The magazine from Jansen Steel Systems | Issue 2.2021

SCALE.

BUILDING WITH STEEL & STYLE

The safety issue

JANSEN

A note from the editors

Security – signed, sealed and delivered

On an objective level, expectations around the issue of safety and security tend to be subject to national standards. However, as individuals, we all have our own ideas about what is and isn't safe. People view safety as a basic need and tend to seek out refuge and a sense of security in the buildings, cities and spaces that surround them. There is a range of timeless solutions that have been used for generations to address objective requirements (such as protection from fire, burglary, gunfire or explosions), as well as more subjective needs (clarity, brightness, orientation, etc.).

With its signature Swiss precision, Jansen meets the highest standards of safety and quality, while also making a distinctive architectural statement with its bold yet delicate design language. No other material makes such literally light work of bearing such heavy loads. Steel profile systems offer an unparalleled level of design freedom. With a level of durability that is second to none, they are making a lasting mark on the image of contemporary architecture. At the same time, they also address a wide range of safety issues.

With this in mind, this issue of SCALE magazine is devoted to the topic of safety. We will take a look at some of the projects we have carried out around the world, demonstrating that our steel systems are capable of realising even the most unusual plans – even when the buildings are subject to stringent safety requirements, as is often the case with parliamentary buildings, prisons, museums or banks. This issue also features some exciting specialist articles from renowned experts in the field, giving us insights into topics such as cyber security and facade testing. In a particularly inspiring article, a visually impaired mountaineer provides his perspective on the topic of safety – one that is bound to change the way we look at the issue ourselves.

Enjoy!

Your SCALE Editorial Team

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Read SCALE online at: scale.jansen.com

Title image: The new bright-red foyer of the Dornbirn exhibition centre. From here, visitors are led from one hall to the next through glazed double doors set into floor-to-ceiling glass panels. In order to meet the exacting demands of an events venue like this one – especially in terms of safety – the exhibition company is gradually working to modernise all of its facilities. For their access areas, which see a lot of foot traffic, they chose the EI60 fireproof doors from the Janisol C4 range.

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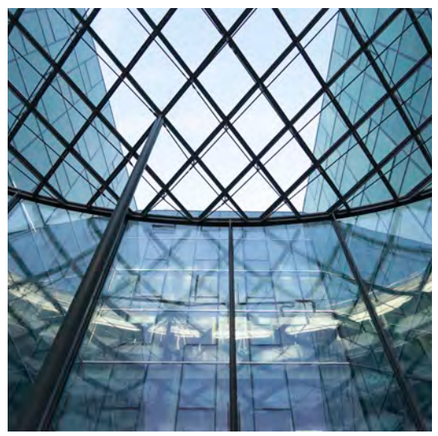

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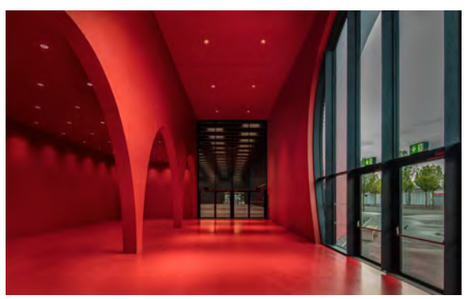

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NEWS

Janisol Arte 2.0 to RC2

From now on, Janisol Arte 2.0 single and double side-hung windows, both inward- and outward-opening versions, as well as bottom-hung windows, now offer comprehensive burglar protection up to RC2.
The ultra-slim profile system was tested by gbd Dornbirn according to DIN EN 1627 and passed with flying colours. The Janisol Arte 2.0 RC2 represents a consistent enhancement to the steel profile series for narrow windows. The second generation of Janisol Arte boasts stainless steel profiles as well as weather-resistant Corten steel. The integrated sealing groove makes processing quicker and easier. The wide variety of different types of opening makes the range ideal for renovating period windows, but also for modern residential construction. Thanks to the slim profiles, measuring just 25 to 40 millimetres in width for fixed glazing, along with a construction depth of just 60 millimetres, it is possible to implement designs that are delicate and yet robust, with a high proportion of glass and excellent thermal insulation.

jansen.com/arte2-0

Jansen and BIM

Building information modelling (BIM) facilitates the continuous planning and shared use of digital building models over the entire life cycle of a building – from planning through to implementation and operation, all the way to demolition. BIM offers a whole host of benefits. It enables a more efficient interaction between different disciplines, reduces the risk of planning errors and – by automatically calculating the quantity of components for any given project – it offers more security when estimating costs for tenders. For the rest of the building life cycle, the planning models can be transferred directly to facility management, making it much easier to carry out any maintenance or renovations in the future. As a supplier of steel systems, Jansen offers an extensive range of BIM models for windows, doors and façades in order to supports architects and planners from the very first phase of conception, planning and specification. In 2019, Jansen won the Architect's Darling Gold Award for being the best provider of BIM models.

jansen.com/bim

Recommended reading

"Sicherheit und Risiko" (Safety and risk) brings together some of the most important voices in the social, cultural and human sciences, to examine our approach to danger in the 21st century. This book, from the series on social theory from German publisher 'transcript' offers an introduction into the subject of safety and provides answers to questions about our changing relationship with danger, threat, uncertainty and risk.
"Although safety and risk may – at first glance – seem like opposite concepts, they actually originate from exactly the same place: the desire to limit or avoid danger and to defend ourselves against threat, […]." The book contains a series of different essays, examining both theoretical perspectives and real-life threat scenarios.

Herfried Münkler, Matthias Bohlender, Sabine Meurer:
Sicherheit und Risiko. Über den Umgang mit Gefahr im 21. Jahrhundert. (Safety and risk. Looking at how we deal with danger in the 21st century.)
transcript Independent Academic Publishing, Mannheim 2010, ISBN 978-3-8376-1229-5.

EI30 VISS Fire: Successful certification of fire resistance

Jansen has subjected its fire-resistant façade VISS Fire to an extended testing program. The thermally separated post and mullion construction is now available with a tried-and-tested face width of 60 millimetres, in addition to the 50 millimetre profile previously available. With its welded flat steel construction, the VISS façade system is able to implement glass loads of up to 1800 kilos. VISS façades can accommodate glass of up to 2700 millimetres in width and 4600 millimetres high – a surface area of more than 12 square metres. That means that, in terms of the choice and size of glass, the construction possibilities with VISS EI30 are almost endless. The test report also states that Janisol 2 doors can be installed in VISS façades – yet more proof of Jansen's expertise in the field of fire safety. The Swiss provider of steel systems offers tested complete solutions for all aspects of façade design, including doors and entrance areas.

While the wide variety of tested glass variants, sizes and corner connections mean that the EI30 façade offers even more design options for architects, it has the added benefit of fewer components to deal with during processing. For example, there is no fire protection laminate in the fastening profile area (as it is only required in the glass rebate) and the range of support anchors has also been condensed (they can be used for several glass sizes). The optimised processing of VISS EI30 saves time and money, giving construction companies an even greater competitive advantage. Jansen also offers processors a comprehensive training programme, which also includes licensing for processing fire protection systems.

AGENDA

Virtual event programme 2021

In 2021, Jansen and its distribution partners will be entering into discussions with architects and metalworkers across Europe. This will take place in the form of virtual and exclusive physical events. Product innovations in the field of building security will be presented, with talks, panel discussions and workshops held to highlight the current issues affecting the construction industry. The main focus will be on key issues shaping society such as safety, digitalisation and sustainability. Should COVID-19 prevent attendees from experiencing products first hand, Jansen will be offering a virtual showroom as a digital alternative from 2021.

You can view current events, possible tour stops and more detailed information, and register at:

jansen.com/2021

An outstanding approach to renovation

University of Graz Library, Austria

The campus of the Karl-Franzens University of Graz in Austria is now home to an impressive new study and meeting space, with a newly renovated university library that creates a harmonious transition between old and new. In addition to the VISS façade, the new building features various doors and windows from the Janisol range, ensuring optimum safety and security.

Not only do educational buildings shape our society and its future, they also help to determine the quality of the learning and research that takes place within them. In an ideal world, they should combine high-quality education with appropriate architectural conditions, creating a fertile field for training individuals that are fit to face the challenges the future holds.

Mindful of this close relationship between education and the built environment, the University of Graz is continuously seeking to optimise its structural infrastructure. With its renovation and expansion of the Graz university library, Austria's state-run organisation for managing public property – otherwise known as BIG – has created a representative, contemporary library that meets the most cutting-edge research standards. The renovation also offers a prime example of what can be achieved when two supposed opposites are cleverly combined. The historic university buildings have been complemented with elements of contemporary architecture, in a design that unites theory with practice and science with art. The international tender for the renovation was commissioned by BIG in spring 2015. 35 companies from all over Austria and two from Germany entered the bidding process. Of the five approved project submissions, it was the proposal submitted by Graz architecture office Atelier Thomas Pucher that eventually won the tender. After around three years of construction, the University of Graz and BIG opened the new university library on 26 September 2019.

The heart of the university campus

The redesign has given the library a completely new look, characterised predominantly by the two-storey glass-fronted platform that juts out from the top of the historic reading room, originally built in 1895. Demolishing the 1970s-built extension uncovered the historic, listed façade on the north side of the library, which now has a large covered area in front of it. The effect of this – in regard to the urban development of the centre of the entire campus – was a major factor in the jury's decision.

The new building more than meets the requirements of a 21st century library, combining different structures, functions, rooms and styles into one homogeneous ensemble. Architect Thomas Pucher also introduced a transparent atrium to connect the library with the main university building, and consolidated the hotchpotch of different add-ons and extensions that had been built over the years into one cohesive whole. He also succeeded in restoring the original library and the historic part of the building to their former glory. The result is a union of opposites between the existing, listed building and the new building, which serves as inspiration for anyone visiting the library, as well as making it the heart of the university campus. The new atrium takes on the role of an entrance and events foyer, and acts as a central junction – with entrances from the north and south, as well as from the main university building. From here, students can also get to the lecture hall and the library service points. They can also access the workstations in the reading room and on the new upper storey provided by the glass platform.

For the first time, the various sections of the building – which cover more than 11,000 square metres in total – have merged to form one unit. In a process that lasted three years, this involved the removal of 4000 cubic meters of earth, the casting of 4200 cubic metres of concrete, and the installation of 400 tonnes of steel, not to mention 3500 square metres of glass. The total investment was around 28 million euros.

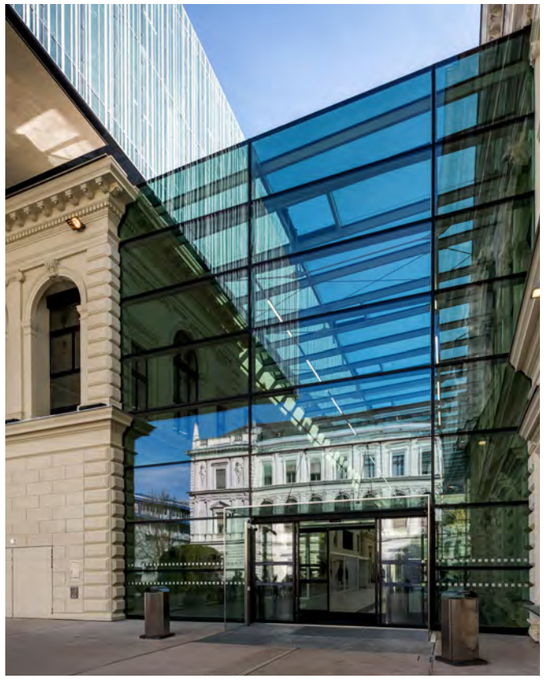
Functional glass façade

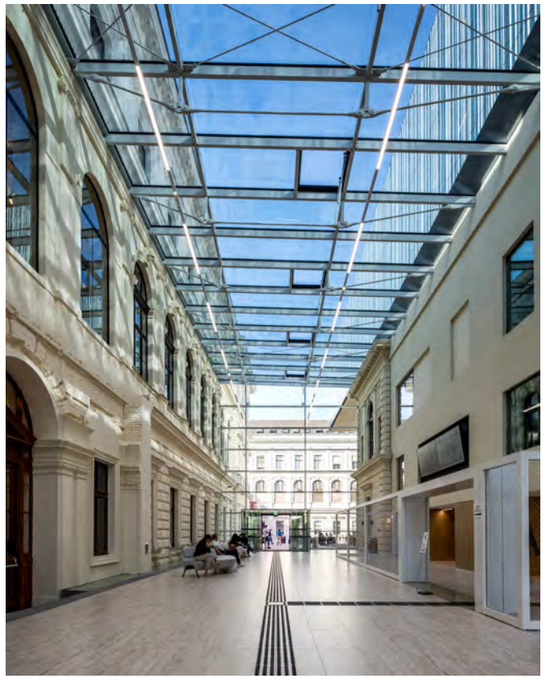
The new building is characterised by a clear, functional design language – and lots of glass. Various profile systems from Schüco and Jansen were used in its construction. One example is the Jansen VISS façade system, which has been perfectly designed to offer highly insulated façade construction with 'Passivhaus' energy efficiency certification for any application, both in new buildings and refurbishments. This is a modular system from which the most suitable components – from a technical and economical perspective – can be selected, according to the static requirements, pane sizes or the filling element thickness.

The new university campus also features Janisol C4 EI60 and Janisol 2 EI30 fire protection doors. The highly thermally insulated Janisol HI system was installed for all non-fire-proof doors and windows.

With state-of-the-art thermal glass, as well as excellent glare protection and ventilation, this system ensures that students and staff have a comfortable indoor climate to work in. Over the course of the renovation, particular attention was paid to sustainable building methods and renewable energy. The building is equipped with an efficient heat recovery system and energy-saving LED lighting that adapts to the level of natural light. In May 2019, a 630 square metre photovoltaic system was installed on the roof of the building, which produces around 180,000 kilowatt hours of electricity per year for the university's power grid.

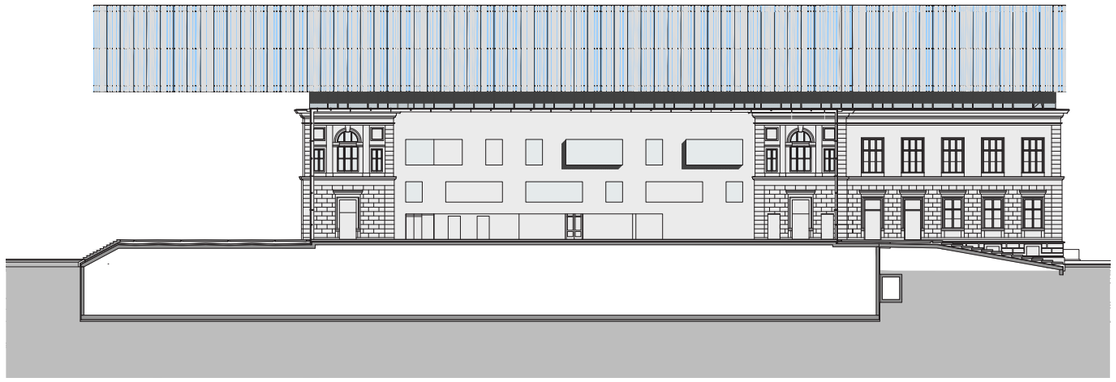
Here's what the Dean of the university, Christa Neuper, has to say about the new library: "Excellent science requires excellent infrastructure. The new university library has everything you could possibly need from a 21st century educational and research institution. This includes attractive learning spaces, as well as access to digital media and cutting-edge technology in the lecture hall – which fits perfectly with our forward-thinking motto here at the University of Graz: "We work for tomorrow!" (GB)



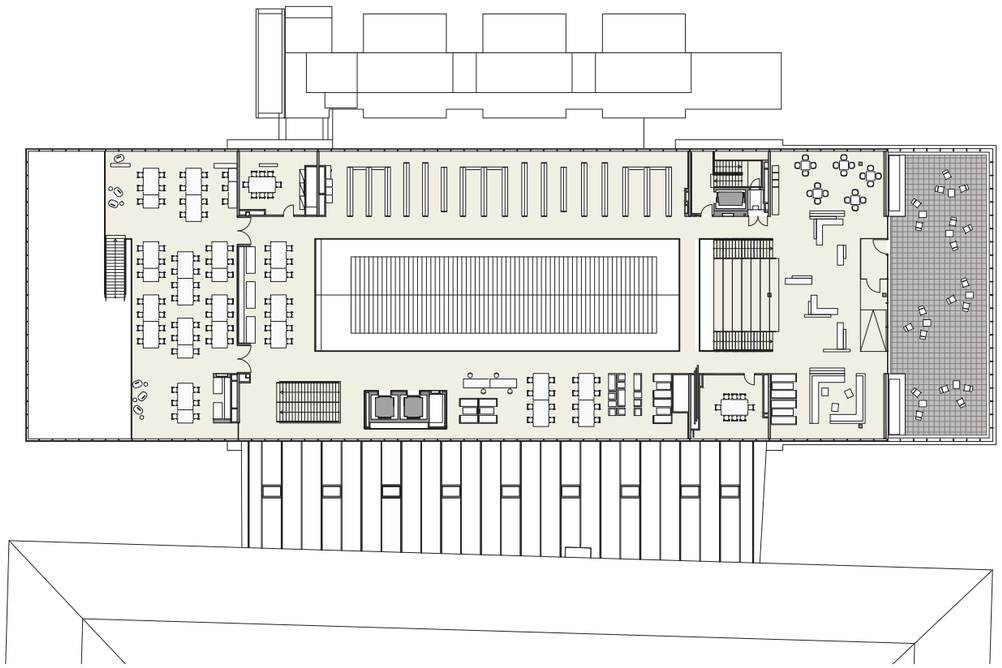


A transparent atrium – constructed from the Jansen VISS façade steel profile system – connects the library to the main university building, making it one continuous space.

For the windows and doors, the heat-insulated system Janisol HI was installed at the new university campus. Janisol C4 EI60 and Janisol 2 EI30 fire-proof doors were also installed.



The two-storey glass platform that juts out from on top of the historic reading room, built in 1895, gives the library a whole new look.



