

UNITISED ELEMENT FAÇADES

CW 65-EF & CW 86-EF



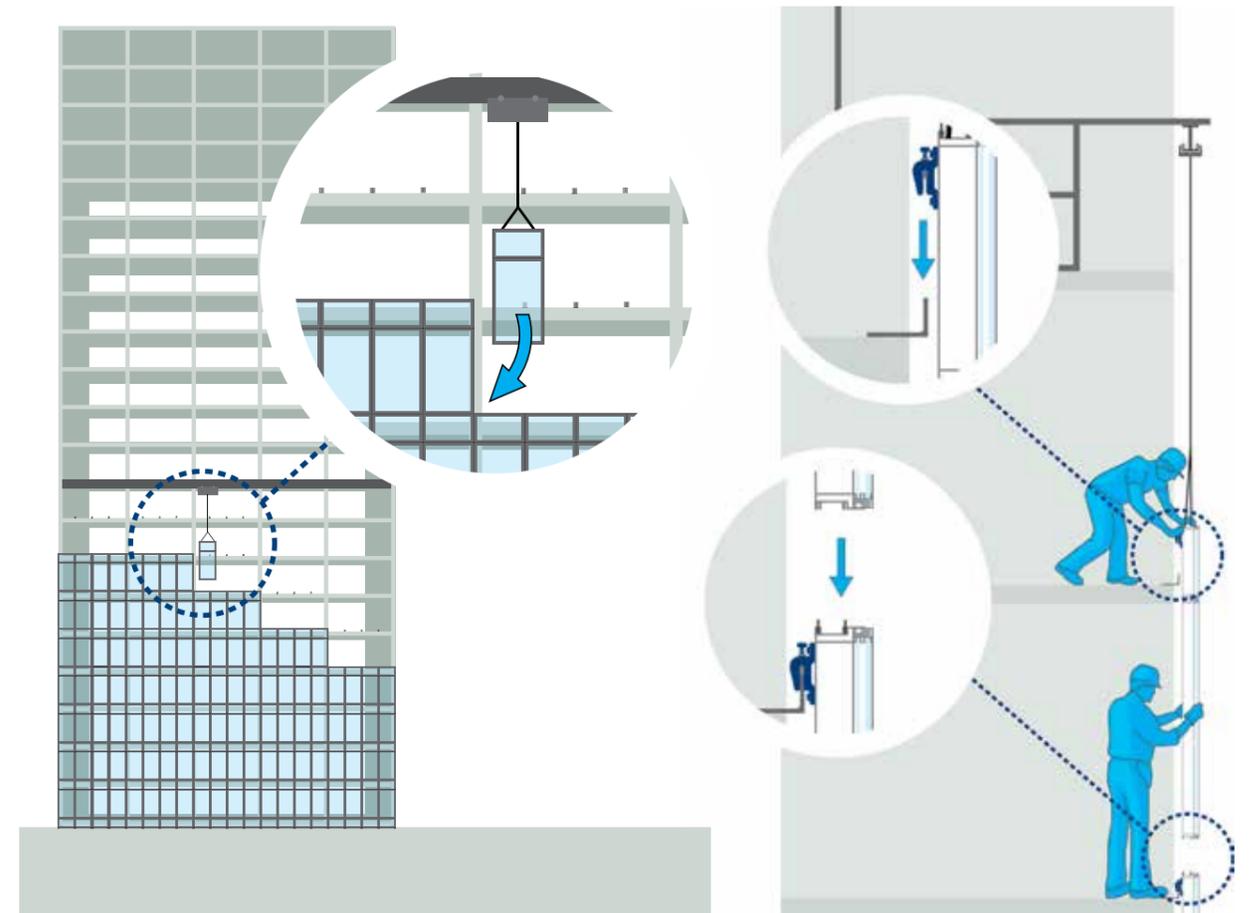
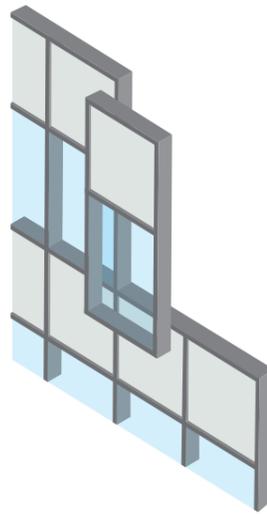
Reynaers Campus - Duffel, Belgium. CW 86-EF/SG
Architect: Jaspers Evers Architects
Photo: Philippe Van Gelooven

ELEMENT FAÇADE OR UNITIZED FAÇADE

The concept of an element, or unitized façade is inspiring due to endless possibilities in design freedom whilst keeping a high quality finished product due to pre-fabrication. Element façades are composed out of individual pre-fabricated elements. This results in a fast and economic installation with limited use of resources in manpower and tooling compared to traditional curtain walls. This construction principle is extremely suitable for high rise constructions, allowing for the necessary tolerances with regard to the building movement, and giving the opportunity to finish the building construction floor by floor allowing for parallel construction inside the building.

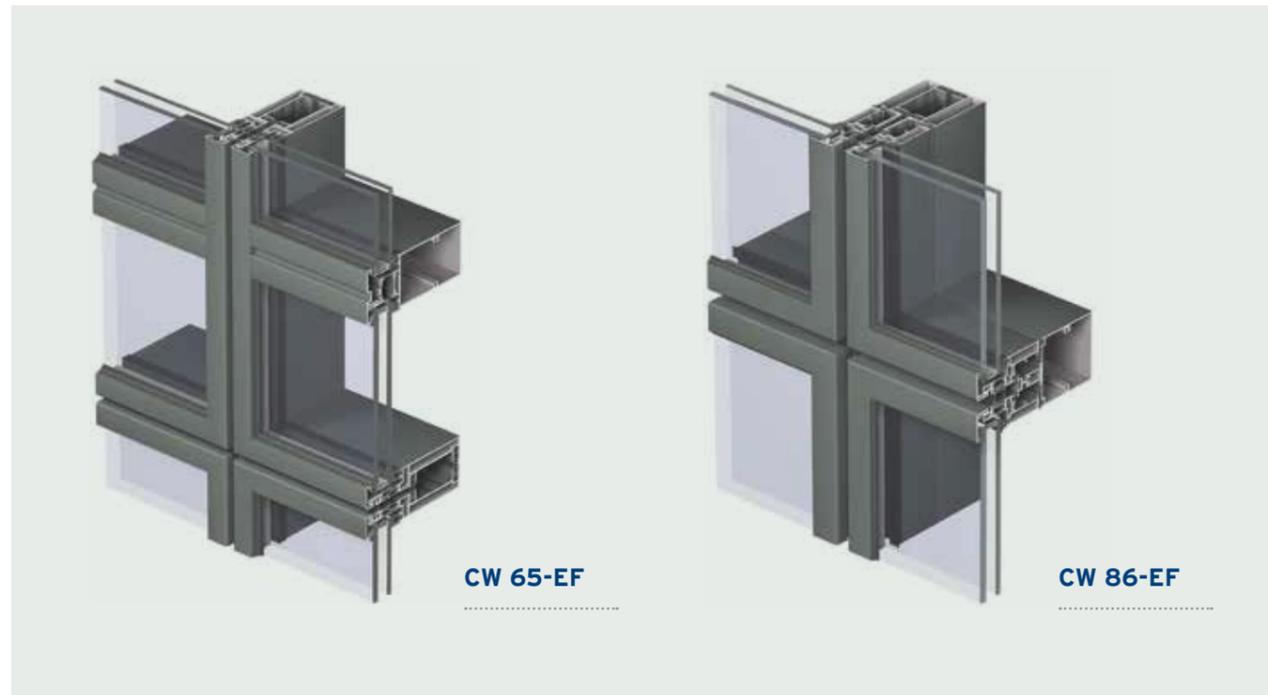
Element façades are available in a wide range of standard solutions, however sometimes standard isn't good enough. Sometimes your projects need a specific solution to suit the needs and requirements of that particular construction. Element façades can be easily tuned to suit those requirements which will enable you to get the required result combined with the ease of installation typical to element façades.

Element façades will also provide the architect with an almost unlimited design freedom with regard to integration of different finishing and by incorporating different techniques. Possibilities going from high insulated structures, ventilated façades, double skin façades with automatic sun shading, automatic opening windows, to linking the techniques with building maintenance systems.



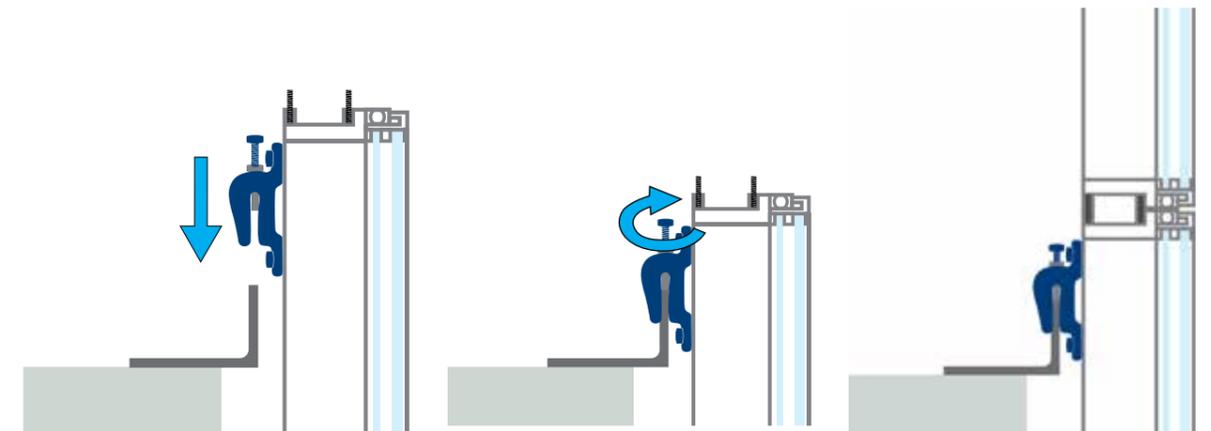
Possible installation solution

Standard element installation



CW 65-EF

CW 86-EF

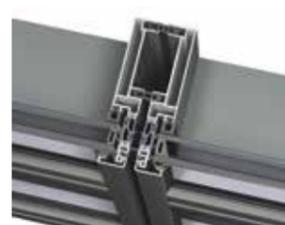


Detail of standard bracket functionalities



CW 65-ELEMENT FAÇADE

Unitised façade system with maximum transparency



CW 65 mullion profile

CW 65 transom profile



THE STANDARD ELEMENT FAÇADE

Reynaers' CW 65-EF is the perfect solution for a project that needs a flexible yet simple solution. With a concept that is easy to follow and execute but still customizable, CW 65-EF is the solution to your Curtain Wall projects.



