GLASS FOR FAÇADE

EDITION 2021

SAINT-GOBAIN

TOURS DUO

Architect: Laetitia Degroote Cheuvreux
Jean Nouvel – Ateliers Jean Nouvel, Paris, France
©Johnny Yim

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MAKING THE WORLD A BETTER HOME

Like every year, we are very proud and excited to share with you our new 'GLASS FOR FAÇADE' Reference Book.

It is our way to take you on a journey to extraordinary projects in many different countries, only made it possible by passionate and dedicated teams that we would like to thank here, including all the stakeholders we are working with.

The new Reference Book 2021 is also reflecting more profound transformation, with climate change and circular economy being now among the main drivers of our market and demanding new responses from the glass industry.

And Saint-Gobain Glass wants to lead the way.

By providing the most performant products on the Façade market allowing energy savings, hence reducing your operational carbon; while lowering our own CO2 emissions and energy consumption, to contribute to the reduction of the embedded carbon of the glass façade building envelops.

But also by integrating a complete recycling journey with refurbishment projects made out of the old glass that we recycle, use as cullet and convert into much higher performant products.

In line with our motto **'Making the World a Better Home'**, this journey is just starting as our teams are committed to offer you the high-performant and sustainable solutions on the Façade market.

We wish you will enjoy this Reference Book as much as we loved working with you on those projects, and rendez-vous next year to present you some astonishing sustainable projects we are currently working on.

Content

RENOVATION | COMMERCIAL OFFICES

GATE:01 FRÖSUNDAVIK

RECYCLED OVER 40 TONS OF OLD FAÇADE GLASS AND THUS CONTRIBUTES TO THE CONSERVATION OF RESOURCES

Location	Stockholm, Sweden
Architect	NIELS TORP+ Arkitekter AS, Oslo, Norway (1987)
Glass processor	Saint-Gobain Glassolutions, BALTIKLAAS, Tartu, Estland
Façade maker	ScandiFront AB, Täby, Stockholm, Sweden
Photos	©Lasse Olsson Foto

35 years ago, Norwegian architect Niels Torp designed the headquarters of airline SAS in the north of Stockholm for 2,000 employees. The building, located in a park near Haga Castle, was meant to look like an airport. The departments were virtually arranged in «terminals», which are connected by a glazed atrium. The highly modern «street» was designed as a winter garden but was not considered attractive – uncoated DGU glass meant it was too cold in winter and too hot in summer. And there were water leakage problems; the ill fate of the atrium became publicly known and meant similar constructions were avoided in Sweden for several years to come.

During the refurbishment of the huge complex, the glazing had to be completely replaced to meet requirements for thermal and visual comfort of a co-working space, 2,000 m² of dining area and meeting places have been created in the former deserted winter garden. The demands were strict – no change in the appearance of the glass or system was allowed, and many glazings were rejected. SAINT-GOBAIN supplied the new solar control glass for the 3,500 m² of double glazing. The highly selective COOL-LITE® XTREME 70/33 II coating on extra-white DIAMANT® glass was selected as the best match between looks and thermal comfort. The aluminium system was also completely replaced to secure the construction against leakage.

Product COOL-LITE® XTREME 70/33 II on DIAMANT®

The architect Niels Torp is still active. He was back in the fall of 2021 and could at first not see that a renovation had taken place, the atrium is so close to the original impression.

In line with circular economy, more than 40 tons of glass from the old façade were collected, processed into cullet. It was then recycled into furnace of the SAINT-GOBAIN float plant in Torgau, Germany. Recycling one ton of waste glass saves 300 kilograms of CO_2 (scope 1 & 2) and preserves natural resources.

As a result of this successful initiative, SAINT-GOBAIN and the Swedish recycling company Ragn-Sells have decided to cooperate permanently in future. SAINT-GOBAIN has been a leader in recovery and recycling of post-consumer cullet in its glazings by establishing successful partnerships networks.

EDUCATION

THE SPINE

ROYAL COLLEGE OF PHYSICIAN

A PIONEER IN SUSTAINABILITY AND BIOPHILIC DESIGN

Location	Grove Street L7 8SZ, Liverpool, United Kingdom
Architect	AHR Architects Ltd., Manchester, United Kingdom with Salvedge Sustainable Design, Stonehouse, United Kingdom
Façade maker	FK Group, Dalmine, Italy
Glass processor	Cristec Glass SL, Spain
Photos	©John Kees Photography
Certifications	BREEAM Excellent and WELL Platinum

Named after its distinctive staircase on the north side, the Spine is located in the heart of Liverpool's innovative Knowledge Quarter. The new headquarters of the well-known Royal College of Physicians represents the harbour city's modern urban development and provides a strong contrast to the historic industrial architecture. The building is BREEAM Excellent certified and is one of the first in the UK to gain the international Well standard. Liverpool's new flagship building is also groundbreaking for a new archetype of biophilic office buildings.

One highlight is the curtain wall glass façade. Almost 23 million mathematical Voronoi diagrams are printed to the glass surface with «PICTUREit®» by SAINT-GOBAIN. In this case, the glass is printed with enamels, and burnt at high temperature. Therefore, the print becomes extremely resistant to moisture, water, temperature fluctuations, scratches, abrasion and even UV discolouration. As a biophilic design element, the printed polygons create constantly changing shadow patterns inside the building, while contributing efficiently to sun protection. AHR Design, Liverpool, believes that the built environment strengthens the mind, supports productivity and even improves fitness.

Fully glazed on all sides, the façade sets the highest standards for controlled light transmission and energy values. With a light transmission of 50%, the selected COOL-LITE® XTREME 50/22 II ensures excellent light values for working and relaxing areas. The good solar factor (g-value) results in low cooling loads and the low Ug-value reduces the heating costs.

Products	COOL-LITE® XTREME 50/22 II PICTUREit®

MIXED USE DEVELOPMENT

TOURS DUO

TWO GLASS GIANTS AS NEW SUSTAINABLE LANDMARKS IN PARIS

Location	43 Rue Bruneseau, Paris, France
Architect	Laetitia Degroote Cheuvreux Jean Nouvel – Ateliers Jean Nouvel, Paris, France
Glass processors	Vetrodomus, Italy Cristec Glass SL, Spain
Façade maker	Permasteelisa Italia
Photos	©Johnny Yim
Certifications	WELL Platinum, LEED® Platine HQE Exceptional and Effinergie+

The twin towers of the Tours Duo, 180 and 125 metres high, are undoubtedly a new landmark of Paris. Located in the 13th arrondissement on the edge of the currently largest urban development area, the Quartier Rive Gauche, the towers mark the point where centre and periphery meet. Furthermore, they form a visual axis with the nearby Bibliothèque François-Mitterrand on Avenue de France.

The ensemble of the two towers designed by Ateliers Jean Nouvel offers a mix of usage. The tallest tower alone, Duo 1, with 39 floors above ground, comprises 69,000 m² of office space, and is also equipped with a restaurant, shops and an auditorium. In the lower Tower, Duo 2, around 19,000 m² are planned for offices as well as shops, a panorama restaurant with bar and a four-star hotel. The hotel has 139 rooms and was designed by renowned designer, Philippe Starck.

Standing asymmetrically in relation to each other and each slightly inclined, the twin towers form a monumental V. A «head» was added to the taller tower, which «bends» towards the Avenue de France and thus creates a visual axis to the library. The façades are made entirely of glass. Thanks to the COOL-LITE® SKN 076 solar control and thermal insulation glass from SAINT-GOBAIN, excellent energy consumption parameters were achieved. This solar control product features a high performance coating. The high light transmittance reduces the requirement for interior lighting during daylight hours, helping reduce energy costs even further.

A special effect is achieved with COOL-LITE® ST Bright Silver, a tempered glass with good levels of sunlight control features and an elegant appearance. The highly transparent and reflective solar control glass was selected for the outer layer of double-skin façades and can be pre-tensioned, bent and laminated into safety glass. This offers architects a great scope for unique and modern designs.

Depending on the orientation and lighting conditions, the façades show the pulsating city life. Some areas of the façade have glass panes pointing downwards like scales. This enhances the effect of reflection and underlines the lively character of the buildings.

The Tour Duo also convinces in terms of sustainability: The new building was awarded LEED® Platine and WELL Platinum. It received the HQE Exceptional certificates for particularly sustainable construction and project planning as well as the Effinergie+ label for its low primary energy consumption.

Products

COOL-LITE® SKN 065
COOL-LITE® SKN 076
COOL-LITE® ST Bright Silver
COOL-LITE® XTREME 60/28

The new commercial (office, retail) and residential building at Szervita Square in Budapest is located in the city center, on the Eastern side of the Danube. The famous promenades and shopping streets – Váci Street and Fashion Street with the Kempinski Hotel – are in walking distance.

Perfectly in line with the location, the architecture of the new building is built for luxury and elegance. The attractive location offers flexible ground plans and generous spaces for office, retail, and residential use. The business premises are spread over four interconnected upper floors. The office space is 100% leased one year after the building's completion, the overall commercial occupancy is 95%. On the top floors luxury apartments are located, which follow a unique and coherent design and color concept. The operator describes the style of the interior design as «contemporary and cosmopolitan».

MIXED USE DEVELOPMENT

SZERVITA SQUARE BUILDING

A JEWEL FOR BUDAPEST WITH SOLAR CONTROL GLASS FROM SAINT-GOBAIN

Location	Szervita Square, Budapest, Hungary
Architect and Design	Concept plan: chief architect Antal Fekete, Budapest, Hungary / Permit and execution plans: DVM Group / Chief architect: László Gellár, Budapest, Hungary
Glass processors	Façade: Jüllich Glas Holding, Székesfehérvár, Hungary Curved part: Vandaglas, Berlin, Germany Glass roof: Saint-Gobain Glassolutions, Pruszków, Poland
Façade maker	Schal-Tech kft., Budaörs, Hungary
Photos	©Sz. Nagy Judit
Certifications and Awards	First LEED® Platinum mixed-use development in EU, Access4You certificate, International Property Awards, FIABCI Prix d'Excellence, Portfolio Property Investment Forum, Luxury Lifestyle Awards, Office of the Year etc.

The architects designed the building shell throughout with glass. It is structured into several storeys, and is partially terraced. The building elevations are broken up by an irregular pattern of filigree vertical elements. The at the corners curved glass envelope reflects the historical façades of the neighboring buildings, resulting in a lively collage of old and new. This mirror effect is made possible by the coated two-in-one COOL-LITE® XTREME SILVER II glass by SAINT-GOBAIN. Its combination of reflective silver appearance and high solar control, outstanding selectivity and thermal insulation ensures high user comfort and energy savings. This is another reason why Szervita Square Building meets the requirements of the LEED Platinum sustainability label. It has also received numerous awards for its architecture, design and development values, including the "Best Mixed-Use Development in Hungary" at the International Property Awards and at the 23rd FIABCI Hungarian Prix d'Excellence, as well as multiple concept awards.

Products COOL-LITE® XTREME SILVER II, STADIP® XN, STADIP®, PLANICLEAR®, MicroShade and curved glass CONTOUR®

In the Libeň district of Prague, an attractive administrative and commercial centre has been built: Harfa is currently the largest Commercial Complex for Business and Entertainment, located close to the O2 Arena and the multifunctional O2 Universe. The complex comprises a shopping centre and an office center and is now complemented by the new «Harfa Business Center», short HBC. The architectural design for the building is from the Prague studio ADR. The HBC offers 30,000 m² of office space in various sizes.

The eight-storey building is crowned by two staggered storeys, which leave plenty of space in front of the modern office units for elaborately cultivated roof gardens. Here, employees can enjoy their breaks. In addition to a spacious lobby, large areas for retail and gastronomy are planned for the ground floor areas. In the basement, an underground car park provides parking possibilities for 300 cars.

COMMERCIAL OFFICES

HARFA BUSINESS CENTER

SUSTAINABILITY IS THE KEY: BUSINESS WITH MAXIMUM COMFORT THANKS TO DAYLIGHT GLAZING FROM SAINT-GOBAIN.

Location	Lisabonská, Prague, Czech Republic
Architect	ADR - Architektura, Design, Realizace, Prague, Czech Republic
Glass processor	Saint-Gobain Glassolutions, Brno, Czech Republic
Facade maker	WIEDEN s.r.o., Liberec, Czech Republic
Photos	©Saint-Gobain
Certification	LEED® Platinum

The façade is enclosed by a modified curtain wall of fix-mounted horizontal panels, which provide additional glare and sun protection in the offices behind - but at the same time they also take on design functions. The post-rail-façade was fitted with the highly transparent COOL LITE® SKN 183 solar control glass in the toughened version II. With its outstanding energy performance and high colour neutrality, this efficient special glass guarantees maximum office comfort. The triple glazing with PLANITHERM® XN and ECLAZ® ONE as counter panes also ensures optimum daylight values with their high light transmission values. A performance that is also convincing in terms of sustainability: the building received the LEED Platinum certificate.

