

# TRIMO Q-Air



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# A NEW GENERATION OF GLASS FAÇADES

## Unitised single skin for double skin performance

Q-Air is a unique single skin glass façade that offers all the performance and benefits of an active double skin façade. A premium unitized glass curtain wall system, Q-Air uses an innovative, multi-chamber insulating core, which delivers exceptional energy efficiency, living comfort, aesthetics and economic benefits. Q-Air is available in transparent, translucent and opaque glass options.



### Q-Air best-performing glass curtain wall:


- Exceptional energy efficiency and living comfort
  - $U_{cw} \geq 0.30 \text{ W/m}^2\text{K}$
  - $g = 0.09 - 0.34$
  - $LT = 0.10 - 0.56$
- The thinnest glass curtain wall with the highest thermal insulation
- Flush internal and external face available
- Increased usable building space
- Unique 3- to 6-chamber unitized glass system

# SUPERIOR ENERGY EFFICIENCY

## Thermal and visual performance

Q-Air is the only glass curtain wall system in the world, which provides superior energy efficiency whilst maximizing the prevention of excessive solar heat gain and delivering unimpeded visual contact with the environment.

Q-Air glass curtain wall compared to conventional glass curtain wall

 Q-Air provides up to 30 % of energy savings.

### Q-Air glass curtain wall:

Q-Air 6 chambers

(QATT6):

$U_{cw} \geq 0.30 \text{ W/m}^2\text{K}$

$g = 0.09 - 0.19$

$LT = 0.10 - 0.33$

Q-Air 5 chambers

(QATT5):

$U_{cw} \geq 0.43 \text{ W/m}^2\text{K}$

$g = 0.10 - 0.27$

$LT = 0.11 - 0.40$

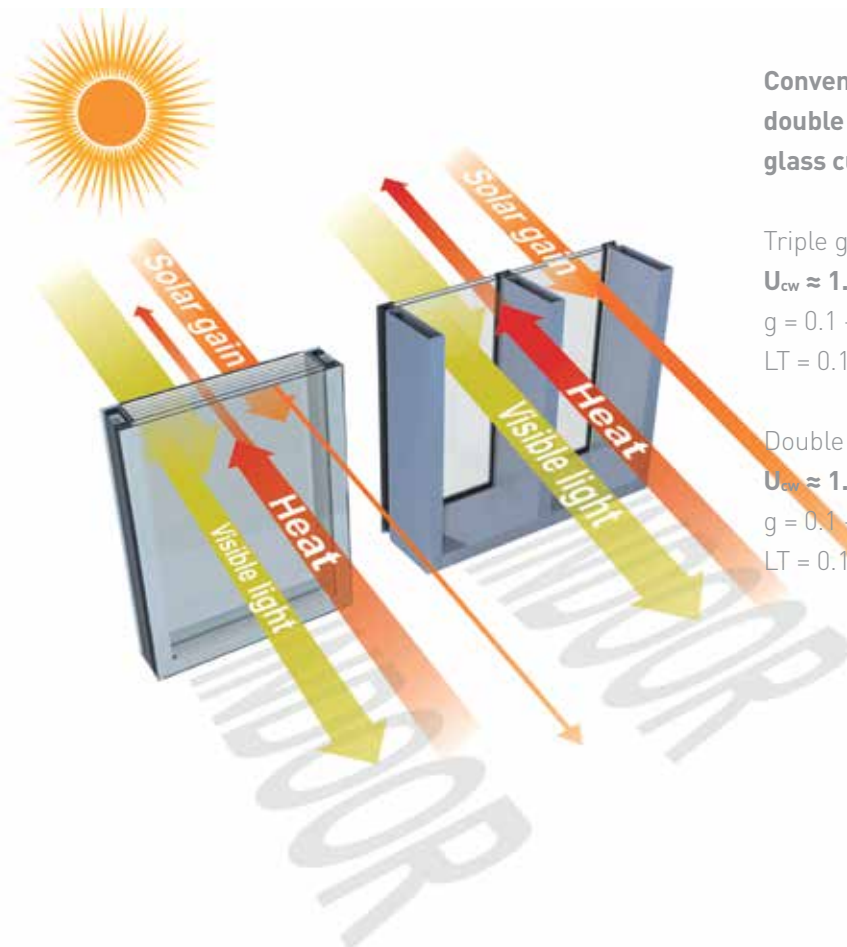
Q-Air 3 chambers

(QATT3):