SYSTEM INFORMATION

Curtain Wall 65-Element Façade is a cost efficient curtain wall system for element façades with unique slender aesthetics, without compromising the extreme strength and stability required in high-rise constructions.

The high productivity, typical for an element façade, embraces architectural aesthetics as the CW 65-EF works with slender profiles of only 65 mm.

CW 65-EF meets the highest performance requirements in water- and air tightness and wind load resistance. The curtain wall system is available in different insulation levels, answering to the appropriate insulating requirement of the building. It also offers the possibility to integrate triple glazing.

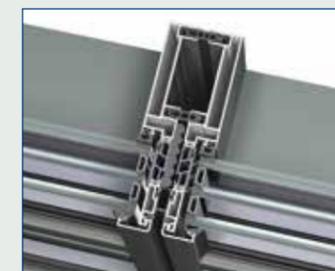
CW 65-EF is available in two glazing variants, with unique aesthetical features: the first variant holds the glass using glazing beads, while the glass of the Structural Glazing (CW 65-EF/SG) variant is structurally bonded, offering a complete glass surface at the outside of the building. To fully answer all needs of the building, CW 65-EF can integrate opening elements, such as a top hung and parallel opening windows.

TECHNICAL CHARACTERISTICS*



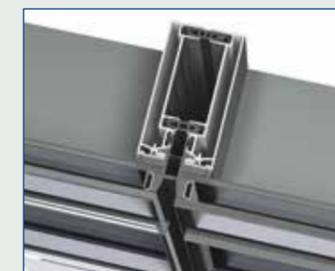
CW 65-EF

Our standard solution offers up to 36 mm thick glass and can hold up to 300 kg glass weights. The maximum dimensions are 1.600 mm x 3.700 mm. The system supports all Reynaers Aluminium systems, as well as Top hung windows and Parallel Opening windows.



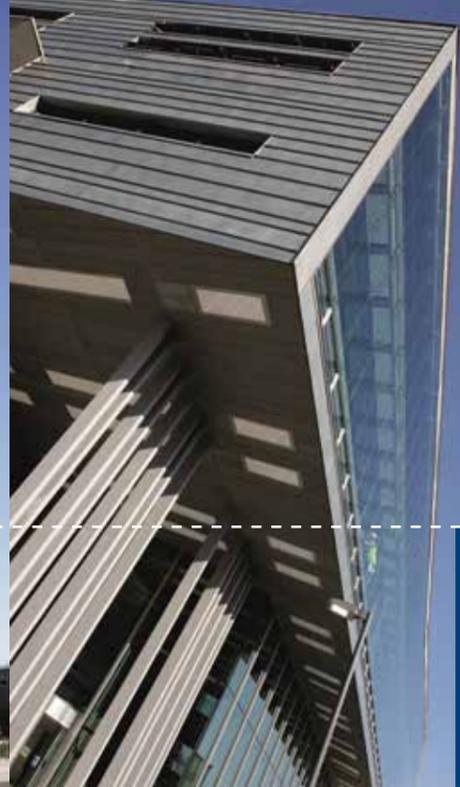
CW 65-EF/Hi

The high insulation CW 65 variant is suitable for triple glass up to 63 mm thick. This variant can also hold up to 300 kg glass weights, with maximum dimensions at 1.550 mm x 3.500 mm.



CW 65-EF/SG

CW 65-EF also offers a Structurally Glazed version, capable of holding up to 40 mm thick glass. Maximum glass weights are 250 kg per glass. The maximum dimensions are 1.600 mm x 3.700 mm.



NUI GALWAY ENGINEERING DEPARTMENT

An impressive entrance to the NUIG north campus

This substantial building completed on the campus of the **National University of Ireland, Galway** (NUIG) in 2011 has a dramatic, landscape setting. Like many universities in Ireland, the buildings of NUIG typically sit as distinct villa blocks in a leafy, almost suburban landscape, in defined areas at the edges of main cities. This is no exception. The building, designed by RMJM Architects in Scotland, in association with Taylor Architects in Ireland is sensitive to its surroundings but still aims to assert itself just enough to act as a gateway to the NUIG north campus.

The building is thought of as a new engineering 'house', giving united homes and rooms to the five engineering departments in the University - namely Civil, Electronic, Industrial, Mechanical and Biomedical Engineering as well as Hydrology. With a large community of over 1,100 students and 100 staff, this ensures that the four-storey, glass and zinc clad building always feels lively and busy, from inside and out, and at the cutting edge of thinking, research and innovation in engineering. This ambition to have the act of learning facilitated by the building organisation is further reflected in the design and construction of the building.

PROJECT INFORMATION

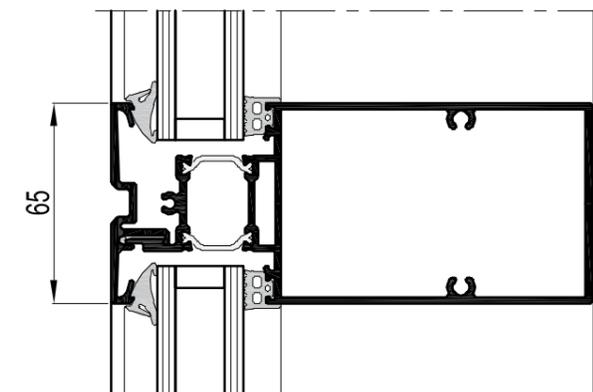
GENERAL INFORMATION

Location : **Galway, Ireland**
 Architect : **RMJM Architects, Scotland & Taylor Architects, Ireland**
 Contractor : **BAM Construction**
 Investor : **National University of Ireland, Galway**
 Fabricator : **Duggan Systems Ltd., Patrickswell**
 Reynaers Aluminium systems : **CW 65-EF, CW 50 & CW 50-SC**

ENVIRONMENTAL ASPECTS

- Twin-skin climate façade
- Natural ventilation
- Night purging
- Thermal storing mass
- Exposed slabs

Natural ventilation is a key feature of the building and its simple potential is very apparent on the riverside façade. Here the Reynaers Aluminium **CW 65-EF**, unitized façade system is employed to great effect. A desire for speed of erection on site and quality control prompted the architects to use this solution as it allowed much of the façade to be pre-assembled off site, at the workshops of Duggan Systems, in nearby Limerick. A substantial 1,150 m² of the CW 65-EF façade were successfully installed in an astonishing two weeks as a result of being freed from weather, access and other constraints. The resulting façade is clean, open and transparent and looks particularly dramatic at night, when the rooms show their colourful interiors to the riverside.



ETOPIA CENTRE FOR ART AND TECHNOLOGY

The new creative centre in Zaragoza

Etopia, Centre for Art and Technology (Centro de Arte y Tecnología) in Zaragoza, Spain, is welcoming and light and at the same time solid and modern. It is an open space where artists, engineers, and the general public can come together. The architecture bureau MCBAD/Colomer Dumont has designed an expressive building merging research, art, economics, communication, culture, and technology.

Even the building's location is outstanding. Etopia is part of La Milla Digital (the Digital Mile), an agglomeration of developments and activities in the field of digital media technology which connects the centre of Zaragoza with the former international exposition grounds.

Three large two-storey areas have been created within the building's 16,000 m² of floor space, immediately making clear that this building is a space for meeting with others. It is an open area where everyone, from business people to artists to engineers can hold workshops, think tanks and training sessions in order to develop and share ideas.

PROJECT INFORMATION

GENERAL INFORMATION

Location : **Zaragoza, Spain**
Architect : **MCBAD/Colomer Dumont, Paris-Valencia**
Investor : **Ayuntamiento de Zaragoza**
Contractor : **UTE Sacyr, S.A.U.- Marcor Ebro, S.A., Zaragoza**
Fabricator : **Euroscsa, Huesca**
Reynaers Aluminium systems : **CW 65-EF bespoke solution, CW 50-SC, CS 77, CS 68-HV**

MAIN ELEMENTS

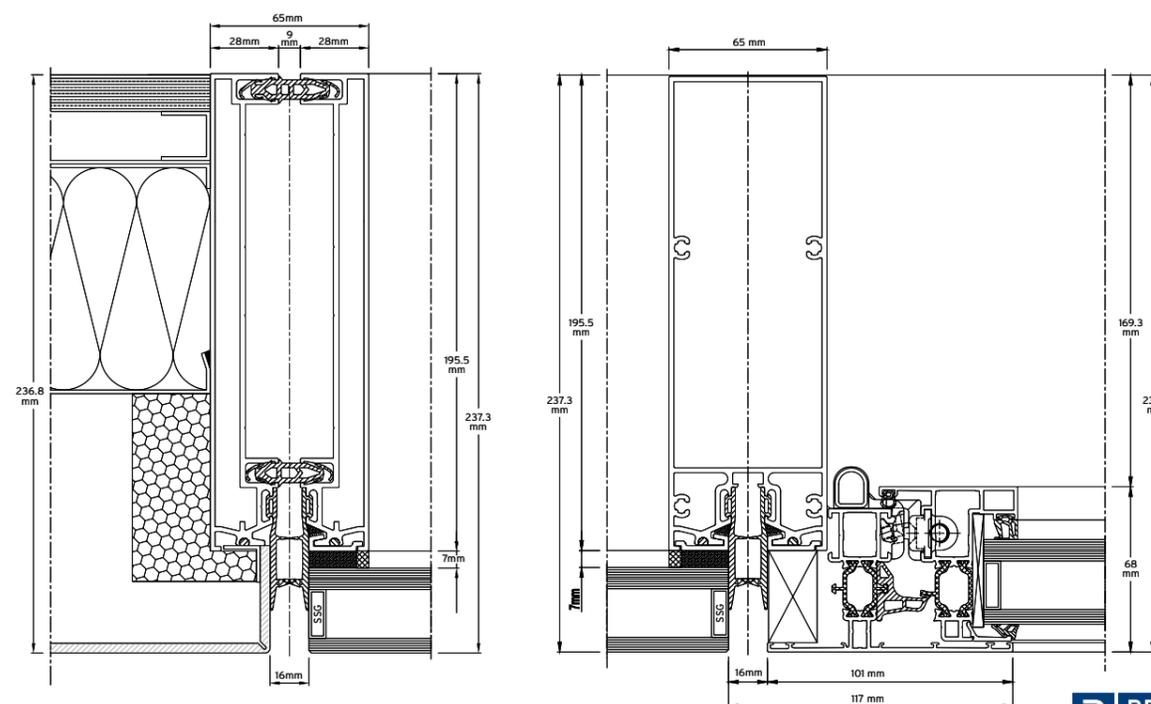
- 2,800 m² exhibition hall divided into 2 showrooms & an Art Lounge
- Individual workshops
- Media Lab
- Meeting rooms, 4 company workshops, 4 fabrication laboratories and an electronics laboratory
- Training rooms for up to 100 people



