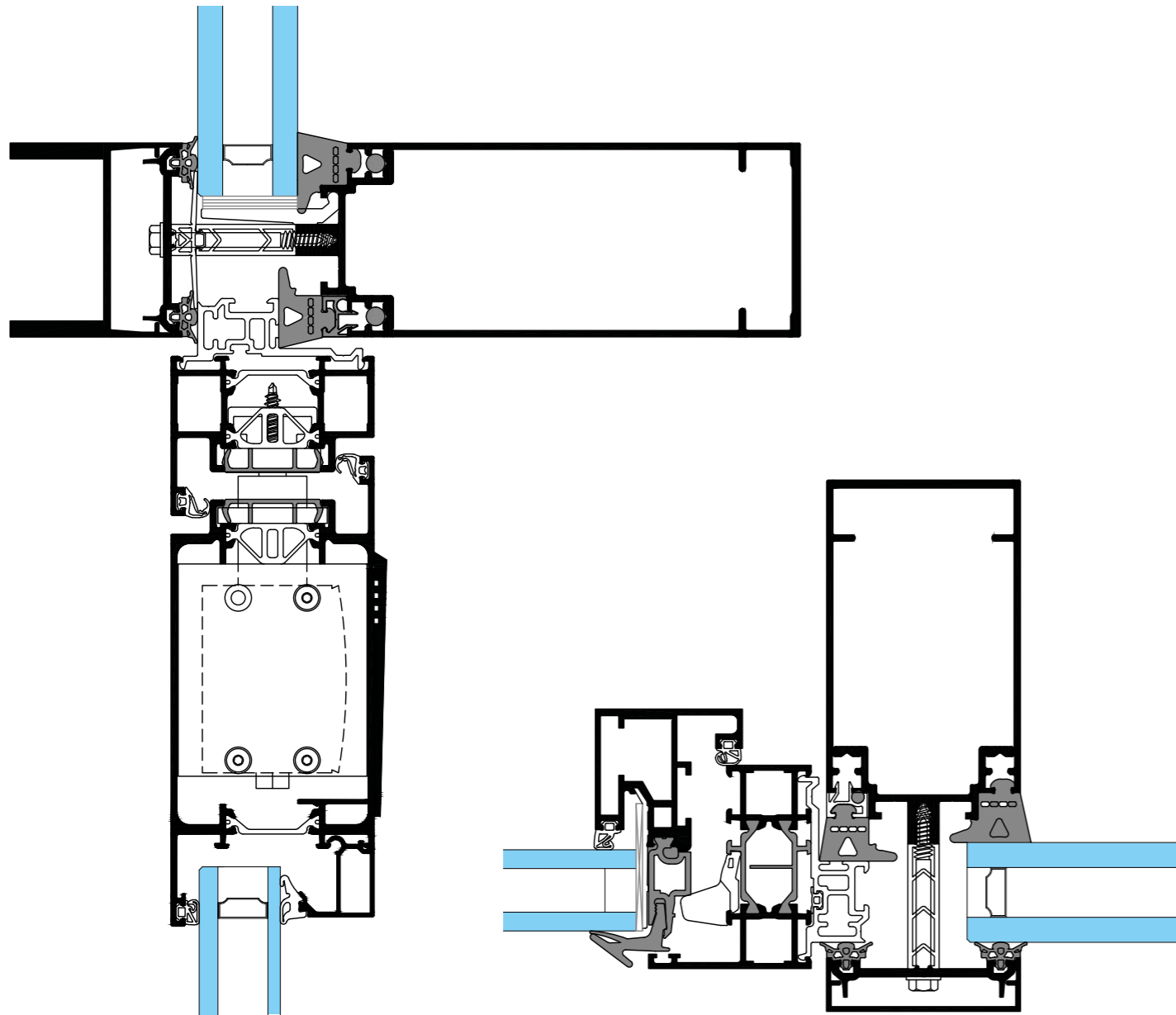


High thermal insulation foam



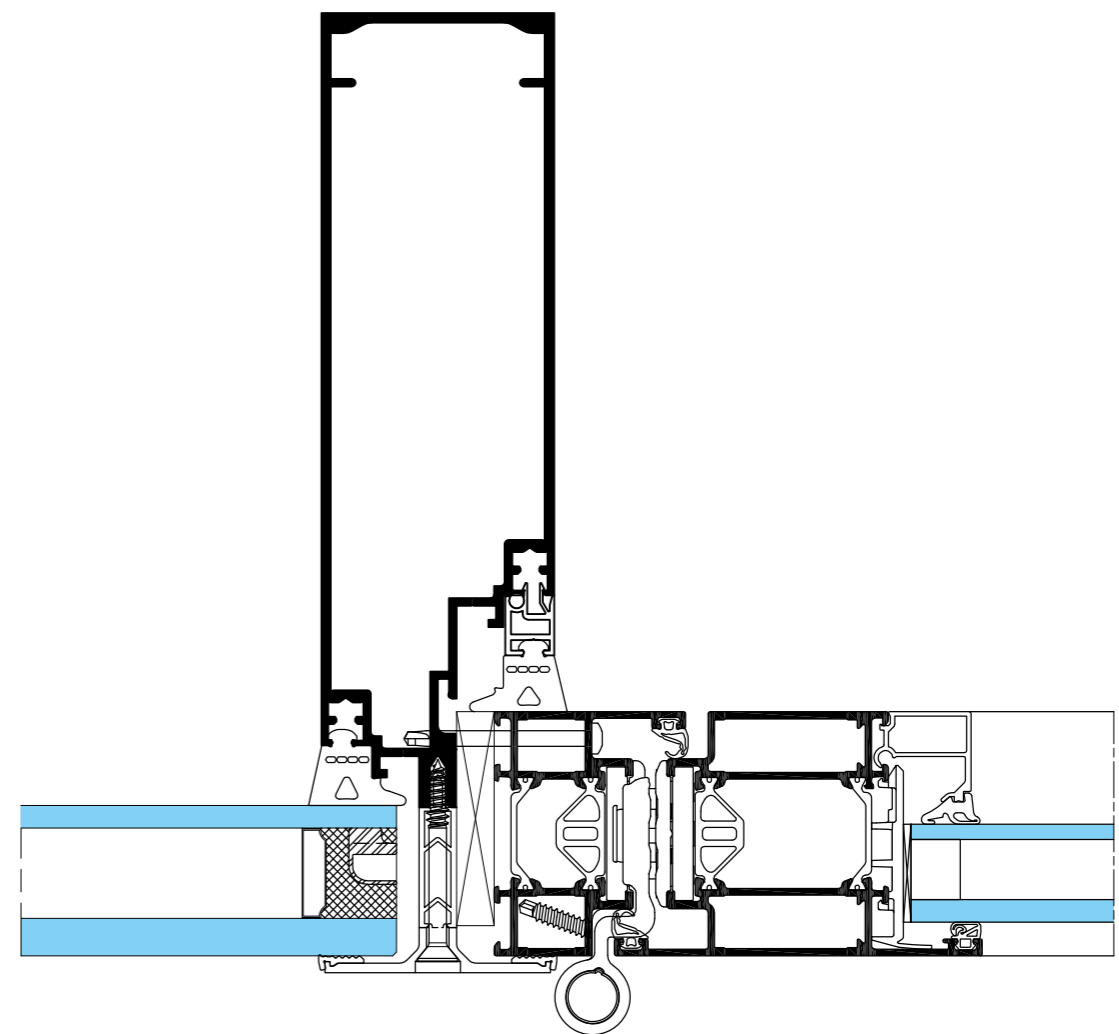


# CROSS-SECTIONS OPENINGS



TITANE 65 door integration

SOLEAL 65 window integration



SOLEAL 65 door integration in SPINAL Minimal

# TECHNAL AND BIM

/ ADD A NEW DIMENSION TO PROJECTS