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PROJECT DETAILS

Client:
Graz University of Technology and BIG, Graz
Architects:
Atelier Thomas Pucher ZT GmbH, Graz
Metalwork:
Strabag, Vienna; Ferroglas Glasbautechnik GesmbH, Hörsching
Steel profile systems:
Janisol HI, Janisol 2 EI30, Janisol C4 EI60, VISS facade

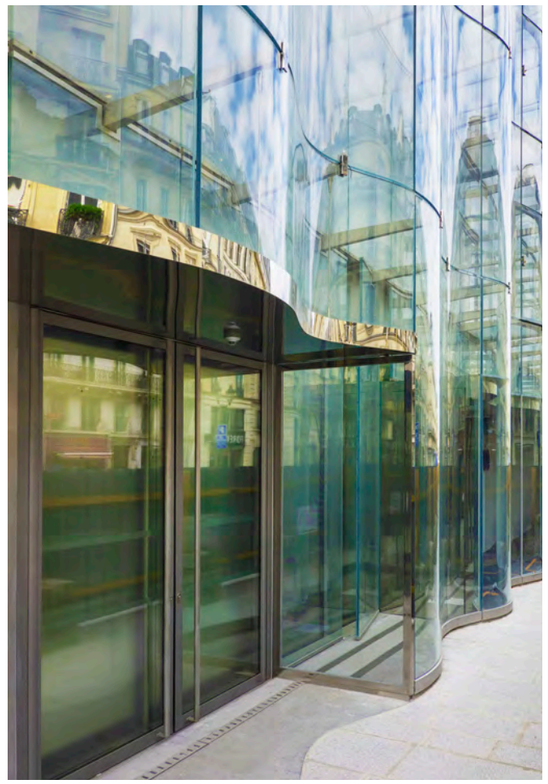
La Samaritaine, Paris, France

Securing the perfect shopping experience

La Samaritaine, once the largest department store in Paris, has been rebuilt from the ground up. The aim of the major renovation and expansion work was to create a multi-purpose space, with a hotel, offices and residential apartments, as well as a much smaller department store. The latter now features fire-proof swing doors, providing easy access to the store and the utmost safety.

For the façade, SANAA developed a simple solution comprising of waved glass panels – a proposal that really did cause quite the ripple, with a complaint from the heritage preservation authority delaying construction work by several years.

The waved glass façade has 11 double-leaf swing doors, leading into the ground floor of the new department store. These extra-high 3.30 m fire-proof doors were developed by Jansen in close collaboration with Frener & Reifer, based on the Janisol 2 EI30 steel profile system.



The story of this legendary department store in the heart of Paris begins in 1869, when shopkeeper Ernest Cognacq opened a store near the Pont Neuf. In honour of a water pump that had been installed there in 1813, which featured a sculpture depicting Jesus with the Samaritan woman at Jacob's well, he named his shop "La Samaritaine", or "The Samaritan". "La Samar", as the shop was fondly known by locals, soon became the largest department store in the city. By the time of its renovation, the store had come to cover 48,000 square metres of floorspace, split across four buildings. The most famous among them is probably the second shop, located in the magnificent Art Nouveau building on the Quai du Louvre, designed by the architect Henri Sauvage. The store also came to occupy the building next door, designed by architect Frantz Jourdain, which is a little older and stretches all the way to the Rue Baillet. Later, the fourth shop was established on the opposite side of the Rue Baillet, and spans all the way to the Rue de Rivoli.

Multi-use space in top location

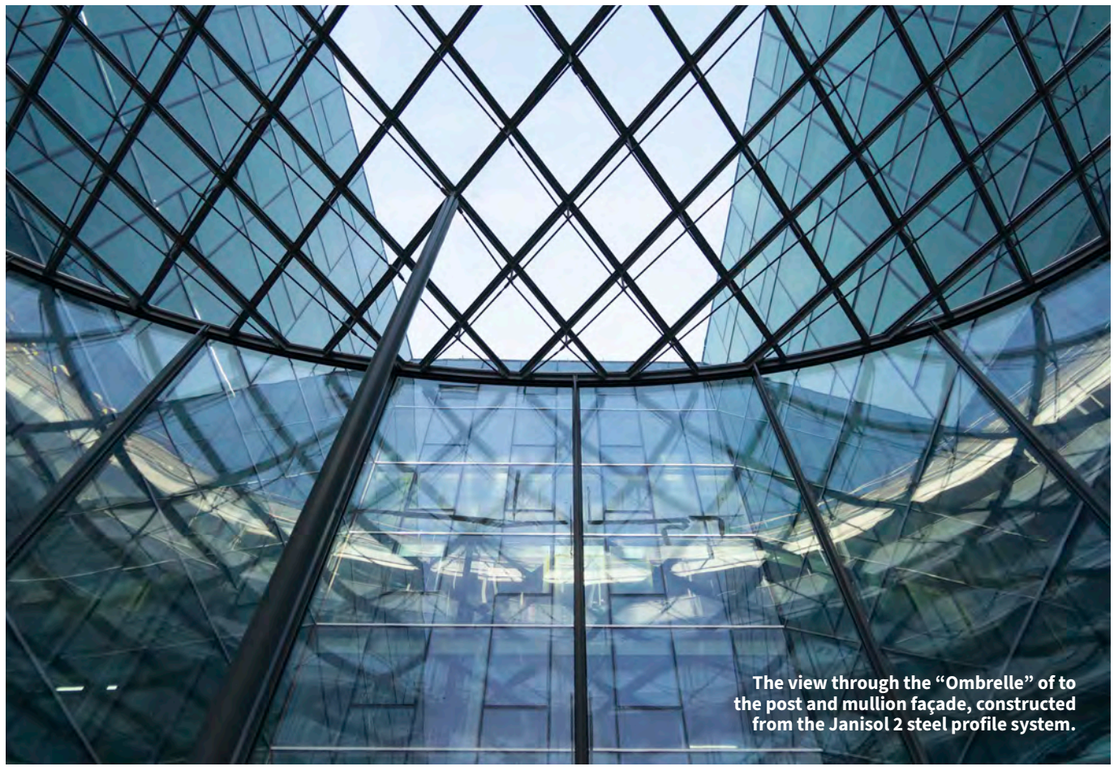
In 2001, the French company LVMH – the world's largest player in the luxury goods industry – took over majority ownership of La Samaritaine, later acquiring full ownership in 2010. However, back in 2005 the department store was closed for safety reasons. As part of the renovation, LVMH has now transformed the space into a multi-use complex, featuring a department store with 20,000 square meters of floor space, a luxury hotel on the upper floors of the listed Sauvage building, 15,000 square metres of office space, 96 residential units and a childcare centre. The French architect Edouard François was commissioned to convert the Art Nouveau building into a hotel, and SANAA designed the new building on the original site of what was formally the fourth section of 'La Samaritaine'.

The Japanese architect duo had recently been awarded the Pritzker Prize for their designs, which have been described as "graceful yet powerful" and "crisp yet fluid". For the façade of the new building, SANAA developed a simple solution comprising of waved glass panels – a proposal that really did cause quite a ripple, with a complaint from the heritage preservation authority delaying the construction work for several years. Only in the third and final case was their claim rejected by the Conseil d'État.

Extra-high fire-proof swing doors

The planning and implementation of the waved glass façade, including the thermal façade behind it, was overseen by the South-Tyrolean façade construction company

The “Dôme” in the Jourdain building, an 18 x 20 m vaulted glass roof constructed by Frener & Reifer using the Jansen VISS steel profile system.



The view through the “Ombrelle” of to the post and mullion façade, constructed from the Janisol 2 steel profile system.

Frener & Reifer. There is no standard procedure for constructing a façade system with such a complex design. The façade specialists from Brixen therefore not only developed the technical solutions, including any necessary tests and project planning, but also took on the role of director for the construction work, liaising between different international companies and systems suppliers to bring this spectacular bespoke design into being. The waved glass façade spans the breadth of the building at a distance of 0.30 to 1.30 metres in front of the thermal façade, providing much-needed protection from the sun’s rays. This effect is achieved through a grid of invisible points that reflect solar radiation. Support arms are used to fix the waved glass panels to just four points on the thermal façade, which is constructed from laser-welded stainless steel profiles. Glass types from different manufacturers were installed on the thermal façade, according to the on-site requirements. On the ground floor, entry is via swing doors installed in the waved glass façade. The 3.30 metre-high door panels, of which there are 22 in total, were developed in close cooperation with Frener & Reifer. Based on the Janisol 2 EI30 steel profile system, they provide full fire protection. The extra-high doors are exceptionally easy to manoeuvre. They only take a little push to swing open, and so can be operated with ease even by older or weaker customers.

Additional glass roofs

Taking on board Jourdain’s preoccupation with the use of light, SANAA also ran with this theme in other areas of the design. In addition to the existing, listed glass roof, the “Verrière”, the architects introduced two new ones: the “Dôme” in the Jourdain building – a vaulted rectangle of around 18 x 20 metres – and the “Ombrelle”, a glass shade in the courtyard of the new building on the Rue de Rivoli. The three successive atriums create a mostly covered walkway connecting the Quai du Louvre to the Rue de Rivoli. Frener & Reifer manufactured the two new glass roofs using innovative lightweight steel designs. The architects were insistent that there should be no visible connections, which posed a major challenge to the façade specialists. In the end, both glass roofs were fully prefabricated in the factory in Brixen and then carried to the construction site in transportable elements using flat-bed lorries, where they were lifted into position using a crane and welded in place. For the production of the “Dôme”, Frener & Reifer chose the VISS steel profile system from Jansen. The use of VISS Fire meant that the areas requiring fire-proof features could be designed such that they would blend in perfectly with the rest of the construction. From a design perspective – i.e. the shape of the roof, its inclination, and the size of the glass panels – the “Dôme” fell within the scope of the approved specifications, which meant that no additional inspection was required.

Masters of disguise

The production of the façades in the inner courtyard of the building on the Rue de Rivoli, on the other hand, was not quite as simple. According to the architects’ request, the vertical joints should be as invisible as possible, despite the EI30 fire-proofing requirement. The challenge for Frener & Reifer was therefore to create a post and mullion façade with the visual appearance of a structural glazing façade. After numerous fire resistance tests using various seals, fastening systems and types of glass, they eventually managed to achieve this using the Janisol 2 series. And their efforts paid off: with their large glass panels and uniform rows of top-hung windows, façades of the inner courtyard fulfil the architects’ vision of a simple, understated design that discreetly conceals the required technology.

According to its own estimations, LVMH has invested around 750 million euros in the building complex. The question remains as to when La Samaritaine will reopen. Having originally been scheduled for April 2020, the reopening had to be delayed at short notice due to the coronavirus pandemic. The newspaper Le Monde predicts that the store will take until 2021 for the department store to resume business. As for the prospective tenants of the offices and apartments, as well as all those eagerly awaiting the opening of the luxury hotel, the “Cheval Blanc” – they will just have to stay patient for a little while longer. (AMR)

PROJECT DETAILS

Client:
LVMH Moët Hennessy – Louis Vuitton SE, Paris
Architects:
Edouard François, Paris; SANAA (Sejima and Nishizawa and Associates), Tokyo
Metal work:
Frener & Reifer, Brixen
Steel profile systems:
Janisol 2 EI30 fire-proof swing doors, VISS, VISS Fire, Janisol 2 facade (tailor-made project-specific solution)

QR code: more images

Load-bearing capacity of transparent surfaces

The art of structural engineering – style and safety

When planning a building, not only is it essential to verify the soundness of the main structure, but also the load-bearing capacity of the building envelope. Here we will take at a special new building project – the 'Futurium' in Berlin – to illustrate how architects and engineers address the requirements of both structure and design.

The art of structural engineering – some would associate this with historical castles, palaces or cathedrals. Others may think of prominent icons of contemporary architecture, be it bridges, train stations, museums or other comparable constructions. One thing all these examples have in common is that they differ from other art forms in two essential areas. Firstly, buildings are primarily created to fulfil a certain set of functions. Secondly, they differ significantly from other works of art in terms of their dimensions.

The increasing complexity of the functional requirements and the often formidable size of a building project challenges the planner to deal not only with the aspects of design, but also with issues such as the choice of materials, structural planning and production technology. With this in mind, structural engineering can be seen as an art form in which architects and civil engineers work together to create the ideal combination of structure and style.

Over the course of industrialisation, process engineering in steel production took a significant step forward. The materials produced by these new processes (wrought iron and, later, forged steel) were of higher quality and available in larger quantities, which opened up new possibilities for structural engineering. As a ductile and extremely resistant material, steel became the material of choice in buildings with intricate structures and large span widths – and has remained so to this day.

An early example that offered an impressive demonstration of the advantages of this 'new' material was the Galerie des Machines in Paris (1889) – a collaborative effort between the architect Charles Louis Ferdinand Dutert and the engineer Victor Contamin. The entire building envelope – which until then would usually have consisted of a solid construction with a minimal number of openings for light and ventilation – was able to be given a light and transparent design using a steel skeleton construction. The result was a look that was truly futuristic for that time.

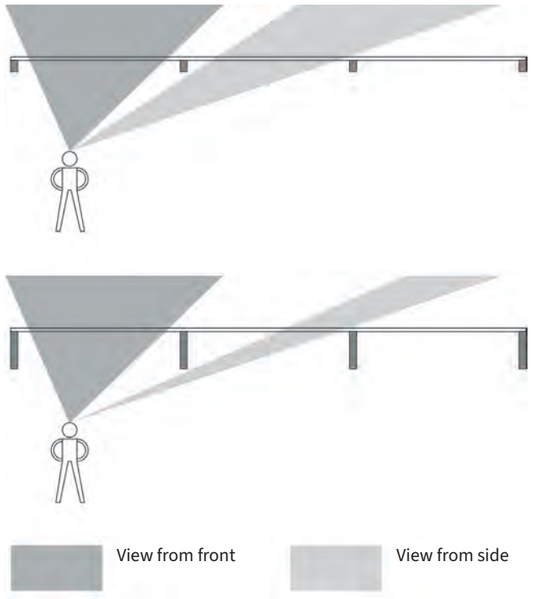
Not just an excellent structure

The increasing acceptance of the use of skeleton frames in structural engineering inevitably led to a structural separation between the main structure (primary structure) and the building envelope (secondary structure). With the consistent development of new materials and production technologies, the infill of the steel structure with conventional wall elements was gradually replaced by an industrially manufactured, non-load-bearing outer shell, which is hung in front of the load-bearing skeleton and encloses the building like a curtain.

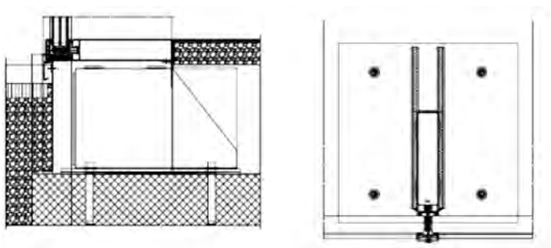
If you look at the early curtain walls of the 1950s or 1960s, you will find impressive examples of highly intricate steel and glass constructions. The planners of the time were all too aware that the curtain wall design, while having many advantages, also presented a number of challenges. With the materials, construction technologies and verification methods available at the time, the complex interplay of static, physical, structural and design requirements could not be fully resolved in the planning process.

The hierarchical division of the main structure and building envelope brought with it the challenge of ensuring that the two structural elements could be connected without penetrating the continuous thermal insulation of the outer shell. Thermally separated profiles and insulating glass were not yet available on the market at that time. It was only as a result of the oil crisis in the 1970s, and the energy requirements that have been steadily increasing ever since, that materials and verification procedures were developed to address these issues.

One of the first thermally separated façade systems to enter the market at that time, which has since been continuously developed and has proven its effectiveness in many outstanding projects, is Jansen VISS. The system, which is based on slim steel profiles, not only offers an excellent supporting structure for large-scale glazing, but also provides the best heat transfer coefficients and can therefore help to achieve the most energy-efficient building envelopes.



In order to increase the transparency of a glazed façade, the selected frame elements should not only have slim face widths but also a low basic depth. The view through the façade and the amount of natural light are largely determined by the distance between and basic depth of the mullion profiles. Depending on the viewing direction, the basic depth of the frame elements appears greater or smaller and contributes to the perceived width of the profile. Here, unlike most other building materials, the excellent static properties of steel can help to reduce the profile depth and emphasise the transparency of the glazed building envelope.



With regard to the statics of the façade, there are numerous ways to reduce the basic depth of a mullion profile. One option is to fix the profile unilaterally rather than the usual joint fixing – provided that this is permitted by the static structural edge conditions at the installation site. This method significantly reduces the required moment of inertia of the profile under transverse load (wind load). At this point it is also worth noting that the required moment of resistance remains unchanged. That makes this approach particularly suitable for building situations in which verification of the static conditions largely depends on the permissible level of deformation (serviceability limit state).

Because the steel material can be welded, components can be fixed quite elegantly in terms of the design. The steel mullion is welded to a console plate, which is anchored to the shell using bolts. The welded joint can be reinforced with additional ribs, depending on the static requirements. Another option for reducing the basic depth is to create a multi-span beam. With this approach, one mullion profile can extend over several floors and is usually anchored to the floor slabs using sliding bearings. This gives rise to various structural and physical issues, for example with regard to the deformation of the floor slabs or sound transmission between different sections of the building, which must be taken into account in the planning. In principle, this static approach is feasible if, in a multi-storey room (e.g. an atrium), a horizontal, static support is put in place in front of the reinforced concrete columns of the primary structure, which then acts as an intermediate support.

Optimised light conditions

Using the façade construction of the Berlin Futurium as an example, we will now take a look at the design possibilities offered by the Jansen VISS façade system.

The plan was to create a futuristic building that would accommodate exhibitions and events on the subject of ‘shaping the future’. A central aspect of this will undoubtedly be digitalisation, and it was clear to the architects that this topic would dominate the changing exhibitions. With this in mind, they not only developed the silvery shimmering façades consisting of special glass tiles, but also – as a stark contrast to this small-scale structure – two large steel and glass façades were installed, which act as screens. The surroundings are reflected on these screens, with the scene changing according to where the viewer is standing.

