



Architect: Manuelle Gautrand | Photography: Vincent Fillon

# GEODE MX

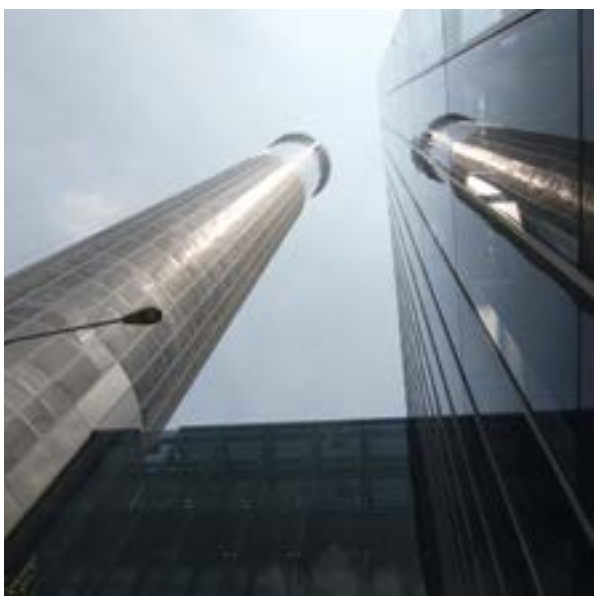
CREATIVE CURTAIN WALL







# GEODE, a complete curtain walling suite



DR Technal

GEODE is a comprehensive curtain walling suite offering designers high thermal performance to meet even the most stringent building regulations, and a wide range of aesthetic options based on a single system.

The variety of curtain walling applications, uses the same mullion and transom grid, and enables designers to vary the external appearance of the building envelope whilst benefitting from the design and construction options of a fully integrated system.

## When aesthetics meet functionality

The GEODE system successfully combines the creative and visual demands of architects with the functional needs of contractors, developers and occupiers, by simplifying the technical aspects as well as the manufacturing and the installation processes to ensure optimum quality and cost efficiency.

Designers also benefit from consistent sight lines and interfaces across a project, whether this is full-height, Trame or structurally glazed or features beaded or sloped glazing.



## Excellence in façade design

The GEODE range offers all the inherent qualities of aluminium: aesthetics, durability and low maintenance, and combines innovative technology and construction features with advanced manufacturing techniques for quality installation and long-lasting performance.

This system is the result of Technal's ongoing development programme and has been rigorously tested in accordance with European standards for wind resistance, water tightness, and air permeability.

## Key features and innovations

- **Visual consistency.** Unique aluminium structure for all external appearances. The discreet and consistent 52 mm for the mullions and transoms give a uniform appearance to the entire GEODE range.
- **Thermal efficiency.** The structure's integrated thermal break and the possibility of using the highest performance glazing means that the lowest Ucw coefficients can be achieved. Energy consumption for heating, lighting, ventilation and air-conditioning is reduced.
- **Technically advanced frame system.** High-quality components for long-term durability.
- **Intelligent design.** Designed for high-quality manufacturing and installation.
- **Meeting the requirements of each individual project.** We offer a selection of mullions up to 260 mm for structural elements and design flexibility to guarantee cost-effectiveness.
- **Complete system compatibility.** SOLEAL thermal break windows or doors can all be used with GEODE curtain walling for a solution that is tailored to each project.
- **Concealed opening vents.** These opening frame solutions, which preserve the external appearance of the facade, can be used in multiple open-in or open-out applications.
- **Design details.** A wide range of external caps for greater aesthetic choice.
- **Choice of infills.** The system can be used with glass, insulated panels and other types of opaque panels.

## Construction

- **Robust construction.** The mullions and transoms are square cut and assembled using a combination of factory-fitted cast face-fixed junction spigots and concealed anti-rotation spigots, or by transom blocks. This strong and easy to build design offers greater accuracy and stability.
- **High-quality design.** The specially designed fittings used for combining mullions/transoms ensure high-quality connections.
- **Cost-effectiveness.** All machining operations can be completed using manufacturing tools in order to reduce manufacturing time and costs, and to achieve consistent quality.

## Thermal performance and weather tightness

- **Increased resistance to climatic conditions.** Fully injectable, the mullion/transom assembly spigot ensures the precise and controlled injection of sealant to ensure weather tightness. In each drainage zone, EPDM caps, positioned between the thermal isolator and pressure plate, prevent the infiltration of water and avoids the need for additional sealant.
- **Effective drainage.** A secondary mullion drainage system enhances weather performance and quality. The system is zone drained and pressure equalised to ensure optimum performance and effective drainage in the most demanding environments.



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GEODE VISIBLE GRID



**Glazing infill:** 6 mm to 42 mm.  
**Façade:** flat or faceted up to 20°.  
**Concealed opening vent:** projecting top-hung, parallel, open-in, tilt-turn, emergency access.



GEODE TRAME HORIZONTALE



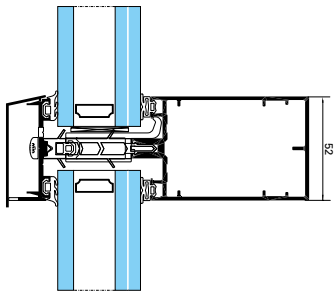
**Glazing infill:** 6 mm to 42 mm.  
**Façade:** flat or faceted up to 10°.  
**Concealed opening vent:** projecting top-hung, parallel, open-in, tilt-turn, emergency access.



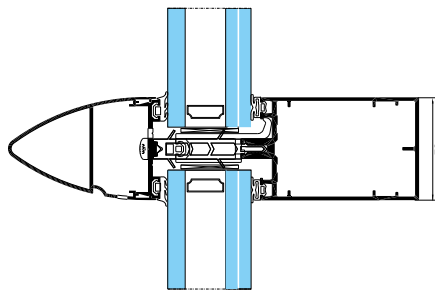
GEODE TRAME VERTICALE



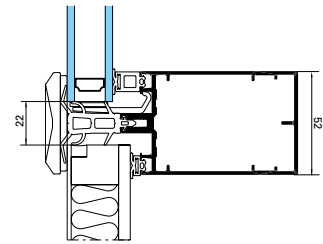
**Glazing infill:** 6 mm to 32 mm.  
**Façade:** Flat.  
**Concealed opening vent:** projecting top-hung, open-in, tilt-turn, emergency access.



Options:  
 - GEODE Acoustic  
 - GEODE 62 for large glass units  
 - GEODE single glazing from 6 to 11 mm  
 - GEODE Flush cap



Options:  
 - GEODE Acoustic  
 - GEODE single glazing from 6 to 11 mm



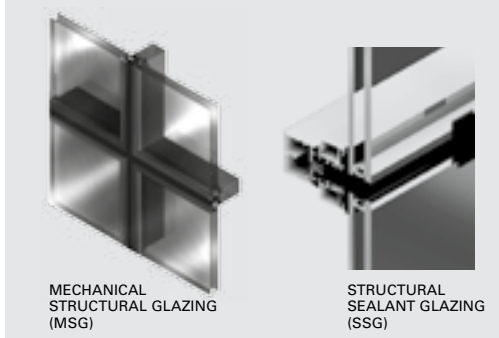
Options:  
 - GEODE single glazing from 6 to 11 mm



GEODE BEADED GLAZING



GEODE STRUCTURAL GLAZING



MECHANICAL STRUCTURAL GLAZING (MSG)

STRUCTURAL SEALANT GLAZING (SSG)



**Glazing infill:** 30 mm to 36 mm.

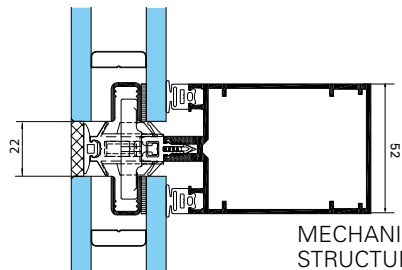
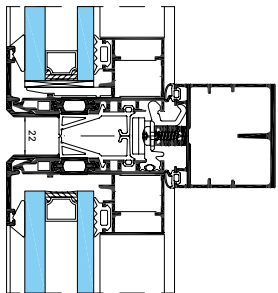
**Façade:** flat or faceted up to 3°.