$U_{cw} \geq 0.62 \text{ W/m}^2\text{K}$

$g = 0.12 - 0.34$

$LT = 0.14 - 0.56$



### Conventional double and triple glass curtain wall:

Triple glass (TG):

$U_{cw} \approx 1.0 \text{ W/m}^2\text{K}$

$g = 0.1 - 0.5$

$LT = 0.1 - 0.65$

Double glass (DG):

$U_{cw} \approx 1.5 \text{ W/m}^2\text{K}$

$g = 0.1 - 0.6$

$LT = 0.1 - 0.75$

## Fully transparent low-energy building solution

With Q-Air a low-energy building of an annual energy consumption as low as 25 kWh/m<sup>2</sup> can be achieved using no exterior solar shading and with 100% transparent Q-Air curtain wall. This is unmatched with any other single skin glass façade systems.

### Thermal / thickness ratio

Q-Air was developed to provide exceptional thermal performance in a consistent minimal wall thickness. All elements within the façade are designed to integrate into the system within the consistent and controlled façade zone.

Q-Air transparent compared to conventional double/triple glazed curtain wall (DG/TG)



Q-Air provides up to 30 % thinner wall, compared to average double/triple glazing system.



Q-Air transparent compared to conventional double skin glass façade (DSGF)



Q-Air enables up to 4 times thinner wall compared to DSGF.



# ULTIMATE AESTHETICS

## Fully structural glazed surfaces

High aesthetics and multiple design possibilities allow Q-Air to meet the widest architectural ideas and aspirations as it uniforms large, fully structural glazed surfaces on both sides without any external shading devices.

Q-Air, available as a structural external and internal face without any visible frames, emphasizes an attractive flat architectural solution.

## Decorative glass

Q-Air offers an extensive choice of decorative and design options. The standard configuration can be either transparent, translucent or opaque glass.

A variety of float, laminated, toughened, coloured and/ or enamelled glass is available in addition to the option of screen and digital printed glass.



### **Q-Air architectural curtain walling:**

- Structural, flush interior and exterior look available
- Light transmission options - transparent, translucent or opaque
- Extensive choice of decorative glass options
- No external solar shading systems needed



# LIVING AND WORKING COMFORT

Q-Air is designed to provide maximum comfort for its occupants with exceptional:

- Thermal comfort
- Visual comfort
- Sound comfort

## THERMAL COMFORT

### Highest thermal insulation and no excessive solar heat gain

Q-Air provides state-of-the-art thermal performance for the entire building envelope through-out the year. Q-Air transparent and translucent optimally utilizes solar energy without any need for external solar shading systems, since the high thermal insulation of Q-Air and low solar heat gain provide optimal and constant building thermal performance.

Using Q-Air, seasonal climate peaks for highly glazed buildings are perfectly managed:

- Winter: Due to high thermal insulation level (low U value), energy loss in winter is low and low solar heat gain (low g value) is sufficient. That's why less energy for heating is consumed.
- Summer: Due to low solar heat gain (low g value), no excessive solar heat gain appears and less energy for air conditioning is consumed.

### Constant indoor temperature

Q-Air provides constant thermal comfort by keeping the temperature at a stable level at all times. Benefiting from constant thermal comfort, personal well-being and productivity are improved. Due to low solar heat gain and high thermal insulation level, temperature oscillations of the room are very low.



#### **Q-Air best-performance in winter:**

- High insulation level (low U value)
- Low energy loss
- Low energy consumption for heating



#### **Q-Air best-performance in summer:**

- High insulation level (low U value)
- Optimal solar heat gain
- No overheating
- Low energy consumption for air conditioning





## VISUAL COMFORT

### Panoramic glazing

Everyone benefits from receiving as much natural light as possible. Q-Air manages solar heat gain, thermal and light transmittance so perfectly that a fully transparent glazed area is achievable whilst fulfilling the building regulations for thermal insulation and total energy consumption of the building. Building regulations for conventional glass curtain wall systems typically lead to the minimising of transparent areas of the façade by as much as 70 %, at which point visual comfort is affected. Q-Air enables full panoramic glazing for maximised visual comfort.