For the project, Reynaers Aluminium developed a bespoke solution based on the **CW 65-EF** unitised façade, but with greater depth in order to maintain the same narrow 65 millimetre width. The large panels stretch from floor to floor and in order to fixate the profiles properly, a special anchor was designed, to have the hook bracket connected in front of the floor slab. All in all, the elegant façades with their quiet yet commanding glass surfaces create such an impression of lightness that even those façades which are largely solid don't seem weighty.

For the upper storeys, it was also very important that the window frames appear as delicate as possible. With this in mind, the Reynaers Aluminium CS 68-HV window profiles were used in such a way that when seen from outside, the moving parts completely disappear behind the fixed frame.

The big frame of the CS 68-HV variant also makes for a distinctive aesthetic mark, creating a visibly outstanding frame around the glass. This is where the advantage of Element Façades come into play. The EF system allows for the insertions to be prepared off-site, under controlled circumstances, and then quickly be fixated once on-site.



LAZURNIYE NEBESA

Constructing the highest tower in Kazan

Lazurniye Nebesa, or “Azure Skies” in English, is the first residential skyscraper in Kazan higher than 100 meters (122 meters). The building consists of 37 floors, 33 of which are residential. The complex is designed as a bright architectural solution with clear lined façades combined with ultra-modern materials, giving the building a futuristic and unforgettable image. The residential complex “Lazurniye Nebesa” is also located in the most eco-friendly area of Kazan and with its distinguishing high-tech and eco-friendly features, the tower is a fine addition to the area.

Some of the more impressive features of the tower is the helipad on the roof as well as the 11,116.5 m² three-storey underground parking garage. Panoramic window systems provide not only aesthetic, but also an optimal thermal and acoustic insulation. Each apartment is complimented by the light from the large glassed surfaces of the curtain wall. Each room of the residential complex is connected to a central HVAC system, which allows customized climatic conditions for each apartment.

PROJECT INFORMATION

GENERAL INFORMATION

Location : **Kazan, Russia**
 Architect : **LLC Aghai, Kazan**
 Investor : **RosInterBank**
 Contractor : **LLC Stroitel'naya Kompania, Kazan**
 Fabricator : **LLC Element Façade, Chelyabinsk**
 Reynaers Aluminium systems : **CW 65-EF/HI**

MAIN ELEMENTS

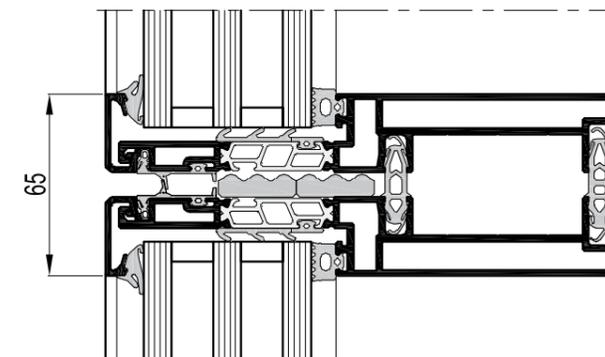
- 37 floors, 122 metres
- 1 Helicopter platform
- 33 Residential floors with apartments
- 2 Office floors
- 3 Parking floors, 275 parking spaces



The tender was won in July 2010 and was at that moment the first project with the new element façade system **CW 65-EF/HI**. Both the fabricator and installer were familiar with Reynaers Aluminium systems, which resulted in high-quality production and installation.

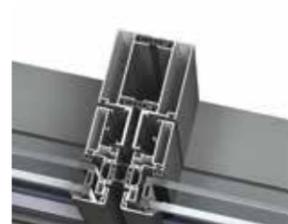
The building is designed as the most eco-friendly building in Kazan and was equipped with 52 mm 3-glass elements. Due to complex space-planning decisions and the constructive features of the building, special solutions for corner profiles as well as mullions and transoms along with pressure plates and glazing beads were developed.

The process of building a 122 meter circular building, with different corners ranging from 90 & 137 to 151 & 177 degrees, requires excellent engineering capabilities. Employees and engineers of the involved companies took on, parallel with works, training courses on assembly of full-size elements. These were held with the assistance of the project team of Reynaers Aluminium, in the Training Centre at the Reynaers Campus.



CW 86-ELEMENT FAÇADE

High execution speed



CW 86 mullion profile

CW 86 transom profile



UNIQUE PROJECT SOLUTIONS

CW 86-EF is one of the most adaptable façade systems in the Reynaers Aluminium curtain wall range. Specialized versions of it has been used in many big projects, such as the Ferrari World in Abu Dhabi and the Four Seasons in Manama, Bahrain.

SYSTEM INFORMATION

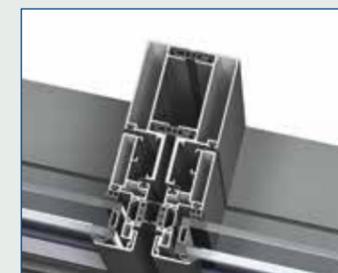
Curtain Wall 86 is an insulated and aesthetical curtain wall system that complies with all requirements for large building projects. For these building projects, the execution speed on the building site is very important. CW 86 Element Façade offers this solution, combined with seamless integration of Top Hung Windows or Parallel Opening Windows all while keeping a flush appearance.

CW 86-EF is available in two glazing variants, with unique aesthetical features: the first glazing variant (CW 86-EF) holds the glass using glazing beads, while the glass of the Structurally sealed Glazing variant (CW 86-EF/SG) is structurally bonded, offering a complete glass surface at the outside of the building.

The energetic performance of the system is offered in different levels, providing thermally insulated profiles also for the Structurally sealed Glazing. Specific drainage methods like cascade drainage lift this façade up to the highest demands in water- and air tightness. This makes this system applicable for extreme conditions such as coastal areas and high altitudes.

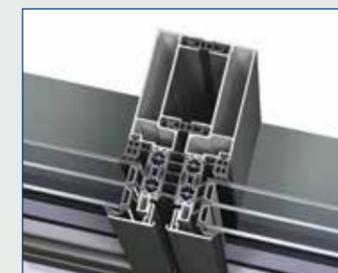
Besides the seamless integration of different types of windows, doors and sun screening systems, CW 86 offers motorised solutions for its opening elements, such as top hung and parallel opening windows, providing a total solution for your façade.

TECHNICAL CHARACTERISTICS*



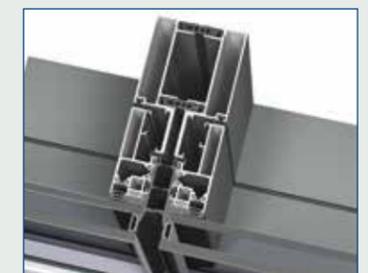
CW 86-EF

Our standard solution offers up to 38 mm thick glass. The profiles are 86 mm wide and 195 mm deep. The system supports integrated Top Hung Windows, Parallel Opening Windows as well as escape windows. All types of CS windows & doors can be integrated.



CW 86-EF/Hi

High insulation variant of CW 86, which is suitable for triple glass up to 50 mm thick. Profiles are 86 mm wide and 168 mm deep.



CW 86-EF/SG

CW 86-EF also offers a Structurally Glazed version, capable of holding up to 36 mm thick glass. The special SG solution creates a clean glass wall, with only a 22 mm visible joint between the glass.

*For a full range of solutions and/or specific data, please consult the CW 86 system brochure & catalogue.



ESENTAI TOWER

The crystal of the mountain city

The **Esentai Tower** is the centrepiece of Almaty's 87,000 m² development Esentai Park, at the intersection of Almaty's main boulevard Al-Farabi Avenue and the Esentai River. The project is sometimes called "Crystals emerging from the ground", due to Esentai Tower's highly transparent curtain wall construction and neutral color, representing crystals coming out of the ground and blending seamlessly with the nearby mountains. The site's location at the edge of a green urban area offers visitors and residents spectacular views of the mountains and city, as well as access and security.

The 37-storey tower is home to the luxury Almaty Marriott Hotel and together with the upcoming Esentai Mall, this spot will become the most advanced and luxurious destination in Almaty, poised between the city and the mountains and overlooking the Esentai River.

Outside of apartments, the tower also encompasses offices, executive-service apartments, shops, leisure club and entertainment centre as well as parking space for 368 cars.

Based on the Reynaers **CW 86** system, unitised curtain wall elements with modulations in the glass give an added dimension to the crystal effect. A special variant for CW 86-EF was created, resulting in an insulated frame for structural gluing of the glass. Due to the special shape of the building special corner solutions had to be developed. Four different solutions were applied in the building.

Almaty is located in a high seismic zone and so therefore the system had to be tested for seismic movement, which meant the new design had to include earthquake proof solutions. The challenge for this earthquake resistant solution was to design large enough profiles, so that it can uphold the glass of the 162 meter tall building, while still being able to move enough to cope with the stress from earthquakes as well as being tight enough to withstand air, wind and water penetration and have a good enough U-value, as to keep the building insulated. Among the thermal conditions were an overall value of the tower of under 1.9 W/m²K and no condensation for -25°C outside, while +21°C and 40% RH inside.