**Concealed opening vent:** projecting top-hung, open-in, tilt-turn.

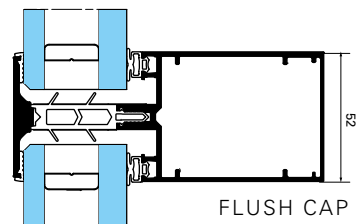
**Glazing infill:** SSG type 6 mm, 28 mm, 34 mm or MSG from 36 to 46 mm.

**Façade:** flat or faceted up to 10° (depending on the technology used).

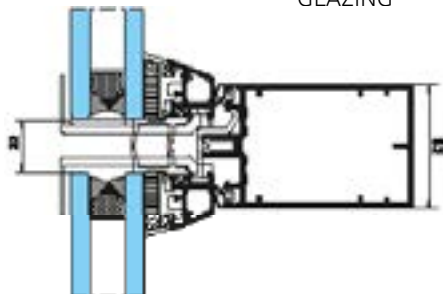
**Concealed opening frame:** SSG type: top-hung, open-in or tilt-turn. MSG type: top-hung or parallel.



MECHANICAL STRUCTURAL GLAZING



FLUSH CAP



# GEODE Design options





# GEODE Design options

## Visible grid

### Flat or faceted façades.

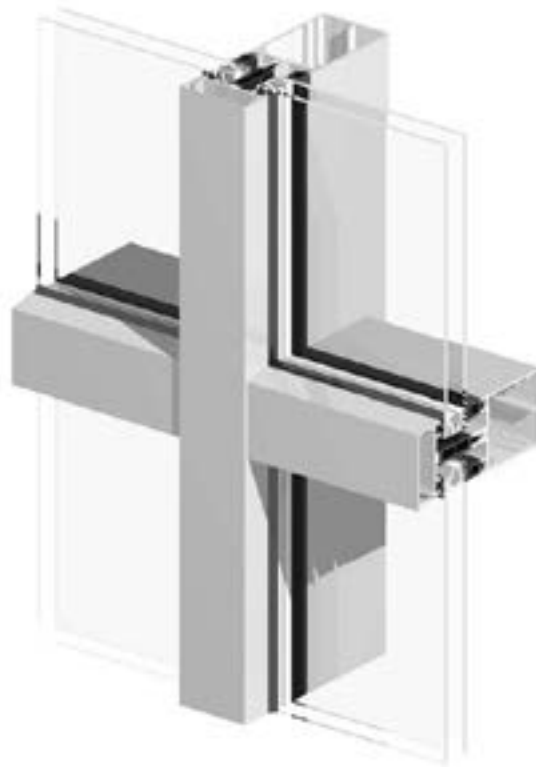
Glazing available from 6 mm to 32 mm for flat or faceted curtain wall up to 20°.

### Common structure with 52 mm-module profiles.

Range of profile depths: from 4.53 cm<sup>4</sup> to 2133 cm<sup>4</sup> to meet the needs of each project.

### Optimised distribution of loads

to prevent unacceptable deflection of the transoms and to allow the use of heavy and large glazing units. Maximum weight of 400 kg (assembled using a connector and anti-rotation spigot).



### Additional acoustic and thermal performance.

GEODE Acoustic is an additional option for GEODE Visible grid, developed for projects requiring enhanced acoustic and thermal performances with glazing up to 42 mm.

### Large dimension glazing.

GEODE 62 is an option that uses 62-mm module mullions and transoms to increase the dimensions of the glazing and thus maximising natural light.

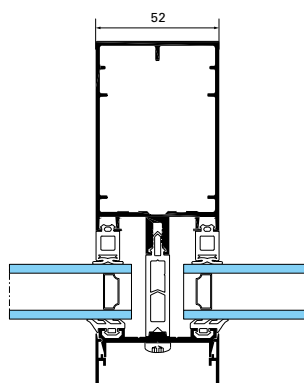
**Design.** Choice of aluminium caps to highlight the external design of the façade.

### Concealed opening vents.

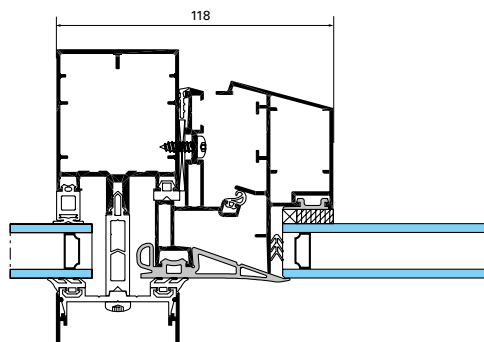
The projecting top-hung, parallel, tilt-turn or emergency access opening vents provide natural ventilation whilst maintaining the aesthetic lines whatever the appearance of the external façade.

**Choice of gaskets.** Available as large vulcanised corner or linear pieces depending on project requirements.

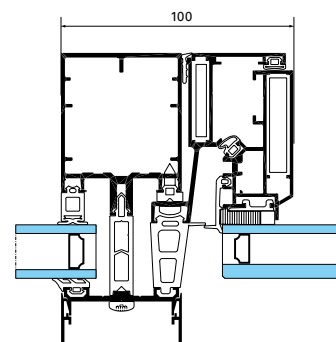
**Infills held in place** with a continuous aluminium pressure plate or a specific polyamide pressure plate with fitted vulcanised gaskets.



Fixed visible grid



Concealed tilt-turn opening frame



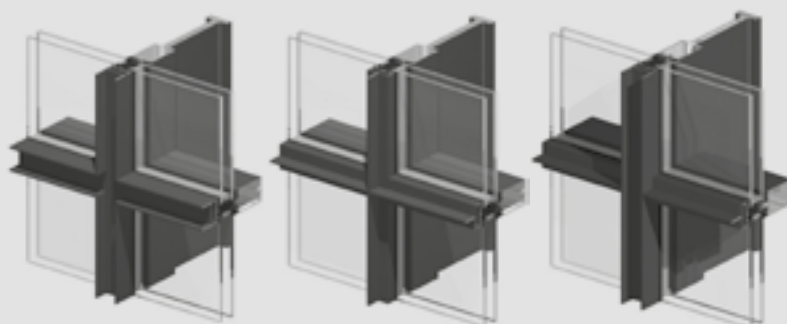
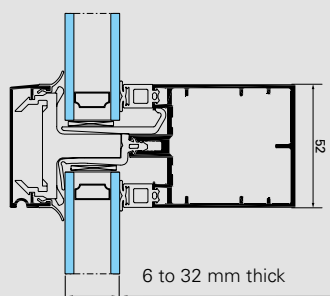
Concealed projecting top-hung opening frame



Thermal insulation provided by individual polyamide parts screwed to the mullion-transoms, keeping infills in place and supporting the external clip-on aluminium caps.

#### Optional non-continuous pressure plate (Technal patent)

Weather tightness assured primarily through the rear face by fitted vulcanised gaskets to accommodate the brise-soleil supports without reducing weather tightness.



#### Variety in the appearance of the façade

The range of mullion-transoms and external caps makes it possible to vary the appearance of the façade.

## Construction

- **Simplified manufacturing.** The mullions and transoms are straight cut and assembled using a combination of cast spigots face fixed and concealed anti-rotation spigots for ease of manufacture.
- **Faceted façades.** For facets up to  $\pm 10^\circ$ , standard connectors may be used. A transom block combining specially designed pressure plates, caps and adaptors can be used for angles between  $10^\circ$  and  $20^\circ$ .
- **Special option.** The transom assembly block options offers an alternative to anti-rotation spigots in order to meet requirements of design or the project in general.

## Performance

- **Advanced thermal performance.** The thermal insulation of the standard GEODE visible grid solution is provided via a 34 mm TPE thermal isolator between the pressure plates and the mullion and transom structure. This principle ensures optimal thermal performance and meets or exceeds building regulations' requirements.
- **Thermal insulation** with glazing  $U_g = 1.1 \text{ W/m}^2\text{K}$  :
  - Fixed curtain wall with 80% glazing (opaque spandrel panel)  $U_{cw} = 1.4 \text{ W/m}^2\text{K}$ .
  - Fixed curtain walling with 50% glazing (80 mm insulating panel,  $U_p = 0.35$ )  $U_{cw} = 1.1 \text{ W/m}^2\text{K}$ .
- **Air, water and wind resistance** in accordance with European and CWCT standards.
- **ITT Testing** and technical approval for the specific pressure plate option.