Q-Air compared to conventional glass curtain wall system at the same Ucw value



| Q-Air glass curtain wall



| Conventional glass curtain wall

### No obstruction with external solar shading devices

Q-Air is a total performance glass curtain wall system, which doesn't need any external solar shading devices that are commonly used with conventional glass curtain wall systems.

Q-Air provides peace of mind for occupants, owners and maintenance providers, because no complex automated or mechanical external solar shading devices are required to be regularly operated, maintained and also replaced.

## SOUND COMFORT

Q-Air provides an excellent working and living environment with superior noise control inside a building with sound insulation levels up to 60 dB.





# SINGLE SKIN FOR DOUBLE SKIN PERFORMANCE

Q-Air, as a unique single skin glass façade, offers all the performance and benefits of an active double skin façade, which means it contributes significantly to lower energy consumption, investment benefits and maintenance savings.

## **Energy savings up to 30 %**

Q-Air enables energy savings up to 30 % and significantly contributes to exceptional energy efficiency of the building, because the highest thermal performance contributes to lowest energy consumption during the whole lifetime of the building. Thermal performance of Q-Air is at least double that achieved by triple glazed conventional glass curtain wall systems. Even large transparent Q-Air, with up to 100% panoramic glazing, consumes low levels of energy.

## **Usable space gain up to 5 %**

Q-Air is the thinnest glass curtain wall system with the highest thermal performance. Up to 5 % of usable space is gained compared to conventional glass curtain wall systems, which can be a highly attractive feature for heavily urbanised locations with space limitations, real estate developers and other investors wanting to gain more value per-square-metre.

## **No cost for solar shading devices**

Based on the world class performance of Q-Air there is no need for external solar shading devices, which are conventionally used with other single or double skin glass facades. This means, that Q-Air saves on the total cost for external mechanical or automated solar shading devices.

## **Low maintenance**

Q-Air, as a complete, prefabricated system with no need for external solar shading devices, provides significant maintenance benefits. There is no maintenance and no requirement to educate occupants about how to use them.

## **Short construction time**

Q-Air, is factory engineered and produced in a controlled environment, and is designed for fast, clean and efficient installation. This means the building can be brought into commission earlier and can begin more quickly returning on its investment. The use of an integrated curtain wall system requires only a limited number of subcontractors on site. Using proven modular unitized principals, each unit is installed from inside the building.





# ACTIVE SUSTAINABILITY

Q-Air is the perfect choice for architects, developers and investors looking to provide the best-performing sustainable building in a highly desirable glass appearance - even 100 % panoramic glazing is now available. Q-Air system assures the highest energy efficiency and provides an excellent living and working environment. Additionally, as much as 96 % of the entire curtain wall system is recyclable as well as being constructed from environmentally and people friendly materials.



### Q-Air assures sustainable benefits:

- Greater transparent-to-opaque glazed area ratio, up to 100%
- Exceptional energy savings
- Unrivalled combination of key performance criteria (g, U, LT)
- High recyclability
- Investment and maintenance benefits

### ENERGY PERFORMANCE RATINGS

Thermal insulation $U_{cw} \geq 0.30 \text{ W/m}^2\text{K}$	Solar heat gain (g value) 0.09 – 0.34
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### ADDITIONAL PERFORMANCE RATINGS

Light transmittance 0.10 – 0.56	Sound insulation 43 – 60 dB
Recyclability 96 %	Water tightness 900-1500 Pa







# SYSTEM

Q-Air is the only glass curtain wall system available, which uses state-of-the-art engineering to achieve the highest performance level.

Q-Air curtain wall system consists of a series of factory-engineered opaque, translucent and transparent insulated sandwich glass units, which are manufactured using advanced structural glazing technology that provides recessed joints throughout.



## **Complete answer to curtain wall systems:**

- Transparent, translucent and opaque units
- Integrated substructure
- Sealing and fixing elements
- Architectural details
- Corner elements
- Integrated windows and doors



# UNIT SELECTION

To provide a complete building envelope solution for any building type or application, such as offices, hotels, sport & leisure facilities, retail centres, libraries, museums, educational and health facilities, Q-Air is available in transparent, translucent and opaque options. If windows, doors and other elements are needed, Q-Air integrates and combines all.