Thanks to the experience with the conservatory and pergola configurators, TECHNAL has developed the new TECH3D software.

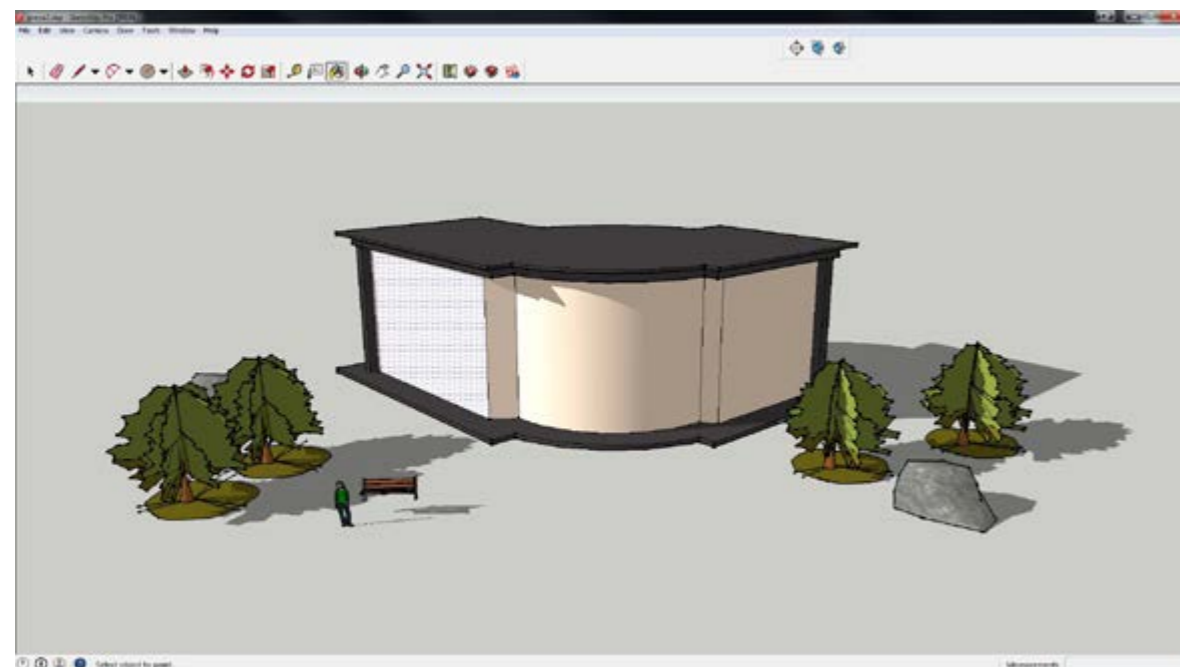
These unique software allows architects to create their composite assembly designs according to desired configurations and dimensions. TECH3D is built around various modules: curtain walling, joinery, railings and verandas.