Products COOL-LITE® SKN 183 II
PLANITHERM® XN II
ECLAZ® ONE

COMMERCIAL OFFICES

MERCATOR ONE

DUISBURG'S CALLING CARD

Location	Duisburg, Germany
Architect	Hadi Teherani Architects, Hamburg, Germany
Glass processor	Vandaglas GmbH, Radeburg, Germany
Façade maker	Ruppert App, Leutkirch, Germany
Photos	©Rohl Fotografie/Saint-Gobain Glass

100 meters long, 17 meters wide and 26 meters high: This is the Mercator One office and commercial building in the middle of Duisburg city center. The award-winning wing of the building with around 11,000 m² of usable space is "the new entrance to the city, a figurehead for Duisburg", says Bernd Muley, project manager at Hadi Teherani Architects, who designed the impressive building right next to the main train station. The highly transparent solar control glass from SAINT-GOBAIN was processed at the Vandaglas Radeburg from the CLIMAplusSECURIT network.

The Mercator One shapes its surroundings with an expressive façade. Setbacks in the large building volume bring movement into the urban space: the sculptural architecture not only attracts the eye of the streams of visitors, but also directs them to the central shopping street of the metropolis with almost 500,000 inhabitants.

The ends of the Mercator One play a special role: This is where the six-story facade ends in a staggered and fan-shaped manner. The lines of light from the exterior façade lighting are reflected in the glazing - which further enhances the fan-like appearance and the guiding effect in the dark.

The striking building received the BDA Rechter Niederrhein Architecture Prize 2020 and won the ICONIC AWARDS 2021: Best of Best in the Corporate Architecture category.

Around 4,500 m² of highly transparent solar control glass from SAINT-GOBAIN was installed in Mercator One: COOL-LITE® XTREME 60/28, COOL-LITE® XTREME 70/33 on the 6th floor and COOL-LITE® SKN 176. While this brings a lot of natural light into the building, the high-performance coating keeps the indoor climate pleasant. In comparison to conventional glazing, the room temperature can be kept noticeably lower.

The lower heating of the rooms makes it possible to run the air conditioning on a low level in summer or to turn it off completely. This reduces costs and relieves the environment. Together with the façade made of 90% recycled aluminium, a sign of sustainability is set. Because synthetic and composite materials were not used, the building materials used can be dismantled according to each type at the end of the building's life cycle and returned to the cycle as a resource.

Products

COOL-LITE® XTREME 70/33
COOL-LITE® XTREME 60/28
COOL-LITE® SKN 176

COMMERCIAL OFFICES

NOWY RYNEK POZNAŃ

(NEW MARKET)

EXCITING DESIGN IN THE NEW SHOWCASE QUARTER WITH SOLAR CONTROL GLASS FROM SAINT-GOBAIN

Location	Stanisława Matyi, Poznan, Poland
Architect	Medusa Group, Bytom, Poland
Glass processor	Q4 Glass, Poland
Facade maker	ESOX PROJEKT, Poland
Photos	©Saint-Gobain
Targeted certifications	Applied for LEED® and WELL Core&Shell, (Building without Barriers)

Nowy Rynek (New Market) is a new quarter in the district of Wilda, Poznań in Poland. The building complex consists of five individual buildings offering a wide range of facilities from office to retail and residential. This investment in a dynamically developing neighborhood is a multiphase project, which thanks to the application of pro-ecological solutions allows to materialize the vision of durable, energy-efficient, and comfortable architecture – with no barriers.

With the recently completed Building D, another 39,000 m² of usable space have now been added. The new building's fully glazed façades enclose a public inner courtyard, which invites shoppers with its modern portico. Copper-coloured vertical louvres provide shade and at the same time structure the glass fronts at the same time. On the lower floors, large glass windows give the building certain lightness. The street façade is protected by green-tinted cladding;

the green flat roofs entice visitors to the roof terraces with fresh vegetation. Special features are the walkways around the building, which can purify the surrounding air with a special coating of the concrete. The complex in the showcase district was the first to be built in the region according to the guidelines of the WELL certification (Core&Shell).

The glass façades from Building D were fitted with the solar control glass COOL-LITE® SKN 165 II by SAINT-GOBAIN. Its efficient functional layer stands for the best possible workplace comfort and guarantees outstanding key figures in light transmission and energy transmittance. Above this six-storeys base, another seven office floors rise like loosely stacked glass boxes. They interfere in height to Tower E, the fifth building in the complex which is still in planning stage. With its 25 storeys the tower will rise up over the entire area.

Product COOL-LITE® SKN 165 II

ADMINISTRATION

EUROPEAN MEDICINES AGENCY

MAXIMUM WORKPLACE COMFORT WITH HIGHLY TRANSPARENT FOR BETTER HEALTH

Location	Dominco Scarlattilaan 6, 1083 HS, Amsterdam, The Netherlands
Architect	MVSA Architects and Fokke van Dijk, CGREA, both Amsterdam, The Netherlands
Glass processor	Tvitec, Spain
Façade maker	Vorsselmans, Wuustwezel, Belgium
Photos	©Rob Acket
Certification	BREEAM Excellent

The new headquarters of the European Medicines Agency (EMA) in Amsterdam's Zuidas banking district is the result of a collaboration between architect Fokke van Dijk of the State Real Estate Agency and Amsterdam-based MVSA Architects. The design was elaborated by MVSA Architects together with the planning partners in an intensive BIM process in 3D and structurally realised in a record time of only 18 months.

The 19-storey office tower is 81 metres high and offers space for 1,300 workplaces on 39,000 m². Most of the space is used as open-plan offices with flexible usage options. The numerous meeting and conference rooms are accessed via a light-flooded atrium, and a lobby and restaurant are located on the ground floor.

The BREEAM Excellent certified building was constructed according to demanding sustainability standards and offers its users the highest comfort in terms of visual, climatic and acoustic working conditions.

The sober geometry of the façade is characterised by a bronze-coloured metal façade with a high proportion of glass. For this, 7,000 m² of solar control glass were installed. COOL-LITE® XTREME 70/33 highly selective solar control glass was used to ensure both a maximum transparency plus daylight and a minimum heat input. The highly efficient special glass has proven ideal for large, south or south-west facing glass surfaces. Its neutral appearance with extremely low internal and external reflectance guarantees the best working conditions and an aesthetic appearance of the façade.

Product COOL-LITE® XTREME 70/33

COMMERCIAL OFFICES

VITANIA TOWER

HIGHLY EFFICIENT THERMAL INSULATION IN GLASS

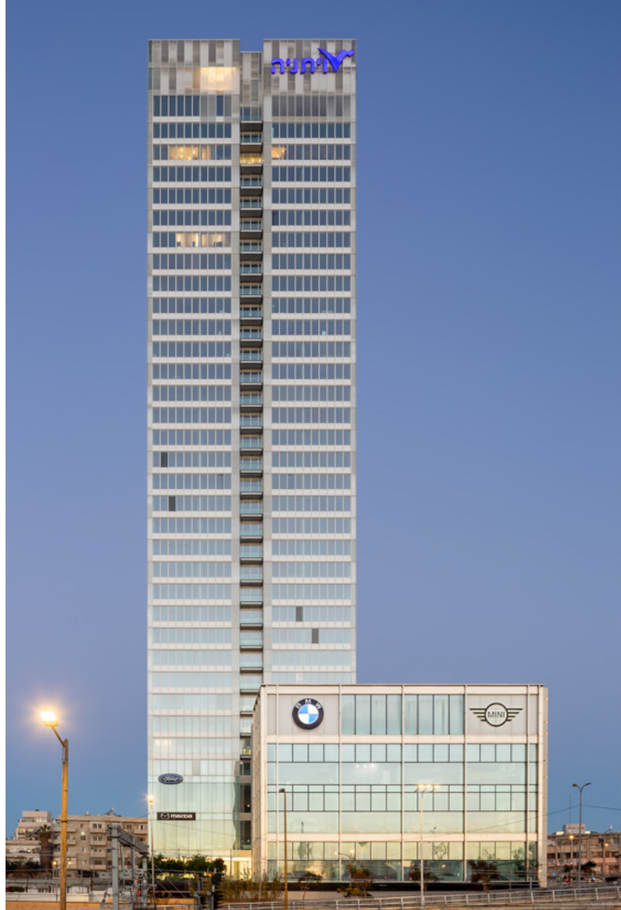
Location	Tel Aviv, Israel
Architect	Yashar Architects, Tel Aviv, Israel
Glass processors	ALK Tempered Glass, Israel Tvitec, Spain
Facade maker	AlumEshet, Yavne, Israel
Photos	©Sharon Tzarfati photography

Products	COOL-LITER XTREME 60/28 II COOL-LITER XTREME 60/28 II DIAMANT® Overlength 8,2 meters - Podium

Three highrises are planned, one is just completed: 40 storeys high, the Vitania Tower rises above Tel Aviv, where a new imposing skyline is being built along the Ayalon Highway. With this tower, the appearance in La Guardia Interchange will change permanently, as the first glass tower, the Vitania Tower introduces an architectural change of style. Almost entirely encased in glass, new office space, hotels, congress rooms and flats are being built on almost 200,000 m². The striking glass facades as well as two glass cubes for high-end car exhibitions effectively set the scene for the high-rise-ensemble.

With a finely balanced alternation between glass façades and exposed building structure, Yashar Architects lend the towers an outstanding architectural lightness. The perfectly orchestrated alternation between «glass curtains» and exposed cantilevered balcony bands structures the façades extensively and draws the viewer's gaze into the building. The façade experts at AlumEshet developed an exceptional architectural solution for this project: a new double skin façade system in which SAINT-GOBAIN solar control glass was integrated.

The performances, the low external reflection as well as the colour-neutral external appearance of COOL-LITE® XTREME 60/28 II, chosen by the architects, create an excellent combination of function and aesthetics. Its transparency and neutrality create a bright and pleasant atmosphere in the room at all times of the year. Excellent energy values are achieved via this triple silver solar control coatings. This efficient coated glass solution from SAINT-GOBAIN reduces overheating in summer and heat loss in winter – this protects the environment and makes a noticeable



ART AND CULTURE

TOM PATTERSON THEATRE

INSPIRING THEATRE ARCHITECTURE WITH HIGHLY SELECTIVE SOLAR CONTROL GLASS FROM SAINT-GOBAIN

Location	111 Lakeside Drive, Stratford, Ontario, Canada
Architect	Hariri Pontarini Architects, Toronto, Canada
Glass processor	Tvitec, Spain
Facade maker	Clarity Architectural
Photos	©Scott Norsworthy
Certification	LEED® Gold

The Festival in Stratford, Canada, is internationally known for its annual Shakespeare performances. To celebrate the 100th birthday of its founder, Tom Patterson, an international architectural competition was launched for the construction of a new theatre. The winning design by Siamak Hariri from Hariri Pontarini Architects received international attention even before its opening, which has been postponed to 2022 due to the pandemic. The theatre won the Best of the Best Award in Cultural Architecture at the MasterPrize in Los Angeles and is listed as a regional finalist in London's prestigious Civic Trust Award 2022. The 70 million dollar building is LEED Gold certified and features sustainable materials throughout.

Product COOL-LITE® SKN 076 II DIAMANT®
Overlength 6,8 meters

A bronze canopy welcomes audiences to the new theatre, which includes a high-tech stage and additional areas for performances, lectures and receptions. The exceptional new theatre building is designed to connect audience and artists with an organic form that blends into the surrounding river landscape and dissolves the boundary between indoors and outdoors. Well-lit rooms and the surrounding nature form a great scenery for encounters and contemplation. A magnificent façade that runs the entire length of the building, allows a wonderful view of Lake Victoria from the interiors of the Tom Patterson Theatre. Many rooms have been soundproofed so that multiple events or shows can take place at the same time. The floor-to-ceiling glazing for this was made with COOL-LITE® SKN 076 II highly selective solar control glass.

The 10,500 m² administrative building of Regensburger Municipal utilities and REWAG - water and energy supplier, which was completed in 2020, is located next to the former company headquarters, in the so-called east quarter of the city. The site is bordered by a four-lane road in the north, to the east and south by multi-family houses and commercial buildings. The new building reacts to this heterogeneous situation with a triangular shape. In the middle, the structure forms a spacious inner courtyard. The publicly accessible customer center is located on the ground floor, while the upper levels are reserved for administration. Individual and open-plan offices with communication zones alternate there.

COMMERCIAL OFFICES

REWAG

OPEN AND DYNAMIC NEW CONSTRUCTION

Location	Regensburg, Germany
Architect	Gewers & Pudewill, Berlin, Germany
Glass processors	Caleoglas Ost GmbH, Potsdam, Germany Vandaglas GmbH, Berlin, Germany
Façade makers	Forster Fassadentechnik GmbH, Mitterteich, Germany Glasbau Kirchmann, Tirschenreuth, Germany
Photos	©HGEsch

Products

COOL-LITE® XTREME 70/33
PLANITHERM® XN II
COOL-LITE® XTREME 60/28 II
CONTRAFLAM® F30 15 mm
STADIP®, SERALIT® EVOLUTION

The façade of the new building is divided into continuous strips of stone and efficient glass from SAINT-GOBAIN. Curved at the corners of the building, they underline the dynamic nature of the building. The parapets are clad with light-colored, regionally extracted natural stone, the surface of which is processed differently depending on the floor. For the flat or curved glazing, the highly selective solar control triple glazing COOL-LITE® XTREME 70/33 were used, and on the upper floors the COOL-LITE® XTREME 60/28 II, both as structure with laminated with safety glass.

