GLASS FOR FAÇADE

EDITION 2020

BUILDING GLASS

SAINT-GOBAIN

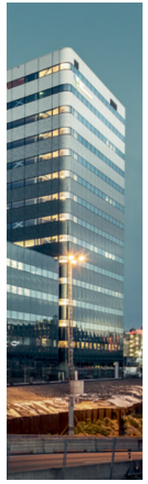
INSPIRATIONAL ARCHITECTURAL DESIGN MADE POSSIBLE WITH EXCEPTIONAL ARCHITECTURAL GLASS BY SAINT-GOBAIN

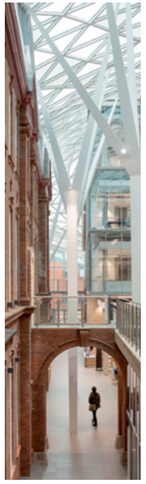
MAKING THE WORLD A BETTER HOME

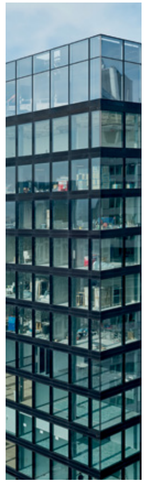
Today, it is no longer possible to talk about architecture without considering the long-term importance of built living spaces for building users and the environment. It is in this perspective that SAINT-GOBAIN encourages innovation in glass - always true to our motto «Making the world a better home».

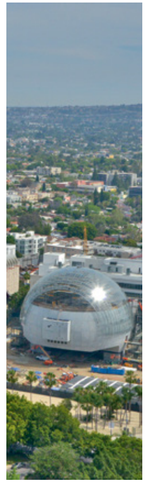
With the Reference Book 2020 we would like to take you on a journey to extraordinary architectural projects in different countries and continents. The projects not only show a wide range of glass solutions and innovations for the building envelope. They also show what we understand by sustainable design of living spaces: distinctive buildings that make our environment worth living in.

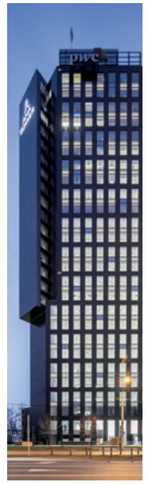
Glass plays a central role in all of them, as the material is highly multifunctional. Glass and glazing today meet very complex and often contradictory requirements that are of great importance in times of climate change. They have to provide daylight and at the same time ensure thermal insulation and solar control – while offering architects a large range of aesthetic options for designing future-oriented living spaces.