The first floor of the building forms a single, cohesive space. The screens provide natural lighting and offer the visitor an unobstructed view of the government district and the hustle and bustle of the city. In order to optimise both the amount of daylight and the view, there was a clear planning goal to minimise the post and mullion construction of the glass façades, which are up to 33 m wide and up to 12 m high. As well as testing the effects of wind load and the dead weight of the triple insulating glass units with panes measuring up to 2.3 x 5.0 m, it was also necessary to ensure the highest class of fall protection for crowd safety.

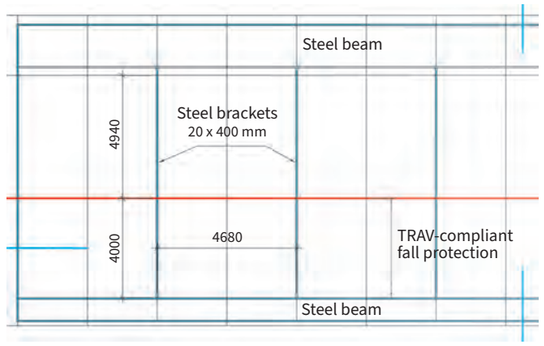
It was essential to ensure the serviceability of the bonded glass façade with regard to wind loads and fall protection, taking into account the possibility that the bonding could fail. At the same time, any components used to secure the glass panes mechanically were not allowed to be visible from the outside, as this would impair the visual appearance of the screens. The requirements for the screen façades were therefore as follows:

- Structural glazing façade
- Triple insulating glazing
- High-quality sun shading glass
- Extremely heavy glass (up to 870 kg)
- Minimal profile geometry
- Fall protection

All of these requirements were able to be met with the VISS SG façade system. Unlike conventional post and mullion constructions, this system diverts the load effects in two ways. The horizontal wind load is transferred via the continuous transom profiles to the steel brackets behind. The mullion profiles are inserted between the continuous transom profiles with non-positive-locking connections, which allows them to transfer the dead weight of the façade to a truss in the roof area.

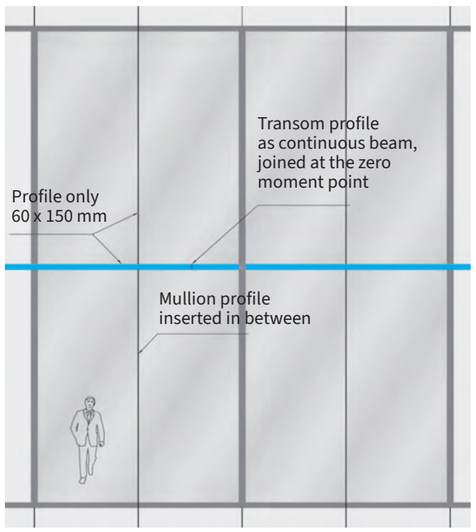
This also means the exhibition space on the first floor is free from supports, because the cantilevered ceiling in the area of the transparent screens is suspended from the roof structure using steel brackets. These steel brackets act as intermediate supports for the continuous transom profile – an example of how the profile cross section can be optimised by creating a multi-span beam.

This principle is illustrated in the following drawings of the south façade. This approach resulted in a profile geometry of just 60 x 150 mm, with steel brackets with a cross section of 20 x 400 mm positioned in every second axis.



When optimised in this way, the profile cross sections ensure a large amount of natural light and the most unobstructed view possible. The fall protection requirement is guaranteed by the glass structure, the façade structure and the anchoring between the glass and frame elements.

In the VISS SG façade construction, the anchoring is performed by a stainless steel glazing clip, which clips into a special opening in the laminated pane. In this specific application, special glazing clips were developed which are perfectly designed to meet the static structural requirements of this extraordinary façade structure – yet another example of the successful union of structure and style.



Considering the requirements described, the visual and structural design of the screens is a prime example of the art of structural engineering. Last but not least, creating the perfect building angle where four surfaces meet, despite all the construction tolerances, is nothing short of a masterpiece – and the Futurium features four of them.

LALO Antwerp, Belgium

Maximising the minimal

You could be forgiven for thinking that renovating a terraced house would have little appeal to an ambitious architect. The LALO property in Antwerp proves just the opposite, where local architecture firm Sculp[IT] created what has to be the most radical solution to the space issue, with the "largest pivoting window in the world".

In the 15th and 16th centuries, Antwerp was one of the largest cities in the world. For a period, it was the most important trading metropolis in Europe and was home to several well-known artists. In the centuries-old Diamond Quarter and around the Grote Markt in the heart of the city, you can still find stunning examples of typical Antwerp architecture in the style of the Flemish Renaissance.

Despite extensive bombing at the end of the Second World War, the historic cityscape has been largely preserved. The same applies to the Lange Lozanastraat (LALO) district, which was the setting for Sculp[IT]'s ambitious renovation project. The aim was to completely refurbish the existing building, as well as to open up and expand the premises into the garden.

A complete contrast

On the side facing the street, the neat historic façade of the town house was left intact, in order to preserve its history and bourgeois character. On this side, the renovation of the five-storey house – , including the mansard roof, which is just six metres wide – was carried out in line with local conservation legislation. On the garden side, however, the house was subjected to a radical transformation, opening up and extending the entire aspect. The contrast could not be any greater: while the front of the property – with its three neat little windows on each storey – looks quaint and compact, the garden side has an overwhelming openness about it. The building has been fully opened up above the previous extension to create a new space that spans three storeys. Rather than installing individual windows, the designers opted for a huge pivoting doorway, with two enormous glazed panels, each measuring three metres wide and six metres high, giving the period town house a completely transparent rear aspect. This floods the house with daylight and opens up the access to the garden, which was previously cut off from the main house. The new dining and living area, along with the gallery, create a harmonious union of space and light.

"We demolished the rear part of the building and took part of the original second storey out onto the garden level in order to provide same-level access and to give the residents a beautiful view of their garden from each of the different floors," the architects explain. The glazed rear of the building makes a bold, radical statement that complements the historic front and brings this home right into the 21st century.

New meets old

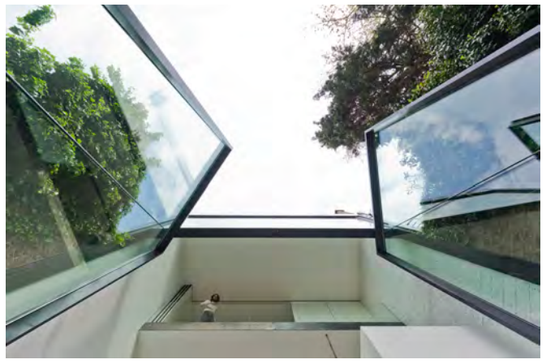
The new area on the ground floor extends into the garden by around six metres. The two-storey space now features an open kitchen and a spacious dining area, while utility rooms and a garage have been integrated into the existing part of the ground floor. The polished concrete floor, which extends from the inside of the building to the outdoor patio, adding to the sense of spaciousness.

Two huge glazed panels measuring 3 m wide and 6 m high form the open rear aspect of the period town house. A combination of profile additions were implemented to reinforce the VISS façade-type Jansen profile used in this project.

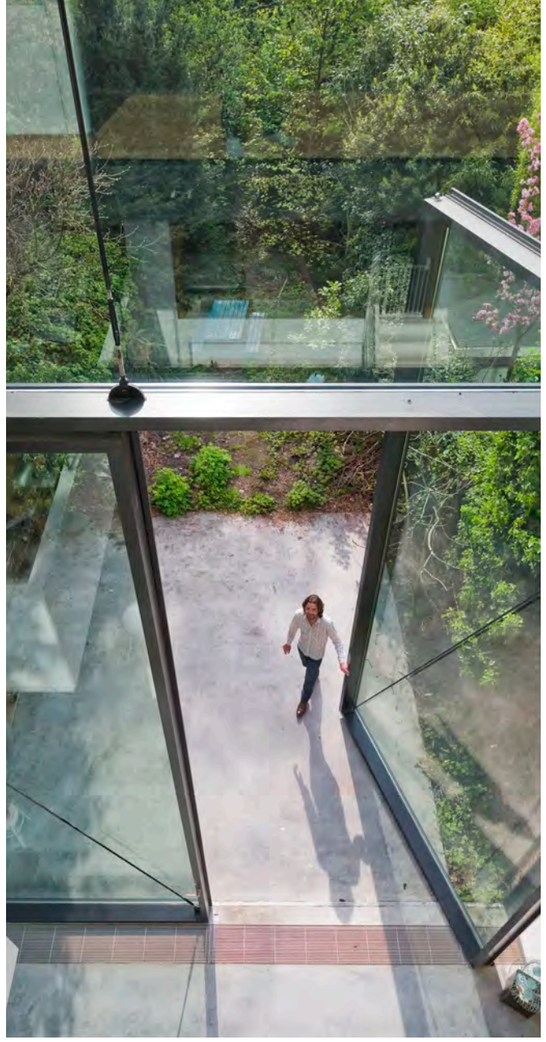
Above the kitchen, there is a narrow gallery running lengthways along the building, which is used as a studio or home office. There are two bedrooms located on the floor above, one of which has access to an interior balcony with a view above the dining area into the garden. There are two bathrooms between the bedrooms, which were also given a refresh as part of the renovation work.

The world's largest pivoting windows

The new, open part of the building has a utilitarian, minimalist feel about it, with white plastered concrete walls, floors and balustrades. The concrete of the ground floor has been polished, but other than that there is no interior decoration, as such. Above the huge pivoting double doors is another fixed glazed panel measuring six by three metres. Each window, including the frame, weighs around two tonnes. For safety reasons, the Jansen VISS façade-type Jansen profiles used to create the windows had to be reinforced in order to be able to withstand extreme winds and protect against break-ins. For this purpose, Jansen is able to offer a sophisticated complete solution for high-spec façade designs, by combining new additions to its range of profiles, such as the highly static VISS steel profiles and the heavy-duty T-joints. VISS façades offer a combination of simple elegance, technical prowess and economic efficiency. With regard to the LALO project, this allowed design aesthetics, structural safety and efficient processing to be reduced to a single, common denominator. With this bespoke solution – which saw Jansen's VISS façade get the XXL treatment – our unique profile system demonstrated its strength as a floor-to-ceiling, module field pivoting door.



"We haven't done much, but what we have done has an enormous impact on the way the house looks and how people can live in it," says the architecture firm Sculp[IT]. (GB)



PROJECT DETAILS

Client:
Van Nuffel, Van der Schueren, Antwerp
Architects:
Sculp[IT] Architecten, Antwerp
Metalwork:
Lootens Deinze NV, Deinze
Steel profile systems:
VISS, VISS Basic swing doors (reinforced and adapted to specific project requirements)

QR code: more images

Cyber crime

Staying safe in a digital world

Whether it's smart building, VR, cloud systems or BIM, digitalisation is in full swing and there is no going back. It is driving new modes of business forward, and leaving analogue business models behind. And yet, many companies are realising that they cannot get by on digitalisation alone. Let's take a look at why any organisation or individual considering entering the world of digitalisation, also needs to pay equal attention to the matter of cyber security.

Digitalisation is fun. Which is fortunate, since it is practically unavoidable these days. The digital age is a time of new possibilities – with everything getting faster, more colourful, but sometimes louder, too. We can all agree that digitalisation has become part of our day-to-day life, and yet it doesn't always work very well. Suddenly plunged into the world of home schooling, no doubt some of us are beginning to see that not everything runs as smoothly as it ought to. And then, just as Covid-19 appeared to be improving our interaction with the digital world, we also started to see the negative impacts, like the sudden onset of 'zoom bombing'. In short, cybersecurity, or rather the lack of cybersecurity, has forced many of our digital pioneers to face the harsh realities of the cyber world.

A swathe of hackers

In old (and even in some more recent) films, the hacker is often portrayed as an elusive sort of character, who wears a hoodie and sits eating pizza in a dimly lit room, typing away in some mysterious-looking code and using all sorts of cool applications. However, the attackers taking on IT systems nowadays – whether they're targeting large or small companies, private homes, medical practices, hospitals, construction companies or window manufacturers – are not sitting alone in their basements. The ones threatening our digital security today are part of a whole swathe of hackers and, as in industry, they work in a division of labour. One group organises distribution – after all, the program code that supports the attack has to be delivered to those implementing it. Other people then organise the use and functionality of this 'malicious code', while yet another group of people takes care of the monetisation – such as the collection of payment in the case of ransomware, or the resale of intellectual property in the case of money laundering. They work in shifts and often the proverbial basement we've seen in the movies is actually more like an infinity pool on an Asian beach.

That said, some hackers also use artificial intelligence that has been specially trained to break into a digital system. In this sense, digitalisation is not only making us more susceptible to attacks, but it also making the attackers more powerful. This criminal industry has existed for quite some time now, and the damage to the national economy is now greater than the economic damage caused by the drugs trade.

What motivates hackers?

You may be wondering why we are so concerned with this. The point is, it is really important to understand what motivates the attackers. The procurement of foreign currency by isolated states leads to ransomware attacks, some of which come with breathtaking ransom demands.

The predominant form of cyber crime and one that has been regularly observed over the past few years, involves hackers stealing company data and selling it on to competitors – or, in some cases, companies directly commissioning the theft of data from their competitors. Data theft has also recently been linked to ransomware and is used to add more weight to ransom demands. In this respect, the 'business model' – so to speak – behind data theft has expanded from an approach to gaining intelligence to an approach that aids extortion.

Unfortunately, data destruction has also become part of the hacker's repertoire, with ransomware attacks now offering the greatest potential value for the lowest risk of detection. Companies that operate in more controversial industries, such as the arms trade, oil production or banking, for example, often provide an additional motivation for attackers, other than the monetary incentive. Attackers often claim that they have some sort of moral duty to target these sorts of businesses, due to their detrimental effects on the environment and society.

The better our understanding of why we're being attacked, the more efficiently we can protect ourselves.

Risk management as a central line of defence

These considerations are all elements of the core risk management strategy that organisations need to establish. Only then is it worth thinking about which processes and technologies might provide you with a level of security that is commensurate to the level of threat. In all cases, the key thing here is to start by fixing the basics. Patching, patching and more patching is essential when it comes to digital security. And yet this still isn't firmly implanted in the collective mindset, as this security gap from Windows demonstrates: using an 'Internet of Things' search engine, several thousand systems on the internet in Germany can be identified, which could have been secured many months ago simply by importing Microsoft security patches. This is where another mechanism of a successful attack comes into play. To use the hotly debated issues of Covid-19 and measles as an analogy – just as any individual who hasn't been vaccinated has an impact on our herd immunity, any unprotected system affects our collective security. These unprotected systems are welcome gateways for potential attacks, and are exploited as such.

Another question we have to ask ourselves is, "Where is my data?" And for those using BIM systems: "Who else is sharing the same data platform as me?" In principle, cloud environments are no worse than systems in your own data centre. In fact, they are often better, because providers like Amazon have much higher security budgets than any medium-sized company; plus the fact that standardisation also makes it easier to manage security. That said, even with the most cutting-edge technology out there, there is always the risk of it being used incorrectly, thus weakening the system. In many cases, weak points in large cloud systems have turned out not to be the fault of the cloud provider, but rather improper implementation – on the part of the user – of things like administrative access. This is what happened a few years ago in a security breach involving Microsoft's Azure cloud.

When it comes to cloud systems, certain questions arise on the issue of compliance – i.e. the observation of data protection regulations such as GDPR. This issue not only affects Europe, however, but also countries like China and the USA, which have their own data protection legislation. The question of compliance poses significant problems for companies, and in fact every organisation would be well advised to actively comply with data protection laws and cybersecurity legislation, rather than leaving it up to chance.

Typical gateways for hackers

As well as weak points in an IT system, which can be identified with the help of so-called Internet of Things search engines like Shodan.io, there are two major weak points that have proven to be particularly effective for attackers. You will not be surprised to discover that the first of these is human error. In an approach known as phishing, where emails are sent containing malicious file attachments or links, individual users become the point of weakness through which attackers gain access into a company. The second major gateway is the supply chain. Companies' increasingly cost-driven purchasing behaviour means that suppliers' margins are becoming ever tighter, which in turn restricts their budget for establishing effective security measures.

Ultimately, this allows attackers to install their own applications onto the system. This undetected software then prepares the ransomware attack, in the case of data theft, send data in the background.

It only takes a quick glimpse at the statistics to see the impact of this (self-induced) vulnerability: almost all successful major attacks in the last three years can be traced back to attacks that were initiated via the supply chain.

What can I do to protect myself?

As well as the basic measures already mentioned, employee training courses are very helpful in making users better equipped to recognise phishing attacks. Failing that, the company should consider using intelligent systems to detect attacks. As well as the expensive threat detection systems available for in-house operation, there are also externally managed threat detection services available, which always offer better value to medium-sized companies than the in-house options.

As long as you take on board these few basic considerations, any organisation should be able to put effective measures in place to achieve an adequate level of data security.

Jörg Asma is the Cyber Security & Privacy Partner at PwC. He studied electrical engineering, with a particular focus on automation. He has more than 20 years' experience in the field of cyber security/information security, and advises customers of all sizes from a variety of industries. Jörg Asma was a member of the standardisation committee for the NI 27A ISMS standards. He has co-written various books on cloud security and security governance. He also teaches cyber security and cyber warfare at universities.

Glossary

Ransomware
Ransomware is a type of malware that uses encryption to restrict or prevent users from accessing their system by locking either the user's computer or their personal files. The user is then blackmailed, being requested to pay a ransom in exchange for decryption and release.

Patching
Patching involves manufacturers releasing updates to an operating system or application, in order to correct an identified error or weak point and thus improve the software.

Phishing
Phishing is an attempt to trick people into disclosing sensitive information such as credit card numbers or passwords. This is often done using email or via websites that appear untrustworthy.