Air, Wind and Water testing, as well as the seismic tests were carried out according to the highest European and American standards at the Reynaers Institute in Duffel, Belgium.

PROJECT INFORMATION

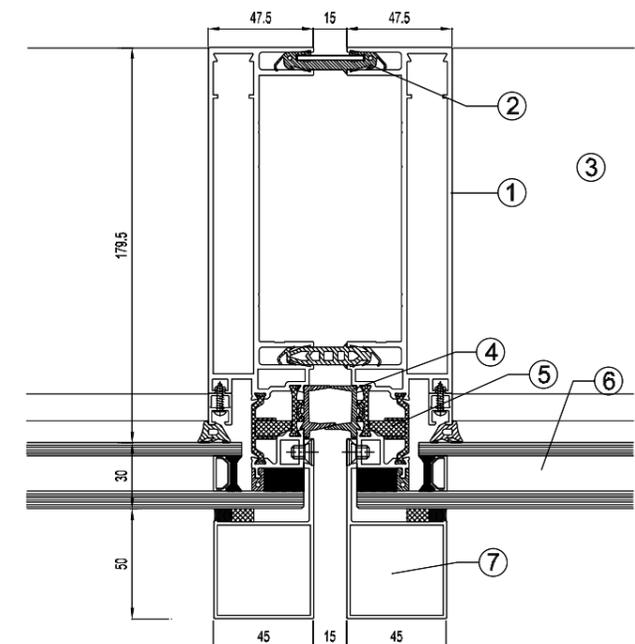
GENERAL INFORMATION

Location : **Almaty, Kazakhstan**
 Architect : **Skidmore, Owings & Merrill**
 Engineer : **Leslie E. Robertson Associates**
 Construction : **ENKA, Istanbul, Turkey**
 Developer : **Capital Partners, Kazakhstan**
 Fabricator : **Fenis Sistem Yapı A.S, Turkey**
 Reynaers Aluminium systems : **CW 86-EF, CW 60 & CS 77**

PROJECT STAGES

- Beginning of design work : **2004**
- Prel. project description finished : **May 2005**
- Reynaers Aluminium first involved : **June 2005**
- General design finished : **April 2006**
- Test at Reynaers Campus : **August 2006**
- Construction finished : **October 2007**

1. CW 86 mullion profile
2. Linking gasket with alu plate
3. Transom
4. Lip gasket
5. Insulation
6. Vision glass
7. Vertical face cap





HÖFÐATORG

A fine addition to Reykjavik's centre

The second tallest building in Reykjavik forms part of an ambitious project which is intended to counteract the raw climate with elegant, optimistic and radiant architecture. The architecture contrasts not only with Iceland's meteorological conditions, but also with the economic climate in which the tower was realised.

The plans were drawn up in the years of prosperity, but the construction itself took place in the economically dramatic year of 2008, when the full extent of the financial crisis became clear.

The tower is part of **Höfðatorg**, a complex just a stone's throw away from Höfði, the villa where Ronald Reagan and Michael Gorbachev met in 1986 to discuss nuclear disarmament. The nineteen-storey, seventy-metre tall tower is one of six buildings in the Höfðatorg complex, which is based on a master plan joint venture between PK Arkitektar and LWW Architekten. The Icelandic bureau PK Arkitektar is responsible for the architectonic execution of the plan. The letters P and K are the initials of the bureau's founder, Pálmar Kristmundsson. So far only two of the six volumes have been constructed, housing a mixed programme of living, working and relaxing.

PROJECT INFORMATION

GENERAL INFORMATION

Location : **Reykjavik, Iceland**
 Architect : **PK Arkitektar, Reykjavik & LWW Architekten, Berlin**
 Contractor : **Eykt ehf., Reykjavik**
 Façade consultant : **IFFT - Karlotta Schott**
 Fabricator : **Gluggar & ASF, Akureyri**
 Reynaers Aluminium systems : **CW 50-SC, CW 86-EF bespoke solution**

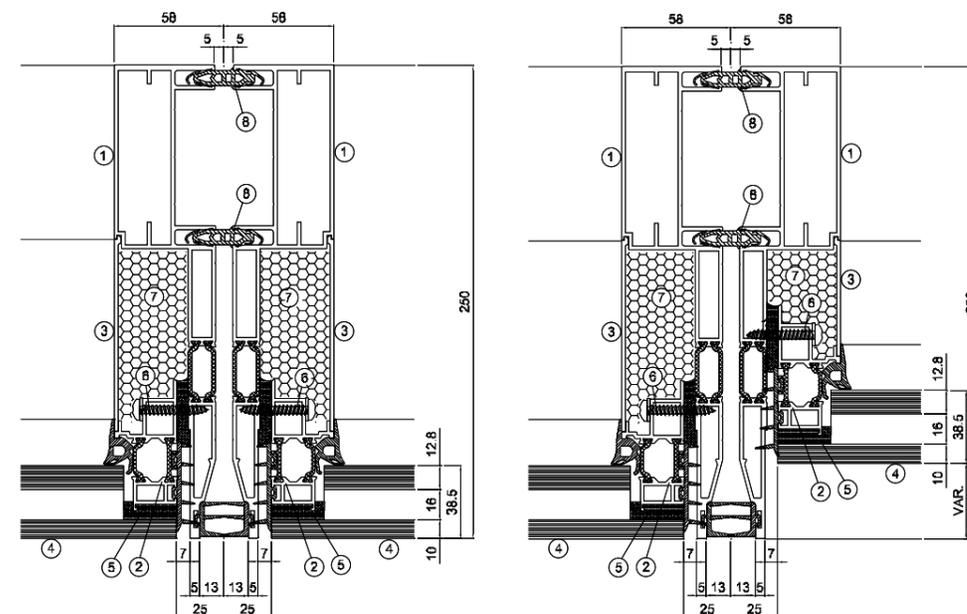
PROJECT SOLUTIONS

- Ground floor: structural clamped solution
- Tower: structural sealed inclined glass parts integrated into the unitized system
- A 250 mm deep thermal broken outer frame
- SSG stepped glass units
- All top hung windows are motor operated, integrated inside the system
- Corner elements were fabricated with special vertical T-profiles to obtain the requested look

For the façade Reynaers Aluminium developed four different unitised elements based on a 1.5 m wide and 3.5 m high module: completely fixed elements with vertical glass; elements with vertical glass and top-hung windows over the total width of the element; elements with sloped glass parts, either fixed or with top-hung windows; and corner elements of 64 and 116 degrees. For the sharp and obtuse corners of the tower, special elements were fabricated with custom-made vertical T-profiles to achieve the desired visual effect.

For the sloped glass parts, Reynaers Aluminium developed a new unitised curtain wall system based on **CW 86-EF**. This curtain wall consists of a main frame, with the requested structural elements, fixed to the concrete structure of the building. Inside this frame, a fixed glass frame or top-hung frame supporting the glass was installed. All top-hung windows are motoroperated, and the motor is integrated inside the system.

For this solution, Reynaers Aluminium developed a 250 mm deep thermal broken outer frame construction with horizontal and vertical transoms to support the glass frames. The 250 mm deep system was required to withstand the expected high wind speeds of up to 280 kilometres per hour. The wind load test of this system, up to 4000 Pa was the highest performance test until now executed at the Test Centre in the Reynaers Campus.



1. Outer frame
2. Thermal broken glass frame
3. Clips profile
4. Vision glass
5. Structural silicone sealant
6. Screw fixation
7. Insulation
8. EPDM linking gasket



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FERRARI WORLD

The red diamond of the desert

At the centre of the world's first Ferrari theme park, located on Yas Island, Abu Dhabi, is the iconic, Ferrari red roof of the world's largest indoor park, **Ferrari World Abu Dhabi**, designed by Benoy Architects, Abu Dhabi. Its shape is directly inspired by the classic double curve of the Ferrari body shell, ultimately resulting in an architecture that presents the language, values and passion of the Ferrari brand itself.

Situated in the prestigious 2,500 hectares Yas Island development, Ferrari World is an entertainment activity theme park with 24 family attractions. It is equipped with a 70-meter-high G Force tower, a unique twin racing rollercoaster, tracks for kart, rally and dune buggy racing as well as an 18-screen complex and numerous food outlets.

The island features attractions such as a world-class motor sports racetrack, signature hotels, the Ferrari World itself, a water park, a 300,000 m² retail area, parkland golf courses, lagoon hotels, marinas, polo clubs, apartments, villas and numerous food & beverage outlets that helps create a unique international tourist destination.

i PROJECT INFORMATION

GENERAL INFORMATION

Location : **Abu Dhabi, United Arab Emirates**
 Architect : **Benoy Architects, London**
 Façade Team : **Besix Global Façade Org., Belgium**
 Fabricator : **Jungbluth Alu Partners Ltd., Belgium**
 Contractor : **SixConstruct**
 Investor : **Aldar Properties, United Arab Emirates**
 Client : **Yas Island, United Arab Emirates**
 Reynaers Aluminium systems : **CW 86-EF bespoke solution**

PROJECT STAGES

- First design meeting : **February 2008**
- Funnel die drawing finished : **August 2008**
- Shield die drawing finished : **September 2008**
- Funnel element testing : **November 2008**
- Shield element testing : **December 2008**
- Final delivery of materials : **April 2009**
- Last Shield element install : **June 2009**
- Last Funnel element install : **July 2009**

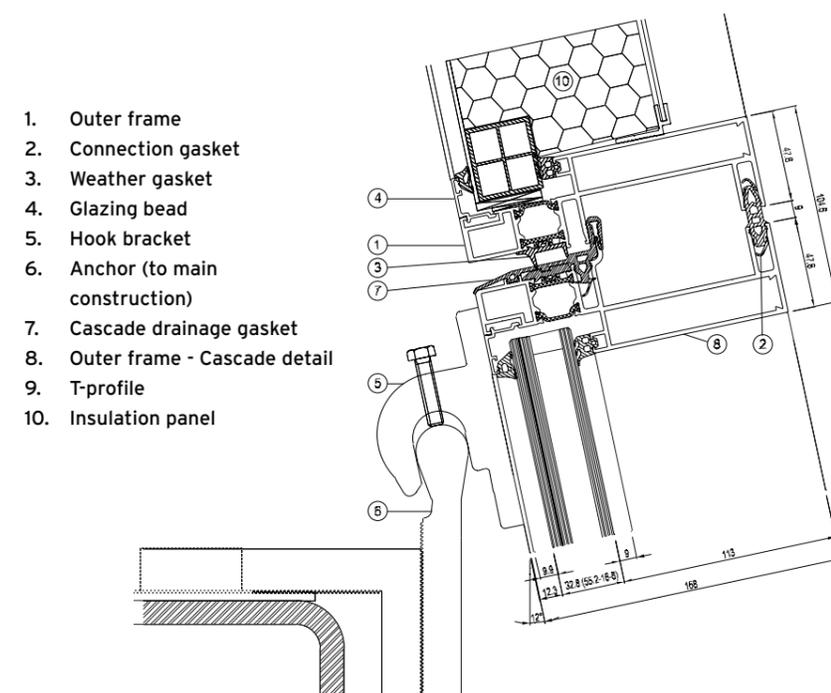
Reynaers Aluminium designed nearly thirty new profiles, twelve new gaskets, and countless fittings for the spectacular Ferrari World theme park in Abu Dhabi. The façade was made from a bespoke version of **CW 86-EF**. A bespoke solution on a 3D steel support system was made for the funnel. The walkway has a bespoke sunscreen solution, also developed by Reynaers Aluminium.