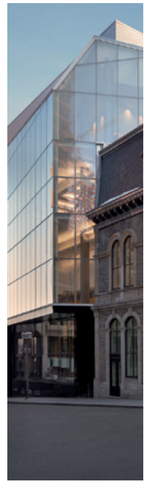


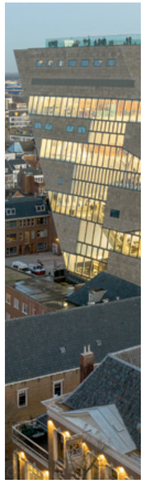


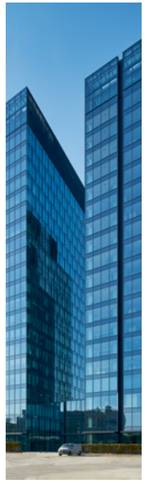


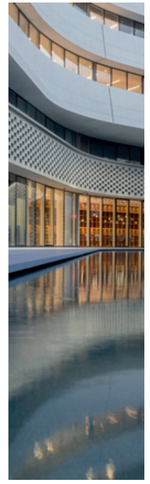


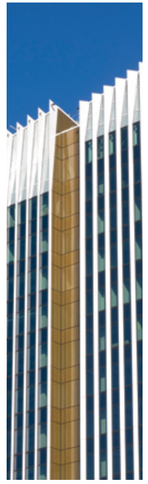


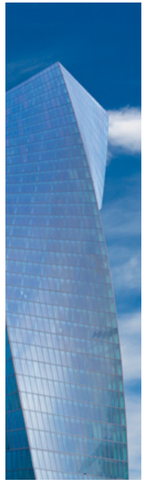


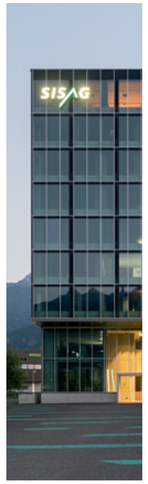


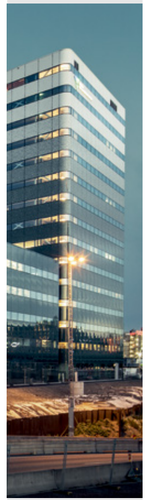












ADMINISTRATION

GOTHENBURG REGIONENS HUS

EXCELLENT TRANSPARENCY WITH INNOVATIVE SOLAR CONTROL GLASS FROM SAINT-GOBAIN

Location	Gothenburg, Sweden
Architects	White Architekten, Gothenburg; Sweden
Glass processor	Stiklu Centr, Latvia; Glassbel Baltic, Lithuania; Tambest (curved glass), Finland
Photos	©felixgerlach_fotograf

MILJÖ BYGGNAD
CERTIFIERAD | SVERIGE

With the Regionens Hus, the Swedish city of Gothenburg has a new landmark. In the spectacular new building, the regional council of Västra Götaland has been given a new home just in time for its 20th anniversary. At the same time, this extraordinary building project is the centrepiece of the largest urban expansion in the modern history of Gothenburg.

Consisting of two 5-storey blocks and a 15-storey tower, the architecture of the Regionens Hus reflects the values of the regional council: modernity, transparency and accessibility for all. About 1,300 employees of the municipality find the most modern working conditions in the new building now.

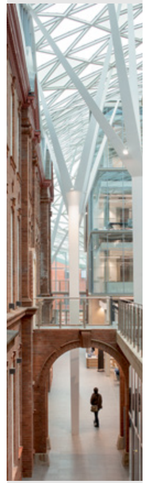
An eye-catcher of the Regionens Hus, visible from afar, is the spacious glass façades. These form a deliberate contrast to the neighbouring historic station building and underline the basic design idea of transparency at the same time. 4,500 m² of the neutral triple glazing **COOL-LITE® XTREME 70/33 II** by SAINT-GOBAIN with MicroShade were used.
Therefore the façade could be realised with a light transmission of more than 60 % at a total solar factor (g-tot) of less than 0.17 – for solar control glass and the interior solar shading system.

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

ADMINISTRATION

GOTHENBURG REGIONENS HUS

The Regionens Hus was awarded the «Stora Glaspriset 2020» by the Swedish façade federation for the innovative solution of façade glazing. The building also received the environmental certification **Miljöbyggnad Guld**.



EDUCATION

HEARTSPACE UNIVERSITY OF SHEFFIELD

A ROOF FOR ENGINEERING SCIENCES WITH SOLAR CONTROL GLASS FROM SAINT-GOBAIN

Location	Portobello Street, Sheffield, London, United Kingdom
Architect	Bond Bryan, Sheffield, London
Glass processor	Roof: SAINT-GOBAIN GLASSOLUTIONS Austria, Eckelt Glas, Steyr, Austria Main entrance: SAINT-GOBAIN GLASSOLUTIONS Objektcenter Radeburg, Germany
Façade maker	Wagner Biro Steel and Glass, Vienna, Austria
Photos	©John Kees Photography