Botnet
A botnet is a network, controlled by cyber criminals, that consists of multiple malware-infected computers connected to the Internet. It is used to distribute spam and other malware, and to cause a level of damage that would not be possible with a single computer.

Threat detection
Threat detection refers to an organisation's ability to accurately identify threats to the network, applications or other assets within the network. A threat is anything that has the potential to damage a computer system or the cloud.

Human firewall
A human firewall refers to the obligation of a group of employees within an organisation to follow best practices and procedures in order to prevent or report data breaches or suspicious activity, and to keep the network secure.

Maximum security against break outs and break ins: The new prison is well-designed, bright and modern. Every component comes together as part of a complete security concept.

Cazis Tignez prison, Switzerland

A prison with a view

When constructing a prison, security is always the top priority. The new Cazis Tignez correctional facility near Chur in Switzerland sets new standards for modern-day correctional facilities. Not only does this extensive new facility play a vital role in protecting the general public, it also offers a pioneering new experience for both inmates and staff.

The old Sennhof prison in Chur Old Town no longer met the required security standards. Despite various renovation projects, the time-honoured 17th century building was simply unable to meet the requirements of a modern correctional facility. The working conditions for prisoners and staff alike left much to be desired; the cramped and haphazard room layout compromised security; and there was no more scope for developing the site. Instead it was decided to build a brand new facility, on a much larger site, further along the River Rhine in Cazis, close to the Realta open prison and Beverin psychiatric hospital.

Specific architectural challenges

Architects and planners face a complicated task when developing a new closed prison, often needing to reconcile opposing requirements and conditions. Front of mind must be that the purpose of prison within the legal system is no longer to simply lock people away; instead they should be reintegrated back into society. Security remains paramount and the need to protect the general public the top priority, but this also requires a more long-term approach; after all, in order to keep re-offending rates low, inmates must been given the skills and experience they need to re-enter society. In order to maintain a well regulated daily routine, prisons need appropriate workplaces, exercise yards and communal spaces. Prison staff also need good working conditions, as they too are essentially confined within the facility. If staff feel motivated, security standards improve and facilities are run more efficiently and cost-effectively.

To ensure the right approach was taken in Cazis, architects were invited to submit their conceptual designs for evaluation as part of a tender process. The authorities were looking for a ‘long-sighted’ solution which “demonstrated real depth of insight”. They were particularly impressed by the “Step by Step” proposal from the La Nicca

planning team led by architects D. Jüngling and A. Hagmann based in Chur. After much research, tests and analyses, the team ultimately arrived at a design resembling a planned town, which also met all the legal requirements for the prison system. A concrete wall – measuring seven metres in height and around a kilometre in length – and metal fences surround several new prison buildings, each designed to replicate real-life residential and work settings. In line with the latest standards and research, the three main buildings are arranged in a similar format to a barracks or cloisters. The largest of these buildings houses the cells for the different groups of inmates. There is also a complex of manufacturing halls and workshops, as well as spaces for leisure activities and sports. Exercise yards are located between the buildings and can be sealed off depending on security requirements.

Corridors with good visibility and breakout-proof fixed glazing provide the required overview of inmates' activities, while Janisol 2 EI30 doors ensure that the cells are secure.

Views outside – visibility inside

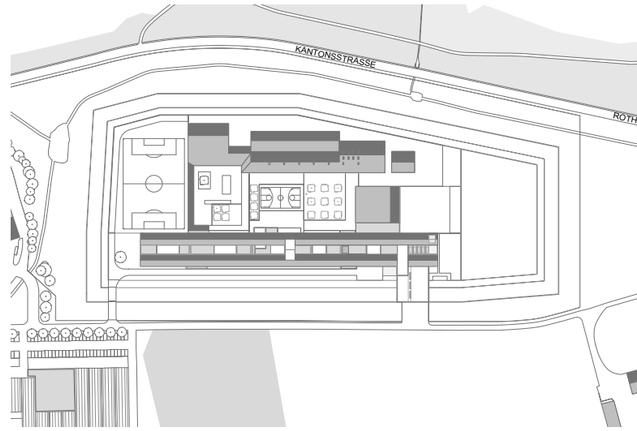
The new facility is well-designed, bright and modern. The biggest design benefits are the amount of natural light and the views over the surrounding mountains. Together, the architects and the authorities have made good use of the 50,000 m² site and its surroundings to create a spacious, well-organised environment which offers plenty of visibility. The facility is now able to accommodate a total of 152 inmates and 110 members of staff. Security is especially important when it comes to maintaining an oversight of dangerous or violent prisoners. This is why the facility is organised in clusters – groups of inmates living in smaller residential units. These groups are separated from one another by a system of corridors and interlocking doors. To move between the different sections, inmates and staff must pass through a series of glass doors. Each group also has their own communal space and dining area within their section. The inmates' cells are the standard 12 m² required by law and each has a large window with a security grille.

The choice of materials throughout the facility is critical. Everything needs to be extremely tough, but still aesthetically pleasing and also sustainable, which is why long-lasting materials such as concrete, steel, hardwood and brick can be found throughout all floors of all buildings (around 29,000 m²).

Environmental considerations

Despite the stringent security demands, such as the need for security glazing in all windows, the prison meets the Swiss Minergie standard for low-energy-consumption buildings. To keep energy consumption to a minimum, the facility is fitted with LED lighting and uses building automation systems to control its lighting, blinds, heating and ventilation. Two large PV systems on-site also provide the vast majority of its electricity. Jansen products also play a key role in ensuring the facility's environmental and security credentials. On arrival, the burglar-resistant and bullet-proof fixed glazing made from Janisol RC3 separates visitors from the inside of the facility. They then proceed through a burglar-resistant Economy 60 interlocking door. The cells themselves are secured with around a hundred doors constructed from the Janisol 2 EI30 steel profile system. Each door is equipped with special fittings and reinforcements to ensure they are both burglar resistant to class RC3 and bullet proof (FB4 NS – non-shattering).

The Janisol 2 EI30 fire protection system is ideally suited to the prison environment, offering exceptional standards of security while also allowing greater creative



The floor plan demonstrates the barrack or cloister-style design of the building, which covers all the legal requirements for the prison system.

We are seeing an emergence of more and more prison buildings that have been designed with the latest standards and findings in mind.

freedom from a design perspective. The steel profiles are extremely stable and secure, but also very elegant. The project was implemented by metal construction company. Fehrtech AG, which has extensive experience of door installation projects, particularly in prisons.

Ultimately, improving prison architecture to create a more dynamic penal and correctional facility can make a real difference to the security of our society in the long-term. If we're serious about crime prevention, it's imperative that we look to the future. (NS) ■

QR code: more images

PROJECT DETAILS

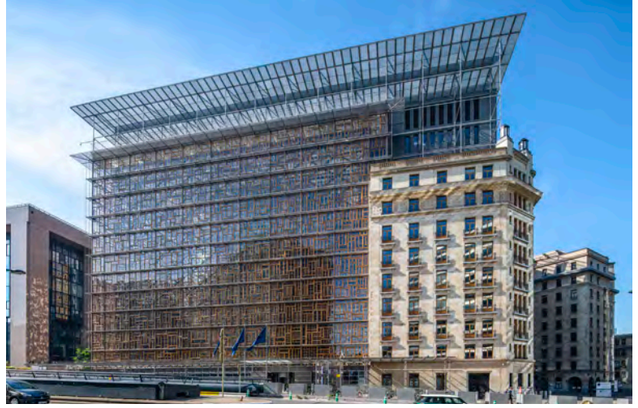
Client:
Canton of Graubünden, represented by Hochbauamt Graubünden, Chur
Architects:
D. Jüngling und A. Hagmann Architekten, Chur
Metalwork:
Fehrtech AG, Buchberg
Steel profile systems:
Janisol 2 EI30 doors, RC3
Economy 60 doors, RC2/RC3, FB4
Economy fixed glazing, RC3, FB4
Economy 60, RC2/RC3
Janisol fixed glazing, RC3

Europa building, Brussels, Belgium

Security of the highest calibre

Many of the infamous ‘closed doors’, behind which the heads of state and government meet in the Europa building in Brussels, feature a combination of RC3-class break-in resistance, FB6-class bullet resistance and EXR 3 explosion resistance, all packaged neatly into one profile: the Economy 60 system from Jansen.

A series of single and double-leaf revolving doors, based on Jansen’s Economy 60 steel profile system, help to make up the multi-layered security and protection system of the Europa building.



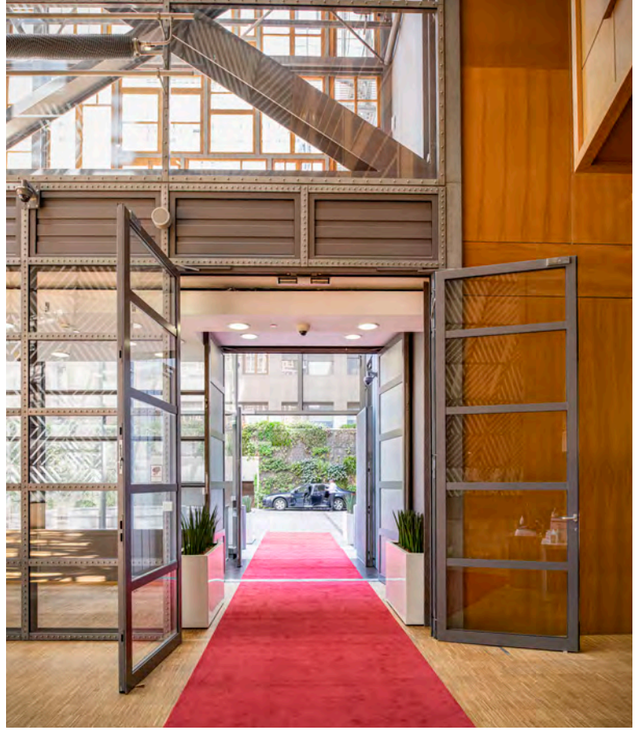
Situated around 2 metres behind the stunning patchwork – made up of around 3500 old windows – the glass façade, held up with robust, diagonal steel supports, acts as thermal envelope.

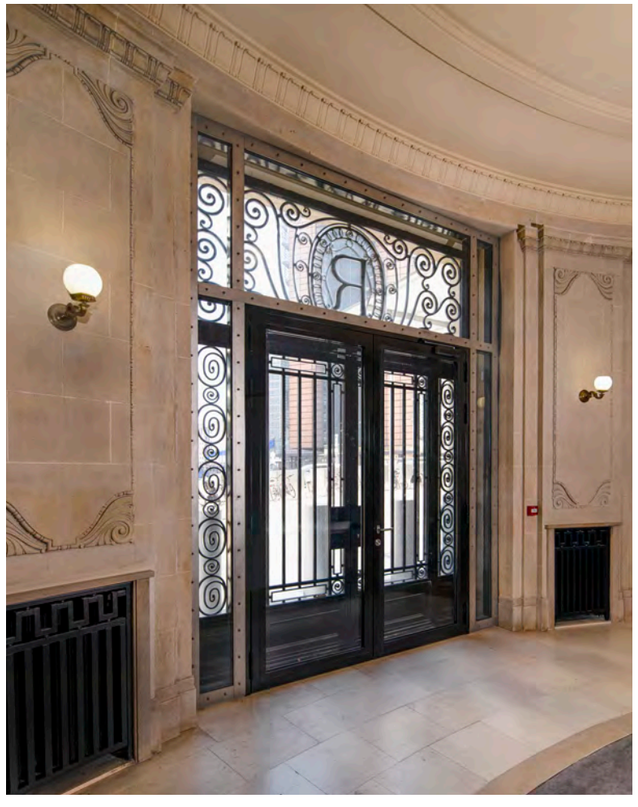
The USA has the White House, Russia has the Kremlin and the European Union has the Europa building. Located in the heart of Brussels' European Quarter, it is home to the two institutions that represent the member states of the EU: the Council of the European Union (also known as the EU Council or the Council of Ministers, this is the body of the European Union that represents the governments of the EU member states), and the European Council (the body of the heads of state and government of the European Union). This is where the heads of state and government, as well as other government members, meet to shape the future of the European Union. The building consists of a new section, which was designed and implemented by a consortium of architects made up of Samyn and Partners (Belgium), Studio Valle Progettazioni (Italy) and Buro Happold (UK), as well as the renovated Residence Palace, a listed Art Deco-style building built by the architect Michel Polak in the 1920s.

Iconic façade design

The façade of the new building is a patchwork of over three and a half thousand windows from all the EU member states. Some of the windows are over 250 years old. Due to the increasingly strict energy-saving measures in government buildings, they were replaced with new windows at their original sites, and so have come to fulfil a more decorative role in the central administration office of the European Union. Behind this outer shell, which is of course a million miles away from any of the EU's energy-related obligations, runs the actual protective shell of the new building – a glass façade supported by robust diagonal steel girders – leaving a gap of about two metres in between.

Through this double façade, you can just make out the interior of the building: a bulbous structure around 40 metres tall, which is particularly striking when it is illuminated at night. Some think it is shaped like a sort of urn, while others see it as a huge egg. The lantern, as the structure is officially, houses the Council's conference and meeting rooms. As strange as the shape may seem, its design is actually very practical. The way the structure swells out towards the middle and tapers in at the top and bottom corresponds directly with the size requirements for the respective rooms. The largest conference room, which has over 300 seats and 32 interpreting booths, is located in the bulbous section of the lantern; while the dining room, which only seats 50, is on the top floor.





Site-specific safety requirements

Despite the playful patchwork façade and illuminated lantern, there is no denying that the Europa building is a impenetrable fortress, designed to be seen but not entered. The sequence of glazed layers, each with different safety standards, guarantees the appropriate level of structural soundness for each part of the building. In other words, the security standard is based on the scope of any potential attack, as well as how resistant the other sections of the façade are. In the entrance area, for example, where the risk of intrusion is particularly high, the bullet-proof triple-laminated glass of the thermal façade has additional reinforcement. The site-specific security and protection measures in the entrance areas also include a series of single and double-leaf revolving doors manufactured by the Belgian metalworker Lootens Deinze NV using the Economy 60 steel profile system from Jansen. They feature a combination of RC3-class break-in resistance, FB6-class bullet resistance and EXR 3 explosion resistance, all packaged neatly into one profile. Between these doors and the electronic security systems, camera surveillance and access control security gates, the Europa building is probably one of the safest structures in Brussels – it is believed that it would even survive unscathed in an attack as severe as 9/11. (AMR)

PROJECT DETAILS

Client:
Council of the European Union, Brussels
Architects:
Samyn and Partners, Brussels; Studio Valle Progettazioni, Rome; Buro Happold, Bath
Metalwork:
Lootens Deinze NV, Deinze
Steel profile system:
Economy 60

QR code: more images

Protection against break-ins, bullets and explosions

Building for maximum security

With specially manufactured windows, doors and gates, façades and entrance areas, in combination with webcams and burglar alarm systems, it is possible to cater for buildings with even the strictest security requirements.

When it comes to the structural security of a building, there are barely any standard solutions. In most cases, custom security planning is required which takes into account the intended use, location and architecture of the building, as well as the people or assets to be protected, along with an other specific security objectives. Working with specialist service providers, planners and other companies that specialise in security – ideally very early on in the planning process – is the best way to ensure the best possible implementation and combination of security components.

One such company is Thiem Security Solutions, based in Schkeuditz, Germany. Having started out as a metal construction company for windows, doors and façades, over the last 30 years, the business has become specialised in providing security measures for buildings and other properties. Company founder and Managing Director explains the company's recipe for success: "Unlike systems providers, who tend to work in line with particular standards that only allow for very specific formats, profiles and glass, we encourage architects to give free rein to their design ideas. We see ourselves as a service provider for architects, and do everything in our power to find viable construction options that fit with their design ideas."

With a portfolio that includes embassies, government buildings, courts, police offices, prisons, airports and museums, as well as research institutions, data processing centres, banks, fashion boutiques, luxury homes and private art collections, Thiem's engineers have developed, built and – most importantly – received structural approval for security components for almost every type of building there is. For obvious reasons, the owners of such properties aren't keen to publicly disclose their specific security concepts, which is why the basic options are described below using a fictitious building as an example. Let's say that the building to be reconstructed is located in the centre of a major European city and, in addition to the parliament, will also house a valuable art collection that is open to the public. The project also includes renovation of an existing, listed façade, and all the windows and doors in this façade are subject to a preservation order for the protection of historic monuments.

Existing window façade, parliament building

The new bullet-proof and burglar-resistant **windows of security class FB4 to FB7 (A)**, in combination with RC3 to RC5, are designed with bars to match the original period windows. However, they have to accommodate glass that is 85 millimetres thick, and remove panels weighing up to 360 kilos. The doors and windows are glazed with white glass to ensure that they match the windows that are not subject to increased security requirements. Of course, the windows also meet the structural requirements for heat and sound insulation. The structural implementation by Thiem Security Solutions includes the production of doors and windows using a thermally separated steel profile system such as Janisol or Janisol HI (adapt to create a bespoke profile, but with the standard face widths) as well as cladding on both sides using profiled wood. The window fittings have lock monitoring and are connected to the burglar alarm system.