FUNNEL :

- Two major parts, funnel and shield
- Additional walkway
- The funnel was installed via a 3D space frame
- The shield's curtain wall was uniquely anchored to the outside steel
- Different colours for outside and inside parts
- The steel walkway has a large aluminium ball nose accepting light fixtures
- The roof is molded after Yas Island's logo

CURTAIN WALL :

- Curtain walls were installed via a 3D space frame to allow movement prompting proper dilatation adjustments
- The mullion's shape was fixed (visual architectural aspect) but the final size was determined through inertia calculations
- Strong fixation of heavy elements to the frame
- Panels are mostly trapezoidal and 3D shapes
- AWW tests to the highest European standards



SOFIA AIRPORT CENTER

A business centre with an environmentally friendly concept and stylish design

The ambitious new development **Sofia Airport Center** (SAC) sets new standards for office and logistic buildings in Bulgaria. The large-scale business park emphasizes sustainability and eco-friendly design. Strategically positioned 300 meters away from the international Sofia Airport and on the junction of all major roads, Sofia Airport Center ensures easy ground and air access for dynamic, forward-thinking companies.

Sofia Airport Center, with its 165,000 m² of total built-up area making it the largest development, has a distinctive individual concept which incorporates three core elements: a 22,000 m² Logistics Center, a 100,000 m² Class A Office Center (**LEED** certified) and a 250-room high-quality hotel.

The completed logistics and office buildings have uniform modular bases to provide maximum flexibility for the tenants' needs. The longitudinal office tract is interrupted by perpendicular volumes, adding plasticity to the building, but also providing maximum natural light to meet the requirements of the high standard **LEED certification**, a widely recognized standard for measuring building sustainability.

PROJECT INFORMATION

GENERAL INFORMATION

Location : **Sofia, Bulgaria**
 Architect : **Cigler Marani Architects, Czech Rep.**
 Contractor : **CO-VER Italy**
 Fabricator : **90 EOOD, Kristian Neiko**
 Project Manager : **Gardiner & Theobald, U.K.**
 Client : **Tishman International Management Ltd.**
 Reynaers Aluminium systems : **CW 86-EF/HI**
bespoke solution

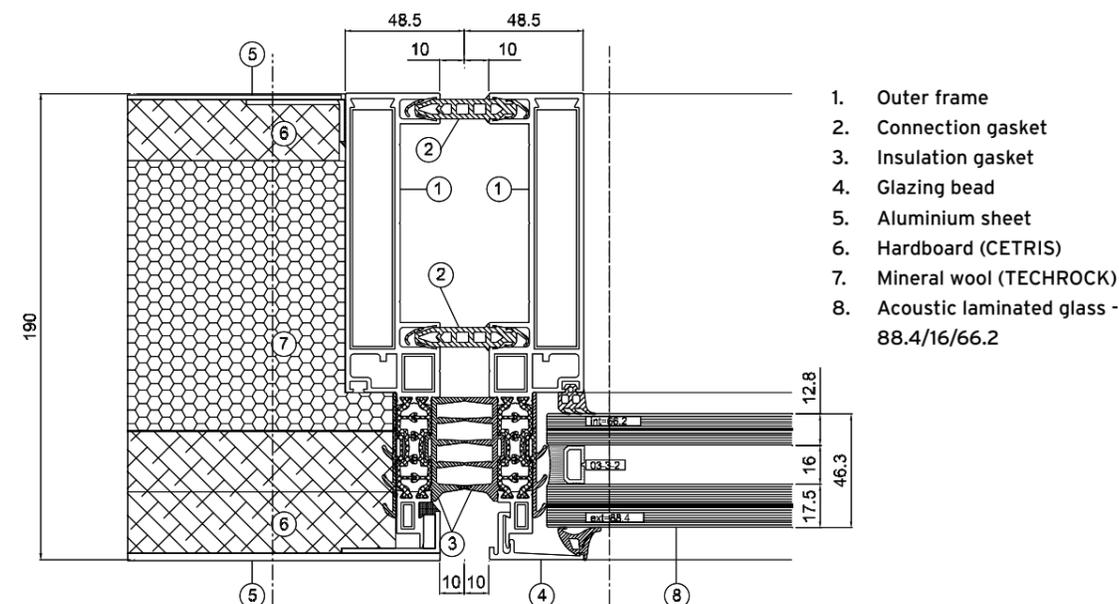
PROJECT STAGES

- Beginning of design work : **2006**
- Reynaers Aluminium involved : **April 2007**
- Beginning of construction work : **2009**
- Façade Installation started : **August 2009**
- Façade installation finished : **November 2009**
- Construction finished : **May 2010**



For the Sofia Airport Center A02, Reynaers Aluminium developed a specific project solution based on the element façade system **CW86-EF/HI** (High Insulation). The façade had to fulfill various technical and design requirements. It had to be adapted to the complex's environmentally-friendly concept and it had to significantly reduce the noise coming from the nearby airport and motorways. This resulted in the development of tailor-made profiles and accessories and a special design for the edges of the building. Acoustic and air-wind-water tests showed that the customized façade minimizes the noise by 45 dB and has very good anti-seismic and high thermal insulation properties. The façade also helps reduce the building's energy consumption due to the use of renewable sources of energy such as natural light, by double-glazed windows and dual-coated glazing.

The customization of the CW 86-EF system was also initiated from an aesthetic point of view. The architects requested sharper edges on the façade profiles. Therefore special profiles with 0.5 mm filleted edges were produced. Another intriguing detail designed by the architects is the concept for the natural ventilation of the façade. Instead of windows which can be opened, they designed 'valves' integrated into the aluminium strips of the façade. Sofia Airport Center became a benchmark for sustainable and smart development in any aspect - from the initial macro concept to the micro details of the working process.





SOPHARMA LITEX TOWERS

A confident green step forward

The **Sopharma Litex Towers** are the first example of a large-scale project with integrated urban planning in Sofia's recent history. The project is a milestone in the developing Bulgarian construction market. In the words of Dimitar Paskalev, the chief architect of the project, close cooperation was sought with the municipality in order to integrate the project in the best way possible in the existing urban tissue while also keeping in mind future plans for the area.

The buildings interact with their surroundings by means of the lower two levels housing shops, restaurants and offices, the entrances to the towers and the parking facilities. The Towers also relate very successfully to the larger scale of the city. Their location just outside the city centre was chosen in order to avoid increasing traffic in urban zones which are already problematic. At the same time the Towers are within walking distance of Sofia's metro, due to the investor's ambition to establish Sopharma Litex Towers in Sofia's urban life in the most sustainable way possible. In this way the Towers are a well-measured urban gesture, which rather adds urban life to the city fabric, than pulls it away from it.

i PROJECT INFORMATION

GENERAL INFORMATION

- Location : **Sofia, Bulgaria**
- Architect : **Dimitar Paskalev, Studio Architektonika, Sofia**
- Contractor : **Telecompect & Markan, Sofia**
- Energy and light consultant : **Köster Lichtplanung, Frankfurt**
- Fabricator : **90 EOOD, Kristian Neiko**
- Reynaers Aluminium systems : **CW 86-EF bespoke solution**

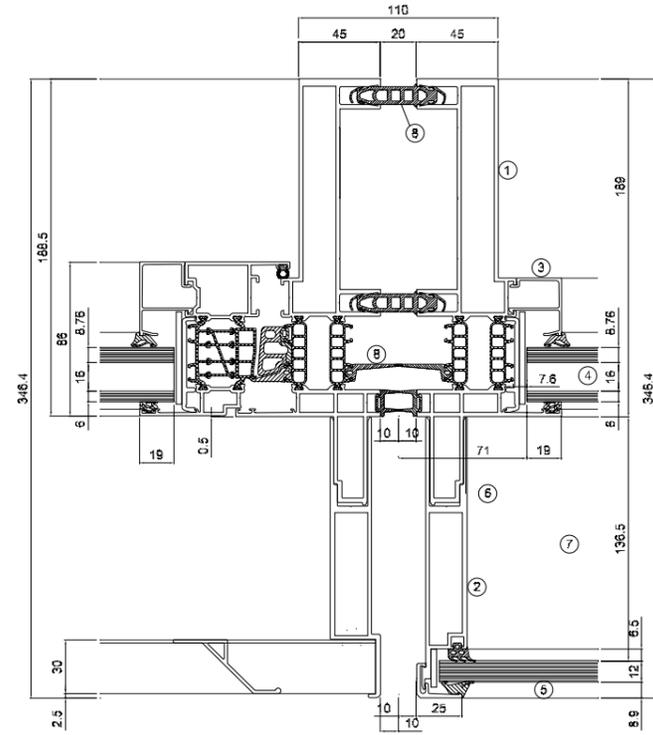
PROJECT SOLUTION

- Closed double skin breathing element façade with integrated sun blinds
- Vapor pressure equilibration through openings covered with filters in the bottom of the frames, to avoid unacceptable condensation of the single glass
- AWW & static seismic tests at the Reynaers Institute

The Towers proved to be a very good symbiosis between the architect's ambition for a high-performance, energy-efficient building and the technology provided by Reynaers Aluminium, which backed up and strengthened the original design idea. For this project, comprising of 20,000 m² of façades, a new façade system was developed, based on the **CW 86-EF** system with CS 86-HI windows, which could satisfy the requirements of the investors for a low-energy, yet flexible and comfortable building. This element façade - measuring 14,000 m² in total - is made with elements that were pre-assembled and glazed in the workshop.