## Unit options

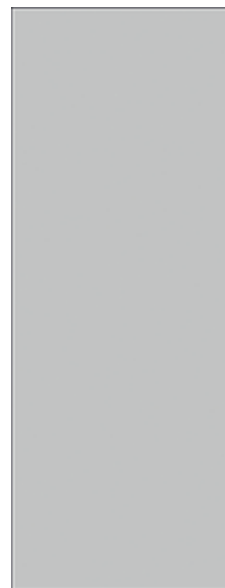
Q-Air unit options and combinations:



| Transparent



| Translucent



| Opaque



| Combination unit

\* Combination unit can be composed of transparent, translucent and opaque option or integrates window.

## Structural supporting system

Q-Air curtain wall offers two structural supporting system options:

- Polymer extrusion profile
- Aluminium extrusion profile

Polymer extrusion profile is the perfect choice for achieving the highest design and demanding thermal insulation levels for the building envelope. A completely integrated substructure using Q-Air unit and spanning from floor-to-floor enables structural, flush interior and exterior look.

Aluminium extrusion profile is the perfect choice for combinations, e.g. when Q-Air unit is used with window and when the highest serviceability limit states must be satisfied.

Q-Air transparent



Q-Air translucent



**Unrivalled performance of transparent system:**

- Energy efficiency:  $U_{cw}$  value  $\geq 0.30$  W/m<sup>2</sup>K
- Solar heat gain: g value = 0.09 – 0.34
- Natural light: LT value = 0.10 – 0.56
- Acoustics: 43 – 60 dB



**Unrivalled performance of translucent system:**

- Energy efficiency:  $U_{cw}$  value  $\geq 0.30$  W/m<sup>2</sup>K
- Solar heat gain: g value = 0.09 – 0.34
- Natural light: LT value = 0.10 – 0.56
- Acoustics: 43 – 60 dB

## Q-Air opaque



### Unrivalled performance of opaque system:

- Energy efficiency:  $U_{cw}$  value  $\geq 0.28$  W/m<sup>2</sup>K
- Acoustics: 46 - 60 dB
- Fire resistance: EI 60 - 120

## Q-Air combination unit

Q-Air enables different combinations and integrations, where Q-Air transparent, translucent and opaque units can be combined or Q-Air unit integrate with window or connects to other elements or systems - doors and other elements.

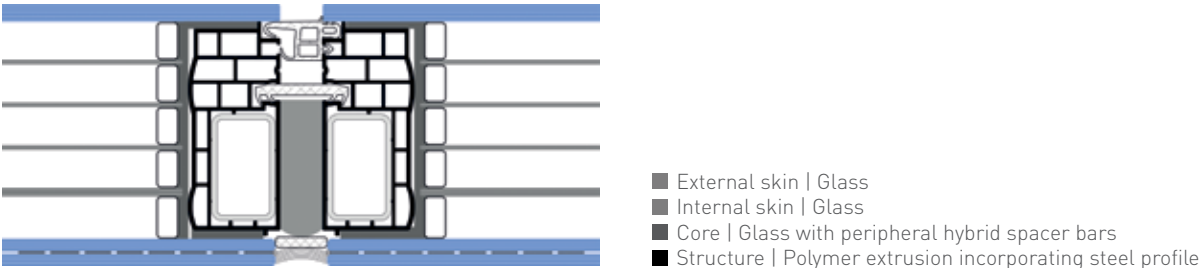


### Q-Air transparent and translucent system

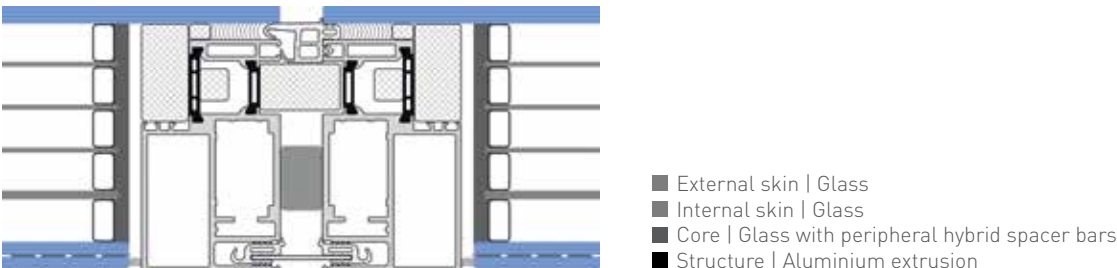
Q-Air, in either transparent or translucent options, is uniquely composed as a three, five or six chamber insulating sandwich glass system to provide exceptionally high thermal performance and visual comfort.