Entrance area, existing façade

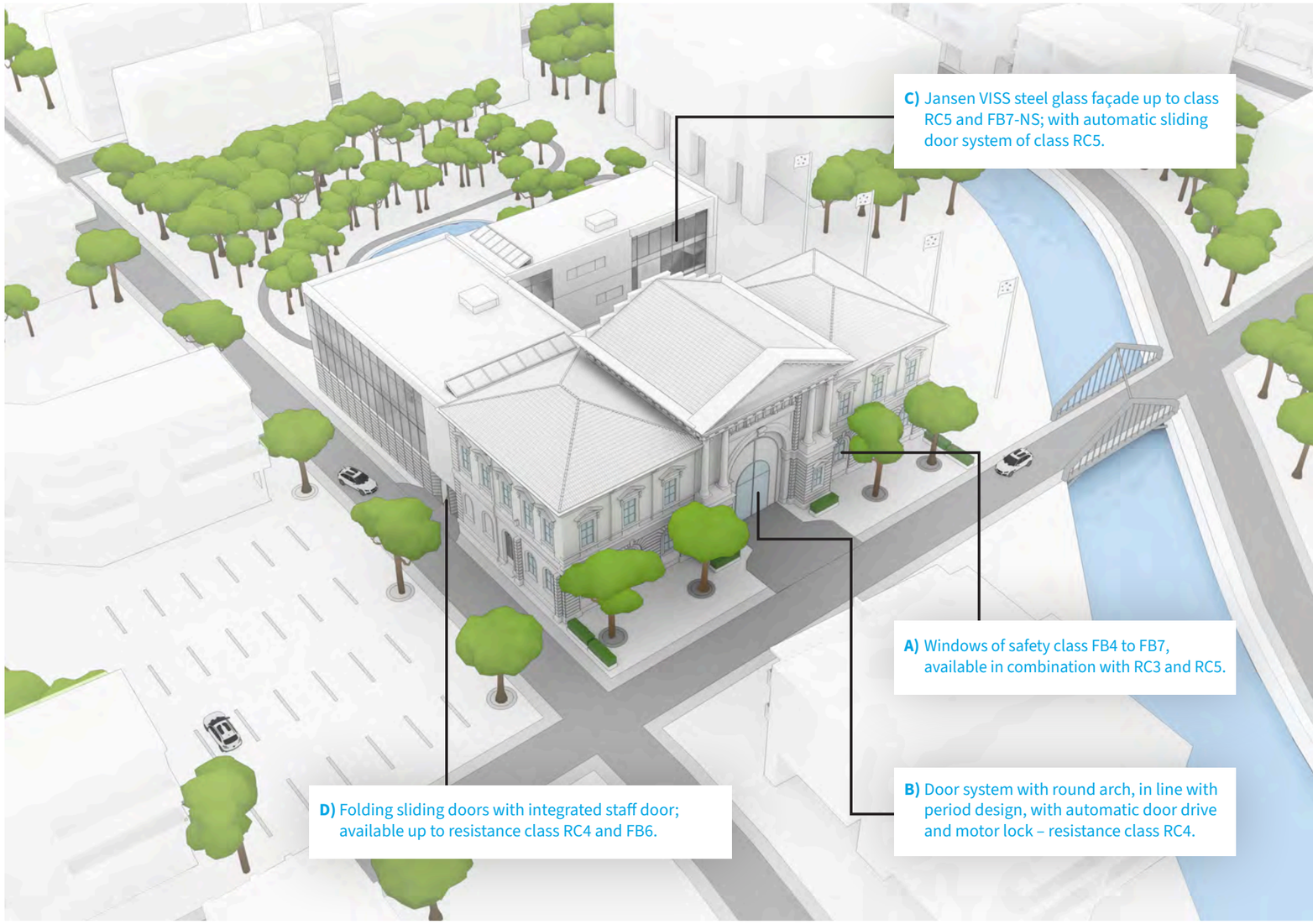
In-keeping with the architecture, the entrance is fitted with a 3.20 metre-high **door system with a round arch, based on the original period design (B)**. The door is manufactured in line with RC4, and includes an automatic door drive and motor lock. The door itself has a slim steel and glass design with an integrated sliding recess and intercom system. A second door positioned directly after the first means that visitors are deliberately isolated in this area, and can only gain access to the secured area after they have registered and signed in. The second door, which also meets the standards of resistance class RC4, is an automatic sliding door constructed from the Jansen Economy 60 steel profile system – upgraded as a custom profile, but with the same face width. It features large glass panels, held in place by comparatively narrow steel profiles, giving it a timeless elegance that means it blends in discreetly with the original architecture. Both doors are operated and controlled by the security staff at the gate, who are also responsible for registering and monitoring visitors.

Façade for the newly built art exhibition

The art museum in the new building will have a large **steel glass façade made from the Jansen VISS (C) steel profile system** and, due to the high number of visitors expected, an automatic sliding door system. Because the exhibition is set to contain some very valuable objects, the façade and integrated sliding door system will meet the standards of resistance class RC5. The steel glass doors for the stairwells and fire compartments are designed as T30/T90 fire-proof doors and fall into resistance classes RC3 and RC4. The various different rooms of the art exhibition, on the other hand, feature fully sheeted tubular frame doors of resistance class RC4, with an electronic monitoring system. Here, too, a custom profile based on the Economy 60 steel profile system from Jansen is the first choice for Thiem Security Solutions, because the face width can be kept unchanged. The doors are clad on both sides with architectural bronze on both sides, reflecting the high value of the collection.

Art exhibition delivery area

Because – due to its inner city location – the delivery area for lorries is very narrow, the client decided on a **folding sliding gate system with an integrated door for staff on foot (D)**. This gate system was manufactured using Jansen's folding door profiles in resistance class RC4. In-keeping with the architecture, which features a cladded façade large Trespa panels, the folding sliding gate is planked with Trespa panels in line with the façade grid.



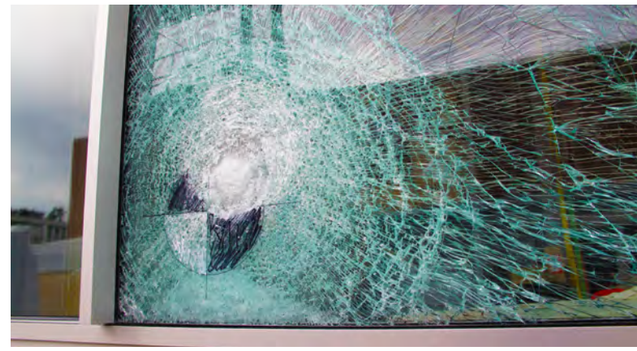
Implementing bespoke security solutions

Thiem Security Solutions develops and manufactures these sorts of bespoke, custom-made designs exclusively in-house, and all the necessary test certificates and certifications are provided in advance. "We mostly use system profiles and upgrade them to meet the specific requirements of the property in question," says Thiem. The advantage of this approach for Thiem's security specialists is that they can rely upon the existing systems having already been tested for things like water tightness, thermal protection and burglar protection – which saves time and money. "In some cases, we can also use the hinges, fittings and sealing systems from the original profiles, while other times have to redesign and adapt them to meet the requirements." The reason that Thiem Security Solutions has been collaborating with Jansen AG for so long is down to the wide variety of profiles offered, the quality of the components and that signature Swiss precision. By using state-of-the-art manufacturing technology, Jansen is able to ensure the production of profiles with extremely small edge radii, even with narrow face widths. This means that constructions designed for high-security areas can be made to look just as slim and elegant as the rest of the architecture, so they don't stick out like a sore thumb. (AMR)

Building Envelopes Competence Centre, Lucerne University

An insight into façade testing

Modern, energy-efficient and sustainable façades are among the most complex and cost-intensive components of any building. Due to the interplay of different requirements, manufacturing structurally sound façades comes with enormous risk. Andreas Luible, Head of the Building Envelopes Competence Centre, explains why – in addition to expert planning – façade testing is an absolute must.



From an environmental perspective, energy-efficient buildings only work if there is complete coordination between all the components, including the façade, and if the specified performance requirements are met. The enormous financial risk of an inadequately designed or executed façade is often underestimated. For example, too much air permeability and the façade can completely destroy the energy concept of a building; while a façade that is not fully water-tight can result in considerable damage to the fabric of the building, and an insufficient load-bearing capacity can result in injury or even fatality.

It is for this reason that the legislation around construction products in Europe and Switzerland stipulates that anyone who markets windows or façades must submit a 'declaration of performance' stating the properties of the product. The essential features required of windows and curtain walls , the regulation of which pertains to product standards SN EN 14351-1 and SN EN 13830, include: resistance to wind load, water tightness, air permeability, heat transfer coefficient and total energy transmittance.

Nowadays, calculations can be used to demonstrate thermal insulation or energy transmittance. However, when it comes to air permeability and water-tightness, it is imperative that what's known as 'type testing' is carried out through an accredited test centre, as these specific quality and performance requirements can only be verified by subjecting the component to rigorous tests.

University-owned façade test centre

The Building Envelope Competence Centre (CCGH) at Lucerne University's School of Engineering and Architecture (HSLU T&A) is one such accredited test laboratory and has been offering these tests in the university's very own façade test centre since 2008. The tests can also be carried out at the client's own test facilities, under the supervision of the competence centre.

The university's test centre is one of the most cutting-edge facilities in Europe and has the capacity to test façades of up to eight metres wide and twelve metres high. It consists of a sealed test chamber – which can be adapted to fit any size of façade and allows the tester to apply pressures of up to 10 kPa – as well as a sprinkler unit fitted with water nozzles to simulate heavy rain.

In 2019, all the lab equipment was replaced with control and measurement technology that has been specially developed by the Lucerne University of Applied Sciences. In particular, the inaccurate vane anemometers were replaced with hot-wire anemometers, which are much more accurate for measuring the rate of air loss at lower flow speeds. Moreover, the university developed its own control software and a control algorithm that uses a high sampling rate to adapt to the loss of the respective test specimen, thus providing a fast and reliable approach to testing different pressures.

Multi-stage testing

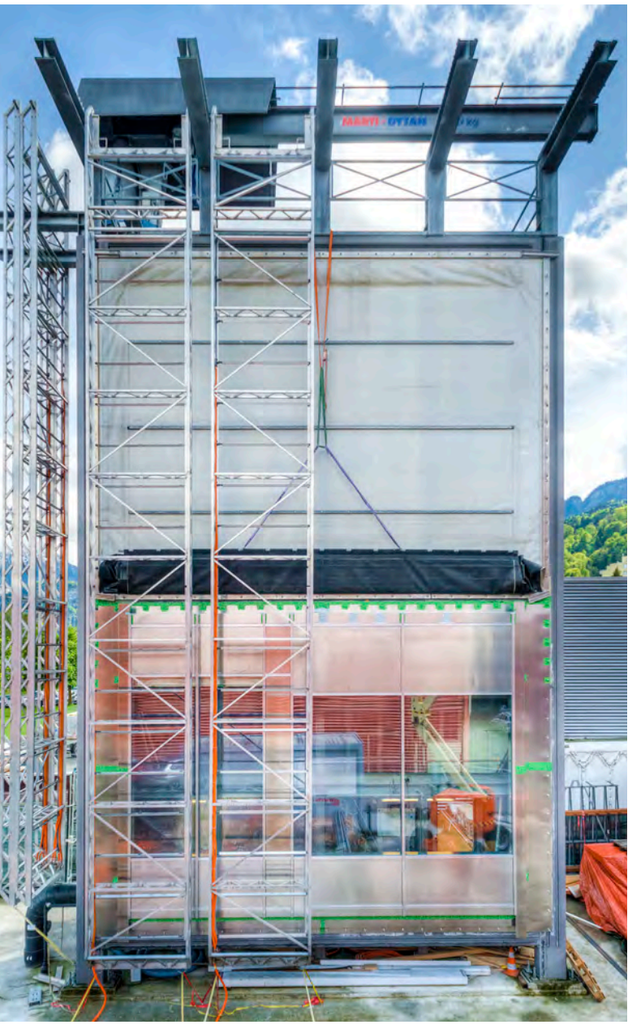
The test procedure specified in the product standards is similar for both curtain walls and windows, and consists of the following sub-tests:

1. Air permeability
2. Water tightness
3. Wind load resistance – serviceability
4. Air permeability – repeated test
5. Water tightness – repeated test
6. Wind load resistance – structural safety

In the air permeability test, the relative air loss is measured under a gradually increasing negative or positive pressure in the test chamber. The measured air loss must not exceed the limit specified in the required air permeability class.

In the test for water tightness, the façade or window is sprayed continuously with a defined quantity of water, as the negative pressure in the test chamber is gradually increased. The level of water tightness is determined according to the maximum amount of negative pressure that can be applied before the water starts to permeate the façade.

The wind load test is used to check for any potential deformation of the façade in response to the design wind load, as well as to establish the structural safety of the façade under increased wind loads (1.5 times the design wind load). Any permanent damage to frame elements, components, brackets or anchors under increased wind load is considered a fail, as is any shifting of the seals or edges of the glass supports.



Benefits for students and industry

As well as testing windows and façades, the CCGH supports the façade industry in many other issues relating to the serviceability and structural safety of building envelopes. Among the most important of these are glass testing (e.g. pendulum impact tests or residual load capacity tests for glazed components), mechanical testing of components (such as joints, brackets and anchors), façade testing using thermal and energy simulations, light simulations and measurement, as well as fogging tests on closed cavity façades (CCF).

One of the main groups to benefit from these cutting-edge testing facilities, and indeed from all the research and development activities at the competence centre, are the students on the Civil Engineering course. This course, which specialises in building envelopes, is the only one of its kind in Switzerland and Europe and is producing the future experts in the field.

Prof. Dr. Andreas Luible is Head of the Building Envelopes Competence Centre and is responsible for the Building Envelopes course at the Lucerne University of Applied Sciences. He studied civil engineering at the Technical University of Munich and received his doctorate in 2004 from the EPF de Lausanne. He then worked as a senior façade engineer for the international companies Schmidlin Fassaden Technologie AG, Josef Gartner Switzerland AG and YUANDA Europe Ltd. His research focuses on the dimensioning of glass, new façade technologies and materials, the development of energy-efficient building envelopes and adaptive building envelopes.

Karel du Jardinstraat, Amsterdam, Netherlands

Sustainability in restoration

From factory to office to apartment block – there is no better way to spell sustainability than by reusing existing buildings.

On the ground floor, the façade openings have been extended down to floor level and glazed with burglar-resistant glass.

With the construction height of the doors at an impressive 3130 mm, Jansen used the opportunity to obtain an extension of its building approval for Janisol RC2.

Amsterdam-based architects ZZDP Architecten B.V. have done just that, transforming what was once a work space into residential apartments in the trendy De Pijp district. The buildings no. 61–63 on Karel du Jardinstraat were built for the clothing manufacturer C & A Brenninkmeijer in the early 1920s, with an extension added in 1976 to form no. 65. The company used this site as its production facility until 1984. The first conversion took place in 1987, when the former clothes factory was turned into an office building for the administration of the recently founded district of De Pijp and its various social services.

When the district merged with the Zuid district ten years later, the building was abandoned for a second time. Another ten years later, the Dutch business Caransa Group acquired the property, with the aim of converting it into apartments and socially sustainable communal spaces. Of those invited to tender, ZZDP Architecten B.V. were the obvious winners. They impressed the client with their proposal to convert the salvageable part of the building into rental apartments in an initial construction phase, and then to to replace the dilapidated flat-roofed building (house no. 67) with a contemporary new one.

Pragmatic procedures

In the former factory building, ZZDP Architecten have retained the parking level in the basement and created bicycle parking areas and storage areas for the apartments. The rooms on the ground floor are reserved for socially sustainable uses – welfare services and daycare centres, for example, but also the Amsterdam Heart Center has also moved in. A total of 53 rental apartments were built on floors 1 to 4. A particular highlight is the roof terrace, which is available for all residents to use.

Burglar-resistant glazing

The ground floor was given a more spacious feel by merging the façade openings and extending them down to floor level. This resulted in door heights of over three metres, which also had to be burglar-resistant to class RC2. The extra-high constructions were custom-made using the Janisol steel profile system with a face width of only 50 millimetres. Because Janisol is only approved by building standards for a door height of 2600 millimetres, Jansen sought an extension of the approval for the construction height of 3130 millimetres during the construction period.

Sensitive restoration

Because the two parts of the former factory building were built at different times, there was little harmony in the way the two façades were structured. The entire façade has now been renovated, deficiencies in the masonry repaired and the windows and doors replaced. “We tried to restore the façade as sensitively as possible,” explains architect Joris Deur, Partner at ZZDP Architecten

The rear glass façade on the ground floor meets fire protection requirement G30. Here, the architects opted for the Jansen VISS steel profile system. On the floors above, floor-to-ceiling tilt and turn windows from Janisol Arte 66 create a light and airy living space.

B.V., "and replaced the existing aluminium windows with steel profile windows." Merford Special Doors B.V. manufactured the floor-to-ceiling tilt and turn windows using the Janisol Arte 66 steel profile system in a burglar-resistant design (RC2). With Janisol Arte 66, Jansen has introduced a contemporary variant to the Janisol Arte series. With a construction depth of 66 millimetres, it allows high-quality insulating glass to be used, up to a sash height of 2300 millimetres. This means that the tilt and turn windows can be implemented with an extremely narrow frame. Concealed fittings allow the architects to achieve the clear lines of their design, giving the façade its attractive appearance and ensures plenty of daylight in the interior rooms.

Successful completion

With their concept for converting the factory building into living space, ZZDP Architecten B.V. had their finger firmly on the pulse. The 53 apartments in the carefully renovated complex were let quickly, and there is already a waiting list for the building to be constructed on the neighbouring property, Karel du Jardinstraat No. 67. The second phase of construction has already begun, which will result in a four-storey building with an additional 24 apartments, communal spaces on the ground floor and an underground car park. (AMR)

PROJECT DETAILS

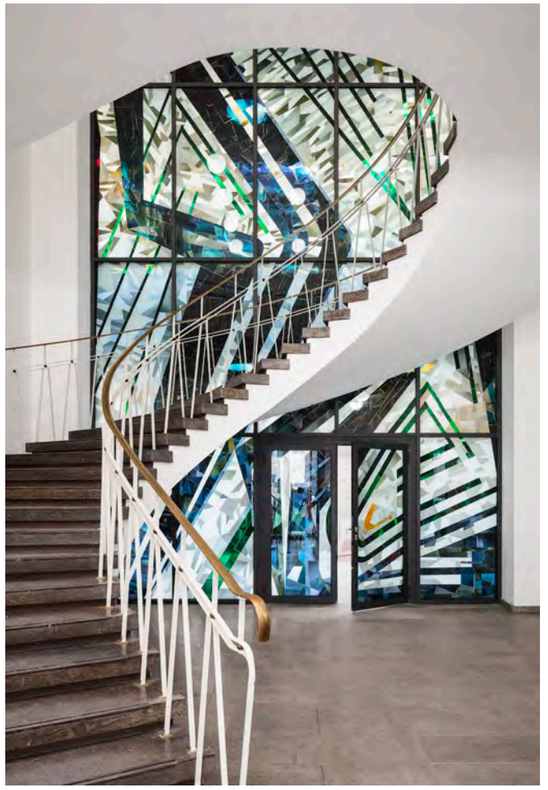
Client:
Caransa Groep B.V., Amsterdam
Architects:
ZZDP Architecten B.V., Amsterdam
Metalwork:
Merford Special Doors B.V., HZ Gorinchem
Steel profile systems:
Janisol, Janisol Arte 66, Jansen VISS

QR code: more images

Haus der Wirtschaft, Nuremberg, Germany

Fire-proofing the past

A huge mosaic made of genuine antique hand-blown glass is turning heads in the new atrium of the 'Haus der Wirtschaft' in Nuremberg. Not only has the feature been restored, but also upgraded to meet the latest fire safety standards.