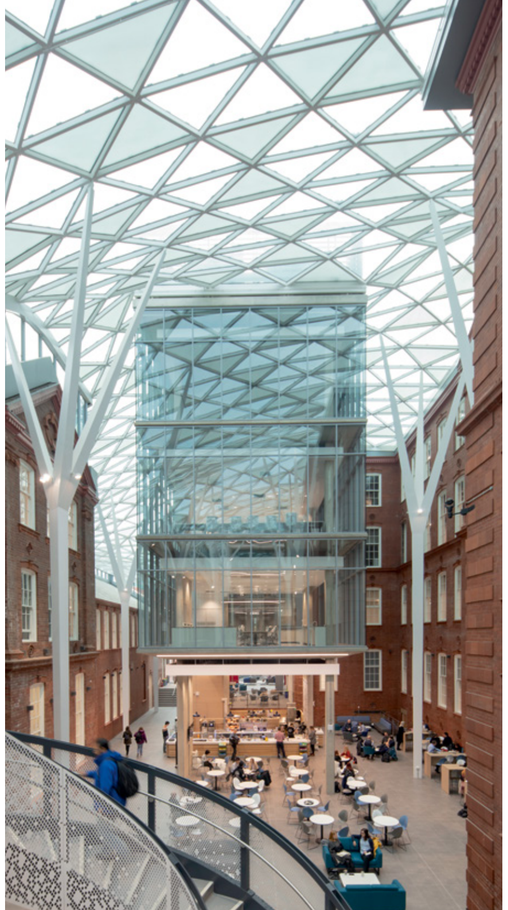
The faculty of engineering at the University of Sheffield is one of the most prestigious in the world. Following sustainable modernisations, new spaces were opened in the spring of 2020, bringing together highly modern laboratories, offices, lecture halls and communication facilities in the heart of the university. As the centrepiece of the new Engineering Heartspace, a central atrium was created under a spectacular curved glass, impressively linking two of the oldest buildings at the university.

White steel 'tree' columns support the approximately 1,400 m² roof, which is made up of interlocking triangular glass and spans the space between the historic buildings with sweeping waves. It forms a new entrance to Portobello Street, connecting the faculty with other facilities on campus. The roof not only creates a clear distinction between old and new, its high-tech construction also improves the energy and CO_2 balance of the renovated existing buildings by enclosing their interior façades in a protective manner.

Products

Roof:
COOL-LITE® XTREME 50/22 II with enameling or small white dot screen-printing on face #3