The building's skin consists of a Reynaers Aluminium double-glazed, close cavity façade, with RETROSolar blinds incorporated in the cavity. The façade breathes, allowing humidity to escape, but does not generate an airflow. The outside layer of the façade is a single layer of transparent glass. On the inner side of the façade, a completely transparent layer of tempered double glass is used. No solar protective layers were applied to the glass. Between the inner and outer layer, the specially designed by Köster blinds are placed.

The building's energy consumption last winter was valued at 70 kWh/m²/year. In milder seasons it has been as low as 40 kWh/m²/year, while the average energy consumption of an office building in Bulgaria is 150-200 kWh/m²/year. The building has been labelled class A.



1. Thermal broken outer frame
2. Glass frame
3. Glazing bead
4. Vision glass
5. Single glass
6. Screw fixation
7. Airgap
8. EPDM linking gasket



LEVENT KANYON

The modern, urban shopping mall

Designed by award winning US architect firm The Jerde Partnership and Turkey's leading architect Tabanlıoğlu Mimarlık, the **Kanyon** project is situated in the heart of the city's financial district Levent, Istanbul and was opened in the Spring of 2006.

The complex's main core includes the shopping and entertainment area and is comprised of a multi-level basement car park (118,000 m²), a retail centre (65,000 m²) including shops and restaurants, an entertainment centre (8,000 m²), exclusive residential units (32,000 m²), and a 27-storey office tower (31,000 m²).

The three-storey area has curling and winding open air galleries overlooking a central long winding courtyard. The entertainment facilities are housed inside a large sphere, part of which forms a large canopy over the main circulation area. The overall feeling of this space - almost an artificial topography - is very exciting, and it delivers a very unique experience for the Istanbul citizens.

i PROJECT INFORMATION

GENERAL INFORMATION

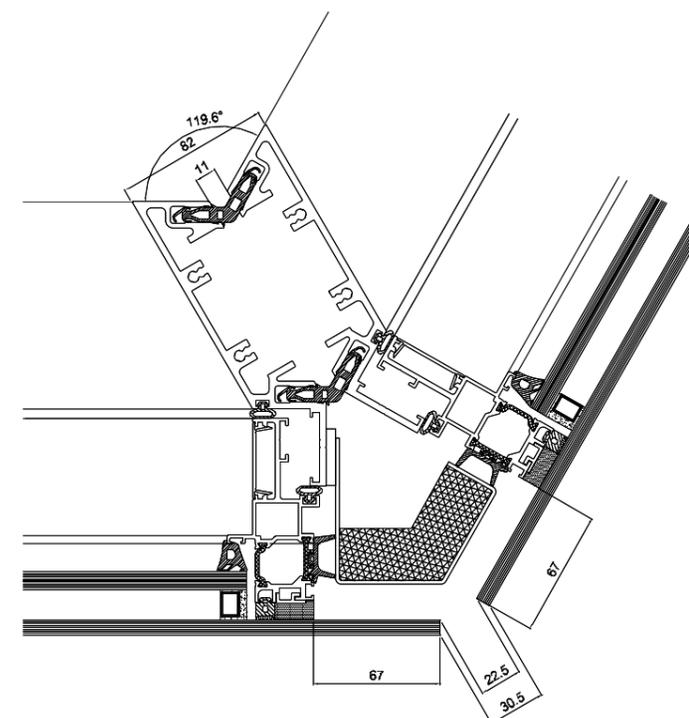
Location : **Istanbul, Turkey**
 Architect : **The Jerde Partnership, Los Angeles**
 Engineer : **Ove ARUP & Partners, London**
 Fabricator : **Fenis Sistem, Turkey**
 Client : **Ys Bank & Eczacıbaşı A.S.**
 Reynaers systems : **CW 86-EF, CW 50, CS 68 & CS 77**

SPECIAL SOLUTIONS

- New profiles for the CW 86 façade
- Special CW 86 corner solutions
- Special anchoring and fixation of the walkway (and sunblinds) to the façade
- New concept for outside opening doors for the façade and walkway
- Bespoke solution for the residential block based on the CW 50-SC system

The highest building of Levent Kanyon is an office block, with a total height of 150 metres. The building needed to be highly resistant to earthquake forces and thus makes use of a specially designed system based on the Reynaers Aluminium façade system **CW 86**. The CW 86 system makes it possible to position the modular façade applications with the classical frame structure (CW 86) and also it allows the manufacturing of the individual façade panels (CW 86-EF) in the workshop.

A special aspect of the Kanyon project is the fact that the façade design takes into account the risk of earthquakes. The water-tightness, air permeability and wind resistance of the aluminium curtain wall system CW 86 for the 150-metre high office tower were tested in both static and dynamic conditions according to the highest standards. A second compound factor is the façade flexibility required; in the event of an earthquake, the floors will move slightly in a horizontal direction. The façades should be able to absorb this movement. This situation was also recreated in a mock-up, and tested according to values that were 20% higher than the strongest earthquake to be expected in Istanbul.



ASPIRE TOWER

A milestone in Qatar

The Middle East is currently undergoing unprecedented development in the field of architecture. Reynaers Aluminium has had a branch in Bahrain since 2004, and the company is therefore playing an increasingly significant role in the region. One of the highlights - in every sense of the word - is the involvement of Reynaers Aluminium in the realisation of the **Sport City Tower** in Doha, Qatar. With its highest point 320 metres above the ground, this tower - also known as the **Aspire Tower** - is the tallest building in Qatar and was the site for the Olympic Flame during the 15th Asian Games held between 1 and 15 December 2006.

The tower has a great diversity of functions, with a hotel on the lower seventeen floors, a health club with a protruding swimming pool, a conference centre, a Presidential Suite at a height of 150 metres above ground level, a sports museum at 184 metres with an observation deck, and a revolving restaurant at a height of 200 metres. The tower has 40,000 m² of floor space and comprises a concrete core encased in a double skin façade designed and produced by Reynaers Aluminium.

PROJECT INFORMATION

GENERAL INFORMATION

Location : **Doha, Qatar**

Architect : **Hadi Seenan (AREP), Qatar**

Contractor : **Midmac-SixConstruct, Qatar**

Fabricator : **JAP, Belgium**

Client : **The Sport City Project Committee**

Reynaers Aluminium systems : **CW 86-EF bespoke solution, CW 50 bespoke solution, CS 59**

REYNAERS ALUMINIUM INVOLVEMENT

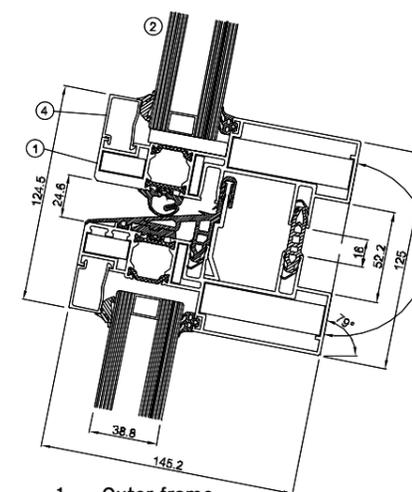
- Design of bespoke CW 50 profiles
- Redesign of CW 86, for inclined construction
- Design of new drainage system for CW 86
- Finding local extrusion company
- Finding local insulation company
- Thermal calculations
- Testing* and method statement for elements according to European standards



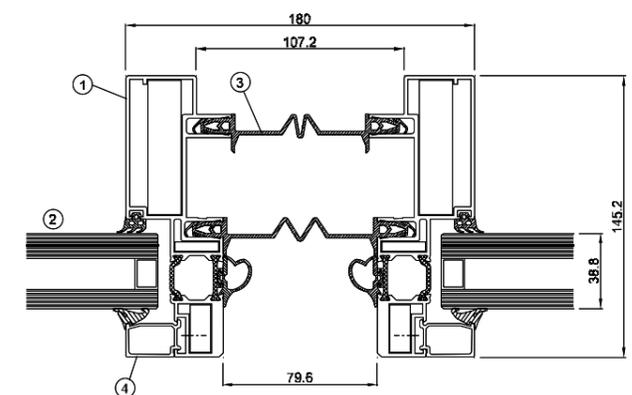
The tower features a double-skin façade, which has been designed to a very high specification by Reynaers Aluminium. To meet the aesthetic and technical demands of the curved architecture, Reynaers Aluminium created bespoke solutions based on its unitised curtain wall system **CW 86** and transom-mullion curtain wall system **CW 50**. Reynaers Aluminium's innovative systems were specified as they are proven to have a great track record, with guaranteed performance even in extreme climates.

The unusual streamlined form of the tower, combined with the extreme climate, demanded a careful analysis. The façade is made up of aluminium profiles, extruded in Saudi Arabia in accordance with Reynaers Aluminium's specifications, along with glass and rustproof wire mesh. Trials were carried out at the Reynaers Campus in order to test the waterproofing and windproofing of the façade, and to be able to calculate the effects of wind on the design. The façade also incorporates an advanced system of programmable artificial light.

"Reynaers Aluminium provided a total solution for the double-skin façade. We designed the aluminium profiles to suit the project and architectural requirements. Special cascade drainage solutions were developed and extensively tested according to the most stringent European standards for air tightness, water tightness and wind load."



1. Outer frame
2. IGU
3. Connection gasket
4. Glazing bead
5. Drainage / connection gasket



1. Outer frame
2. IGU
3. Connection gasket
4. Glazing bead



JERSEY ESPLANADE

Seafront Splendour

Extending to over 200,000 sq ft, Jersey Esplanade contains large, open plan office spaces across six storeys which surround a central atrium and circulation core. Maximising the coastal location, this allows breathtaking panoramic views of St Aubins Bay and creates a striking new gateway to St Helier.