*Thermal calculations of curtain walling carried out in accordance with EN 13947.*

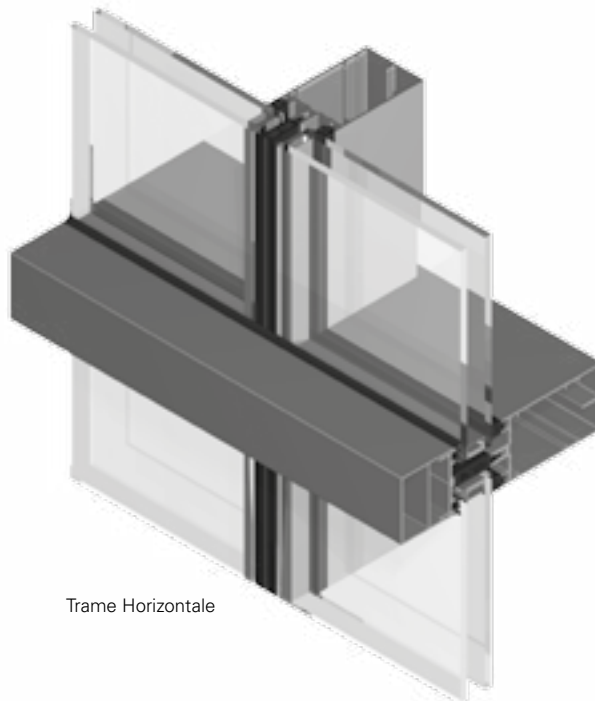
# GEODE Design options

## Trame (Horizontale or Verticale)

**Common structure with 52 mm-thick profiles.** Choice of mullion-transoms members from 4.53 cm<sup>4</sup> to 2133 cm<sup>4</sup> to meet the needs of each project.

**Reinforced acoustic and thermal protection.** GEODE Acoustic is an option designed for the GEODE system. Trame Horizontale for environments requiring heightened thermal and acoustic performance.

**Distinctive design details.** GEODE Trame is an additional design option offering the option of highlighting the vertical or horizontal profiles on the building's envelope.



Trame Horizontale

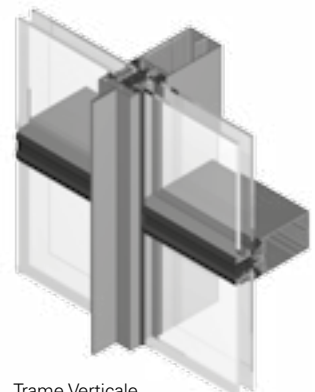
**Glazing from 6 to 32 mm.** Up to 42 mm for the Geode Acoustic option.

**Infills are held in place** with a continuous aluminium pressure plate, or a specific polyamide pressure plate with fitted vulcanised gaskets, on the transom or mullion.

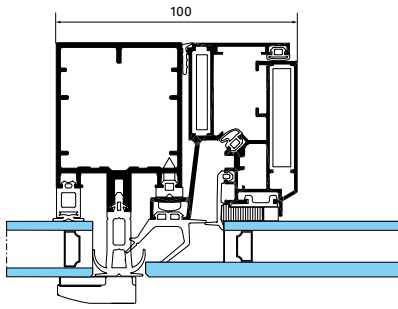
### Maximum weight

**Concealed opening vents.** Projecting top-hung, parallel, tilt/turn and emergency access opening vents provide natural ventilation whilst maintaining consistent sight lines.

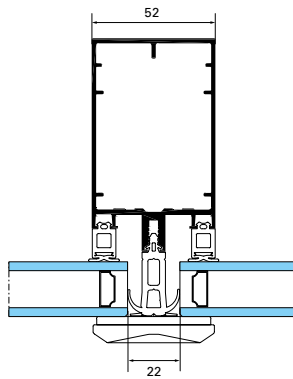
**Minimal strain.** On large mullion or transom spans glass deflection is reduced using a special pressure block.



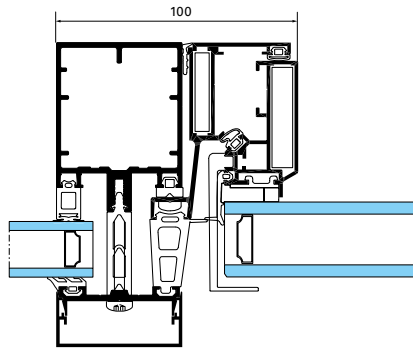
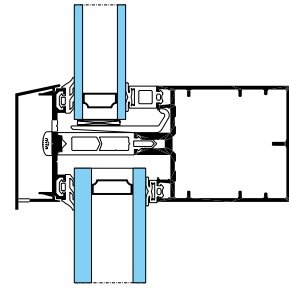
Trame Verticale



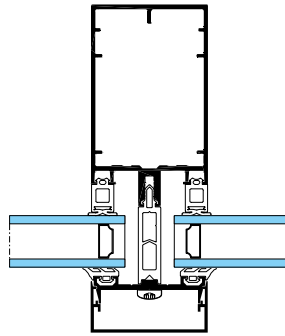
GEODE Trame Horizontale with concealed projecting top-hung



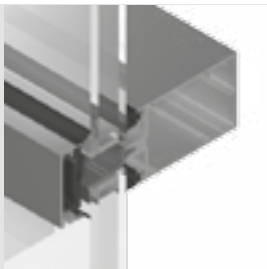
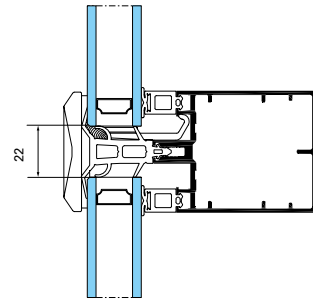
GEODE Trame Horizontale



GEODE Trame Verticale with concealed projecting top-hung



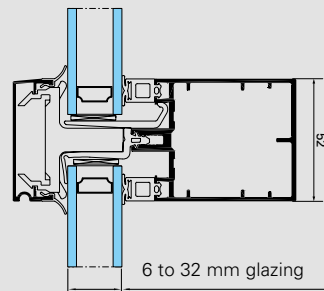
GEODE Trame Verticale



#### Optional punctual pressure plate (Technal patent)

assured primarily through the rear face by fitted vulcanised gaskets to accommodate the brise-soleil supports without reducing the weather tightness.

Horizontal caps clipped on to the special pressure plates and a 22 mm "hollow" effect gasket conceals the verticals. Infills are kept in place horizontally by specific polyamide pressure plates. Special pressure plates keep the panels in place.



## Construction

- **Contemporary design.** Depending on the type of frame, vertical or horizontal, a range of caps add depth to the facade whilst the gaskets, which are flush with the infills, conceal the verticals or horizontal.
- **Dry glazing.** Geode Trame system does not require sealant to be applied on site.
- **Flat or faceted** up to 10° (Trame Horizontale only).

## Performance

- **Technical design** resistant to the most extreme climatic conditions. A pressure plate on the mullion or the transom, depending on the version, and a combination of EPDM gaskets keep the infills in

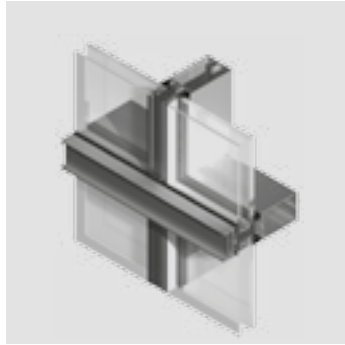
place. Effective drainage is ensured by equalising the pressure through holes in the pressure blocks and caps.