The different modules mean that it's possible to choose the most appropriate and intuitive interface based on the specificities of each product being implemented.

Quick and easy to use, the TECH3D software supports architects in the design of their collaborative model and helps them visualise their new building in just a few clicks. It also reinforces the work between contractors and retail builders who can now import the project generated in the TECH3D software into TECHDESIGN.

They can work out the costs of the joinery and validate and edit all necessary technical reports.

The architects save time and gain autonomy to meet the digital BIM model opportunities.



# SPINAL

/ WEATHER PERFORMANCE AND TIGHTNESS

| WEATHER TIGHTNESS (Air, Water, Wind) and impact resistance |                  |                 |                                       |                   |
|--|------------------|-----------------|---------------------------------------|-------------------|
| SPINAL Curtain wall  | Air permeability | Water tightness | Resistance to wind pressure           | Impact resistance |
| Grid aspect (panel drainage)                               | AE 1500 Pa       | RE 1500 Pa      | Service 1600 Pa<br>Security 2400 Pa   | I5/E5             |
| Grid aspect (mullion drainage)                             | AE1500 Pa        | RE1500 Pa       | Service 2000 Pa /<br>Security 3000 Pa | I5/E5             |
| 1 leaf, inward opening                                     | Class 4          | RE 1500 Pa      | Class C5                              | I5/E5             |
| Top hung opening   | Class 4          | RE 1500 Pa      | Class C5                              | I5/E5             |

| WEATHER TIGHTNESS (Air, Water, Wind) and impact resistance |                  |  |                                   |                                    |                           |                     |
|--|------------------|--|-----------------------------------|------------------------------------|---------------------------|---------------------|
| SPINAL Roof light  | Air permeability | Water tightness  | Resistance to wind pressure       |                                    | Impact resistance         |                     |
| Grid aspect  | AE1200 Pa        | Angle 60° up to 45°<br>= RE1200 Pa<br>Angle 30°<br>= RE1050 Pa | Angle 30°<br>= Service<br>2000 Pa | Angle 30°<br>= Security<br>3000 Pa | Heavy body<br>= SB 1200 j | Hard body<br>= pass |
| Vertical trame aspect                                      | AE1200 Pa        | Angle up to 7° =<br>RE1200 Pa                                  | Angle 7°<br>= Service<br>2000 Pa  | Angle 7°<br>= Security<br>3000 Pa  | Heavy body<br>= SB 1200 j | Hard body<br>= pass |

| THERMAL PERFORMANCE linear pressure or ponctual pressure plate                |                            |
|---|----------------------------|
| Glazing   | U <sub>cw</sub> [W/(m².K)] |
| Triple glazing + high insulation crossbar<br>U <sub>g</sub> =0.5 W/(m².K)     | 0.61                       |
| Triple glazing + standard insulation crossbar<br>U <sub>g</sub> =0.5 W/(m².K) | 0.8                        |
| Double glazing<br>U <sub>g</sub> =1.1 W/(m².K)                                | 1.2                        |

## MATERIALS AND PARTS

As with all TECHNAL systems, only the best materials and parts are used to minimise maintenance and ensure long-term performance.

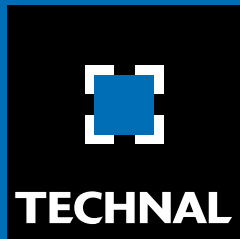
- The aluminium profiles are extruded from alloys 6060 Building compliant with EN 12020, EN 573-3, EN 515 and EN 775-1 to 9.
- Fittings are cast from EN 12844 compliant Zamak 5.
- All gaskets are EPDM or TPE (Thermoplastic elastomer).
- The thermal breaks are made with recycled PVC material from pA6-6 (0.25 FV).
- Screws are made from stainless steel.

## FINISHES AND COLOURS

A wide range of finishes and colours are available to meet individual project requirements, enhancing existing buildings and offering architects and designers greater design freedom:

- Natural anodised in accordance with EN 123731: 2001.
- Polyester coating finishes in a wide range of colours in accordance with "QUALICOAT" instructions.
- SPINAL is also available in powder coated finishes in Technal exclusive colours for a stylish and modern appearance.





IMAGINE WHAT'S NEXT

270, rue Léon-Joulin  
BP 63709 - 31037 Toulouse cedex 1  
Tél. 05 61 31 28 28 - [www.technal.com](http://www.technal.com)



By  Hydro