Almost six metres wide and nine and a half metres high, the stunning window, made from mouth-blown antique glass mosaic, was constructed many years ago by the glass artist Dr Gottfried Frenzel for the staircase of the historic hall on Nuremberg's Winklerstrasse. When Berlin architects Behles and Jochimsen redesigned the original Nuremberg Chamber of Commerce, which comprised a total of four buildings, they created a brightly lit atrium by roofing the inner courtyard with glass. As a result, what was once an external façade became an interior fire-resistant façade, making it subject to F90 fire-proofing requirements. It took the expertise of several specialists to re-design the glass window of this façade to meet F30 fire protection standards. The solution partially involved the construction of a post and mullion façade based on Jansen's VISS Fire steel profile system. (...)

Read more online at: scale.jansen.com

PROJECT DETAILS

Client:
Nuremberg Chamber of Commerce, Germany
Architects:
Behles & Jochimsen, Berlin
Glass window restoration:
Derix Glasstudios, Taunusstein
Glass window assembly:
Derix Glasstudios, Taunusstein and Georg Diezinger GmbH, Leutershausen
Steel profile systems:
VISS Fire, Janisol 2

QR-Code: complete article

OMM Odunpazarí Museum of Modern Art, Eskişehir, Turkey

Open to new perspectives

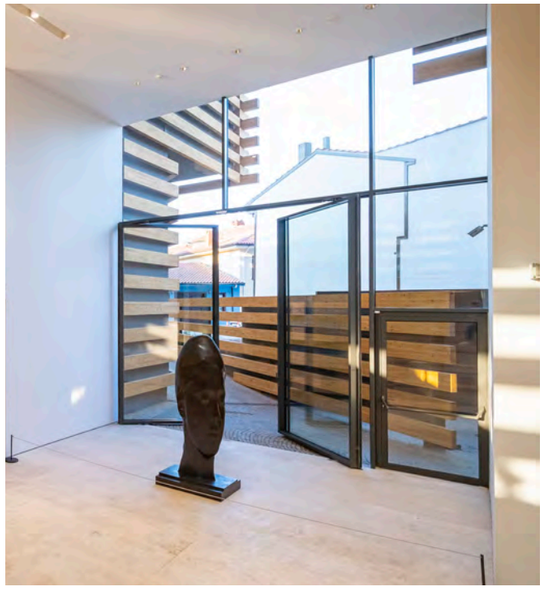
Tradition and transparency are not mutually exclusive – as is demonstrated by this spectacular new museum in Eskişehir, Turkey. Behind the cladding made from solid square-edged timber, a glazed façade provides heat insulation and fire protection.

The VISS façade pivoting doors of the main entrance on the bottom floor are almost 4.50 m high. The bespoke design is continued with the generous contour of the VISS façade in the entrance area.

A world away from the cosmopolitan capitals we would usually associate with modern art, lies the city of Eskişehir, where a spectacular new museum building is making its mark on the Anatolian landscape. The city's striking new landmark is characterised by an ensemble of eleven square-edged timber cubes, all nested inside one another. The Japanese architects Kengo Kuma and Partners see their design for the Odunpazarí Museum of Modern Art as an homage to the region, where there is a centuries-old tradition of woodwork and wood trading. The museum is named after its location on the former wood market in Eskişehir (Odunpazarí), around which the museum district is growing.

New perspectives

The university city of Eskişehir is already home to numerous museums; including an archaeological museum, a glass and ceramics museum, and a museum of technology. Nothing unusual there. And then comes the Odunpazarí Museum of Modern Art, adding a whole dimension to the district. The new gallery houses an collection of modern art with great international significance, and includes exhibits dating from the 1950s to the present day.



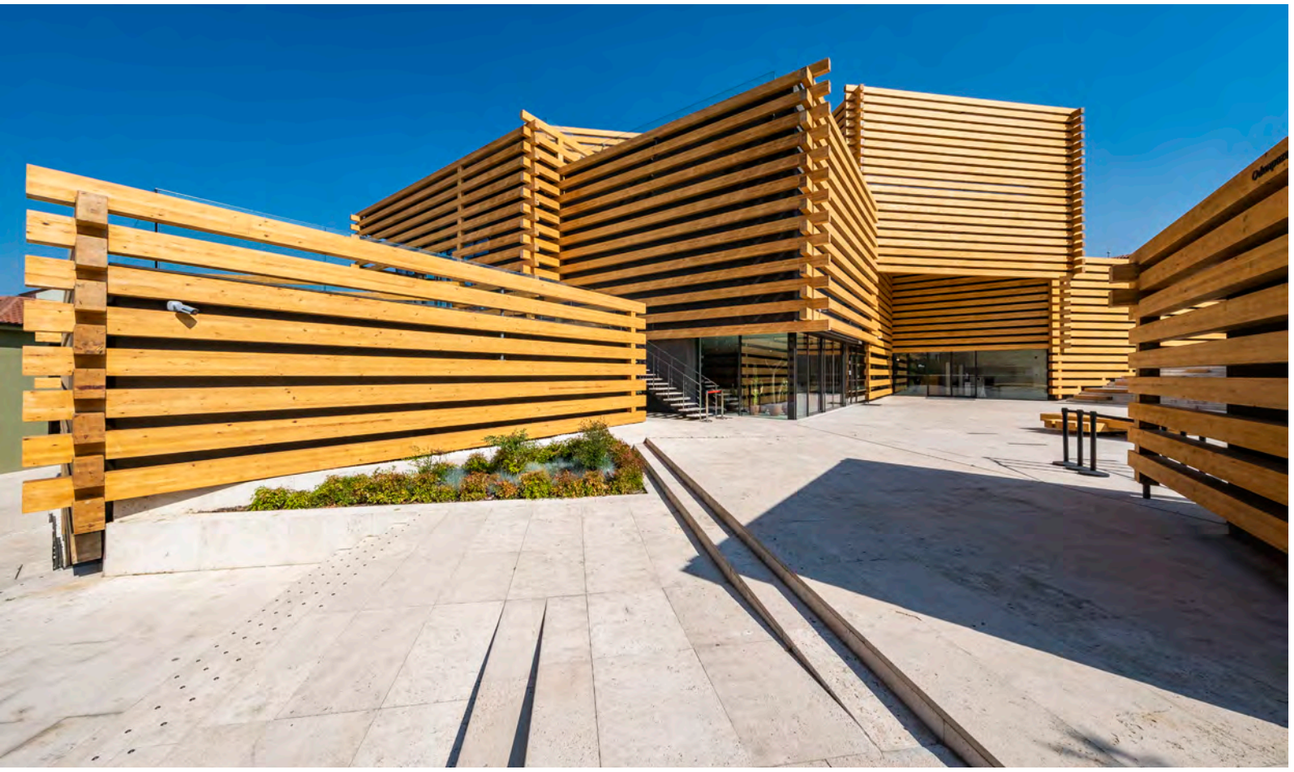
The highly thermally insulated post and mullion construction from Jansen VISS fulfils the strict fire protection requirements in certain parts of the building. Thanks to the VISS Fire (for the façade) and Janisol C4 EI60 (for the doors) steel profile systems, these could be implemented without changing the look of the building.

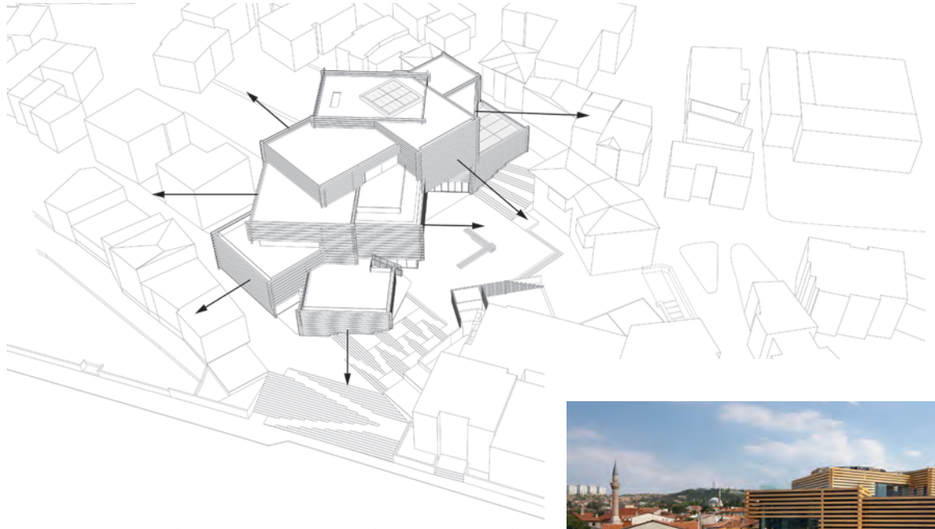
It was put together by architect and building contractor Erol Tabanca, whose initiative is also responsible for the new museum building in the heart of the old town. The aim of this self-confessed patron of the arts is to challenge people with new perspectives, and – at least as far as the architecture of the new building is concerned – he has achieved just that. With its sensational architecture, the city is no doubt hoping to cultivate a sort of “Bilbao effect” in Eskişehir – using cultural tourism to generate an economic upswing.

Opened to the public on 28 September 2019, the Odunpazarí Museum of Modern Art boasts a multitude of exhibition rooms, with three whole floors of diverse artworks for visitors to explore. The topography of the site, which has a height difference of several metres, led to a design that includes two entrances. The main entrance, with the foyer and reception area, is on the lowest level. A second entrance is located one level above that on the plaza, where visitors are also attracted by the museum café. On this level and the two floors above is where you find the permanent exhibition rooms, as well as events and office space. The atrium, which extends across all levels, not only brings daylight into the interior of the building, but also provides visitors with an infinite variety of perspectives on the exhibition.

Extra-high VISS façade pivoting door

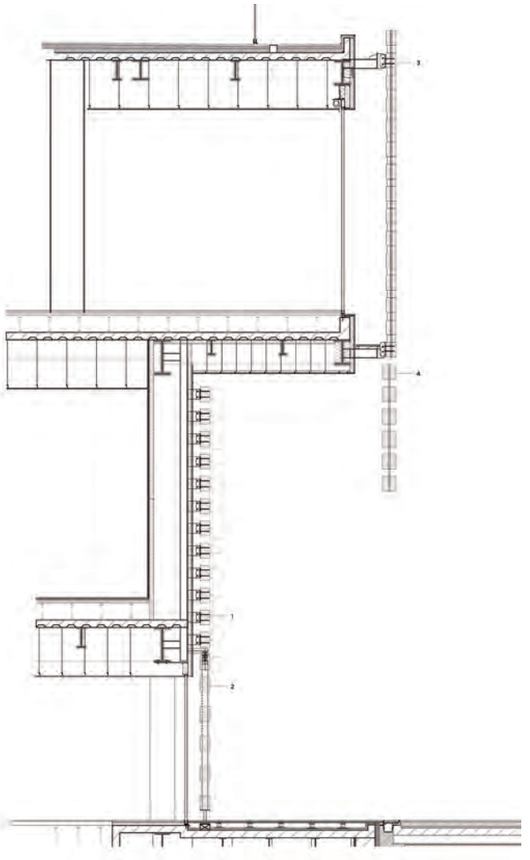
When it came to implementing the huge glass façades in the entrance areas and to the terraces, the architects chose the VISS steel profile system from Jansen. VISS offers highly thermally insulated façade constructions with ‘Passivhaus’ energy efficiency certification, which is an absolutely must with regard to the harsh Anatolian winters. The post and mullion construction with double-insulated glass (10/16/66.2 millimetres) has an insulation value of 1.4 W/m²K. The 39 millimetre-thick, 1600 x 3100 millimetre panes are held in place with profiles that are extremely slim by comparison. Here, the architects opted for Jansen VISS with a face width of just 50 millimetres. The VISS façade pivoting door in the main entrance on the bottom floor is a bespoke construction designed especially for this building. With a height of 4415 millimetres, two panels measuring 2140 millimetres each and a forend width of just 140 millimetres, it continues the generous contour of the VISS façade in the entrance area.





The topography of the site means there is a height difference of several metres. The main entrance, with the foyer and reception, is on the bottom level, and there is a second entrance in the plaza on the level above, which is also where the museum café is.

The mounted façades made from squared-edge timber are an homage to the centuries-old tradition of woodwork in the region. They have the added benefit of providing sun protection where the glass façades are.



First-class fire protection

It goes without saying that, with such an excessive use of wood, the architects needed to pay particular attention to the issue of fire proofing. What sets Jansen apart when it comes to fire safety is that its solutions allow for complete façades, including doors and entrance areas, can be implemented as one cohesive aspect, despite different sections being subject to different safety requirements. Here, the glass façade between the events space and the terrace had to meet the EI60 fire safety standard. Thanks to the VISS Fire steel profile system, it could be produced in line with the generous grid of the other VISS façades. Moreover, when it came to producing the double-leaf, outward-opening revolving doors, the use of Janisol C4 EI60 with the same profile view and installation depth ensured they blended in visually with the rest of the façade.

Whether it is the spectacular new museum building or the wide-ranging art collection that draws in the crowds, the fact is that around 140,000 art and architecture enthusiasts visited the Odunpazarí Museum of Modern Art of it being open. Unfortunately, the museum also had to close its doors temporarily due to the coronavirus pandemic. However, the numbers of visitors in the first half of the year leave no doubt that the “Bilbao effect” is working. (AMR)

PROJECT DETAILS

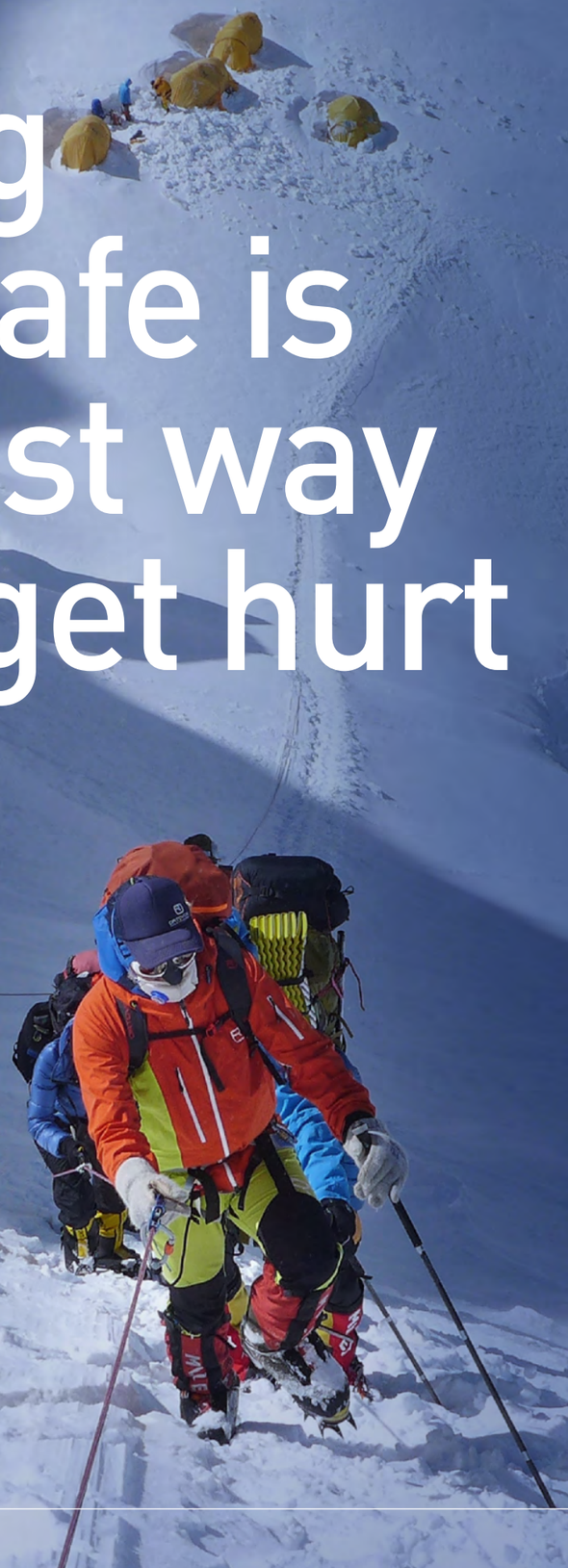
Client:
Polimeks Holding, Istanbul
Architects:
Kengo Kuma and Associates, Tokyo
Façade construction:
Bisam Facade Systems, Istanbul
Steel profile systems:
VISS, VISS Fire, VISS façade revolving doors, Janisol, Janisol C4 EI60

QR code: Video of the museum

Blinding bravery

Thinking you're safe is the safest way to get hurt

Andreas "Andy" Holzer has climbed the highest mountain on each of the seven continents. He has toured Antarctica on skis, defying ice storms, extreme gales, freezing temperatures and the steepest rock faces. On 21 May 2017, he finally achieved his dream of reaching the summit of Mount Everest. He joined us for a chat about safety, fear, and how blind people "see" their surroundings.



Andy, you would think that climbing the highest mountains in the world would require the full use of all your senses. As someone who's visually impaired, how did you get into mountaineering?