«The aim was to develop a high-quality, open-plan building with a contemporary working environment, in which the 460 employees and their customers feel welcome and enjoy staying,» write the architects Gewers Pudewill about their building design. The solar control glazing from SAINT-GOBAIN plays a key role in this. With a selectivity greater than 2 and a Ug value of 0.6 or 1.0 W/m²K, it has the highest ratio between penetrating daylight and protection against overheating through solar radiation. This creates an extremely bright atmosphere inside the room. The building is equipped with district heating and thermal component activation for heating and cooling.

COMMERCIAL OFFICES

TORRE CALEIDO

AESTHETIC GLASS FAÇADE CHARACTERISES THE «QUINTA TORRE"

Location	Paseo de la Castellana, 259-E, Madrid, Spain
Architect	Fenwick Iribarren Architects/Serrano-Suñer Arquitectura, Madrid, Spain
Glass processor	Saint-Gobain Glassolutions La Veneciana SA, Lalin, Spain
Façade maker	Permasteelisa Espana, Madrid, Spain
Photos	©imagen subliminal

Set transversely an elongated base building, the Torre Caleido rises 181 metres into the sky of Madrid. The fifth tower, the so-called «Quinta Torre», completes an impressive high-rise ensemble in the north of Castellana. Serrano-Suñer Arquitectura reduced the architectural form to flat, elongated cuboids and inserted an iconographic cubus in black into the existing ensemble.

The curtain wall façade represents the special technical and architectural top class of the COOL-LITE® XTREME family from SAINT-GOBAIN. The reduction to the finely balanced play with the black "colour" makes the Torre Caleido a real eye-catcher. No protrusions, curves or recesses interfere with the aesthetic effect of the glass façades. Only vertical pilaster strips were added to the main body - a stylistically minimal measure that effectively highlights the verticality of the high-rise building.

The selected COOL-LITE® XTREME 60/28 II glass is heat-strengthened and characterised by an high light transmission of 60%, and with a g-value of 28% it's also the solution to the building-physics requirements to the occasionally extreme heat in Madrid. This good g-value ensures a high level of comfort in the interior, with a high level of light penetration at the same time. Compared to standard solar control glass, the heating of the interiors is reduced by up to 5°C. Reduced cooling loads and the elimination of external shading systems that are prone to repair effectively reduce operating costs.

Products PARSOL® Grey
COOL-LITE® XTREME 60/28 II

MIXED USE DEVELOPMENT

HUMANITI

MONTREAL'S FIRST VERTICAL COMMUNITY: HIGH-RISE FAÇADES WITH SPECIAL GLASS FROM SAINT-GOBAIN

Location	385 Avenue Viger O., H2Z 2B8, Montreal, Canada
Architect	Lemay – Architecture and Design, Montreal, Canada
Glass processors	Multiver, Quebec, Montreal, Canada Saint-Gobain Glassolutions Eckelt Glas GmbH, Steyr, Austria
Façade maker	Epsylon, Montreal, Canada
Photos	©Adrien Williams
Targeted certifications	LEED® & WELL

«Humaniti» is the name of a modern high-rise complex in downtown Montreal that comprises 39 floors of flats, a hotel and space for offices and restaurants. The multifunctional complex itself is as a unique project for vertical living, working and housing and is aiming for LEED and WELL certification - a debut for this kind of building in the Canadian province of Quebec.

The architectural design for the H-shaped glass architecture was made by the Canadian design office Lemay, which also designed the interior of the hotel together with its affiliated company Lemay + Escobar. The 120-metre-high residential glass tower pays tribute to the Flatiron building in Manhattan and seems to split into two wings halfway up. In front of it, two horizontal bars with five and eleven storeys, respectively are stacked on top of each other, that the horizontal

Products COOL-LITE® SKN 176 II
PLANITHERM® ONE II

volume of the hotel connects to the tower as a bridge link. The entire complex comprises a luxury hotel with 193 rooms, a rooftop pool, over 460 residential units, including 150 condominiums, 57,000 m² of office space and a further 17,000 m² of commercial space.

The evenly designed glass façades are interrupted by honeycomb structures. The staggered arrangement favors the incidence of natural light into the residential units. Each honeycomb accommodates about four households, similar to the typology found in many Montreal neighborhoods. The glass façades were made with PLANITHERM® ONE II toughened multi-pane safety glass and COOL-LITE® SKN 176 II highly transparent solar control glass. SAINT-GOBAIN Glassolutions Austria Eckelt supplied the special oversized formats providing breathtaking views.

COMMERCIAL OFFICES

THE CURVE

COMPREHENSIVE SUSTAINABILITY
WITH HIGH PERFORMANCE CURVED
SOLAR CONTROL GLASS

Location	Rue du Landy, Saint Denis, France
Architect	Chartier Dalix Architectes, Paris, France
Glass processors	Vandaglas GmbH, Berlin, Germany Saint-Gobain Pietta Glass Working, Romania
Facade maker	Metal Yapi, Istanbul, Turkey
Photos	©Johnny Yim
Certifications	BREEAM, HQE, Effinergie+

ZAC de la Montjoie is an urban development area in Saint-Denis, in the north of Paris, planned according to ecological principles. Here, particularly strict specifications were applied for the promotion of biodiversity and the use of sustainable materials such as wood. In addition to public green spaces, there are infrastructure facilities as well as residential and administrative buildings. The latter includes the 24,400 m² office building "The Curve". The name of this new eight-storey building refers to its curvilinear basic shape, which stretches across the site. In addition, the views convey a certain dynamic because the corners of the building were concavely and convexly curved at Glas Döring, Berlin. The pane structure consists of an outer laminated glass with COOL-LITE® XTREME 70/33 coating on the inside.

The building is accessed via two equal entrances. Around an "inner street" there are restaurants, a fitness- and business centre with co-working spaces, bars and a café. While designing the floor plans, the planners placed emphasis on flexibility of use, natural light and spatial transparency.

Products COOL-LITE® XTREME 70/33
COOL-LITE® XTREME 70/33 II

"The Curve" was built as a solid wood structure from prefabricated cross-laminated timber and glulam in combination with steel as a load-bearing element.

The Building has 40% lower energy consumption than specified by the French thermal regulation for new buildings (RT 2021) and achieves high environmental targets: It meets the French HQE Excellent standard for commercial buildings and is BREEAM and Effinergie+ certified. The building's high energy standard is the result of the natural insulating properties of the wood, but also of the floor-to-ceiling windows with COOL-LITE® XTREME solar control glass. This solution has a true selectivity greater than 2 and an Ug value of up to 0.9 W/m²K.

COMMERCIAL OFFICES

NESTLÉ HQ

EXAMPLE PAR EXCELLENCE
FOR ENERGY EFFICIENCY WITH
SAGEGLASS® SMART GLASS

Location	Vevey, Switzerland
Architect	Brönnimann et Gottreux Architectes SA, Vevey, Switzerland
Glass processor	SageGlass®
Façade makers	Buri, Müller + Partner GmbH, Burgdorf, Switzerland Hevron SA, Courtételle, Switzerland
Photos	©Adrien Barakat

The reconstruction of Nestlé's headquarters in Vevey, Switzerland, aims to reduce CO_2 emissions on site by more than 2,000 tons per year. Building B, planned in 1977 as an extension by Burckhardt & Partner, no longer met today's energy standards' requirements. During the renovation, a new façade was installed to improve energy efficiency, without having to change the aesthetics of the building.

After a trial period, Nestlé decided to replace all of the glazing in Building B with SageGlass® electrochromic glass. Preceded by investigations into light quality in interior rooms and the supply of daylight to the staff, a total of 4,400 m^2 of glazing were installed. SageGlass® LightZone® with Bright Silver coating provides optimal solar and thermal protection. The COOL-LITE® Bright Silver coating was especially customized by SageGlass® for this project to maintain the reflective character of the original aesthetic of the building.

SageGlass® LightZone® has three controllable zones in which the different tint states can be precisely adjusted in terms of heat and light

transmittance. Simultaneously, the view to the outside remains unaffected, as the glass remains transparent at all times. In Building B, the glass is controlled by sensors and is linked to the building management system, allowing synchronization of the tint level, room occupancy and energy needs. Consequently, SageGlass® becomes an integral part of Nestlé's energy performance strategy, optimizing not only the building's energy consumption, but also the working conditions and comfort for employees.

Products

SageGlass® LightZone® CLIMATOP®
Classic COOL-LITE® Bright Silver TGU

EDUCATION

BINGHAMTON UNIVERSITY

HIGH-TECH FOR MONUMENT PROTECTION WITH SAGEGLASS® DYNAMIC GLASS

Location	Johnson City, New York, USA
General contractor	FAHS Construction Group, New York, USA
Glass processor	SageGlass®
Façade maker	BR Johnson, LLC, East Syracuse, USA
Photos	©SageGlass

On the area of Binghamton University in Johnson City, a historic building dating back to 1916 has been converted into a modern high-tech medical campus. Therefore, the university renovated 8,600 m² in the heritage-protected building of the former shoe factory and had built a further 1,860 m² as a new extension.

The university's planning team, led by Bill Hall, associate director of design and architecture at the university, had to meet the requirements of the state and national heritage authorities. The historic character of the factory façades, which are more than 100 years old, had to be preserved at all costs. At the same time, the planners had to ensure that the modern requirements in terms of energy efficiency and comfort were met. The architects emphasized the marriage between old and new with gorgeous aesthetic features, like exposed concrete and

brick, original factory glass and steel frames plus modern porcelain-wood floors.

For most of the six-story building's windows, the design team chose SageGlass® electrochromic glass, which dynamically tints to reduce glare and heat, while preserving daylight and views. Since the large glass windows are mostly facing west and east, the heat gain from solar insolation would have been substantial. The planners did not want to spoil the view of the old factory windows with blinds. As a result of the installation of SageGlass® LightZone®, the building's cooling requirements were significantly reduced while preserving the historic appearance of the old factory.

Product SageGlass® LightZone®

Kielce's famous bus station glitters once again after an extensive refurbishment. The striking building was designed as an "UFO" by the famous Polish Architect Edward Modrzejewski. Originally opened in 1984, it was designed to accommodate 1,500 buses and 24,000 passengers a day. Now a listed tourist attraction, it is considered one of the most valuable architectural designs of the 1970s and 1980s in Poland and a modern Polish cultural heritage site.

In 2018, the reconstruction was launched, financed with funds from the European Union among others. The goal was to rebuild the station almost completely, which had become dilapidated in the meantime, while preserving the building's distinctive shape and basic design. Today, after the renovation, the station is once again the pearl of the city – for locals, tourists and travelers.

TOURISM AND TRAVEL

KIELCE BUS STATION

RECONSTRUCTION OF A MONUMENT WITH SAGEGLASS® SMART GLASS

Location	Kielce, Poland
Architect	Edward Modrzejewski, Kielce, Poland
Glass Processor	SageGlass®
Photos	©Saint-Gobain
Awards	EU Prize for Contemporary Architecture, Mies van der Rohe Award 2022

While the interior was completely redesigned with the use of fire rated glass CONTRAFLAM® STRUCTURE 30, the building retained its UFO shape. The façade was newly glazed with more than 500 m² of SageGlass® Classic DGU. The innovative technology of smart glass helped to preserve the original aesthetics. Thus, the characteristic circular skylights and cosmic outlines could be preserved to the original.

The dynamic glass tints or clears depending on the amount of sunlight entering the building. No blinds or shades are needed to protect visitors from undesired glare and heat. This creates a comfortable interior regardless the weather conditions. In addition, waiting passengers can watch the traffic outside and see the buses arrive and depart, no matter what time of day.

Products SageGlass® Classic DGU
CONTRAFLAM® STRUCTURE 30

In order to consolidate the workforce of Sammons Financial Group in a headquarters in central Iowa, a new office building had been constructed in West Des Moines. The building offers modern and comfortable workplaces for more than 1,600 employees on 20,000 m². The six-story main building is situated on a 26-hectare property with lavishly landscaped outdoor spaces. The office floors are planned as a functional working environment, ideally equipped for collaborative and team-oriented interaction.

Knowing that only satisfied employees are efficient and successful, the company attached great importance to a pleasant indoor climate and abundant daylight in the offices when the new office building was equipped. The indoor environment quality was optimized for the comfort of the staff. Workstations should be protected from heat and glare without blinds or shades to ensure a view to the beautiful landscape around the campus at all times.