External skin is made of toughened or toughened laminated glass with special optical properties. Internal skin can be either a single glass plate, laminated safety glass or additionally integrated with gas-filled insulating glass unit (IGU). Structural supporting system can be either fully integrated polymer extrusion, which incorporates steel profile or aluminium extrusion.

Material composition of transparent and translucent system with polymer extrusion profile:



Material composition of transparent and translucent system with aluminium extrusion profile:

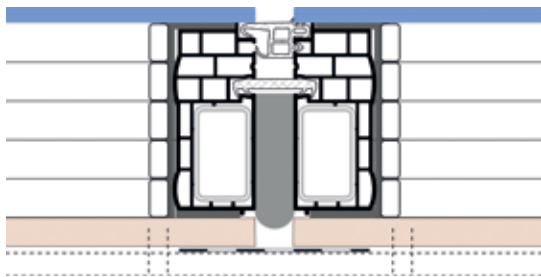




## Q-Air opaque system

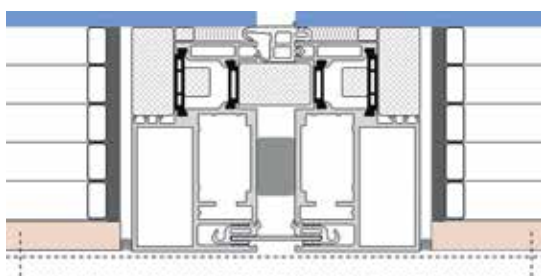
Q-Air opaque option is a unique five chamber insulating sandwich system integrated with exterior glass and interior gypsum skin. Structural supporting system can be either fully integrated polymer extrusion, which incorporates steel profile or aluminium extrusion. The totally integrated gas-filled system delivers the ultimate level of thermal insulation for the highest energy efficiency, but still incorporates no solid insulation.

Material composition of opaque system with polymer extrusion profile:



- External skin | Glass
- Internal skin | Reinforced gypsum
- Core | Aluminium foil chambers with peripheral hybrid spacer bars
- Structure | Polymer extrusion incorporating steel profile
- ⋮ Interior decorative finish\*

Material composition of opaque system with aluminium extrusion profile:



- External skin | Glass
- Internal skin | Reinforced gypsum
- Core | Aluminium foil chambers with peripheral hybrid spacer bars
- Structure | Aluminium extrusion
- ⋮ Interior decorative finish\*

\* Not in the product scope

## MAXIMISED INSTALLATION EFFICIENCY

Q-Air is designed for fast, clean and efficient installation. Based on proven modular unitized principals, each unit is installed from inside the building eliminating the need for external access. All elements of the Q-Air system, including all seals and accessories are designed as modular units to ensure total integration and a flush façade with recessed joints.



| Q-Air installation





# TECHNICAL SPECIFICATION

	Test method	Transparent/Translucent	Opaque
<b>External skin</b>		Glass	Glass
<b>Internal skin</b>		Glass	reinforced gypsum board
<b>Insulation core system</b>		QATT3: 3 chambers (3-chamber core) QATT5: 5 chambers (5-chamber core) QATT6: 6 chambers (5-chamber core + additional IGU)	QAO: 5 chambers
<b>Unit thickness (mm)</b>		117 - 149	124 - 137
<b>Modular width (mm)</b>		850 - 1250	500 - 1250
<b>Modular height (mm)</b>		850 - 4000	300 - 4000
<b>Weight (kg/m<sup>2</sup>)</b>	/	55 - 125	40 - 75
<b>U<sub>cw</sub> value – thermal transmittance</b> (W/m <sup>2</sup> K), across the whole modular unit	EN ISO 12631:2012	0.30 – 0.62 for the complete system at unit size 1250 x 4000 mm	0.28 for the complete system at unit size 1250 x 4000 mm
<b>U value – thermal transmittance</b> (W/m <sup>2</sup> K), centre of glass value	EN 673:2011	0.21 – 0.49	0.19
<b>g value – solar heat gain coefficient</b>	EN 410	0.09 – 0.34	/
<b>LT - light transmittance</b>	EN 410	0.10 – 0.56	/
<b>Rw – sound insulation (dB)</b>	EN ISO 10140-3	43 - 60	46 - 60
<b>Water permeability</b> (resistance to driving rain under pulsating pressure)	EN 12865	900 - 1500 Pa	900 - 1500 Pa
<b>Air permeability (n; C [m<sup>3</sup>/Pa*s])</b>		0.1 m <sup>3</sup> / m <sup>2</sup> /hr at 50 Pa	0.1 m <sup>3</sup> / m <sup>2</sup> /hr at 50 Pa
<b>Wind load resistance (kPa)</b>		Minimum 1.25 at L/400 at unit size 1250 x 4000 mm	Minimum 1.25 at L/400 at unit size 1250 x 4000 mm
<b>Reaction to fire</b>	EN 13501-1	B-s1, d0	B-s1, d0
<b>Fire resistance</b>	EN 13501-2	NPD	EI 60
<b>Recyclability (%)</b>		96	96