- **Thermal efficiency.** GEODE Trame's thermal insulation is assured by a standard 34 mm TPE insulator between the pressure plate and mullion or transom.
- **Thermal insulation** with glazing  $U_g = 1.3 \text{ W/m}^2\text{K}$  :
  - Fixed curtain wall with 80% glazing (opaque spandrel panel)  $U_{cw} = 1.6 \text{ W/m}^2\text{K}$ .
  - Fixed curtain wall with 50% glazing (80 mm insulating panel,  $U_{cw} = 0.35$ )  $U_{cw} = 1.2 \text{ W/m}^2\text{K}$ .
- **Air, water and wind resistance** in accordance with European and CWCT standards.
- **ITT testing** and technical approval for the special pressure plate option.

*Thermal calculations of facade in accordance with EN 13947.*



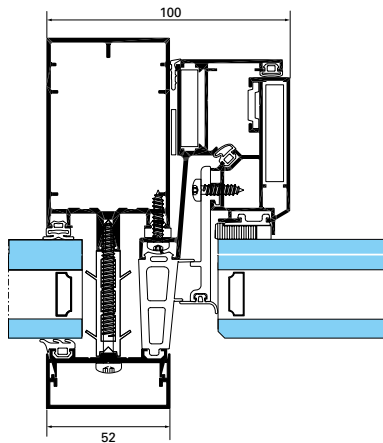
GEODE Acoustic  
Visible grid



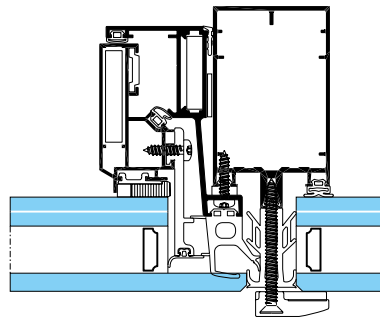
GEODE Acoustic  
Trame Horizontale

## GEODE Design options

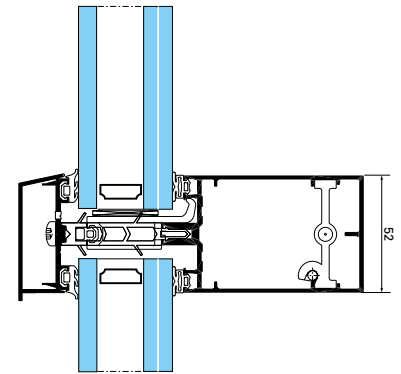
### Acoustic



Concealed projecting top-hung  
Visible grid



Concealed projecting top-hung,  
Trame Horizontale



Vertical section  
Visible grid or Trame Horizontale

## Features

- **The enlarged glazing infill up to 42 mm offers greater acoustic and thermal protection.** Can be used in environments where additional performance is required (city centre apartments, hospitals, buildings close to airports and railways lines, etc.).
- **Visible grid or Trame Horizontale.**
- **Flat or faceted curtain walling.** For visible grid; 10 degrees for Trame
- **Concealed opening vent.** The concealed SSG projecting top-hung opening frames can be supplied for use with 36 mm and 42 mm glazing.
- **System compatibility.** The profiles allow Technal's window and door systems to be integrated into curtain wall structures.

## Construction

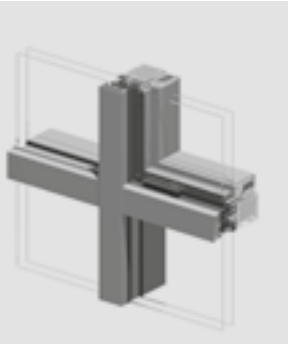
- The transoms are fixed with spigots or block mounted and can accommodate glazing infill up to a maximum weight of 240 kg per transom.

## Performance

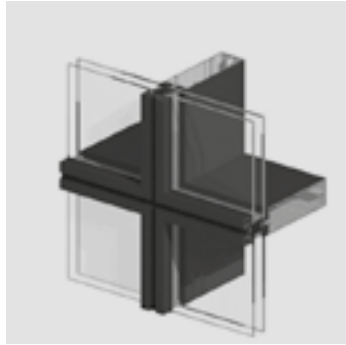
- Reinforced thermal insulation is provided through a multi-chamber spacing gasket and partitioning tabs.
- **Thermal insulation** with 42 mm triple glazing  $U_g = 0.6 \text{ W/m}^2\text{K}$ :
  - Fixed curtain walling with 80% glazing (opaque spandrels panel)  $U_{cw} = 0.9 \text{ W/m}^2\text{K}$ .
  - Fixed wall cladding with 50% glazing (80 mm insulating panel,  $U_p = 0.35$ )  $U_{cw} = 0.8 \text{ W/m}^2\text{K}$ .
- **Air, water and wind resistance** in accordance with European and CWCT standards.
- **ITT testing.**

*Thermal calculations of curtain walling in accordance with EN 13947.*





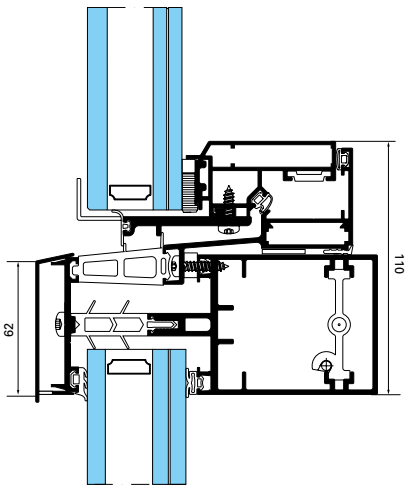
GEODE 62 Visible grid version with external caps



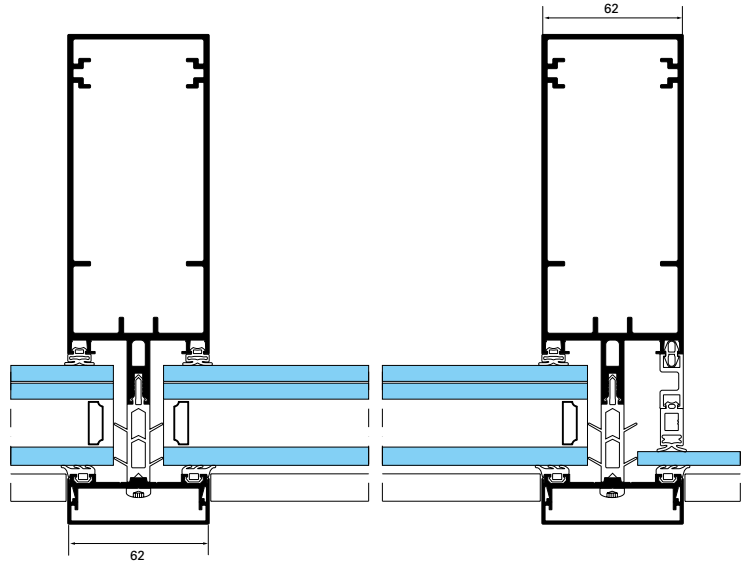
GEODE 62 Visible grid and Trame version with external caps

## GEODE Design options

### GEODE 62



GEODE 62 concealed projecting top-hung



GEODE 62 Visible grid

16

## Features

- **Large dimension glazing.** With larger glass cover of 20mm, GEODE 62 is an option designed for visible grid curtain walling, enabling designers to use large glazing units to create glazed surfaces from 6 to 12 m<sup>2</sup> (semi-perimeter between 5 and 7 m) and thus to increase the natural light.
- **Load.** The maximum load is 600 kg per transom.
- **Mullions/transoms:** from 80 to 210 mm for inertias from 92 to 1689 cm<sup>4</sup>.
- **Simple application.** For flat façades, this option uses a pressure plate, a horizontal and a vertical cap and can accommodate glazing from 8 mm to 44 mm.
- **Concealed vents.** The concealed projecting top-hung opening vents can be supplied with 36 mm or 42 mm glazing.
- **System compatibility.** The profiles allow Technal's window and door systems to be integrated into the curtain wall grid.