COMMERCIAL OFFICES

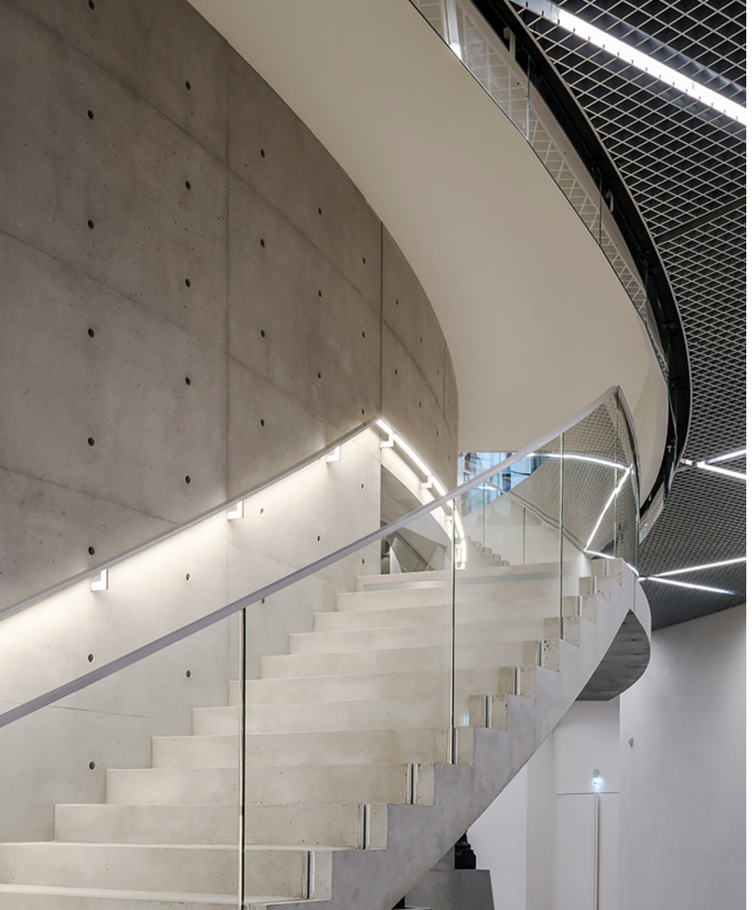
SAMMONS FINANCIAL GROUP

SATISFIED EMPLOYEES IN THE NEW COMPANY HEADQUARTERS THANKS TO SAGEGLASS®

Location	West Des Moines, USA
Architects	HKS Architects, Dallas, USA SVPA Architects, West Des Moines, USA
Glass processor	SageGlass®
Photos	©SageGlass

The project team chose SageGlass® Harmony®, a smart glazing solution that eliminates glare and provides a precise daylight control with a natural seamless in-pane tint transition. The glass blocks up to 99% of the light and ensures excellent color rendering in the interior even when it is tinted. The infinitely variable tinting transitions can be controlled manually or intelligently via a building management system. More than 3,000 m² of SageGlass® Harmony®, have been installed. As a result, the company was able to significantly reduce the demand for cooling in the building.

Products SageGlass® , Harmony®



ART AND CULTURE

BOURSE DE COMMERCE

PINAULT COLLECTION

SPECTACULAR RECONSTRUCTION: HIGHLY EFFICIENT AND TRANSPARENT FIRE PROTECTION BY VETROTECH IN THE NEWLY RENOVATED CULTURAL HERITAGE

Location	2 rue de Viarmes, 75001 Paris, France
Architects	Tadao Ando (Tadao Ando Architect and Associates – TAAA), Osaka, Japan, NeM / Niney & Marca Architects and Pierre-Antoine Gatier Agency, Paris, France
Glass processor	Vetrotech SAINT-GOBAIN
Photos	©Pinault Collection , ©Tadao Ando Architect & Associates, NeM, Niney et Marc Architectes, agence Pierre-Antoine Gatier Photographer: K. Khlafi
Green label & certification	HQETM Bâtiment Durable 2016 Excellent level BREEAM® IRFO 2015 (being processed)

The Bourse de Commerce – Pinault Collection bears witness to five centuries of architectural history in Paris. The circular building was originally used as a market hall, later as a stock exchange. Destroyed and rebuilt several times, the building has been rented for 50 years from the City of Paris to the collector François Pinault. From 2016 to 2021, the building was completely renovated by the Japanese architect Tadao Ando, along with French architecture agency NeM / Niney et Marca, but also Chief Heritage Architect Pierre-Antoine Gatier, and transformed into an art museum for Pinault's collection.

Besides the huge glass dome of the heritage-listed building, the central large courtyard flooded with light is characteristic for the architecture. The natural light is carried deep into the building by using highly transparent glass for a large part of the doors and partitions as well as smoke barriers. The glass for this was supplied by Vetrotech SAINT-GOBAIN in collaboration with the company T.S.M.

The CONTRAFLAM® STRUCTURE from Vetrotech used for the partitions sets new technical and visual standards in transparent fire protection. The patented flush-mount glazing achieves fire resistance classes from EW30 to EI120 without vertical frame profiles, while at the same time providing maximum transparency and colour neutrality. The butt-joint fire-rated glass partitions of the auditorium have exceptional dimensions of 2.3 m width per pane and meet highest requirements regarding sound insulation.

As part of the architecture within the building, the Pyroswiss® SBS glazed smoke barrier system controls the movement and containment of hot smoke within the building in case of a fire.

In addition, the likewise frameless LUNAX® by Vetrotech fully glazed doors were installed in the transparent fire protection system. This building reflects Vetrotech SAINT-GOBAIN's true expertise in providing the highest levels of fire protection glazing solutions, without compromising the design and comfort of building users.

Products

CONTRAFLAM® STRUCTURE
LUNAX® PORTA fully glazed fire doors
PYROSWISS SBS

HEALTH & CARE

MED 360 HEADQUARTERS

STATICS TURNED UPSIDE DOWN

Location	Marie-Curie-Straße 12, Leverkusen, Germany
Architect	Architekturbüro Rotterdam Dakowski GmbH, Leverkusen, Germany
Glass processor	Vetrotech SAINT-GOBAIN
Photos	©Vetrotech SAINT-GOBAIN Photographer: Andreas Wiese

44 by 44 metres – for the new MED 360° company headquarters in Leverkusen-Manfort, the architects Rotterdam Dakowski designed a strictly square structure. The spacious entrance area leads directly into a three-storey atrium measuring 15 by 15 metres, spanned by slender prestressed concrete beams with elongated glass strips. Large-sized fire-resistant windows in the surrounding walls of the inner courtyard lead the daylight into the offices behind them. Naturally lit workplaces were created for almost all 280 employees – a great challenge for the construction material glass in terms of fire and sound protection.

CONTRAFLAM® 30, a high-tech product from Vetrotech SAINT-GOBAIN was chosen for the fire resistant glazing. Its high colour neutrality and transparency provides discreet, almost imperceptible fire protection. Medicke Fassadentechnik GmbH installed a total of 339 m² of fire resistant glass in the new company headquarters. 172 m² were used as fall-protection glazing and further 22 m² with an alarm, providing secure access to the offices to prevent unauthorised entry.

Altogether, the large-scale fire-resistant glazing made of CONTRAFLAM® 30 guarantees bright and open workplaces for the staff and a high level of sound insulation for undisturbed working.

Products CONTRAFLAM® 30 fire resistant glazing, fall-protection glazing, Fire-resistant glass with alarm sensors

THE TECHNICAL NOTEBOOK

OUR TECHNICAL SUPPORT

Professional high level of service is our priority.
We offer tailor-made advisory about glass products and technical solutions.
Static calculations: deflection and stress calculation are performed for different types of glazing under permanent and variable loads combination.
Thermal stress analysis: calculation of maximum temperatures and analysis of the risks of thermal breakage.
Acoustic calculations: computation of sound transmission loss and calculation acoustic insulation parameters.
Spectrophotometric calculations: the most important glazing parameters such as light transmission, light reflection, energy absorption, Ug, etc.

If you want more information, please contact us at:
glass.facade@saint-gobain.com

GLASS SOLUTIONS FOR FACADES

HOW TO READ OUR PRODUCT NAMES

COOL-LITE® XTREME 70/33 II

performance	Light Transmission (TL)	g-value/solar factor	processing
XTREME = Extremely selective solar control coatings (triple silver) with reinforced thermal insulation	in double glass unit with 6 | 16 | 4 mm	in double glass unit with 6 | 16 | 4 mm	II = to-be-tempered
			ø = annealed

COOL-LITE® SKN Highly selective solar control (double silver) with reinforced thermal insulation

COOL-LITE® K Selective solar control coatings (single silver) with thermal insulation

COOL-LITE® ST Standard solar control coatings offering full flexibility for processing

COOL-LITE® SKN 183 II

performance	color	substrate	Light Transmission (TL)	processing
S = selective	B = blue	0 = DIAMANT®	at 6 mm mono pane	II = to-be-tempered
K = K-value (Ug-value)	G = golden	1 = PLANICLEAR®		ø = annealed
	N = neutral	2 = PARSOL® Bronze		
	S = silver	3 = PARSOL® Grey		
		4 = PARSOL® Green		
	T = temperable	7 = PARSOL® Saphire blue		

KEY PERFORMANCE FACTORS

Solar Factor (g-value)

Percentage of solar energy transmitted through the glass. It measures the ability of a glazing to reduce the heating of the room. The lower the solar factor is, the better it helps to improve the comfort inside of the building.

Shading Coefficient (SC)

Ratio of the solar factor of a glazing unit to the solar factor of a clear float glass of nominal thickness of 3 mm to 4 mm (0.87). The lower the shading coefficient number, the less heat gain and thus more shading is provided.

Selectivity (LSG)

Ratio between the glass' light transmission and solar factor. When the selectivity of the glass is higher than 2, it gives you twice as much light versus heat.

Light transmission (LT)

Percentage of visible light directly transmitted through the glass.

Reflection outside (LRe)

Percentage of visible light directly reflected from the exterior glass surface.

Reflection inside (LRi)

Percentage of visible light directly reflected from the interior glass surface.

Color rendering index (CRI)

Ability of the glass to keep the colors the same as if they were observed without glazing. Measured with a scale from 1 to 100. A low CRI gives a poor representation of colors, and a high CRI gives a natural and bright representation of colors.

Ug-value

Measure of the heat loss by penetration of the glass. The lower the Ug-value is, the better the insulating properties are. Expressed in W/m^2K.