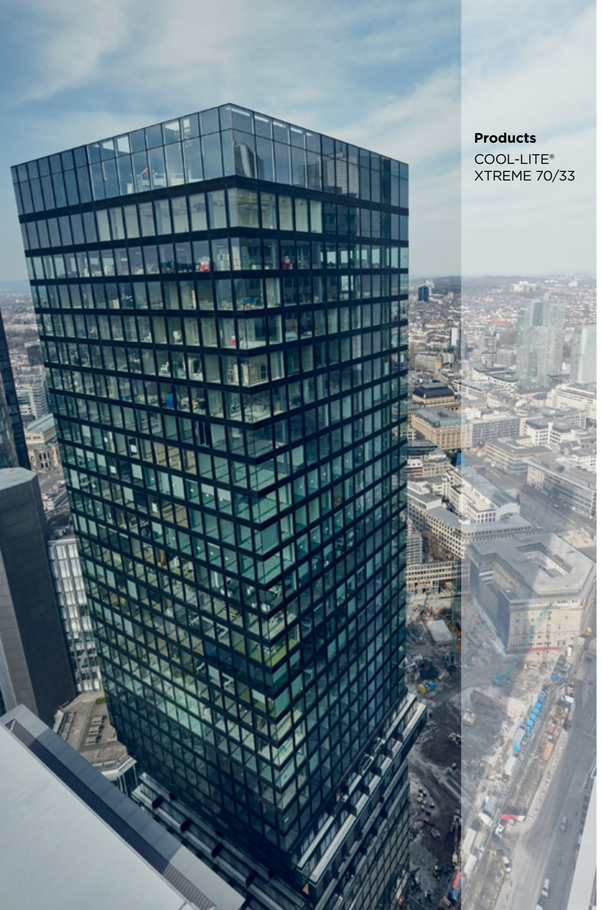
Front:
COOL-LITE® XTREME 60/28 II



EDUCATION

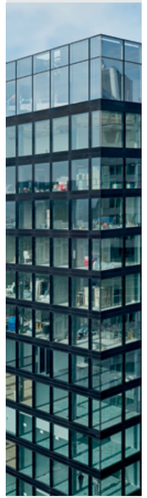
HEARTSPACE
UNIVERSITY OF SHEFFIELD

The more than 900 glazing panels of the roof with white serigraphy of small dots were supplied by SAINT-GOBAIN GLASSOLUTIONS Austria, Eckelt Glas. Thanks to its low reflection, the **CLIMAPLUS® COOL-LITE® XTREME 50/22 II** solar control glass combines functionality and elegance in equal measure. Its properties guarantee ideal solar control and excellent insulation to gain maximum comfort. Therefore the high-performance glass contributes significantly to lower energy consumption and provides at the same time an extremely bright and luminous atmosphere under the glass roof at all times of the year. The newly designed main entrance adds another striking element to the ensemble. For this purpose the experts from GLASSOLUTIONS Objektcenter Radeburg used 600 m² of the high selectivity solar control glass **COOL-LITE® XTREME 60/28 II.** The eye-catching project has now been nominated for the shortlist of the British Construction Industry Awards.



Products

COOL-LITE®
XTREME 70/33



COMMERCIAL OFFICES

OMNITURM

THE FRANKFURT SKYLINE HAS ANOTHER HIGHLIGHT - THE GLASS OMNITURM AT THE PROMINENT LOCATION BETWEEN THE COMMERZBANK HIGH-RISE AND THE MAIN TOWER IN THE CITY CENTER.

Location	Große Gallusstraße 16-18, Frankfurt, Germany
Architects	BIG - Bjarke Ingels Group, Copenhagen, Denmark; B&V Braun Canton Architects, Frankfurt, Germany
Glass processor	SAINT-GOBAIN GLASSOLUTIONS Objektcenter Radeburg, Germany; SAINT-GOBAIN GLASSOLUTIONS Austria, Eckelt Glas, Steyr, Austria; SAINT-GOBAIN GLASSOLUTIONS Pietta Glass Working, Romania
Façade maker	Dobler Metallbau, Deggendorf, Germany
Photos	©Olaf Rohl, SAINT-GOBAIN

The residents in Frankfurt describe the curve in the silhouette of the new skyscraper as a «cheeky hip swing». A number of levels halfway up and off the main axis are what make up the striking cubature of the Omniturm. Designed by Danish architect Bjarke Ingels, behind the architectural accent the special mix of uses of the high-rise: the "hip curve" arching out of the façade characterizes the living area from the 15th to the 22nd floor, which stands out visually from the linearly stacked floors with offices and public uses.

The Omniturm is the first skyscraper in Germany to combine work, living and public areas in its spatial program. The 45 levels accommodate 44,000 m² of offices, 8,200 m² of rental apartments and a further 1,700 m² of restaurants and shops. Based on the Latin «omnia» - «everything» - this is what the name of the tower expresses.

The shifting of the axes on the residential floors also has a positive effect on the floor plans: This is how the offset balconies of the apartments were created. From a static point of view, however, the "hip swing" was a challenge - which the planners solved with elegantly inclined supports. The high-strength steel reinforcement connected to the building core ensures maximum stability.

Sun protection, daylight and filigree corners

A surprising amount of daylight gets into the interior of the high-rise building through the 15,000 m² of solar control glass. The **COOL-LITE® XTREME 70/33** from SAINT-GOBAIN used for all office floors is a triple solar control glass with an excellent selectivity of 2.12. With its light transmission of 66–70% (depending on the glass structure), it brings plenty of natural light into the building and protects the user with its solar factor of 0.32–0.33 (also depending on the glass structure) and its Ug value of 1.0 W/m²K from too much solar heat.