## Performance

- **Thermal insulation** with 44 mm triple glazing  $U_g = 0.6 \text{ W/m}^2\text{K}$ :
  - Fixed curtain walling with 80% glazing (spandrel panel)  $U_{cw} = 0.9 \text{ W/m}^2\text{K}$ .
  - Fixed curtain walling with 50% glazing (80 mm insulating panel,  $U_p = 0.35$ )  $U_{cw} = 0.8 \text{ W/m}^2\text{K}$ .
- **Air, water and wind resistance** in accordance with European and CWCT standards.
- **ITT testing.**

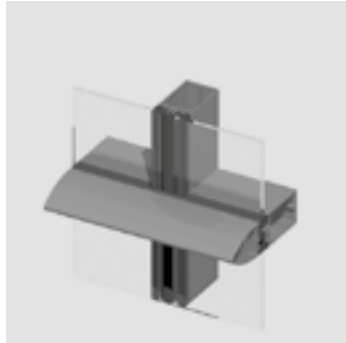
*Thermal calculations of curtain walling carried out in accordance with EN 13947.*







GEODE Visible grid



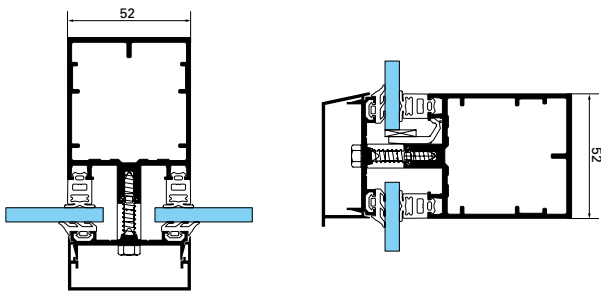
GEODE Trame Horizontale



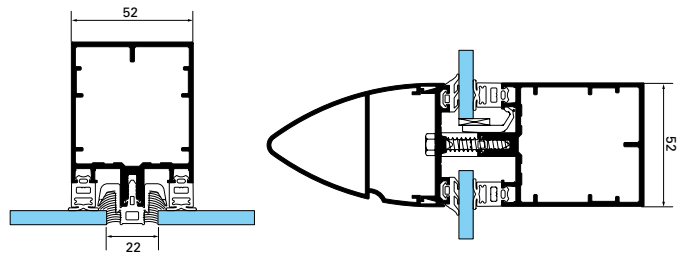
GEODE Trame Verticale

## GEODE Design options

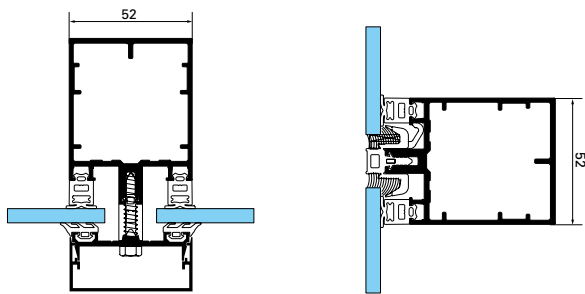
### Single glazing



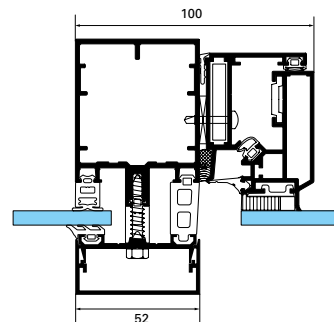
GEODE single glazing  
Visible grid



GEODE single glazing  
Trame Horizontale



GEODE SG single glazing  
Trame Verticale



GEODE single glazing with a concealed  
projecting top-hung opening frame

### Features

- **Version optimised for temperate regions.** The single glazed GEODE option for visible grid and Trame is dedicated to geographical regions in which the climatic conditions do not require advanced thermal performance or the use of double glazing.
- **Concealed vent option.** Structurally bonded projecting top-hung opening vents can be supplied for use with glazing from 6 mm to 11 mm.
- The GEODE single glazing system allows Technal's window and door systems to be integrated into curtain wall structures.
- **Flat and faceted façades:** up to 10°.
- **Laminated single glazing from 6 to 11 mm.**

### Construction

- The internal structure and external caps are as used on the standard GEODE visible grid and Trame options.
- Glass deflection can be limited on the free side by a specific piece positioned mid way.

### Performance

- **Air, water and wind resistance** in accordance with European standards.
- **ITT testing.**



# GEODE "BG" Beaded glazing

## A contemporary alternative.

The externally beaded frame option of GEODE BG makes it possible to create curtain walling with a "picture frame" appearance.

## Patented Technal design.

A patented "hook and toggle" fastening system facilitates the installation of the frames.

**Insulation.** Fixed and opening frames with a thermal break.

**Dry glazing.** The glazing is mounted onto the frames in the factory and held in place with beading.

## Replacement glazing.

A single carrier frame can be easily removed from the inside for replacement glazing using a special tool.

## Concealed opening frames.

The concealed projecting top-hung and tilt-turn opening frames, as well as emergency access frames, can be used without altering the aesthetics of the façade.

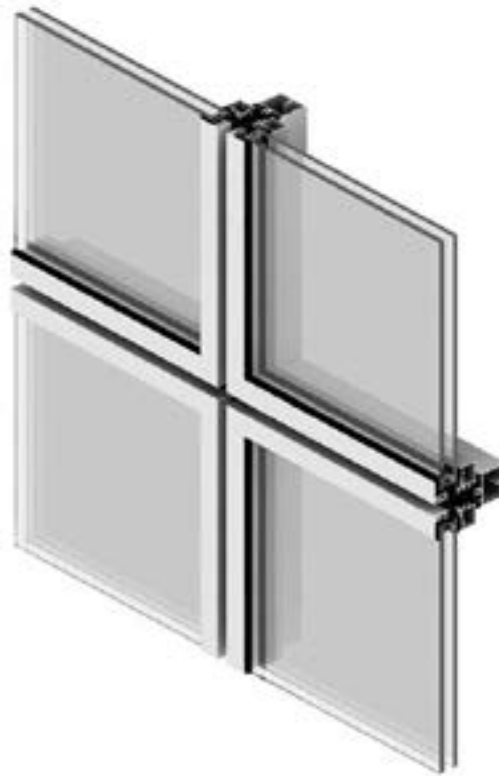
**Infills.** Fixed frames up to 200 kg. Opening frames up to 120 kg (projecting top-hung).

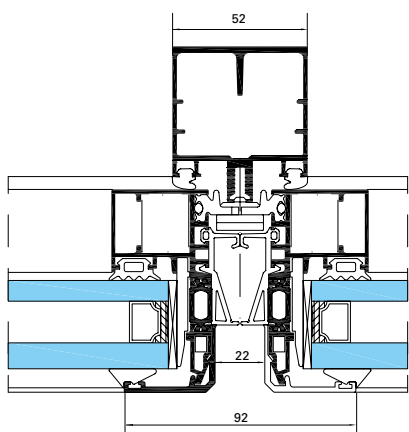
**Externally glazed.** The top and bottom glazing beads are riveted to the frame for additional security.

## Glazing and infills.

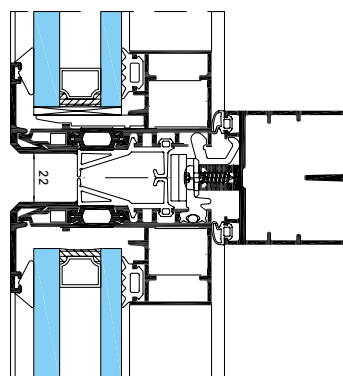
GEODE BG can support glazing from 30 mm to 36 mm on the fixed sections and the opening frames. 54 mm insulated panels.

**Flat or faceted.** Available as a flat façade or faceted up to  $\pm 3^\circ$ .

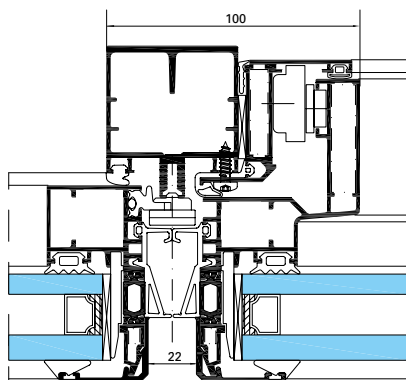




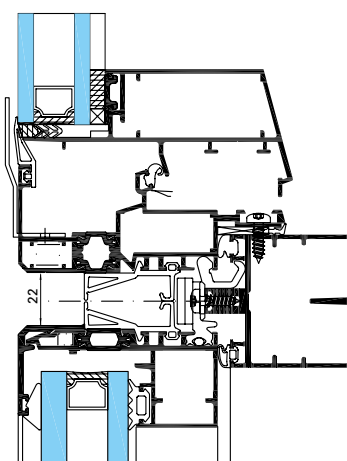
GEODE BG transparent glazing horizontal section



GEODE BG transparent glazing vertical section



GEODE BG concealed projecting top-hung opening frames



GEODE BG concealed open in frame



## Construction

- **Air tightness.** An internal EPDM compression gasket assures the system's total air tightness in the form of oversized vulcanised corners or fitted vulcanised frame gaskets.
- **Installation.** The carrier frames are fitted to the curtain wall grid with a patented hooking system.