DOUBLE GLAZING UNITS - CLIMAPLUS

Values given according to the standards [1]EN 410, [2]EN 673 and [3]EN 12758

coating / to be tempered / annelead	with EASYPRO	color in reflection	light transmission LT [%]	solar factor g-value[1]	shading coefficient SC	selectivity LT / g	reflection outside LRe [%]	reflection inside LRi [%]	Ug-value[2] [W/m²K]	weight [kg/m²]	assessed sound reduction index Rw,P (C; Ctr)[3] [dB]	use as mono glazing (coating on surface #2)	processing possibilities: tempering	lamination tested towards PVB[4]	bending[5]	screenprinting & enamelling[6]
COOL-LITE® XTREME in double glazing unit CLIMAPLUS® (6 | 16 | 4 mm, 90% Argon, coating on face #2) on PLANICLEAR® or DIAMANT® *Extremely selective solar control coating with reinforced thermal insulation*																
COOL-LITE® XTREME 70/33 II DIAMANT®	●	extra neutral	71	0.33	0.38	2.15	11	13	1.0	25.0	35(-1;-5)		to be tempered		yes[5]	
COOL-LITE® XTREME 70/33 DIAMANT®		extra neutral	71	0.33	0.38	2.15	11	13	1.0	25.0	35(-1;-5)					
COOL-LITE® XTREME 70/33 II	●	neutral	70	0.33	0.38	2.12	11	13	1.0	25.0	35(-1;-5)		to be tempered		yes[5]	
COOL-LITE® XTREME 70/33		neutral	70	0.33	0.38	2.12	11	13	1.0	25.0	35(-1;-5)					
NEW COOL-LITE® XTREME 61/29 II DIAMANT®	●	extra neutral	62	0.29	0.33	2.14	11	15	1.0	25.0	35(-1;-5)		to be tempered			
NEW COOL-LITE® XTREME 61/29 DIAMANT®		extra neutral	62	0.29	0.33	2.14	11	14	1.0	25.0	35(-1;-5)					
NEW COOL-LITE® XTREME 61/29 II	●	neutral	61	0.29	0.33	2.10	11	15	1.0	25.0	35(-1;-5)		to be tempered			
NEW COOL-LITE® XTREME 61/29		neutral	61	0.29	0.33	2.10	11	14	1.0	25.0	35(-1;-5)					
COOL-LITE® XTREME SILVER II DIAMANT®		bright silver	50	0.25	0.29	2.00	30	18	1.0	25.0	35(-1;-5)		to be tempered		yes[5]	
COOL-LITE® XTREME SILVER II		silver	49	0.25	0.29	1.96	30	18	1.0	25.0	35(-1;-5)		to be tempered		yes[5]	
COOL-LITE® XTREME 50/22 II DIAMANT®	●	extra neutral	48	0.21	0.24	2.29	16	18	1.0	25.0	35(-1;-5)		to be tempered		yes[5]	
COOL-LITE® XTREME 50/22 II with EASYPRO®	●	neutral	47	0.21	0.24	2.24	16	18	1.0	25.0	35(-1;-5)		to be tempered		yes[5]	
COOL-LITE® SKN in double glazing unit CLIMAPLUS® (6 | 16 | 4 mm, 90% Argon) on PLANICLEAR® or DIAMANT® *Highly selective solar control coating with reinforced thermal insulation*																
COOL-LITE® SKN 083 II	●	extra neutral	76	0.41	0.47	1.85	12	13	1.0	25.0	35(-1;-5)		to be tempered		yes[5]	
COOL-LITE® SKN 083		extra neutral	76	0.41	0.47	1.85	12	13	1.0	25.0	35(-1;-5)					
COOL-LITE® SKN 183 II	●	neutral	75	0.40	0.46	1.88	12	13	1.0	25.0	35(-1;-5)		to be tempered		yes[5]	
COOL-LITE® SKN 183		neutral	75	0.40	0.46	1.88	12	13	1.0	25.0	35(-1;-5)					
COOL-LITE® SKN 076 II	●	extra neutral	71	0.38	0.44	1.87	13	15	1.0	25.0	35(-1;-5)		to be tempered	yes[8]	yes[5]	
COOL-LITE® SKN 076		extra neutral	71	0.38	0.44	1.87	13	15	1.0	25.0	35(-1;-5)					
COOL-LITE® SKN 176 II	●	neutral	70	0.37	0.43	1.89	13	15	1.0	25.0	35(-1;-5)		to be tempered	yes[8]	yes[5]	
COOL-LITE® SKN 176		neutral	70	0.37	0.43	1.89	13	15	1.0	25.0	35(-1;-5)					
COOL-LITE® SKN 065 II	●	extra neutral	62	0.35	0.40	1.77	17	19	1.0	25.0	35(-1;-5)		to be tempered	yes[8]	yes[5]	
COOL-LITE® SKN 065		extra neutral	62	0.35	0.40	1.77	17	18	1.0	25.0	35(-1;-5)			yes[8]		
COOL-LITE® SKN 165 II	●	neutral	61	0.34	0.39	1.79	16	19	1.0	25.0	35(-1;-5)		to be tempered	yes[8]	yes[5]	
COOL-LITE® SKN 165		neutral	61	0.34	0.39	1.79	16	18	1.0	25.0	35(-1;-5)			yes[8]		
COOL-LITE® SKN 054 II	●	extra neutral	53	0.29	0.33	1.83	18	23	1.0	25.0	35(-1;-5)		to be tempered	yes[8]	yes[5]	
COOL-LITE® SKN 054		extra neutral	53	0.29	0.33	1.83	19	23	1.0	25.0	35(-1;-5)			yes[8]		
COOL-LITE® SKN 154 II	●	neutral	52	0.28	0.32	1.85	18	23	1.0	25.0	35(-1;-5)		to be tempered	yes[8]	yes[5]	
COOL-LITE® SKN 154		neutral	52	0.28	0.32	1.85	19	22	1.0	25.0	35(-1;-5)			yes[8]		
COOL-LITE® SKN 045		neutral	42	0.22	0.25	1.91	19	15	1.1	25.0	35(-1;-5)					
COOL-LITE® SKN 145		neutral	41	0.22	0.25	1.86	19	15	1.1	25.0	35(-1;-5)					
COOL-LITE® SKN 044 II	●	extra neutral	42	0.23	0.27	1.87	21	15	1.1	25.0	35(-1;-5)		to be tempered	yes[8]		
COOL-LITE® SKN 144 II	●	neutral	42	0.23	0.26	1.83	20	15	1.1	25.0	35(-1;-5)		to be tempered	yes[8]		

4 Solar control coating in contact with PVB modifies performances and aesthetics. Please contact us to get the approved PVB list. **5** Bending results depend on the process; trials should be done for validation. **6** Screen-printing, roller coating, spray, digital printing inks and enamels validation is required. **7** COOL-LITE® SKN 154 may have a slight color deviation in transmission with SKN 154 II. Validation of a prototype is recommended if both versions are used on the same façade. **8** This coating can be laminated for use on a façade up to 1,500 m2 and project must be made from a single production batch from SGG.

DOUBLE GLAZING UNITS - CLIMAPLUS®

Values given according to the standards [1]EN 410, [2]EN 673 and [3]EN 12758

coating / to be tempered / annelead	with EASYPRO on demand	color in reflection	light transmission LT [%]	solar factor g-value[1]	shading coefficient SC	selectivity LT / g	reflection outside LRe [%]	reflection inside LRi [%]	Ug-value[2] [W/m²K]	weight [kg/m²]	assessed sound reduction index Rw,P (C; Ctr)[3] [dB]	use as mono glazing (coating on surface #2)	processing possibilities: tempering	lamination tested towards PVB[4]	bending[5]	screenprinting & enamelling[6]
COOL-LITE® K in double glazing unit CLIMAPLUS® (6 | 16 | 4 mm, 90% Argon, coating on face #2) on PLANICLEAR® *Selective solar control coating with thermal insulation*																
COOL-LITE® KN 166 II with EASYPRO®		neutral	61	0.39	0.45	1.56	22	26	1.0	25.0	35(-1;-5)		to be tempered			
NEW COOL-LITE® KNT 148 II with EASYPRO®		neutral	47	0.32	0.37	1.47	27	18	1.0	25.0	35(-1;-5)		to be tempered			
COOL-LITE® K in double glazing unit CLIMAPLUS® (6 | 16 | 4 mm, 90% Argon, coating on face #2 with PLANITHERM® XN on face #3) on PLANICLEAR® *Selective solar control coating with reinforced thermal insulation*																
COOL-LITE® KG 137 tempered		golden	34	0.27	0.32	1.26	34	28	1.1	25.0	35(-1;-5)		to be tempered			
COOL-LITE® KG 137 annealed		golden	34	0.27	0.31	1.26	30	25	1.1	25.0	35(-1;-5)					
COOL-LITE® KNT 164		neutral	57	0.42	0.49	1.36	13	7	1.1	25.0	35(-1;-5)		temperable	yes		
COOL-LITE® KNT 155		neutral	48	0.35	0.40	1.37	16	7	1.1	25.0	35(-1;-5)		temperable	yes		
COOL-LITE® KNT 140		neutral	38	0.27	0.31	1.41	22	9	1.1	25.0	35(-1;-5)		temperable	yes		
COOL-LITE® KS 147		silver	43	0.30	0.34	1.26	42	34	1.1	25.0	35(-1;-5)					
NEW COOL-LITE® KS 146 II		silver	42	0.29	0.33	1.45	33	16	1.1	25.0	35(-1;-5)		to be tempered			
COOL-LITE® KS 138 II		silver	36	0.25	0.29	1.44	38	17	1.1	25.0	35(-1;-5)		to be tempered			
COOL-LITE® ST in double glazing unit CLIMAPLUS® (6 | 16 | 4 mm, 90% Argon, coating on face #2 with PLANITHERM® XN on face #3) on PLANICLEAR® *Solar control glass offering full flexibility for processing*																
COOL-LITE® ST BRIGHT SILVER DIAMANT®		silver	62	0.52	0.60	1.19	32	31	1.1	25.0	35(-1;-5)	yes	temperable	yes	yes[5]	yes
COOL-LITE® ST BRIGHT SILVER		silver	61	0.50	0.58	1.22	32	30	1.1	25.0	35(-1;-5)	yes	temperable	yes	yes[5]	yes
COOL-LITE® ST 167		neutral	61	0.49	0.56	1.24	21	21	1.1	25.0	35(-1;-5)	yes	temperable	yes	yes[5]	yes
COOL-LITE® ST 150		neutral	46	0.38	0.43	1.21	19	19	1.1	25.0	35(-1;-5)	yes	temperable	yes	yes[5]	yes
COOL-LITE® ST 136		grey	33	0.28	0.32	1.18	23	20	1.1	25.0	35(-1;-5)	yes	temperable	yes		yes
COOL-LITE® ST 120		silver	19	0.17	0.20	1.12	32	26	1.1	25.0	35(-1;-5)	yes	temperable	yes		yes
COOL-LITE® STB 136		blue	32	0.28	0.32	1.14	19	17	1.1	25.0	35(-1;-5)	yes	temperable	yes		yes
COOL-LITE® STB 120		blue	20	0.18	0.21	1.11	21	29	1.1	25.0	35(-1;-5)	yes	temperable	yes		yes
Low-E coating in double glazing unit CLIMAPLUS® (4 | 16 | 4 mm, 90% Argon, coating on face #3) on PLANICLEAR® or DIAMANT®																
PLANITHERM® XN II DIAMANT®	yes	extra neutral	82	0.67	0.77	1.22	12	12	1.1	20.0	31(-1;-4)		to be tempered		yes[5]	
PLANITHERM® XN DIAMANT®		extra neutral	83	0.67	0.77	1.24	12	12	1.1	20.0	31(-1;-4)					
PLANITHERM® XN II	yes	neutral	81	0.65	0.75	1.25	12	12	1.1	20.0	31(-1;-4)		to be tempered		yes[5]	
PLANITHERM® XN		neutral	82	0.65	0.75	1.26	11	12	1.1	20.0	31(-1;-4)					
PLANITHERM® ONE II DIAMANT®	yes	extra neutral	72	0.55	0.63	1.31	22	22	1.0	20.0	31(-1;-4)		to be tempered		yes[5]	
PLANITHERM® ONE DIAMANT®		extra neutral	72	0.53	0.61	1.36	23	23	1.0	20.0	31(-1;-4)					
PLANITHERM® ONE II	yes	neutral	71	0.53	0.61	1.34	22	23	1.0	20.0	31(-1;-4)		to be tempered		yes[5]	
PLANITHERM® ONE		neutral	71	0.52	0.60	1.37	22	23	1.0	20.0	31(-1;-4)					

4 Solar control coating in contact with PVB modifies performances and aesthetics. Please contact us to get the approved PVB list.
5 Bending results depend on the process; trials should be done for validation.
6 Screen-printing, roller coating, spray, digital printing inks and enamels validation is required.

DOUBLE GLAZING UNITS - CLIMAPLUS®

Values given according to the standards
[1]EN 410, [2]EN 673 and [3]EN 12758

coating / to be tempered / annelead	color in reflection	light transmission LT [%]	solar factor g-value[1]	shading coefficient SC	selectivity LT / g	reflection outside LRe [%]	reflection inside LRI [%]	Ug-value[2] [W/m²K]	weight [kg/m²]	assessed sound reduction index Rw,P (C, Ctr)[3] [dB]	processing possibilities: tempering	lamination tested towards PVB[4]	bending[5]	screenprinting & enamelling[6]
Low-E coating in double glazing unit CLIMAPLUS® (4 | 16 | 4 mm, 90% Argon, coating on face #3) on PLANICLEAR® or DIAMANT®														
ECLAZ® II DIAMANT®	extra neutral	84	0.73	0.83	1.15	12	12	1.1	20.0	31(-1;-4)	to be tempered			
ECLAZ® DIAMANT®	extra neutral	85	0.73	0.84	1.16	12	12	1.1	20.0	31(-1;-4)				
ECLAZ® II	neutral	83	0.71	0.81	1.17	12	11	1.1	20.0	31(-1;-4)	to be tempered			
ECLAZ®	neutral	83	0.71	0.81	1.17	12	11	1.1	20.0	31(-1;-4)				
ECLAZ® ONE II DIAMANT®	extra neutral	80	0.61	0.71	1.31	16	18	1.0	20.0	31(-1;-4)	to be tempered			
ECLAZ® ONE DIAMANT®	extra neutral	81	0.62	0.71	1.31	15	16	1.0	20.0	31(-1;-4)				
ECLAZ® ONE II	neutral	79	0.60	0.69	1.32	16	18	1.0	20.0	31(-1;-4)	to be tempered			
ECLAZ® ONE	neutral	80	0.60	0.69	1.33	15	16	1.0	20.0	31(-1;-4)				
BIOCLEAN for double glazing unit CLIMAPLUS® (6 | 16 | 4 mm, 90% Argon) on PLANICLEAR® for easy maintenance														
BIOCLEAN II	neutral	79	0.76	0.87	1.04	18	18	2.6	25.0	35(-1;-5)	to be tempered			
BIOCLEAN	neutral	77	0.74	0.85	1.04	17	17	2.6	25.0	35(-1;-5)				
NEW BIOCLEAN XTREME 61/29	neutral	57	0.27	0.31	2.11	14	15	1.0	25.0	35(-1;-5)				
BIOCLEAN SKN 183	neutral	70	0.37	0.43	1.89	15	15	1.0	25.0	35(-1;-5)				
BIOCLEAN SKN 176	neutral	66	0.35	0.40	1.89	16	17	1.0	25.0	35(-1;-5)				
BIOCLEAN SKN 165	neutral	57	0.32	0.37	1.78	19	19	1.0	25.0	35(-1;-5)				
BIOCLEAN SKN 154	neutral	49	0.26	0.30	1.88	21	23	1.0	25.0	35(-1;-5)				
BIOCLEAN SKN 145	neutral	39	0.21	0.24	1.86	21	16	1.1	25.0	35(-1;-5)				

4 Solar control coating in contact with PVB modifies performances and aesthetics. Please contact us to get the approved PVB list.
5 Bending results depend on the process; trials should be done for validation.
6 Screen-printing, roller coating, spray, digital printing inks and enamels validation is required.