The BREEAM-rated building combines modulated stone cladding with expansive areas of Reynaers aluminium curtain walling and is occupied by blue-chip brands such as Royal Bank of Canada, Deloitte and C5 Alliance.

Architects at Axis Mason have created a modern, innovative co-working space that facilitates collaboration with its open layout. Transforming the Jersey seafront with a touch of splendour, the Reynaers systems utilised include CW 86 and CW 50 curtain walling, as well as CS 68 and CS 77 aluminium windows and doors.

The conditions of the building location on this development proved a challenge. With seafront projects, timing is everything. Unitised facades therefore provided the perfect solution for Jersey Esplanade due to their speed of build and increased fabricator efficiency, with no compromise on performance or aesthetic quality.

With high execution speed and available in two glazing variants, elements of curtain walling system CW 86 can be pre-assembled in the workshop to decrease time on the building site. Cassettes can then be hooked onto a traditional stick structure or the façade can be built up element by element according to the modular curtain wall principle.

Reynaers Aluminium prides itself on developing, where required, bespoke solutions to meet all glazing requirements. For Jersey Esplanade, efficient CW 86 unitised facades and CW 50 curtain walling gave the architects design freedom to accommodate large glazed areas, as well as meeting their time constraints.

i PROJECT INFORMATION

GENERAL INFORMATION

Location : **St Helier, United Kingdom**

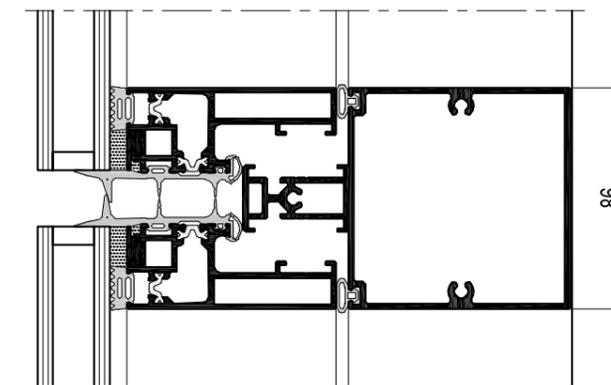
Architect : **Axis Mason**

Fabricator: **Deepdale Solutions Ltd**

Reynaers Aluminium systems : **CW 86, CW 50, CS 77**

REYNAERS ALUMINIUM INVOLVEMENT

- CW 86 curved unitised panels with structurally glazed glass
- Each module is designed to be 1500 x 3550 mm high



ORUZHEYNIY

Monumental Art Deco style in Moscow

The iconic building on Oruzheynyi Lane is the latest high-rise project in the city centre of Moscow. The 166,000 square metre multifunctional administrative and commercial complex is just starting to acquire its finished appearance. In the ten years of design and construction, the complex has managed to become a prominent site in the city.

When the reinforced concrete frame without the façades was erected in the early 2010s, the building gave rise to many negative comments. Most of them concerned the inadmissibility of constructing 'yet another Stalinist skyscraper' in the city centre (the first investor, Donstroy, built a pseudo-Stalinist skyscraper in the city in 2002). However, when the building finally began to acquire substance by 2015, the glass planes and vertical aluminium ridges became visible, and it became clear that Oruzheynyi was not a retro imitation, nor an ultramodern manifesto, but a kind of 'alternative history' of Moscow architecture. "We tried to preserve the traditions, while coming up with a contemporary look," says the architect. They used two types of finishes: for the three bottom storeys it is stone and white granite, and on the upper storeys an aluminium facing.

PROJECT INFORMATION

GENERAL INFORMATION

Location : **Moscow, Russia**

Architect : **Mikhail Plekhanov, M. Posohin, A. Levitina, E. Tarasenok**

Contractor : **Midmac-SixConstruct, Qatar**

Fabricator : **JAP, Belgium**

Client : **The Sport City Project Committee**

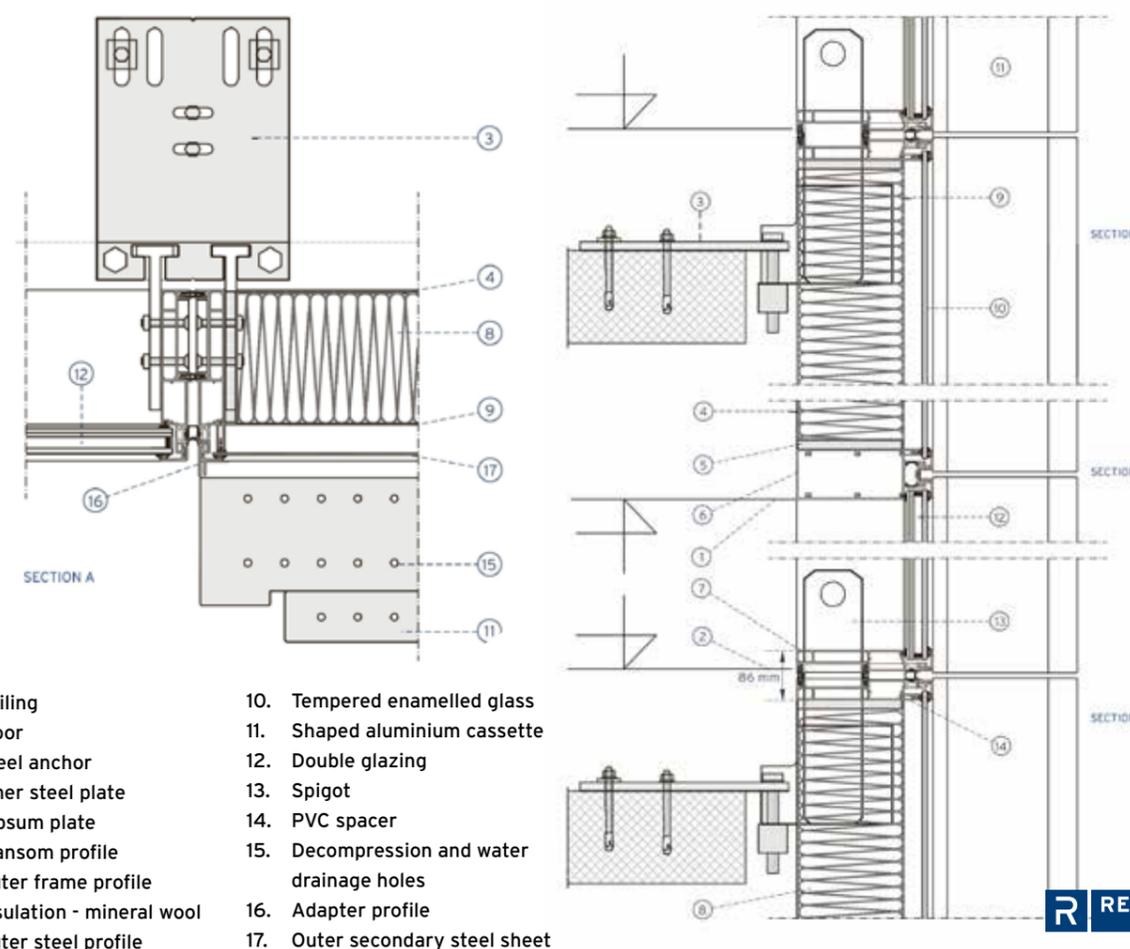
Reynaers Aluminium systems : **CW 86-EF bespoke solution, CW 50 bespoke solution, CS 59**

REYNAERS ALUMINIUM INVOLVEMENT

- Development of CW 86-EF/OS bespoke façade solution to match static requirements of the building (windloads)
- Bespoke corner solutions - Split Corner for transportation purposes
- Transom to Transom connection
- Structural calculation/validation
- Fire Proof testing



Reynaers Aluminium was involved in the construction of the fully glazed façade and Plekhanov is very pleased with the collaboration. "This is very laborious work due to the complex shape of the pylons. And the metal repeats all of these forms and even the division of the stone facing along the length, height and width. Each pylon also has a top - an Art Deco inspired light, like a beacon." The building has great significance for Moscow's urban landscape. The overall volume is traditional for Moscow in terms of its massiveness and monumentality. The building has almost no horizontal components. All of its materiality is in the metal ridges and pylons, which emphasise the upward drive and visually break down the mass.



- | | |
|------------------------------|--|
| 1. Ceiling | 10. Tempered enamelled glass |
| 2. Floor | 11. Shaped aluminium cassette |
| 3. Steel anchor | 12. Double glazing |
| 4. Inner steel plate | 13. Spigot |
| 5. Gypsum plate | 14. PVC spacer |
| 6. Transom profile | 15. Decompression and water drainage holes |
| 7. Outer frame profile | 16. Adapter profile |
| 8. Insulation - mineral wool | 17. Outer secondary steel sheet |



CRYSTAL

Chessboard-like crystal in Prague

The new Crystal office building, beside the busy Vinohradská boulevard, was constructed and completed in the summer of 2015. Commissioned by the GES REAL development group, the structure of the building with a total of 12,827 square meters, comprises of offices available for rent and five retail units on the ground floor, including a café and a brasserie. Warehouses, technical facilities, and 121 parking spaces are concealed underground.

The Crystal building's height exceeds the height of surrounding structures, creating a high-rise counterpart to the nearby Casablanca office tower that subtly and sensitively fits in with the existing urban environment. "Its significant height and shape means that this building has a unique and unexpected look, from every angle", says Libor Hrdoušek of Atelier 15, who together with Radek Lampa, designed this geometrically rigorous yet organic structure.

The Crystal building has two main parts. On the Vinohradská side, it rises a total of fourteen storeys. The façade of the second part stands alongside the much quieter Kouřimská street on the opposite side of the site. Together, the larger and smaller volumes create a compact architectural landscape unit, sliced by a striking sharp chasm, which inspired its name.

The volume has been covered with a chessboard-like glazed surface. "The façade was designed to conjure up the concept of a crystal. This chess-like visual structure is also used on the roof parts to visually unify all exposed sides of the building. Walking around the outside of the building, the reflected and refracted light give an impression of dynamism. Clarity and light underpin the strength of the composition", says the architect.