## Performance

- **Thermal insulation** with glazing  $U_g = 1.1 \text{ W/m}^2\text{K}$  :
  - Fixed curtain walling with 80% glazing (opaque spandrel panel)  $U_{cw} = 1.7 \text{ W/m}^2\text{K}$ .
  - Fixed curtain walling with 50% glazing (insulating panel) 80 mm,  $U_p = 0.35$   $U_{cw} = 1.5 \text{ W/m}^2\text{K}$ .
- **ITT testing** allows the manufacturer to use CE markings.
- **Air, water and wind resistance** in accordance with European and CWCT standards.
- **Acoustic** attenuation up to 40dB.

*Thermal calculations of curtain walling in accordance with EN 13947.*

# GEODE Structural glazing





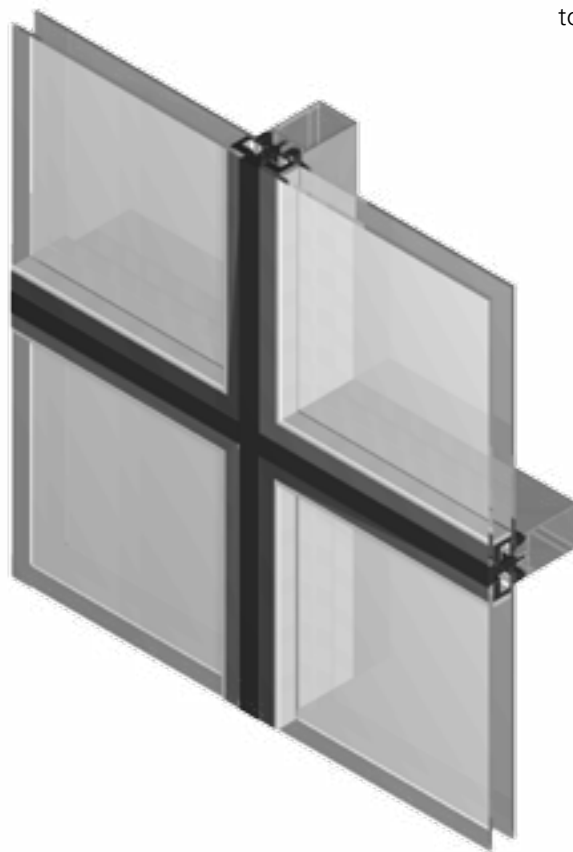
# GEODE Structural glazing

## Mechanical structural glazing

The **GEODE mechanical structural glazing** curtain walling is a technical design enabling the creation of fully glazed façades without attaching aluminium frames to the glazing. As an alternative to SSG (Structural Sealant Glazing) which uses traditional silicone sealant, the glazing for the fixed and opening sections is attached to the aluminium frame mechanically using special aluminium supports. From the outside, only the glazing and a thin gasket are visible.

**Flat or faceted upto 10 degrees.**

**Finish and weather tightness** provided between the glass panel by a dry EPDM or silicone seal.



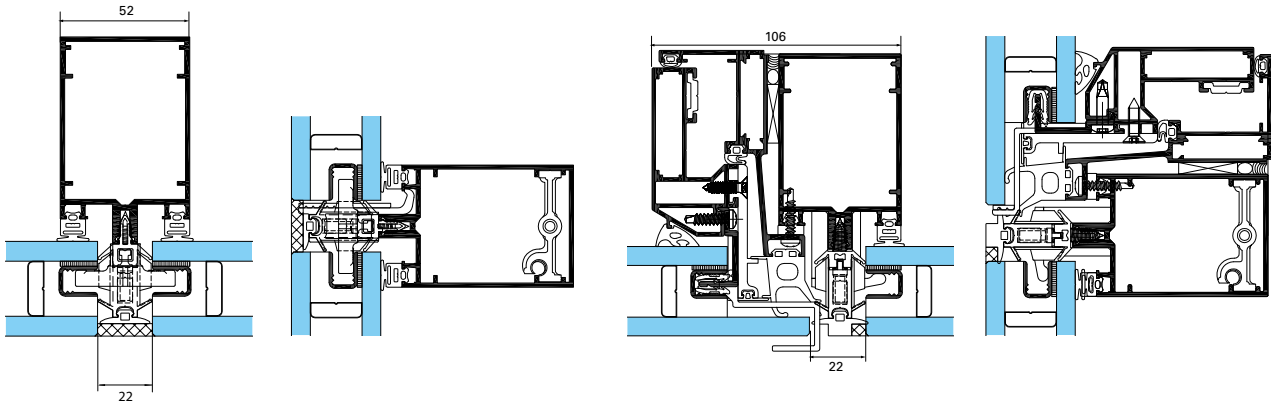
**Concealed opening vents** projecting top-hung or parallel.

**Glass panels:**  
Fixed frames: W 3.00 m x H 2.00 m  
- Max. weight 240 kg  
Vents: projecting top-hung 130 kg  
- Parallel 150 kg.

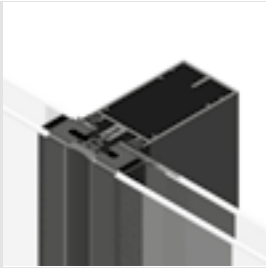
**The glazing for the fixed or opening sections** is attached to and held onto the grid structure by special retaining fixtures made from moulded or extruded aluminium.

**Glazing** from 36 to 42 mm for the transparent sections of the fixed and opening frames. Spandrel panels with 6 or 8 mm glazing or insulating panels from 40 to 120 mm.



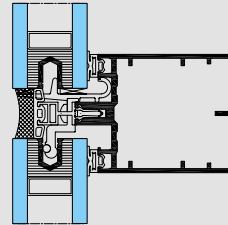


Projecting top-hung or parallel opening



#### Option GEODE SG

- **Glazing and infills.** Fixed and opening frames with glazing from 32 to 34 mm for the transparent spandrel wall panel with glazing from 6 to 8 mm and 4 mm aluminium composite panels for opaque sections.
- **SSG type projecting top-hung opening vent** - max. weight 120 kg.
- **High-performance weather tightness.** A silicone gasket is positioned between the leaves on a continuous support for guaranteed optimal weather tightness.
- **Flat or faceted façade** up to +/- 5°.
- 22 mm gap between the glass panels.



## Construction

### ■ Glass panels

- Use of special double glazed unit integrating a continuous u-shaped aluminium profile between the two panes of glass inside the silicone chamber for fixing to the curtain wall structure.
- The double glazing unit is fixed in place with aluminium toggles positioned at regular intervals along the nose of the aluminium grid structure and screwed into the transoms and mullions.
- The ends of the toggles are inserted into the u-shaped aluminium profiles between the two panes of double glazing unit.

### ■ Opening vents

The concealed opening vents can accommodate projecting top-hung or parallel opening windows. The same double glazing fastening system is used for opening frames. In this case, the glass panels are held onto the opening frame by special aluminium pressure blocks and can accommodate security pieces.

## Quick and easy to manufacture

- **Reduction of costs and time** in factory and on site:
  - No aluminium frames to produce and deliver to the glass manufacturer.
  - No drying/bonding time for the glass panels on the aluminium frames.
- **Glazing** fixed directly onto the curtain wall grid structure without any intermediary profile.