MONOLITHIC AND LAMINATED GLASS

Values given according to the standards
[1]EN 410, [2]EN 673 and [3]EN 12758

coating / to be tempered / annelead	color in reflection	light transmission LT [%]	solar factor g-value[1]	shading coefficient SC	selectivity LT / g	reflection outside LRe [%]	reflection inside LRI [%]	Ug-value[2] [W/m²K]	weight [kg/m²]	assessed sound reduction index Rw,P (C, Ctr)[3] [dB]	Description / processing possibilities
VISION-LITE® on DIAMANT® for anti-reflectance (STADIP® (Laminated glass) and Monolithic glass)											
STADIP® VISION-LITE® (laminated glass 44.2) DIAMANT®	extra neutral	97	0.84	0.97	1.14	1	1	5.5	20.0	34(-1;-3)	VISION-LITE coating on faces #1 and #4 of laminated glass
VISION-LITE® II DIAMANT® (6 mm)	extra neutral	98	0.87	0.99	1.13	1	1	5.7	15.0	32(-1;-2)	VISION-LITE coating on both sides (#1 & #2) of monolithic glass - to be tempered
Semi VISION-LITE® II DIAMANT® (6 mm)	extra neutral	94	0.88	1.01	1.07	5	5	5.7	15.0	32(-1;-2)	VISION-LITE coating on one side of the glass - to be laminated
Semi VISION-LITE® DIAMANT® (6 mm)	extra neutral	94	0.89	1.03	1.06	5	5	5.7	15.0	32(-1;-2)	VISION-LITE coating on one side of the glass - to be laminated

TRIPLE GLAZING UNITS - CLIMATOP®

Values given according to the standards [1]EN 410, [2]EN 673 and [3]EN 12758

coating / to be tempered / annelead	with EASYPRO	color in reflection	light transmission LT [%]	solar factor g-value[1]	shading coefficient SC	selectivity LT / g	reflection outside LRe [%]	reflection inside LRi [%]	Ug-value[2] [W/m²K]	weight [kg/m²]	assessed sound reduction index Rw,P (C; Ctr) [dB]	use as mono glazing (coating on surface #2)	processing possibilities: tempering	lamination tested towards PVB[4]	bending[5]	screenprinting & enamelling[6]
COOL-LITE® XTREME in triple glazing unit CLIMATOP® (6 | 12 | 4 | 12 | 4 mm, 90% Argon, coating on face #2 with PLANITHERM® XN on face #5) on PLANICLEAR® or DIAMANT® *Extremely selective solar control coating with reinforced thermal insulation*																
COOL-LITE® XTREME 70/33 II DIAMANT®	●	extra neutral	65	0.32	0.36	2.03	13	16	0.7	35.0	36(-1;-5)		to be tempered		yes[5]	
COOL-LITE® XTREME 70/33 DIAMANT®		extra neutral	65	0.32	0.36	2.03	13	16	0.7	35.0	36(-1;-5)					
COOL-LITE® XTREME 70/33 II	●	neutral	63	0.31	0.35	2.03	13	16	0.7	35.0	36(-1;-5)		to be tempered		yes[5]	
COOL-LITE® XTREME 70/33		neutral	63	0.31	0.36	2.03	13	16	0.7	35.0	36(-1;-5)					
NEW COOL-LITE® XTREME 61/29 II DIAMANT®	●	extra neutral	56	0.27	0.32	2.07	13	18	0.7	35.0	36(-1;-5)		to be tempered			
NEW COOL-LITE® XTREME 61/29 DIAMANT®		extra neutral	56	0.28	0.32	2.00	13	17	0.7	35.0	36(-1;-5)					
NEW COOL-LITE® XTREME 61/29 II	●	neutral	55	0.27	0.31	2.04	12	17	0.7	35.0	36(-1;-5)		to be tempered			
NEW COOL-LITE® XTREME 61/29		neutral	55	0.27	0.31	2.04	12	16	0.7	35.0	36(-1;-5)					
COOL-LITE® XTREME SILVER II DIAMANT®		bright silver	45	0.24	0.27	1.88	31	20	0.7	35.0	36(-1;-5)		to be tempered		yes[5]	
COOL-LITE® XTREME SILVER II		silver	44	0.23	0.27	1.91	30	20	0.7	35.0	36(-1;-5)		to be tempered		yes[5]	
COOL-LITE® XTREME 50/22 II DIAMANT®	●	extra neutral	44	0.20	0.23	2.20	17	20	0.7	35.0	36(-1;-5)		to be tempered		yes[5]	
COOL-LITE® XTREME 50/22 II	●	neutral	43	0.19	0.22	2.26	17	20	0.7	35.0	36(-1;-5)		to be tempered		yes[5]	
COOL-LITE® SKN in triple glazing unit CLIMATOP® (6 | 12 | 4 | 12 | 4 mm, 90% Argon, coating on face #2 with PLANITHERM® XN on face #5) on PLANICLEAR® or DIAMANT® *Highly selective solar control coating with reinforced thermal insulation*																
COOL-LITE® SKN 083 II	●	extra neutral	69	0.38	0.44	1.82	14	16	0.7	35.0	36(-1;-5)		to be tempered		yes[5]	
COOL-LITE® SKN 083		extra neutral	69	0.38	0.44	1.82	14	16	0.7	35.0	36(-1;-5)					
COOL-LITE® SKN 183 II	●	neutral	67	0.37	0.43	1.81	14	16	0.7	35.0	36(-1;-5)		to be tempered		yes[5]	
COOL-LITE® SKN 183		neutral	67	0.37	0.43	1.81	14	16	0.7	35.0	36(-1;-5)					
COOL-LITE® SKN 076 II	●	extra neutral	65	0.35	0.41	1.86	15	18	0.7	35.0	36(-1;-5)		to be tempered	yes[8]	yes[5]	
COOL-LITE® SKN 076		extra neutral	65	0.35	0.41	1.86	15	18	0.7	35.0	36(-1;-5)					
COOL-LITE® SKN 176 II	●	neutral	63	0.35	0.40	1.80	15	17	0.7	35.0	36(-1;-5)		to be tempered	yes[8]	yes[5]	
COOL-LITE® SKN 176		neutral	63	0.35	0.40	1.80	15	17	0.7	35.0	36(-1;-5)					
COOL-LITE® SKN 065 II	●	extra neutral	57	0.32	0.37	1.78	18	21	0.7	35.0	36(-1;-5)		to be tempered	yes[8]	yes[5]	
COOL-LITE® SKN 065		extra neutral	57	0.33	0.37	1.73	18	20	0.7	35.0	36(-1;-5)			yes[8]		
COOL-LITE® SKN 165 II	●	neutral	55	0.31	0.36	1.77	18	20	0.7	35.0	36(-1;-5)		to be tempered	yes[8]	yes[5]	
COOL-LITE® SKN 165		neutral	55	0.32	0.36	1.72	18	20	0.7	35.0	36(-1;-5)			yes[8]		
COOL-LITE® SKN 054 II	●	extra neutral	48	0.27	0.31	1.78	19	24	0.7	35.0	36(-1;-5)		to be tempered	yes[8]	yes[5]	
COOL-LITE® SKN 054		extra neutral	48	0.27	0.31	1.78	20	23	0.7	35.0	36(-1;-5)			yes[8]		
COOL-LITE® SKN 154 II	●	neutral	47	0.26	0.30	1.81	19	23	0.7	35.0	36(-1;-5)		to be tempered	yes[8]	yes[5]	
COOL-LITE® SKN 154		neutral	47	0.26	0.30	1.81	20	23	0.7	35.0	36(-1;-5)			yes[8]		
COOL-LITE® SKN 045		neutral	38	0.21	0.24	1.81	20	18	0.7	35.0	36(-1;-5)					
COOL-LITE® SKN 145		neutral	37	0.20	0.23	1.85	20	17	0.7	35.0	36(-1;-5)					
COOL-LITE® SKN 044 II	●	extra neutral	39	0.21	0.25	1.86	22	18	0.7	35.0	36(-1;-5)		to be tempered	yes[8]		
COOL-LITE® SKN 144 II	●	neutral	38	0.21	0.24	1.81	21	17	0.7	35.0	36(-1;-5)		to be tempered	yes[8]		

4 Solar control coating in contact with PVB modifies performances and aesthetics. Please contact us to get the approved PVB list. **5** Bending results depend on the process; trials should be done for validation. **6** Screen-printing, roller coating, spray, digital printing inks and enamels validation is required. **7** COOL-LITE® SKN 154 may have a slight color deviation in transmission with SKN 154 II. Validation of a prototype is recommended if both versions are used on the same façade. **8** This coating can be laminated for use on a façade up to 1,500 m2 and project must be made from a single production batch from SGG.

TRIPLE GLAZING UNITS - CLIMATOP®

Values given according to the standards [1]EN 410, [2]EN 673 and [3]EN 12758

coating / to be tempered / annelead	with EASYPRO	with EASYPRO on demand	color in reflection	light transmission LT [%]	solar factor g-value[1]	shading coefficient SC	selectivity LT / g	reflection outside LRe [%]	reflection inside LRi [%]	Ug-value[2] [W/m²K]	weight [kg/m²]	assessed sound reduction index Rw,P (C; Ctr) [dB]	use as mono glazing (coating on surface #2)	processing possibilities: tempering	lamination tested towards PVB[4]	bending[5]	screenprinting & enamelling[6]
COOL-LITE® K in triple glazing unit CLIMATOP® (6 | 12 | 4 | 12 | 4 mm, 90% Argon, coating on face #2 with PLANITHERM® XN on face #5) on PLANICLEAR® *Selective solar control coating with reinforced thermal insulation*																	
COOL-LITE® KN 166 II		●	neutral	55	0.35	0.41	1.57	23	26	0.7	35.0	36(-1;-5)		to be tempered			
NEW COOL-LITE® KN 148 II		●	neutral	42	0.28	0.32	1.50	28	20	0.7 3	5.0	36(-1;-5)		to be tempered			
COOL-LITE® K in triple glazing unit CLIMATOP® (6 | 12 | 4 | 12 | 4 mm, 90% Argon, coating on face #2 with PLANITHERM® XN on face #3 and #5) on PLANICLEAR® *Selective solar control coating with thermal insulation*																	
COOL-LITE® KG 137 tempered			golden	31	0.24	0.28	1.29	33	28	0.7	35.0	36(-1;-5)		to be tempered			
COOL-LITE® KG 137 annealed			golden	31	0.24	0.27	1.29	30	26	0.7	35.0	36(-1;-5)					
COOL-LITE® KNT 164			neutral	52	0.37	0.42	1.41	14	11	0.7	35.0	36(-1;-5)		temperable	yes		
COOL-LITE® KNT 155			neutral	43	0.30	0.35	1.43	17	11	0.7	35.0	36(-1;-5)		temperable	yes		
COOL-LITE® KNT 140			neutral	34	0.23	0.27	1.48	23	12	0.7	35.0	36(-1;-5)		temperable	yes		
COOL-LITE® KS 147			silver	39	0.26	0.30	1.50	43	33	0.7	35.0	36(-1;-5)					
NEW COOL-LITE® KS 146 II			silver	38	0.25	0.29	1.52	33	18	0.7	35.0	36(-1;-5)		to be tempered			
COOL-LITE® KS 138 II			silver	33	0.22	0.25	1.50	39	19	0.7	35.0	36(-1;-5)		to be tempered			
COOL-LITE® ST in triple glazing unit CLIMATOP® (6 | 12 | 4 | 12 | 4 mm, 90% Argon, coating on face #2, with PLANITHERM® XN on face #3 and #5) on PLANICLEAR® *Solar control glass offering full flexibility for processing*																	
COOL-LITE® ST BRIGHT SILVER DIAMANT®			silver	57	0.45	0.51	1.27	34	31	0.7	35.0	36(-1;-5)	yes	temperable	yes	yes[5]	yes
COOL-LITE® ST BRIGHT SILVER			silver	55	0.43	0.49	1.28	33	30	0.7	35.0	36(-1;-5)	yes	temperable	yes	yes[5]	yes
COOL-LITE® ST 167			neutral	55	0.42	0.48	1.31	22	22	0.7	35.0	36(-1;-5)	yes	temperable	yes	yes[5]	yes
COOL-LITE® ST 150			neutral	42	0.32	0.37	1.31	20	20	0.7	35.0	36(-1;-5)	yes	temperable	yes	yes[5]	yes
COOL-LITE® ST 136			grey	30	0.24	0.27	1.25	23	21	0.7	35.0	36(-1;-5)	yes	temperable	yes		yes
COOL-LITE® ST 120			silver	17	0.15	0.17	1.13	32	26	0.7	35.0	36(-1;-5)	yes	temperable	yes		yes
COOL-LITE® STB 136			blue	29	0.23	0.27	1.26	19	19	0.7	35.0	36(-1;-5)	yes	temperable	yes		yes
COOL-LITE® STB 120			blue	18	0.15	0.17	1.20	21	28	0.7	35.0	36(-1;-5)	yes	temperable	yes		yes
Low-E coating in triple glazing unit CLIMATOP® (4 | 12 | 4 | 12 | 4 mm, 90% Argon, coating on face #2, with																	
PLANITHERM® XN II DIAMANT®		yes	extra neutral	75	0.55	0.63	1.36	14	15	0.7	30.0	32(-1;-5)		to be tempered		yes[5]	
PLANITHERM® XN DIAMANT®			extra neutral	75	0.55	0.63	1.36	15	15	0.7	30.0	32(-1;-5)					
PLANITHERM® XN II		yes	neutral	73	0.53	0.61	1.38	14	15	0.7	30.0	32(-1;-5)		to be tempered		yes[5]	
PLANITHERM® XN			neutral	73	0.53	0.61	1.38	14	14	0.7	30.0	32(-1;-5)					
PLANITHERM® ONE II DIAMANT®		yes	extra neutral	65	0.46	0.53	1.41	25	23	0.7	30.0	32(-1;-5)		to be tempered		yes[5]	
PLANITHERM® ONE DIAMANT®			extra neutral	65	0.44	0.51	1.48	25	23	0.7	30.0	32(-1;-5)					
PLANITHERM® ONE II		yes	neutral	64	0.44	0.51	1.45	25	23	0.7	30.0	32(-1;-5)		to be tempered		yes[5]	
PLANITHERM® ONE			neutral	64	0.43	0.49	1.49	25	23	0.7	30.0	32(-1;-5)					

4 Solar control coating in contact with PVB modifies performances and aesthetics. Please contact us to get the approved PVB list.
5 Bending results depend on the process; trials should be done for validation.
6 Screen-printing, roller coating, spray, digital printing inks and enamels validation is required.