STS-11/0023 National Technical Approval

For individual solutions and project specific data contact Trimo Technical Support.



Energy  
efficiency



Living  
comfort



Natural  
illumination



Sound  
insulation





## SUPPORT AND CONSULTING



From an initial idea to the final implementation: Q-Air team supports you throughout every phase of your architectural project. Q-Air expert team is a partner you can count on to provide comprehensive support throughout the entire duration of your project: from planning and purchasing to project management and creation, as well as flawless implementation.

Individual solutions: Q-Air expert team provides you with special product solutions designed to perfectly suit your project.

Support and consulting:

t: + 386 (0)7 34 60 057

e: [q-air@trimo-group.com](mailto:q-air@trimo-group.com)

# COMPANY PROFILE

Q-Air is a product brand of Trimo.

Trimo is one of the leading providers of building envelope solutions. With over 50 years of experience and worldwide realized projects, its engineering, production and sales teams provide efficient, innovative and sustainable solutions to meet your demands.

Trimo sells its products and services under its own brand across more than 50 countries worldwide. Trimo has a sales network in more than 25 countries and has production facilities in Slovenia and Serbia.

Trimo's product brands:



| Q-Air, Glass Curtain Wall System



| Trimoterm, Fireproof Roofs and Façades



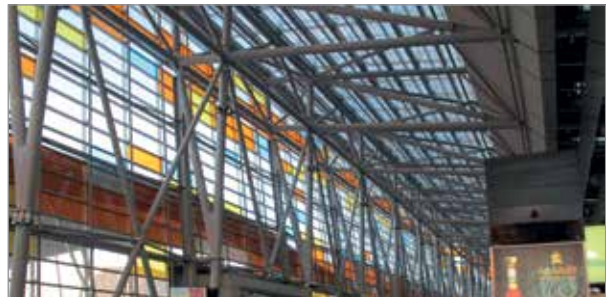
| Qbiss One, Metal Modular Façade System



| Trimo Modular Space Solutions



| Qbiss One with ArtMe, Design Solution



| Trimo Steel Construction



Wergelandsveien Office Building Refurbishment





Q

Location: Oslo, Norway  
Year of completion: 2016  
Architect: MAP Arkitekter AS  
Product: Q-Air



# PROJECTS

## Belimed Office and Industrial Building





Location: Slovenia  
Year of completion: 2012  
Architect: Savaprojekt, d.o.o.  
Product: Q-Air and Qbiss One

**KJG Business Centre**





Location: Bratislava, Slovakia  
Year of completion: 2015  
Architect: Bouda a Masár,  
architektonická kancelária s.r.o.  
Product: Q-Air and Qbiss One



Kindergarten Mavrica





Location: Slovenia  
Year of completion: 2011  
Architect: Prinic + Partners  
Product: Q-Air



**Exhibition Pavilion**





 Location: Slovenia  
Year of completion: 2012  
Architect: Q-Air design team  
Product: Q-Air

Hospital





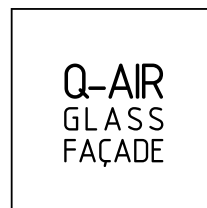
Q  
Project concept  
FYR Macedonia  
Product: Q-Air





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INNOVATION IN ACTION

Q-Air represents a new generation of glass façades and is recognised by the European Commission for being highly innovative, energy efficient, sustainable and for its technological performance, which impacts positively across architecture, building construction, refurbishment and wider society.



Co-funded by the  
European Union

This project has received funding from the European Union's Horizon 2020  
research and innovation programme under grant agreement No 737757.