## Performance

- **Thermal insulation** with glazing  $U_g = 1.1 \text{ W/m}^2\text{K}$ :
  - Fixed curtain walling with 80% glazing (opaque border)  $U_{cw} = 1.5 \text{ W/m}^2\text{K}$ .
  - Fixed curtain walling with 50% glazing (120 mm insulated panel,  $U_p = 0.24$ )  $U_{cw} = 1.1 \text{ W/m}^2\text{K}$ .
- System subject to a **DTA [French technical application document]** and **ITT testing** allowing the manufacturer to use CE markings.
- **Air, water and wind resistance** in accordance with European and CWCT standards.

# GEODE Structural glazing

## Structural Sealant Glazing (SSG)

**Less visible aluminium.** The GEODE SSG systems meets the demand for glazed façades with a smooth finish and no externally visible aluminium. The glazing units panels are bonded onto the carrier frames with silicone.

**Quality assurance.** The system is manufactured and bonded in the factory by certified companies in accordance with European standards.

**Concealed opening vents.** Concealed projecting top-hung and tilt-turn opening vents up to 120 kg are available and ensure the consistent appearance of the façade.



**Patented design.** A patented hanging system facilitates onsite installation.

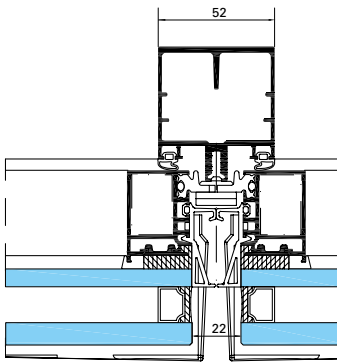
**Flat or faceted façade**  
up to  $\pm 3^\circ$ .

**The external edges of the glazed units** are arised and a 2 mm step to the outer pane allows standing water to drain away for improved weather performance.

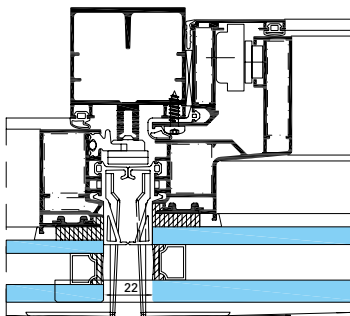
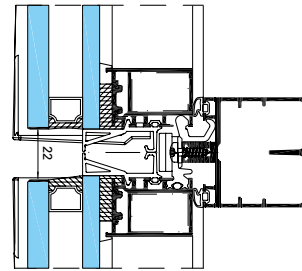
**Shadow gaskets of 22 mm between glazed panels.**

**Loads.** The glazing is supported by a patented glass security support at each corner of the carrier frame. Each fixed frame can therefore receive glass with a maximum weight of 200 kg.

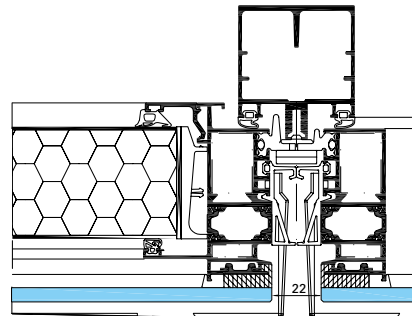
**Glazing and infills.** The GEODE SSG system can receive 6 mm glazing in front of the opaque sections, 28 mm or 34 mm for insulating glazing on opening or fixed frames or insulated panels of 54 mm.



GEODE SSG fixed frame



GEODE SSG concealed projecting top-hung opening frame



GEODE SSG insulated panel and single glass



## Construction

- **Air tightness.** An internal EPDM compression gasket assures the system's total air tightness in the form of vulcanised corners or fitted vulcanised frame gaskets.
- **Quick installation.** The SSG frames are installed onto the curtain wall grid with a patented hooking system.
- **Strong construction.** The carrier frames are mitre jointed using an epoxy-bonded and mechanically crimped corner cleat for a robust construction.

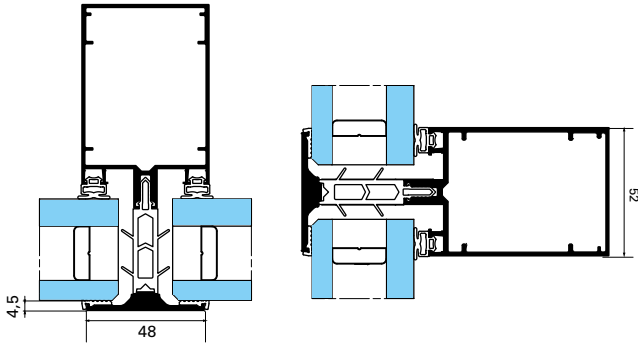
## Performance

- **Thermal insulation** with glazing  $U_g = 1.1 \text{ W/m}^2\text{K}$ :
  - Fixed curtain walling with 80% glazing (spandrel panel)  $U_{cw} = 1.8 \text{ W/m}^2\text{K}$ .
  - Fixed curtain walling with 50% glazing (insulated panel) 50 mm,  $U_p = 0.54$   $U_{cw} = 1.6 \text{ W/m}^2\text{K}$ .
- SSG subjected to **ATE and ITT testing** allowing the manufacturer to use CE markings
- **Air, water and wind resistance** in accordance with European and CWCT standards.
- **Acoustic** attenuation up to 40dB.

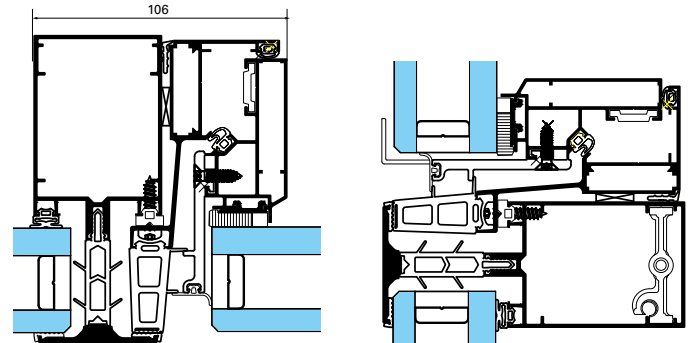
*Thermal calculations of curtain walling in accordance with EN 13947.*

# GEODE Structural glazing

## Flush Cap



Fixed frame



Top-hung open-out vent

GEODE Flush Cap is an **aesthetic and economical alternative** to structural glazing options, which allows a flush appearance across the facade.

## Features

- Black integrated cap-pressure plate
- 4.5-mm depth on the external glazing
- **Infill up to 42 mm**
- **Vertical façade**
- Convex/concave facet 90° to 135°
- **Concealed vent**, 24- or 31-mm glazing
- **SOLEAL Visible vents** (with fireman's access)
- Maximum weight: 300Kg by glazing panel



## Performances

- **ITT tests** allow CE marking
- **Weather tightness** in accordance with European standards



# GEODE

## Sloped glazing





## Features

**Uniform appearance.** These solutions offer designers the possibility to create inclined roofs, vaults, atria and pyramids that are fully compatible and visually consistent with GEODE vertical façade.

### GEODE Visible grid:

**Specially designed cap.** A special cap for the horizontal and vertical sections reduces the accumulation of water on the inclined sections.

### GEODE Trame Verticale:

**Minimal strain.** The vertical caps and a silicone seal with pressure blocks on the transoms prevent deflection of the glass under negative wind pressure.

**Glazing.** The double glazed units are manufactured using structural silicone.

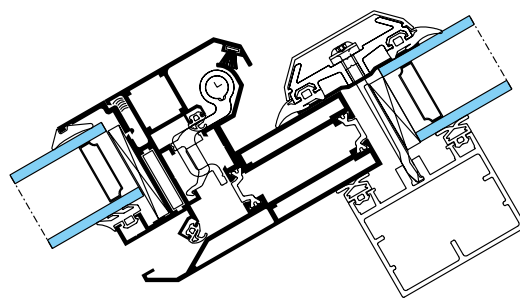
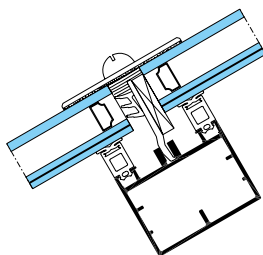
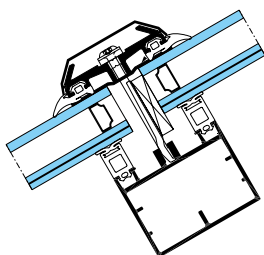
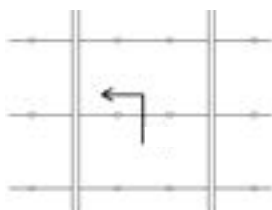
**Incline.** Minimum slope: 10° for single glazing 15° for double glazing.