TRIPLE GLAZING UNITS - CLIMATOP®

Values given according to the standards
[1]EN 410, [2]EN 673 and [3]EN 12758

coating / to be tempered / annelead	color in reflection	light transmission LT [1] [%]	solar factor g-value[1]	shading coefficient SC	selectivity LT / g	reflection outside LRe [%]	reflection inside LRi [%]	Ug-value[2] [W/m²K]	weight [kg/m²]	assessed sound reduction index Rw,P (C; Ctr) [dB]	use as mono glazing (coating on surface #2)	processing possibilities: tempering	lamination tested towards PVB[4]	bending[5]	screenprinting & enamelling[6]
Low-E coating in triple glazing unit CLIMATOP® (4 | 12 | 4 | 12 | 4 mm, 90% Argon, coating on face #2, with PLANITHERM® XN on face #5) on PLANICLEAR® or DIAMANT®															
ECLAZ® II DIAMANT®	extra neutral	77	0.58	0.66	1.33	14	15	0.7	30.0	32(-1;-5)		to be tempered			
ECLAZ® DIAMANT®	extra neutral	77	0.59	0.67	1.31	15	15	0.7	30.0	32(-1;-5)					
ECLAZ® II	neutral	75	0.56	0.64	1.34	14	15	0.7	30.0	32(-1;-5)		to be tempered			
ECLAZ®	neutral	76	0.57	0.65	1.33	14	15	0.7	30.0	32(-1;-5)					
ECLAZ® ONE II DIAMANT®	extra neutral	73	0.51	0.58	1.43	20	18	0.7	30.0	32(-1;-5)		to be tempered			
ECLAZ® ONE DIAMANT®	extra neutral	74	0.51	0.59	1.45	19	17	0.7	30.0	32(-1;-5)					
ECLAZ® ONE II	neutral	71	0.49	0.57	1.45	20	18	0.7	30.0	32(-1;-5)		to be tempered			
ECLAZ® ONE	neutral	72	0.49	0.57	1.47	18	17	0.7	30.0	32(-1;-5)					
BIOCLEAN® in triple glazing unit CLIMATOP® (6 | 12 | 4 | 12 | 4 mm, 90% Argon, with PLANITHERM® XN on face #5) on PLANICLEAR® for easy maintenance															
BIOCLEAN II	neutral	72	0.57	0.66	1.26	20	19	1.0	35.0	36(-1;-5)		to be tempered			
BIOCLEAN	neutral	70	0.56	0.64	1.25	20	19	1.0	35.0	36(-1;-5)					
NEW BIOCLEAN XTREME 61/29	neutral	52	0.25	0.29	2.08	15	17	0.7	35.0	36(-1;-5)					
BIOCLEAN® SKN 183	neutral	64	0.35	0.40	1.83	17	17	0.7	35.0	36(-1;-5)					
BIOCLEAN SKN 176	neutral	60	0.32	0.37	1.88	17	19	0.7	35.0	36(-1;-5)					
BIOCLEAN SKN 165	neutral	52	0.30	0.34	1.73	20	21	0.7	35.0	36(-1;-5)					
BIOCLEAN SKN 154	neutral	45	0.24	0.28	1.88	22	24	0.7	35.0	36(-1;-5)					
BIOCLEAN SKN 145	neutral	35	0.19	0.22	1.84	22	18	0.7	35.0	36(-1;-5)					

4 Solar control coating in contact with PVB modifies performances and aesthetics. Please contact us to get the approved PVB list.
5 Bending results depend on the process; trials should be done for validation.
6 Screen-printing, roller coating, spray, digital printing inks and enamels validation is required.

OUTSIDE EUROPE OUR PRODUCTS

Average performance data are based on NFRC standards for center-of-glass only in the glazing configuration 6mm / Air or Argon space / 6mm

Product[1]	Coating Position	Light Transmittance LT (%)	SHGC	Shading Coefficient SC	LSG Selectivity	External Light Reflectance LRe (%)	Internal Light Reflectance LRi (%)	U-Value (NFRC) W/(m².K) 12mm air	U-Value (NFRC) W/(m².K) 12mm air (R)	U-Value (NFRC) W/(m².K) 16mm argon	U-Value Btu/(h.ft².F) 12mm air	U-Value Btu/(h.ft².F) 16mm argon	Processing[5] Hot Bending	Processing[5] Screen-printing and enamelling[2]	IGDB
NEUTRAL															
COOL-LITE® XTREME 70/33 II[4]	#2	70	0.30	0.34	2.33	11	13	1.62	0.62	1.40	0.29	0.25			21053
COOL-LITE® XTREME 61/29 II[4]	#2	61	0.27	0.31	2.26	11	15[6]	1.61	0.62	1.35	0.28	0.24			-
COOL-LITE® XTREME 50/22 II	#2	47	0.20	0.23	2.35	16	18	1.61	0.62	1.39	0.28	0.24			21076
COOL-LITE® SKN 183 II[4]	#2	74	0.36	0.42	2.06	13	13	1.63	0.61	1.41	0.29	0.25			20896
COOL-LITE® SKN 176 II[4]	#2	68	0.34	0.39	2.00	13	15	1.60	0.63	1.39	0.28	0.24			21100
COOL-LITE® SKN 165 II[4]	#2	60	0.31	0.35	1.94	16	17	1.63	0.61	1.41	0.29	0.25			21112
COOL-LITE® SKN 154 II[4]	#2	50	0.26	0.30	1.92	18	26[3]	1.61	0.62	1.39	0.28	0.24	yes		21136
COOL-LITE® SKN 144 II	#2	40	0.22	0.26	1.82	20	12	1.64	0.61	1.42	0.29	0.25			21160
COOL-LITE® KNT 164	#2	57	0.46	0.53	1.24	14	10	1.87	0.53	1.67	0.33	0.29	yes		21176
COOL-LITE® KNT 155	#2	47	0.37	0.42	1.27	17	10	1.83	0.55	1.63	0.32	0.29	yes		21192
COOL-LITE® KNT 140	#2	37	0.28	0.32	1.32	23	12	1.80	0.56	1.60	0.32	0.28	yes		21208
COOL-LITE® KN 166 II	#2	60	0.37	0.43	1.62	22	25	1.63	0.61	1.41	0.29	0.25			21224
COOL-LITE® KN 148 II	#2	47	0.31	0.36	1.52	27	18	1.63	0.61	1.41	0.29	0.25			-
COOL-LITE® ST 167	#2	60	0.60	0.69	1.00	22	23	2.67	0.37	2.53	0.47	0.45	yes	yes	21232
COOL-LITE® ST 150	#2	46	0.46	0.55	1.00	20	22	2.67	0.37	2.53	0.47	0.45	yes	yes	21248
EXTRA CLEAR															
COOL-LITE® XTREME 70/33 II DIAMANT®[4]	#2	71	0.30	0.35	2.37	11	13	1.62	0.62	1.40	0.29	0.25			21056
COOL-LITE® XTREME 61/29 II DIAMANT®[4]	#2	62	0.27	0.31	2.30	11	15[6]	1.61	0.62	1.35	0.28	0.24			21072
COOL-LITE® XTREME 50/22 II DIAMANT®	#2	48	0.20	0.23	2.40	16	18	1.61	0.62	1.39	0.28	0.24			21080
COOL-LITE® SKN 083 II[4]	#2	76	0.37	0.43	2.05	12	13	1.61	0.62	1.39	0.28	0.24			20904
COOL-LITE® SKN 076 II[4]	#2	71	0.35	0.40	2.03	13	15	1.61	0.62	1.39	0.28	0.25			21104
COOL-LITE® SKN 065 II[4]	#2	62	0.32	0.37	1.94	17	19	1.63	0.61	1.41	0.29	0.25			21116
COOL-LITE® SKN 054 II[4]	#2	53	0.27	0.31	1.96	18	23	1.61	0.62	1.39	0.28	0.24	yes		21140
COOL-LITE® SKN 044 II	#2	42	0.23	0.26	1.83	20	15	1.64	0.61	1.42	0.29	0.25			21156
SILVER REFLECTIVE															
COOL-LITE® XTREME SILVER II DIAMANT®	#2	50	0.23	0.26	2.17	30	18	1.61	0.62	1.39	0.28	0.24			20884
COOL-LITE® XTREME SILVER II	#2	49	0.23	0.26	2.13	30	18	1.61	0.62	1.39	0.28	0.24			20880
COOL-LITE® ST 120	#2	7	0.11	0.13	0.64	44	39	1.88	0.53	1.69	0.33	0.30		yes	21280
COOL-LITE® ST BRIGHT SILVER DIAMANT®	#2	63	0,66	0,76	0,95	35	35	2.69	0.37	2.55	0.47	0.45		yes	21228
BLUE															
COOL-LITE® STB 136	#2	32	0.37	0.42	0.86	19	20	2.60	0.38	2.46	0.43	0.43		yes	21400
COOL-LITE® STB 120	#2	20	0.26	0.30	0.77	21	32	2.53	0.40	2.38	0.42	0.42		yes	21312
HIGH LIGHT TRANSMISSION LOW-E GLASS															
PLANITHERM® XN	#3	80	0.60	0.69	1.33	12	12	1.68	0.60	1.46	0.30	0.26			21436
PLANITHERM® XN II	#3	80	0.60	0.69	1.33	12	11	1.66	0.60	1.47	0.29	0.26			21424
PLANITHERM® ONE II	#3	70	0.49	0.56	1.43	22	23	1.63	0.61	1.41	0.29	0.25			21411
ECLAZ® II	#3	82	0.67	0.77	1.22	11	11	1.7	0.60	1.46	0.30	0.26			20756
ECLAZ® ONE II	#3	78	0.55	0.63	1.42	15	17	1.62	0.62	1.40	0.29	0.25			20764
EASY MAINTENANCE GLASS															
BIOCLEAN® II	#1	79	0.76	0.87	1,04	18	17	2.69	0.37	2.55	0.47	0.45			21469

1 DGU values calculated with Clear Substrate as inner pane, except for extra clear appearance for which low-iron DIAMANT is used. Saint-Gobain Glass Glass reserves the right to change product performance features without notice or obligation. The performance values shown are nominal and subject to variations due to manufacturing tolerances. **2** Validation should be taken with digital printing inks and enamels. **3** COOL-LITE® SKN 154: LRi=22%. **4** Also available in annealed version. **5** Refers to the processing guidances of each product for more details about the processing conditions or contact the local Technical Support Manager. **6** COOL-LITE® XTREME 61/29: LRi=14%.