Andy Holzer: I grew up in the Dolomites and was born blind. As a child, I didn't even know that what I was doing was considered mountaineering. I simply found that I could get about more easily on steep slopes than I could on flat terrain. As a blind person, you use your hands a lot to orient yourself, which is difficult when walking upright. When I was scrambling over rocks, I suddenly had the world under control. That's why mountaineering is still the safe option for me to this day.

You have climbed the highest peaks in the world. What does the word 'safety' mean to you?

As a mountaineer who can't see, every step I take is another step into the unknown. Over the years, however, I have learned to live with this constant sense of uncertainty, and to learn from the fact that something unexpected could happen at any time. Ultimately, that's what keeps me safe even in unsafe situations. I had to take countless steps like this to reach this realisation. It's the kind of thing you really have to work at, allowing yourself to feel the fear time and again so that you can eventually make it work for you in a positive way. Nobody but myself is responsible for making sure that I am really and truly safe. And safety is always relative.

With weather changes, heavy rain, ice storms, the stress of being in extreme situations, can you ever really be 'safe' when scaling a mountain?

If you feel safe as a mountaineer, I would recommend staying at home. Because if you feel too safe, you make mistakes that can be fatal on the mountain. My unique sense of humour always has me calling out to my climbing partners when we're at a scary point in the climb: "Only the fearless fall!". Mountaineering is all about understanding the forces of nature, your own capabilities and those of the team. It is always a balancing act. The real trick is to plan the tour as realistically as possible in advance, identifying and evaluating the dangers and being aware that there are always uncertainties.

How do you prepare for an expedition? What do you pay particular attention to?

Over the last 15 years, I have done 21 expeditions. There are the usual mandatory preparations that everyone has to make, such as precise planning of the route and the equipment, putting the team together, arranging the food, sorting out the funding and logistics or studying the weather forecast. For me personally, the important thing is to work out whether the destination and the route make sense for a blind person like myself, and whether the route can be adapted to my abilities – or, even better, whether my abilities can be adapted to the route I most want to take. So far, my team and I have managed to climb the highest mountains on every continent using my ideal route.

As an extreme mountaineer, you depend on your team and you have to be able to trust one another. Is it always the same belay partner accompanying you?

Having the right team is the single most important factor in achieving your goals. It is essential to cultivate a sense of mutual dependency within the team, whereby the team is always aware that they are relying on each other; they look out for one another and help each other out. However, I prefer 'open systems' in which the team varies from one expedition to the next. It's not important to me to always have exactly the same team, nor do I need my colleagues to have experience of working with someone who is visually impaired. The key thing is that my belay partners are as good as possible at working as part of a team.

How do you climb a mountain? Are you guided along by a rope or someone's hand, or do you feel your way along?

No, I don't have to be guided in any special way. The success of the tour depends on what we call 'dynamic leadership', meaning that everyone in the team has to be able to lead at any time, but also to stand back and be led by someone else. In other words: I have to guide my leaders so that they can guide me! I use my senses to help me. I hear, touch and feel my way to the top. Also, I can do things like using my ice pick to expand my tactile and acoustic skills and tell me whether the snow is frozen solid, melting, brittle or light and fluffy, which helps me to know how safe it is to walk on.

You climb some of the most difficult routes in the world. Do you think your senses are stronger than most sighted people? Can that be an advantage in certain situations?

In purely mathematical terms, I have 80% of the traditionally recognised senses or perception that sighted people have. However, my brain isn't aware that I can't see. So I "see" all the more intensely with my other senses. In my mind, I have images of my surroundings – a 3D visualisation that is generated by specific information taken from various stimuli in my environment. In addition to the usual four senses such as hearing, smell, taste and touch, I also have my sense of balance, temperature and the other physical sensations in my body. These senses allow me to form an overall impression of my surroundings, which is how I "see", so to speak. In fact, other people are often unable to work out which member of our team is blind.

In enclosed spaces, sensory inputs are less pronounced than in the great outdoors. Do you feel less safe indoors than outdoors?

Yes, definitely. I grew up in the great outdoors – in the mountains – and I perceive nature very vividly through smells, sounds, temperature fluctuations, winds or topographical changes. I have been exploring the natural world since childhood, which has given me a profound sense of safety when it comes to navigating the great outdoors. Nature is inherently logical. So-called civilisation, on the other hand – the man-made world – is a much more difficult place for me to navigate. The built world is unpredictable; it often lacks the intrinsic logic of nature. I tend just to get annoyed by guidance systems for the blind.

How do you protect yourself on a psychological level when you feel uneasy or unsafe about an ascent or descent? How do you decide whether to go on or turn back?

When we're on a climb and I feel uneasy or uncomfortable in a certain situation, I articulate that to the team. I call upon the help of my sighted colleagues and we explore the issue together. There have been times when my climbing partners have noticed from my hesitant or uncertain movements that I may have sensed something was not quite right. And there have also been moments when I've been the one to warn the team of an impending problem, having identified it earlier.

In your book about conquering Everest, you write: "Imagine being thrown out of a plane at an altitude of almost 9000 metres. It's 40 degrees below zero, there's an icy wind blasting your ears, and the oxygen level of the air you're breathing is only a third of what it should be: you can't actually survive that. And now, strap a rucksack on your back and push your mind and body harder than you ever have before ...". Why do you take on such strenuous and dangerous challenges?

Some people believe in life after death. Deep down, I am a very religious person and I do feel that there's some sort of divine power above us, but, first and foremost, I believe in life before death – a life that is there to be experienced, enjoyed and conquered.

Spending 24 hours a day, 365 days a year living in comfort and safety gets dull and makes you lethargic. I am a curious person. I want to discover new things, overcome new challenges and develop even further. And to do this, I have to leave the safety of my own four walls and get out of my comfort zone ...

When you stand at the top of a mountain, what do you "see"; what do you feel?

My brain generates images even without my eyes. When I arrive at the summit, that's when I get real feedback that I made the right decisions; that I chose the right material; that I had the right belay partner. When I reach the peak, I feel like I've won. It's a sort of confirmation that my thought process is in line with what's really happening around me. If I make a mistake, I won't get up the mountain.

Safety means being protected from danger or harm. What makes you feel scared, what are you afraid of?

I feel fear or insecurity every day. Fear manifests itself in many different ways and isn't something you can fight off. Fear is a release of hormones – a warning signal that instantly tells us that something is wrong. It is there to warn us and protects us from danger. Like hunger or thirst, fear is part of our subconscious, and it is indispensable. Suppressing your fear and believing that you are completely safe is the safest way to get hurt.

Andreas "Andy" Josef Holzer was born in 1966 in Lienz, East Tyrol. He is a mountaineer, extreme athlete and guest speaker. He was born with retinitis pigmentosa, a retinal disease that left him blind from birth.
Holzer did his first few well-known climbs in 1994. Over the following few years, he went on to climb six of the 'seven summits' – the highest mountains on each of the world's continents: Kilimanjaro (Africa), Elbrus (Europe), Aconcagua (South America), Mount McKinley (North America), Carstensz Pyramid (Oceania) and Mount Vinson (Antarctica).
On 21 May 2017, Holzer and his partners Wolfgang Klocker and Klemens Bichler conquered Everest. The highest mountain in the world, Andy Holzer is the first blind man to reach the summit via the Mallory route on the north side. In his talks, Holzer tries to share with people the way he "sees" the world, and the extraordinary experiences he has had as a blind climber on the world's highest mountains.

Recommended reading:
Andy Holzer: ***Balanceakt. Blind auf die Gipfel der Welt.***
Walter-Verlag, Mannheim 2010, ISBN 978-3-530-50613-6.
Andy Holzer: ***Mein Everest. Blind nach ganz oben.***
Patmos Verlag, Mannheim 2018, ISBN 978-3-8436-1093-3.

www.andyholzer.com

Carlebach Synagogue, Lübeck, Germany

A safe space for the Jewish community

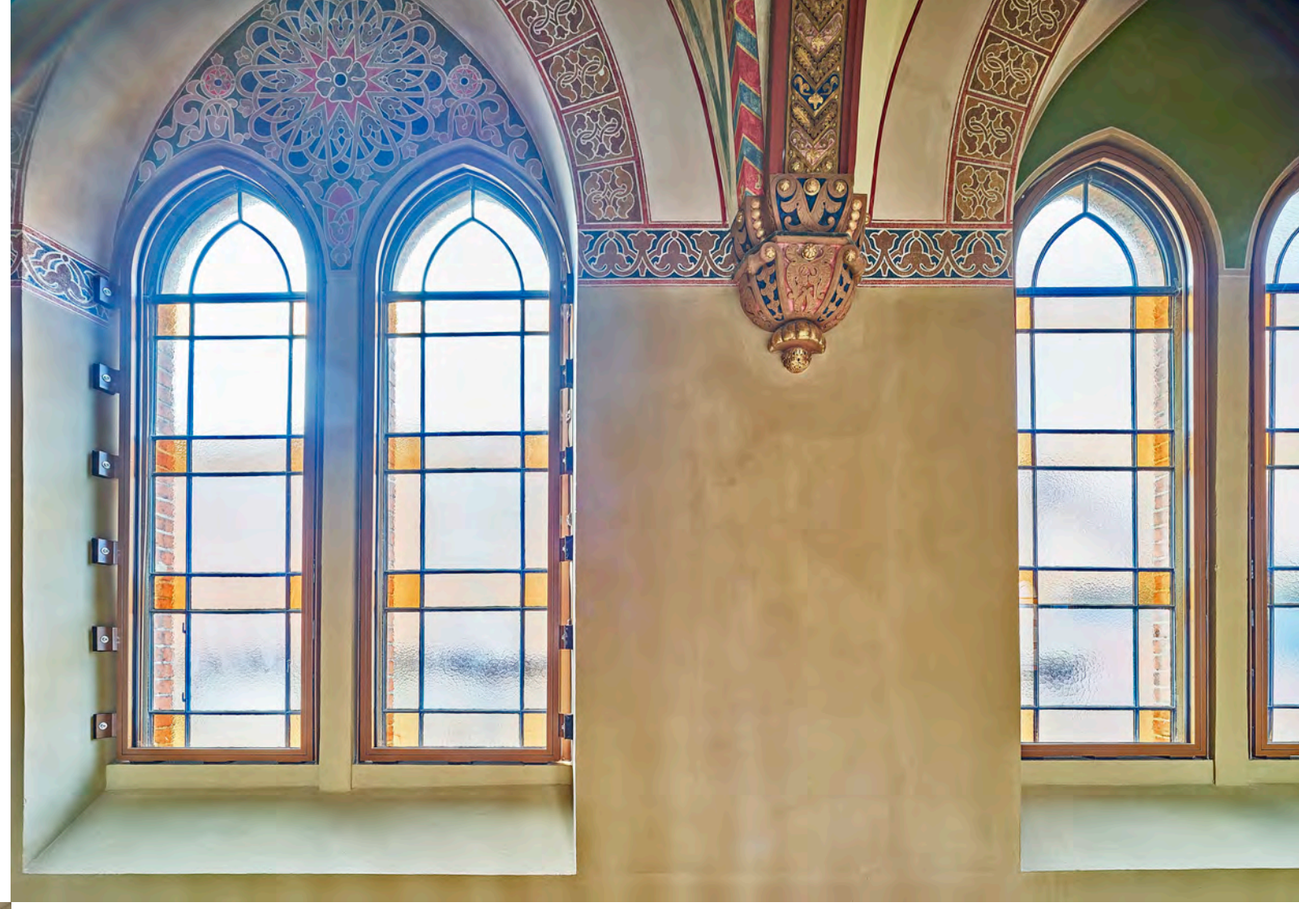
After seven years of construction, the Carlebach Synagogue has finally been handed back to the Jewish community in Lübeck. The renovation of this house of worship was shaped by the growing terrorist threat. The new break-in and bullet-proof doors and windows made from the Janisol HI steel profile system offer vital protection from such attacks.

The Carlebach Synagogue – built in 1878 in Lübeck's Old Town by local architect F. H. A. Münzenberger and inaugurated by Rabbi Salomon Carlebach in 1880 – is one of the few synagogues to have survived the 'Night of Broken Glass' in November 1938, although it was badly damaged in the pogrom. One can only speculate as to whether it was the forced sale of the building to the city or if it was its location in a heavily built-up residential area that saved it from being desecrated by Nazis. Either way, the fact is that the building still succumbed to arson in the end. Almost 50 years after the end of the war, in March 1994, an arson attack by neo-Nazis devastated the entrance hall of the synagogue and damaged valuable documents. Only 14 months later, in May 1995, there was another fire – this time in one of the synagogue's extensions.

In 2014, a complete renovation of the listed synagogue began, under the leadership of the Lübeck-based architect Thomas Schröder-Berkentien. The ambition to ensure the best possible protection against potential future attacks played a major role in all planning decisions. "It is particularly difficult to incorporate high-security doors and windows into a listed building," says Project Manager Petra Woppowa, who has been involved in the renovation from the start.

Steel profiles for maximum security

It was not an easy job for Thiem Security Solutions, Schkeuditz – the company entrusted with manufacturing and installing the new doors and windows. They specialise in providing custom solutions for the protection of buildings and properties, and manufactured the bespoke constructions using the highly thermally insulated steel profile series, Janisol HI. "The greatest challenge we faced was from those security elements with round arches, basket arches and segmental arches," explains Managing Director Jürgen Thiem, "but we were also able to overcome these using the relatively slim yet heavy-duty steel profile and still achieve an attractive aesthetic." The bespoke designs were developed exclusively in-house and the necessary tests and certifications were carried out in advance by Thiem Security Solutions. With the Janisol HI steel profile system, the company was able to construct the windows and doors in a slim design, ensuring that they would look the same as the standard constructions, with the relevant security features are discreetly concealed inside them. (AMR)



The original leaded windows from 1880 have been restored and reinforced with the latest safety technology, making them completely impermeable.

The main entrance from St. Annen-Strasse into the front of the synagogue seems quite plain and modest. However, the construction combines the most cutting-edge safety technologies, which meets a range of security requirements and is therefore able to withstand any conceivable attack.

PROJECT DETAILS

Client:
Jewish Community, Lübeck
Architects:
Schröder-Berkentien + Spilker, Architekten Part GmbB, Lübeck
Metalwork:
Security doors and windows: Thiem Security Solutions, Schkeuditz
Fire and smoke-proof doors: Emcken Metallbau, Lübeck
Steel profile systems:
Janisol, Janisol HI, Janisol T30/RS

QR code: more images

Banco Santander Madrid, Spain

Shaded and secured

The new headquarters of Banco Santander in the Spanish capital makes an imposing mark on the city's skyline. The outer façade has a barred effect which screens, protects and shades the interior, while the floor-to-ceiling glazed inner façades capture the light and give the building a sense of spaciousness. The strict security standards were met using the VISS Fire and Janisol C4 systems.

The new headquarters of Banco Santander, formerly Banco Popular, is located in Madrid's Hortaleza district. With easy access from the nearby motorway exit, the seven-storey building on Calle Abelias soars skywards towards the hot sun of central Spain. The impressive building is centrally located in the semicircular plot of around 10,600 square metres.

The project was put to a competitive tender, in which seven teams proposed designs based on the preliminary plans. The studio Arquitectos Ayala from Madrid made the winning bid, supported by the MC2 Estudio de Ingeniería in the field of construction management. The bank's vision for the building was one that would clearly communicate – in a way that would be recognisable to users and visitors – the company's values of discretion, objectivity, strength, service and flexibility. The then Banco Popular also set three parameters as the basis for the design: the optimisation of surfaces and volumes, flexibility of use, as well as achieving LEED certification.

An imposing openness

The entire premises is surrounded by with steel bars, with a security area on the periphery allowing selective access to the site. The floor plan includes three underground levels for the garage and facilities. The ground floor above is where the public areas are found, such as the spacious entrance, foyer, various meeting and conference rooms and office space. Additional office space is towered high on the six floors above.

The result is a huge, blocky cuboid structure that – at 95 x 56 metres –is almost twice as long as it is deep. The massive structure is situated on a clear, readable grid, which is characterised by white steel beams and supports. This steel framework, which runs through the entire building, houses a series of open and closed units. These are arranged in a staggered sequence in order to capture more daylight and provide mutual shade.

With its barred façade, the new headquarters of Banco Santander has an austere, defensive look about it. And yet the building also has a certain openness, with a recess on the entrance side that extends six floors up from the ground floor and almost down to the central axis of the building. This recess draws daylight right into the interior of the building, covering several floors. The partially landscaped inner courtyard leads visitors to the central entrance area, which is in the exposed centre of the building. Volume was also taken out of structure, with a six-storey recess in the front edges on both sides of the building. This allowed the façade surface to be increased, while also protecting the interior from direct sunlight. The rear side of the building is completely enclosed, apart from two square recesses spanning five storeys.

Open interior

The architects also created an open space right at the core of the building, where three large, landscaped atriums flood the building with daylight from the inside. This section of the building opens out into an open and transparent office space with 16,445 square metres of bright and airy work stations. The open design of the space promotes communication and encourages people to work together as a group. The structural design allowed for large distances between each steel support, meaning that the supports do not obstruct the work space. The grid of the supports is 13 x 7.80 metres and tests the limits of structural possibility thanks to its 30 centimetre-thick post-tensioned ceiling panels.

The office space is accessed is via a spacious stairwell that is flooded with natural light, creating a bright meeting area that should encourage the use of stairs. Aside from saving energy, reducing the use of lifts also means the floors can be used more flexibly and creates more interaction between the different areas. Walkways, corridors and stairs situated next to the glazed façade mean those inside can see the hustle and bustle of life outside, and vice versa – although the sheer magnitude of the building gives it a life of its own.