## Construction

- The 8 mm to 32 mm infills are held in place with horizontal and vertical pressure plates for the GEODE Visible grid system and by vertical pressure plates and horizontal pressure blocks for the GEODE Trame Verticale.
- Design details. The rafters and transoms are square cut and assembled using the penetrating transom principle.

## Performance

- Effective drainage. Drainage takes place at the end of the transoms via the rafters.
- Resistance to climatic conditions. The weather tightness of the grid system is assured via an internal EPDM gasket and external butyl tape. The weather tightness of the GEODE Trame Verticale for the Visible Grid version is assured by EPDM gaskets and a silicone gasket on the transoms.

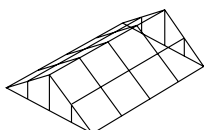


GEODE Sloped, Visible Grid

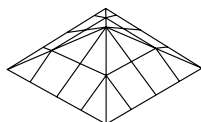
GEODE Sloped with Trame Verticale

GEODE Roof-mounted opening vent

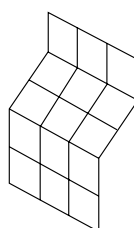
## Applications



Lantern



Pyramid



Roof light



# Performance

## Weather performance

A sample curtain wall has been tested for each of the following systems in accordance with NF standards (French standard), meeting the specific curtain wall requirements of the European standard EN 13830.

The GEODE range also meets the requirements of the CWCT standard for building envelopes. Further information is available upon request.

		GEODE	Air tightness	Water tightness	Wind resistance
TRAME	VISIBLE GRID	FIXED	A4	R7	PASS under pressure and depression-1600 and 2400 pa (sudden pressure)
		PROJECTING TOP-HUNG OPENING	A3	E1200	VC5
	TRAME HORIZONTALE	FIXED	A4	R7	PASS under pressure and depression-1600 and 2400 pa (sudden pressure)
		PROJECTING TOP-HUNG OPENING	A4	E9A	VC3
	TRAME VERTICALE	FIXED	A4	R7	PASS under pressure and depression-1600 and 2400 pa (sudden pressure)
		PROJECTING TOP-HUNG OPENING	A4	E8A	VC3
	ACOUSTIC	VISIBLE GRID	A4	E1200	PASS under pressure and depression-1600 and 2400 pa (sudden pressure)
		TRAME HORIZONTALE	A4	E750	PASS under pressure and depression-1600 and 2400 pa (sudden pressure)
		PROJECTING TOP-HUNG OPENING	A4	E1050	VC3
	GEODE 62	VISIBLE GRID	A4	R7	PASS under pressure and depression-1600 and 2400 pa (sudden pressure)
		PROJECTING TOP-HUNG OPENING	A4	E1050	VC3
	SINGLE GLAZING	VISIBLE GRID	AE	RE1650	PASS under pressure and depression-1600 and 2400 pa (sudden pressure)
TRAME HORIZONTALE		AE	RE900	PASS under pressure and depression-1600 and 2400 pa (sudden pressure)	
PROJECTING TOP-HUNG OPENING		A4	E1200	VC2	
BEADED	BEADED GLAZING	FIXED	A4	R7	PASS under pressure and depression-2400 and 3600 pa (sudden pressure)
STRUCTURAL GLAZING	MECHANICAL STRUCTURAL GLAZING	FIXED	A4	R7	PASS under pressure and depression-1200 and 1800 pa (sudden pressure)
		PROJECTING TOP-HUNG OPENING	A4	RE900	VC3
	SSG	FIXED	A4	R7	PASS under pressure and depression-2400 and 3600 pa (sudden pressure)
	FLUSH CAP	FIXED	A4	RE1200	PASS under pressure and depression-2400 and 3600 pa (sudden pressure)
PROJECTING TOP-HUNG OPENING		A4	E1200	VC3	





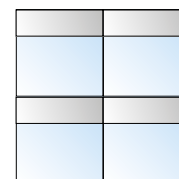
# Thermal performance

The precise performance depends on a combination of the size of the frames, the thickness of the glass, the type of infill and the options chosen. The values below are provided for indicative purposes only. Further information is available upon request.

## U<sub>cw</sub> coefficient of curtain walling without protection (W/m<sup>2</sup>.K)

		U <sub>g</sub> insulation coefficient of glazing (W/m <sup>2</sup> .K)										
		Triple glazing				Double glazing						
		0.6 + int. insulating	0.6	0.8	1.0 + int. insulating	1.1 + int. insulating	1.0	1.1	1.3	1.5	1.7	1.9
Trame	Grid				1.2	1.3	1.3	1.4	1.5	1.6	1.8	1.9
	Grid v. Acoustic	0.9	1.0	1.1	1.2	1.3	1.3	1.4	1.5	1.6	1.8	1.9
	Horizontale				1,2	1.3	1.3	1.4	1.5	1.6	1.8	1.9
	Horizontale v. Acoustic	0.9	1.0	1.1	1,2	1.3	1.3	1.4	1.5	1.6	1.8	1.9
	62 Grid	0.9	1.0	1.1	1,2	1.3	1.3	1.4	1.5	1.6	1.8	1.9
Structural Glazing	MSG*				1.4	1.5	1.5	1.6	1.7	1.8	2.0	2.1
	SSG							1.8	1.9	2.1	2.3	2.4
Beaded	Beaded glazing							1.7	1.9	2.1	2.2	2.4

100% glazed on the inside:  
transparent glazed section +  
opaque spandrel panel  
2 frames per level:  
W = 1.35 m x H spandrel =  
0.70 m + transparent glazing  
= 2.50 m.  
insulating, extruded  
polystyrene, 50 mm thick  
(U<sub>p</sub> = 0.54)

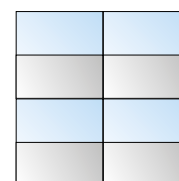


\* insulator ACERMI 40 mm (U<sub>p</sub> = 0.66)

## U<sub>cw</sub> coefficient of curtain walling without protection (W/m<sup>2</sup>.K)

		U <sub>g</sub> insulation coefficient of glazing										
		Triple glazing				Double glazing						
		0.6 + int. insulating	0.6	0.8	1.0 + int. insulating	1.1 + int. insulating	1.0	1.1	1.3	1.5	1.7	1.9
Trame	Grid				1.1	1.1	1.1	1.2	1.3	1.3	1.4	1.5
	Grid v. Acoustic	0.9	1.0	1.0	1.1	1.1	1.1	1.2	1.3	1.3	1.4	1.5
	Horizontale				1.1	1.2	1.2	1.2	1.3	1.4	1.5	1.6
	Horizontale v. Acoustic	0.9	1.0	1.1	1.1	1.1	1.2	1.2	1.3	1.4	1.4	1.5
	62 Grid	0.9	1.0	1.1	1.1	1.1	1.1	1.2	1.3	1.3	1.4	1.5
Structural Glazing	MSG*				1.3	1.4	1.4	1.4	1.5	1.6	1.7	1.7
	SSG							1.6	1.7	1.8	1.9	2.0
Trame	Beaded glazing							1.5	1.6	1.7	1.8	1.8

60% glazed on the inside:  
glazed transparent section  
+ opaque curtain wall  
2 frames per level  
W = 1.35 m x H transparent  
glazing = 1.50 m + curtain  
wall = 1.00 m. 50 mm thick  
extruded polystyrene  
insulator (U<sub>p</sub> = 0.54)



\* insulator ACERMI 40 mm (U<sub>p</sub> = 0.66)



1



2



3

1. Architect: Luis Pérez Salamanca Photography: Technal
2. Architects: Cabinet BROCHET LAJUS PUEYO Photography: ABBADIE Hervé
3. Architects: TETRARC Photography: Stéphane Chalmeau

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