OUR PRODUCTS

SAGEGLASS® PRODUCTS

Values provided according to the following configurations: SageGlass® Climaplus (6+2.2/12/4) and SageGlass® Climatop (6+2.2/12/4/12/4) in the 4 tint states

	color in reflection	light transmission LT [%]	solar factor g-value	shading coefficient SC	selectivity LT / g	reflection outside LRe [%]	Ug-value [W/m²K]	Possible use a single glazing	Coating position on IGU
SAGEGLASS® CLIMAPLUS									
Full Clear	Neutral	59	0.40	0.46	14.75	16	1.1	N	#2
Light Tint	Neutral	17	0.12	0.14	14.75	10	1.1	N	#2
Mid Tint	Neutral	6	0.07	0.08	14.75	10	1.1	N	#2
Full Tint	Neutral	1	0.04	0.05	14.75	11	1.1	N	#2
SAGEGLASS® CLIMATOP									
Full Clear	Neutral	54	0.36	0.41	18	19	0.6	N	#2
Light Tint	Neutral	16	0.10	0.11	18	11	0.6	N	#2
Mid Tint	Neutral	5	0.05	0.05	18	10	0.6	N	#2
Full Tint	Neutral	1	0.03	0.03	18	11	0.6	N	#2

PROPERTIES

- Electronically tintable glass for curtain walls, windows and skylights
- Available as SageGlass® Classic, SageGlass LightZone® SageGlass® Harmony™

ADVANTAGES

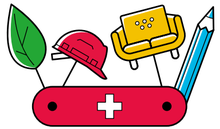
- Tint levels change automatically or manually to control the adverse effects of sunlight including glare and excessive solar heat gain
- Replaces mechanical shading systems and internal blinds
- Remains transparent, providing an unimpeded view and connection to the outdoors
- Intelligent daylight management
- Help achieve green labels
- Excellent interior color rendering
- Enhanced biophilic design

Glass solutions for the protection of people and property

Vetrotech SAINT-GOBAIN designs, produces and markets glazed solutions for the safety of people and property: fire protection, attack, bullet and blast resistance. With its own ballistic and fire resistance testing laboratories, Vetrotech assists and responds to the specific resistance requirements of each project, all while innovating with you.
SAINT-GOBAIN GLASS glazing solutions provide aesthetics, design and comfort and can be combined with Vetrotech solutions to offer optimum protection for people and property and thus meet the highest architectural demands.

Safety
Fire protection
Alarm
EMS shielding
Radar interference
Spy mirror

Comfort
Acoustic insulation
Dynamic privacy
Thermal insulation
Anti reflection



Sustainability
Double or triple glazing
Solar control
Self-cleaning

Design
Coloring
Digital printing
Screen printing

Vetrotech's mastery of tertiary building environments, acquired over more than 40 years of experience, enables it to provide advice and support for all your projects and developments.
For more information, please do not hesitate to contact us: vetrotech.com

Fire-resistant glass

Glass from the following ranges, PYROSWISS, PYROSWISS SBS, VETROFLAM, CONTRAFLAM LITE, CONTRAFLAM LITE STRUCTURE, CONTRAFLAM, CONTRAFLAM MEGA and CONTRAFLAM STRUCTURE, are all types of fire-resistant glass, composed of one or several layers of tempered safety glass. These types of glass, all tested in specific environments and frames, in steel, wood or aluminium, meet the different resistance classes of the EN 357 standard:

Class E, integrity, stop flames, smoke and hot gases: PYROSWISS.

EW class, radiation control, keep the level of radiant heat transmission low: VETROFLAM, CONTRAFLAM LITE, CONTRAFLAM LITE STRUCTURE.

Class EI, insulation, compartmentalize fire and block heat transfer: CONTRAFLAM, CONTRAFLAM MEGA and CONTRAFLAM STRUCTURE.

The glass elements have a resistance time of between 30 and 120 minutes.

Markets and applications

Hospitals, schools, hotels, shopping centres, airports, offices or even collective housing, SAINT-GOBAIN's fire-rated glass solutions, in addition to the fire resistance they provide, meet the specific requirements of each of their environments.
For outdoor applications, fire-rated solutions can be mounted in double or triple glazing.
Vetrotech SAINT-GOBAIN provides solutions for any kind of applications: partitions, façades, windows, doors, smoke barrier systems, skylights or even floors.

High-security glass

VETROGARD and POLYGARD high-security glass solutions are resistant to attack, bullet or blast, and are all tested in a specific frame and environment.
In addition to meeting regulatory requirements, these glass units are only sold on the basis of official reports: documents issued by an approved laboratory, certifying the successful completion of a resistance test on a glazed element (specific glass, frame and environment). Testing this element ensures the reliability and resistance of the solution.
VETROGARD - Laminated glass solutions composed of 2 or more panes of glass, PVB interlayer(s).
POLYGARD - Laminated glass solutions composed of 2 or more panes of glass and polycarbonate interlayer(s). POLYGARD solutions are less than half as thick as the VETROGARD range but provide the same level of resistance. These solutions are available with or without splinter (S or NS) on the opposite side of the impact and meet the highest levels of resistance defined by European standards (EN).

Attack resistance,
EN 356B security glass standard (P6B to P8B). We also carry out specific developments to meet the EN1627 standard (resistance classes for construction elements).

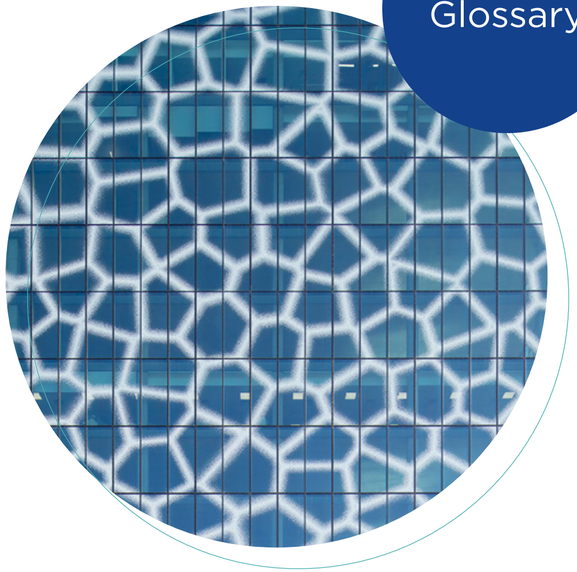
Bullet resistance,
EN 1063 security glass standard (BR1 to BR7 + SG1/ SG2 specific to shotguns). We also carry out specific developments according to market needs.

Blast resistance,
EN 13541 security glass standard (ER1 to ER4). We also carry out specific developments according to market needs.

Markets and applications

VETROGARD and POLYGARD glass solutions are specifically intended for the ERP [public access building] and HRB markets. Specific needs also exist in the private residential sector.

Glossary



Category	Product	Explanation
Float glass	PARSOL PLANICLEAR DIAMANT	Body Tinted Glass High quality clear glass with mid-iron content Highly transparent extra-clear and low-iron glass
Solar control glass	COOL-LITE® ST COOL-LITE® KN(T) COOL-LITE® SKN COOL-LITE® XTREME	Standard solar control coatings offering full flexibility for processing Selective solar control coatings (single silver) with thermal insulation Highly selective solar control (double silver) with reinforced thermal insulation Extremely selective solar control coatings (triple silver) with reinforced thermal insulation
Low-e glass	PLANITHERM® ECLAZ®	Standard Low-E coating High performance Low-E coating with high light transmission
Patterned glass	DECORGLASS MASTERGLASS	Translucent glass with special texture rolled into Glass Translucent glass with special texture rolled into extra-clear Glass
Printed glass	EMALIT EVOLUTION SERALIT EVOLUTION PICTUREIT	Tempered Glass made opaque by enameling one side of the glass (one or two colors, full face coverage, no pattern) Screen-printed tempered enamelled glass (monochromic, full or partial coverage with regular pattern) Tempered Enamelled Glass with digitally printed image
Curved glass	CONTOUR	Curved Glass with or without coating which can be laminated or assembled into glazed units
Safety and security (Heat treated & Laminated glass)	PLANIDUR SECURIT SECURIT-H STADIP® STADIP® PROTECT	Heat-strengthened glass Thermally toughened safety glass Thermally toughened safety glass with Heat-Soak-Test Laminated safety glass Laminated safety glass for protection of goods and people
Insulated glazing unit	CLIMALIT CLIMAPLUS CLIMATOP	Basic double glazing unit High performance double glazing unit (DGU) High performance triple glazing unit (TGU)
Active & dynamic glazing	PRIVA-LITE EGLAS SAGE GLASS®	Electric swicheable glass from translucent to transparent Electric swicheable heating glass Swicheable electrochromic glass
Fixing systems	POINT S (SPIDERGLASS) POINT D (SPIDERGLASS) POINT SLW (LITE WALL MONO) POINT DLW (LITE WALL ISO) POINT XS VARIO	Point fixing systems for monolithic toughened or laminated glazing with articulated fixing Point fixing systems for double-glazed applications with articulated fixing Point fixing system for monolithic glass with fixed-bolt fixings Point fixed system for insulated glazing units (IGU) with fixed-bolt fixings Point fixing system for monolithic or laminated glazing with fixed-bolt fixing which do not pass through the glass Integrated invisible fixing system for insulated glazing units

OUR SERVICES AND TOOLS

GLASSPRO - THE VIRTUAL RENDERING OF COATED GLASS

The GlassPro app and GlassPro Live are unique services of Saint-Gobain, bringing new perspectives on building design and glazing prototyping through digital simulation. Accurate predictive glass façade 3D physico-realistic rendering reduces the need for physical glass mock-ups, which opens the door to a more sustainable approach for prototyping, and accelerates the decision-making process with regards to selecting the ideal glazing with the desired aesthetics corresponding to your design intention.

GLASSPRO APP - THE IPAD APPLICATION

GLASSPRO app is an application for Apple iPad which enables the user to visualize virtually all Saint-Gobain's standard glazing products on a standard building façade.

Choose and compare two types of glazing with a personalized rendering of a glazing product under a variety of lightning conditions and several interior design settings through two different environments (urban and countryside to avoid representative issues).

This app, **downloadable on the Apple store** shows an accurate and realistic virtual rendering, based on physical properties of the glass.

GLASSPRO LIVE - THE ON-DEMAND SERVICE

GLASSPRO Live is Saint-Gobain's on-demand service of glass facade rendering. It allows architects to appreciate the look of Saint-Gobain Glazing products on their own building, as if it was real, before it's even built!

Ask for your glazing configuration to be represented under a variety of lightning conditions and several interior design settings thanks to our 2 scenes just like in the app. With our on-demand service, you can also ask for us to stimulates a realistic image of different glazing products on your own building facade.

Visualize and compare all Saint-Gobain glazing products on high definition 3D synthesis images called "physico-realistic" under a variety of lightning conditions and even on your own building 3D rendering.

To request the service, please **contact your local sales and specifier team.**

WEBSITE SAINT-GOBAIN GLASS

Discover our product range to find the ideal glass for your project which responds the best to your expectations.

Find also our services, the apps and calculation tools you need in the website **www.saint-gobain-glass.com**

You may select your area/country to have our local offer and dedicated products

INSTAGLASS - THE REFERENCE PROJECT WEBSITE FOR GLASS FACADES

Come and explore our architectural references showing a wide range of glass solutions, innovations and aesthetic options for the building envelope.

Discover inspirational sustainable design of living spaces and distinctive building that make our environment worth living in

www.saint-gobain-glass.com/instaglass

CALUMEN®: THE REFERENCE OF CALCULATION

Determine the light, energy, thermal or acoustic performances of your glazing; or to find a suitable glazing for your project based on its performance values.

Personalize settings such as type of glazing, type of coating, glass and cavity thickness.

Specify a project, make comparisons between our products, change the configurations and obtain the right product.

CalumenLive is available on **www.calumenlive.com**

CALUWIN®: COMFORT BY NUMBERS

Calculate quickly and easily:

- The whole U-value (Uw value)
- Surface temperatures
- The condensation risk in the glass edge area
- Energy savings thanks to warm edge spacer

Caluwin® is available on **www.caluwin.com**

GLASS VISION: THE REALISTIC ONLINE TOOL FOR DECO AND DESIGN GLASS

GLASS VISION supports you online in finding your first ideas - quickly, easily, free of charge and without registration.

The inspiration tool includes many classic interior scenarios for both private homes and commercial properties, as well as numerous materials, colours and styles of furnishing.

Choose between kitchen, living room, bathroom, office, retail, hotel lobby and hotel rooms, and with just a few clicks test which colours, glasses and textures go best together there.

www.saint-gobain-glass.com/visualizer

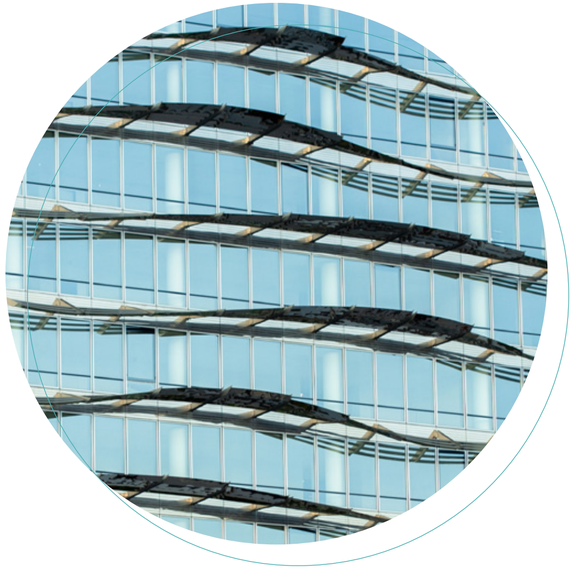
GREEN BUILDING WEBSITE: FOR SUSTAINABLE HABITAT

Discover how all Saint-Gobain products and solutions can contribute to achieving credits in green building certifications.

Explore our certifications among different international labels such as LEED, BREEAM, DGNB, HQE or even WELL.

Find all the needed documentation for certification process. Saint-Gobain solutions covers numerous applications such as facades, ceilings, floors, foundations, roofs, walls, and many others.

www.greenbuilding.saint-gobain.com



SAINT-GOBAIN

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