Petr Nevšimal, general manager of façade fabricator Nevšimal adds: "To produce a complete skin for the entire Crystal building, we used a modular façade, which proved to be the only truly ideal solution for this project. This type of façade also facilitated other aspects of the project: the shape of the object, the segmentation, maximising the use of the land, the construction time, the physical characteristics, and of course the architectural assignment."

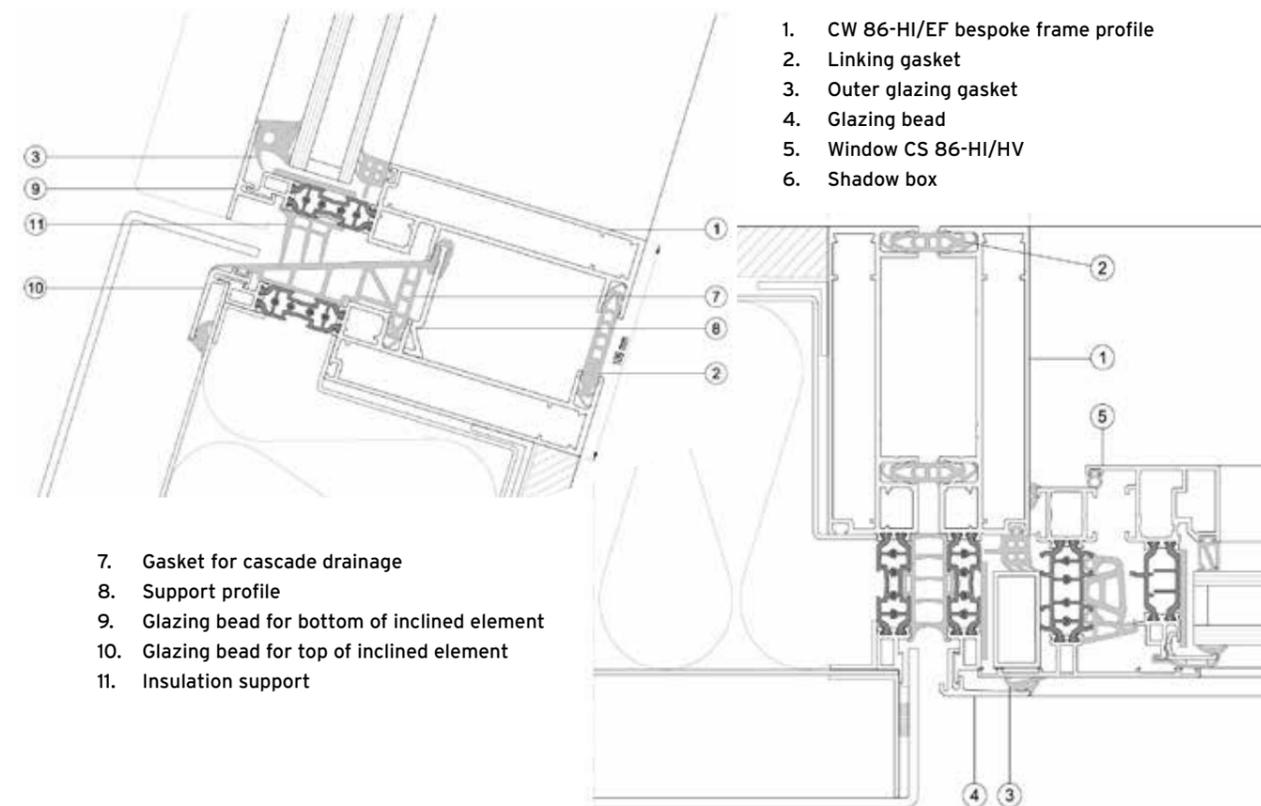
PROJECT INFORMATION

GENERAL INFORMATION

Location : **Prague, Czech Republic**
 Architect : **Libor Hrdousek & Radek Lampa (Atelier 15), Czech Republic**
 Contractor : **Metrostav (General Contractors)**
 Fabricator : **Nevšimal**
 Reynaers Aluminium systems : **Bespoke solution based on CW 86-EF/HI with integrated opening elements, CS 86-HI windows, CS 86-HI door, CW 50-HI FRV, CW 50-HI**

REYNAERS ALUMINIUM INVOLVEMENT

- Development of CW 86-EF/HI bespoke façade solution to match static requirements of the building (windloads)
- 300 m² of CW 86-HI element façade, of which 15% is inclined
- CW 86-EF/HI profile shape (inner part) was modified to enable more flexible anchoring position and better possibilities for profile corner connections
- Bespoke corner solutions
- Bespoke cascade drainage solutions for inclined elements by use of bespoke gaskets and special glazing beads





REYNAERS CAMPUS

Technology Centre

The Reynaers Aluminium Technology Centre is the largest privately owned innovation and testing centre in Europe. All Reynaers Aluminium systems are rigorously tested for air-, wind- and water tightness, thermal and acoustic insulation, safety, ... to ensure that they meet the international standards. One of the showpieces of the test centre is a state-of-the-art testing wall for curtain walls with a height of 15 metres, allowing air- wind- water tightness testing of glass façades. Thanks to the 15 m height we can test elements from several floors, with connections playing an important role.

- 1 dedicated test wall with a total capacity of 2 positions for test elements.
- 1 operating unit
- max. dimensions of the element: 10m (W) x 15m (H)
- max. test pressure: 8000Pa, 400 km/h
- test methods following European Standard (EN) / Australian Standard (AS) / American Standard (ASTM)
- dynamic testing following EN 13050

TESTED AND APPROVED

Yearly, Reynaers performs an average of 180 tests in the Technology Centre. Our tests are performed in close collaboration with various European notified bodies such as SKG, IFT, WTCB, TNO, Peutz, Efectis, ITB & WFRG.

TESTING AT REYNAERS


AIR


WIND


WATER


SOUND


BURGLAR


IMPACT


SIZE


INSULATION

EXTERNAL TESTING


FIRE


BULLET



Watch a video about AWW testing on façades:



The Technology Centre also accommodates the Research Centre, with the R-Cube and the R-Lab. The R-Cube is a rotatable research- and test installation designed for thermal performance analyses. The R-Lab is the dedicated lab to test solutions at an early stage through the use of rapid prototyping and 3D printing.

Find out all about our Reynaers Campus here





ANATOLIUM TRADE CENTRE



MEDIA CITY

PROJECT INFORMATION

This project has been designed as a combined living area consisting of office, home - office and shopping center concepts. Attention is being paid to the use of energy, sustainable life sources and the ecosystem within the project, with work directed at the project receiving a "Breeam Gold" green building certificate, beginning at the design stage.

Project : **Anatolium Trade Centre**

Location : **Istanbul, Turkey**

Architect : **Viva Architects**

Contractor : **Maya Yilsan**

Fabricator : **Aksoy Aluminium**

Facade consultant : **Pridemann**

PROJECT INFORMATION

MediaCityUK is a 200-acre (81 ha) mixed-use property development on the banks of the Manchester Ship Canal in Salford and Trafford, Greater Manchester, England.

Project : **X1 Media City, Tower 1**

Location : **Manchester, UK**

Architect : **Falconer Chester Hall**

Contractor : **Vermot**

Fabricator : **Staticus UAB**

Facade consultant: **Wintech**



TORRES KIANDA



ESPACE MEEÛS

PROJECT INFORMATION

The Kianda Towers are one of the latest projects to change the architectural landscape of downtown Luanda. The two towers are located a few meters from the Museum da Moeda in an area of 10.000m². The project includes four 12-story towers that house a commercial center, offices and a patio with garden.

Project : **Torres Kianda**

Location : **Luanda, Angola**

Architect : **FA.A Arquitectos**

Contractor : **Edifer Angola SA and GrinerSA**

Fabricator : **Edimetal Angola**

Investor : **Panservice S.A.**

PROJECT INFORMATION

Espace Meeûs is an 8-storey high corner office building in the center of the Leopold District in Brussels. In total, Espace Meeûs consists of 10,202 m² of office space, 1,050 m² of storage space and 40 parking spaces.

Project: **Espace Meeûs**

Location : **Brussels, Belgium**

Architect : **Atelier d'Architecture de Genval**

Fabricator : **Hegge N.V., Hamont Achel**

Investor : **Immo De Meeus, Brussels**

MAKE THE DIFFERENCE WITH CURTAIN WALLS.

The strength of the Reynaers Aluminium element façade systems lies in the fact that there is a lot of flexibility to make non-standard connections, meaning that one of the existing systems can often be adapted. If this doesn't work, it's possible to choose a custom-made solution.

Custom-made solutions go hand-in-hand with high performance, which is why the Reynaers Campus is always available. Being one of the largest privately owned testing facilities in Europe, the Test Centre at our Reynaers Campus can handle many different tests and the staff at hand will stop at nothing to make sure that your project can be realised.

ABOUT REYNAERS ALUMINIUM

Established in 1965 and with its headquarters in Duffel, Belgium, the Reynaers Group is a global, family-owned company, active in more than 70 countries worldwide. Driven by innovation and entrepreneurship, the Reynaers Group has spun out activities as a supplier of aluminium and steel solutions for architectural applications, surface treatments of profiles and accessories, products for roofs and façades and ready-to-install elements for the building industry.

As a part of the Reynaers Group, Reynaers Aluminium is a leading European specialist in the development and marketing of innovative and sustainable aluminium solutions. These include a wide variety of window and door systems, curtain walling, sliding systems and conservatories. Besides offering an extensive range of standard solutions, the company also develops solutions that are tailored to the individual customer or project and provides extensive technical support and advice to fabricators, contractors and architects.

Research, product development and testing are conducted at the Reynaers Campus, the sector's largest private innovation and testing centre, located in Duffel (Belgium).

Driven by innovation, the focus on digitalisation is key for Reynaers Aluminium. At the Reynaers Campus, you can experience the most advanced digital technologies: from the AVALON virtual reality room, where you can visit future buildings in 3D, and the Experience Room with numerous digital applications to the implementation of the ReynaFlow software to digitalize the entire production process.

Interested in knowing more about the projects mentioned in this document? Get in touch with your local Reynaers Aluminium contact on www.reynaers.com/contact or see the contact information below.

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