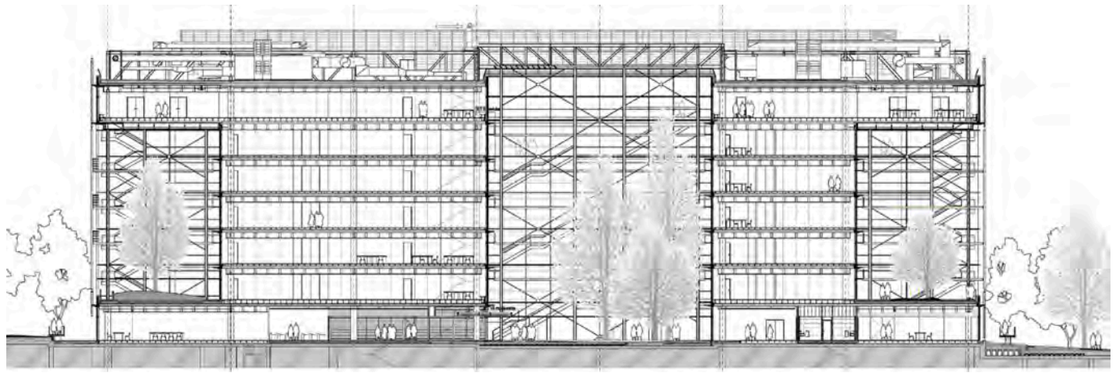
Sun-proof façade

The façades of the building are glazed from floor to ceiling. In order to protect the rooms from the strong sunlight outside, the glass installed features a special type of sun protection. On the outside of the building, the construction of the building envelope features a a double-skin façade. The external façades are shielded from direct sunlight by means of horizontal pipes. The ce-

On the entrance side, the cuboid structure opens up over several storeys, drawing indirect sunlight right into the interior of the building.

The ceramic coating on the solar reflector tubes in front of the outer façades catches the light and diffuses it into the building at a dimmed level.

Corridors and stairways next to the glazed façade allow passers-by to see the hustle and bustle going on inside the building.



The architects designed a huge, blocky cuboid structure, positioned on a clear, readable grid.

ramic-coated pipes, each measuring six centimetres in diameter, are spaced in rows at a horizontal distance of 17 centimetres from one another. The pipes are held in place by vertical struts every 260 centimetres. These not only reflect solar radiation, but also have a distinctly industrial character that helps to reinforce the defensive look of the building. The ceramic coating of the solar reflector tubes catches and diffuses the light, thus creating a sort of dimming effect. This helps to ensure a controlled level of indirect sunlight that, depending on the angle of incidence, creates a soft play of colours inside the building.

In the centre of the structure around the inner courtyards, sun protection is provided by a series of vertical tubes at ceiling height, creating a sort of canopy. A comprehensive light control system uses blinds and light intensity monitoring to ensure the glare-free use of daylight and the efficient use of artificial light inside the building.

The glass façade is based on the tried-and-tested VISS system, with particular use of the VISS Basic Façade and VISS profile systems. This efficient and visually impressive system solution is designed to be mounted on any kind of support. This meant that the architects could create large expanses of uninterrupted surface when constructing the façades. Each floor has its own maintenance walkway, allowing for adequate maintenance of these huge glass surfaces.

The new bank headquarters of Banco Santander is an imposing structure. The composition of the building's volume with is atriums and recesses; the ingenious design of the façade, and the structural measures for sun-proofing, all serve to maximise the use of daylight while also minimising energy consumption. The result: the building achieved LEED certification with a rating level of no less than Gold. (GB)

PROJECT DETAILS

Client:
Banco Popular, Madrid (now: Banco Santander)
Architects:
Arquitectos Ayala, Madrid
Metal work:
INASUS S.L., Lalín; Proinller, Madrid
Steel profile systems:
Janisol C4, VISS Basic, VISS Fire EI90

QR code: more images

Messe Dornbirn, Austria

The venue that makes a statement

By designing the new foyer of the Dornbirn exhibition centre in a striking bright red, the architects Marte.Marte make a bold statement about the uncompromising brilliance of Vorarlberg's architecture. With a new hall complex, they have transformed the almost 40-year-old conference facility into a venue that's ready to host the future.

Art lovers, brides and grooms, athletes or gardening enthusiasts – the Dornbirn exhibition halls are bustling with life in all its many facets. People come here to pursue their passions, grow their businesses, continue their education or cultivate their social lives. In fact, trade fairs and major events play an ever-important role in both our economic and our social lives. The venue in Dornbirn has been hosting its own trade fairs and guest fairs for many decades. It also plays host to all sorts of conferences, lectures, balls, exhibitions, sporting events, cultural events and concerts, welcoming up to 400,000 visitors through its doors every year.

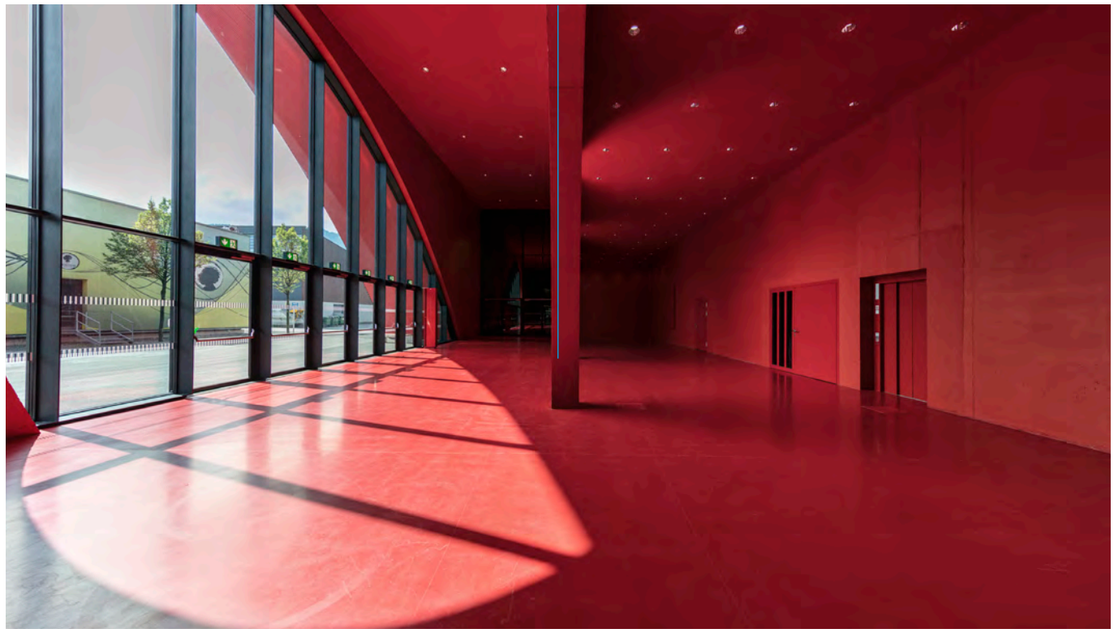
In order to meet the exacting demands of an events venue like this one – especially in terms of safety – the exhibition company is gradually working to modernise all of its facilities. In 2014, ten architecture firms from Vorarlberg were invited to submit proposals for the renovation of halls 9 to 12. The winners were the architects Marte.Marte from Feldkirch who, according to the jury report, succeeded in delivering a "distinctly unique and consistently coherent interpretation of the brief". Among other factors, this included plans to improve the sequence and functions of the halls.

Monolithic structure

The result is an imposing monolithic structure that sits between two of the existing buildings – a horizontal cuboid measuring 170 meters long, 70 metres wide and 16.5 metres high. It contains four halls of different sizes – including the largest events hall in Vorarlberg (Hypo Vorarlberg Hall 11), with 4800 square metres of floor space – and can accommodate up to 9000 visitors.

The outside of the structure is clad entirely with black corrugated iron. The fine vertical profiling of the sheet metal gives the huge, closed façade a moulded structure. On the two longer sides, the surface of the building is broken up with three striking recesses in hyperbolic shapes. These are also clad with corrugated iron, but in the same bright crimson red we see in the foyer. The recesses mark the entrance areas to the halls. On the east side, visitors enter the complex through a spectacular, elliptically shaped portal that tapers inward before opening out into a generous, curved glass front with six doors. This is how you reach the very heart of the building: the 'red foyer'. This completely red entrance hall features a striking architectural design, with an arching interior concrete wall containing five elliptical openings – creating a grandness that transforms the room into a sort of abstract ballroom. In terms of function, the arched wall separates the stream of visitors from the bistro behind.

The foyer itself also forms hall 10, and can therefore also be used as a stand-alone events space. At the same time, it connects the imposing Halls 9 and 11, which are located to the north and south of the foyer. Like the foyer, bistro and entrance area, exhibition hall 12 is also designed in red; while the two main halls in between are completely black from floor to ceiling. Glazed floor-to-ceiling openings lead visitors from one hall to the next – red to black to red to black.



For the access areas, which see a lot of foot traffic, Janisol C4 EI60 fire-proof doors guarantee a high degree of stability and reliable fire protection.

Innovative timber construction

In addition to its architecture, Vorarlberg is also known for its innovative timber constructions. The use of wood therefore also played a major role in the design. The metal shell of the building conceals a wooden structure, supplemented by reinforced concrete. A sophisticated wooden roof structure made of 65 glued timber lattice girders spans the building, which rest on wooden supports up to eleven metres high and span a width of a good 66 metres. Acoustic panels concealed in the grid offset the dreaded flutter echo and guarantee the perfect acoustic conditions for events. The interior cladding is also largely made of timber. A black false ceiling conceals the installation level in the lofty exhibition rooms.

Between the fire façade supports, there are around 70 doors with cross bars that open up to the outside in the event of a fire. For these access areas, which see a lot of foot traffic, the architects used Janisol C4 EI60 fire-proof doors. The processed fire-proof profiles combine a high degree of stability with the latest fire safety standards. Thanks to the innovative ceramic fire-resistant filling, fire resistance classes of up to EI90 can be achieved at a construction depth of just 70 millimetres. Fittings, locks and accessories can be integrated into the profiles relatively easily. Bar handles in line with standard EN 1125 were also installed in all the relevant public access areas.

The setting for the new halls is therefore fitting and functional in equal measure. Its multi-functional design complies with all the different requirements and offers cutting-edge technologies for safety and business. (NS)

PROJECT DETAILS

Client:
Messe Dornbirn GmbH
Architects:
Marte.Marte Architekten ZT GmbH, Feldkirch
Metalwork:
Starmann GmbH, Klagenfurt
Steel profile systems:
Janisol C4 EI60, VISS EI90

QR code: Video recordings of building

Moving with the times

“Panta rhei” – everything flows. The famous words of Heraclitus ring true at Jansen’s headquarters in eastern Switzerland, and not just due to its proximity to the River Rhine.

231,000 litres of water flow past the village of Oberriet every second. We wouldn’t even begin to try to work out how much that would add up since Jansen was first founded here in 1923 – let’s just say it’s an inconceivable amount. Jansen’s location in the St. Gallen Rhine Valley was no accident. Not only does it offer excellent access to the road, rail and waterway network, but it also allowed us to establish a connection to the Swiss high-pressure natural gas transport network at a very early stage. Having a reliable supply of energy is an essential competitive factor for a company that develops, manufactures and sells steel profile systems. Another thing that goes a long way towards achieving success on the international market is offering products that are just ahead of their time. This was the case with the first fully insulated steel profile system for building façades, which Jansen patented in 1969 under the name “VISS”. Not long after, the world was hit with the first-ever oil crisis, which led to a major re-think of the energy consumption of buildings. And thanks to Jansen’s large steel and glass façades, the new demand for improved thermal insulation could be met. History repeated itself recently, with Jansen having a similarly successful product launch with its new Janisol Arte system. This highly heat-insulating steel profile system for restoring intricate industrial and fixed glazing came onto the market at exactly the same time as the sustainable renovation of old buildings was enjoying increased popularity.

Just as social requirements change, so too must companies. After all, if you don’t keep up with the times, they will leave you behind. The future of Jansen will be determined by its approach to sustainability, digitalisation and security. In recent years, the issue of security in particular has become increasingly prevalent in construction planning. This issue of SCALE gives an impressive demonstration of how the heavy-duty steel profile systems from Jansen can be used to implement robust constructions that meet even the strictest security requirements. With planning becoming increasingly digital, the company also has its own BIM competence centre, which supports architects and planners from the first click to the finished façade. Façades made of steel profiles are particularly sustainable. When combined with high-quality functional glass, they are guaranteed to meet the necessary requirements for decades to come, and at comparatively low maintenance costs. What’s more: steel profiles are 100% recyclable – a key factor when assessing the building standard according to Leadership in Energy and Environmental Design (LEED), the German Sustainable Building Council (DGNB), Building Research Establishment Environmental Assessment Methodology (BREEAM) and, last but not least, the Swiss Sustainable Building Standard (SNBS).

LOOKOUT

Four Seasons Hotel Bodrum, Turkey

After taking the step into the tourism sector in 2005 in collaboration with Four Seasons, the Astay company is now bringing its successful partnerships and experience to the Turkish Riviera. The Four Seasons Resort in Bodrum is being built on a site measuring 1 million square metres, on a cliff overlooking the sea. Jansen is supplying the site with VISS pivoting doors and Janisol HI doors.

Hotel Le Calvet Bordeaux, France

The renovation and reconstruction of this hotel complex includes the use of Janisol and Janisol Arte window systems, as well as the VISS façade system. It has been planned entirely in BIM, with the interior architecture designed by renowned designer Philippe Starck.

Bundesbank Dortmund, Germany

The new branch of the Bundesbank is being built on the site of a former barracks. The site has 79,000 square metres of floor space and the new building will have 290,000 cubic metres of enclosed space. It will be used for verifying, sorting, cleaning and packing coins and bank notes before putting them back into circulation. The security requirements are strict as you might expect, although the bank wishes not to disclose the exact structure of the building, nor may we disclose exactly which Jansen profile systems will be implemented.

Teatro Albéniz Madrid, Spain

This iconic cultural site will soon be shining with new splendour, with a new hotel set to be opened at the venue in autumn 2021. The new building makes use of Janisol Arte 2.0, Janisol and Janisol C4.

Leerfabriek KVL Oisterwijk, Netherlands

The disused former KVL leather factory in Oisterwijk is being transformed into a trendy leisure and shopping centre to serve the city and surrounding area. Around 60 companies will be located at the site. Of all the buildings in what was once Europe's biggest leather factory, two will be given new uses. Janisol HI doors, Janisol C4, Janisol 2, Art'15 and Economy 50 EW30 are to be installed within the existing structure.

BNP Paribas Paris, France

On the fashionable Boulevard des Italiens in the French capital, the headquarters of the major bank BNP Paribas is in the process of renovation. The new building will make use of Janisol Arte 2.0 dry glazing.

Waterside living: Sluishuis, Amsterdam, Netherlands

Right where the city meets the sea, Amsterdam is now home to a new housing development known as the Sluishuis (or 'Lock House') – a large, courtyard-style apartment complex brings a whole new meaning to the idea of waterside living. It appears to float on the water, rising up towards the sea like the open bow of a ship. The block descends towards the neighbouring district in a cascade of landscaped terraces, creating a natural transition to its small-scale surroundings. A promenade snakes its way around the building and out towards the water, offering a range of public facilities. It also extends right up to the top of the building, where it serves as a viewing platform over Lake Ljssel.

The Sluishuis offers a mixture of freehold and rental apartments in a range of different sizes. What makes the building particularly special is the combination of sloped and straight glass panels, each measuring 1360 x 3120 millimetres and forming an integral part of each apartment – functioning as a base plate, among other things. Never before has a glass panel for façades received fire resistance certification in this position. Once again, Jansen's product stepped up to the plate, providing EI90 fire-proofing.

IMPRINT

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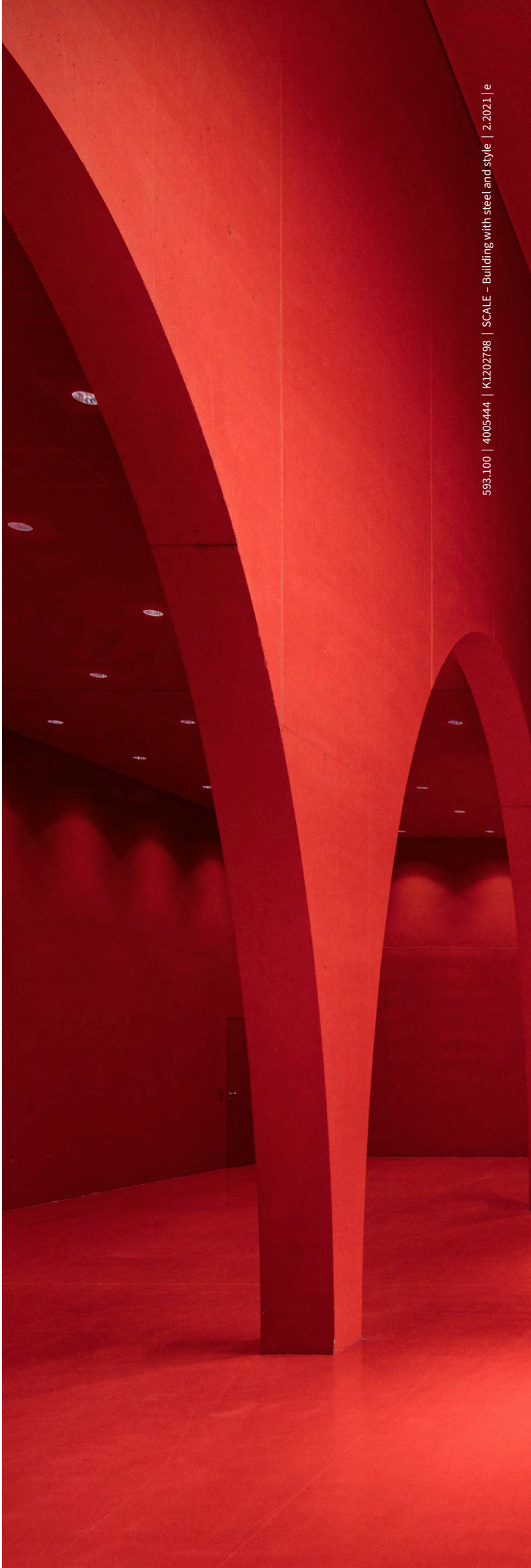

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