COMMERCIAL OFFICES

OMNITURM

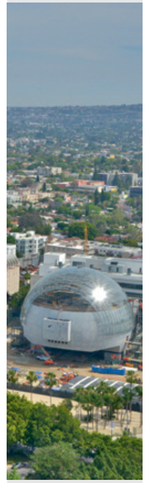
Contrary to what was expected, the approx. 3,000 x 3,800 millimeter large laminated safety glass panes are not made of partially toughened glass HSG or toughened safety glass, although this is usually necessary for large-format glass to protect against thermal breakage. The detailed thermal stress analyzes by the structural engineers showed that a corresponding edge grinding sufficiently increases the load-bearing capacity of the edges and thus that of the entire panes.

For the corners of the building, the architect wanted a continuous and filigree look. That is why there were no profiles and all-glass corners were chosen. So that these are statically effective, they were designed as step insulating glass. A silicone is used as the edge seal, which also blackens the steps. Since the corner solution of the Omniturm is not subject to the stipulations of the technical building regulations introduced, approval in individual cases and external monitoring was required. IFT Rosenheim took over the control of the production.

From glass production to prefabrication of the element façade

The impressive quantity of 15,000 m² of glass was produced across three SAINT-GOBAIN GLASSOLUTIONS plants. Each company took on a special area of responsibility: The Saxon SAINT-GOBAIN GLASSOLUTIONS Objektcenter in Radeburg, Germany, concentrated on the overall control of the project in addition to the glass production of the smaller elements. SAINT-GOBAIN GLASSOLUTIONS Austria; Eckelt Glas; mainly produced the corner elements and the glasses with a high serial character were manufactured in cooperation with the SAINT-GOBAIN GLASSOLUTIONS Pietta Glass Working factory.

From the three different locations, the panes were sent directly to the metal construction company Dobler in Deggendorf, Germany, which prefabricated the element façade in the factory. Storey-high individual elements that already contained all the necessary components were finally delivered from there to the Frankfurt construction site and installed directly in the façade.



ART AND CULTURE

ACADEMY MUSEUM OF MOTION PICTURE

HIGHLY TRANSPARENT DOME CONSTRUCTION WITH STADIP DIAMANT FROM SAINT-GOBAIN

Location	Fairfax Avenue, Los Angeles, United States
Architects	Renzo Piano Building Workshop, Paris, France - Realisation with Gensler, Los Angeles, United States
Glass processor	SAINT-GOBAIN GLASSOLUTIONS Austria, Eckelt Glas, Steyr, Austria
Photos	©Renzo Piano Building Workshop, Academy Museum Foundation

Los Angeles gets a new architectural showpiece: The new Academy Museum of Motion Pictures opens in spring 2021. The American Film Academy, known for its Oscar awards, will show the highlights of its collection of film and cinema history on 30,000 m^2 of exhibition space spread over six floors. The more than 2,500 exhibits range from famous film props, posters, photographs and scripts to historical cinematographs and modern digital projectors.

The new museum ensemble is made up of two buildings, each with its own unique design language: the former May Company department shop, built in 1939 and now thoroughly modernised, revives an architectural icon of modernity. The contemporary concrete structure «Sphere» designed by Renzo Piano Building Workshop closes to the north. The round building contains a cinema hall with 1,000 seats and is crowned by a roof terrace with a fantastic view of the Hollywood Hills and the famous Hollywood sign.

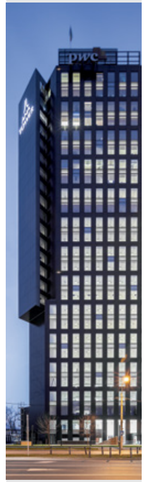
Products
STADIP®
DIAMANT®

ART AND CULTURE

ACADEMY MUSEUM OF MOTION PICTURE

The open space of the terrace is vaulted by a spherical grid shell 45 m in diameter, reinforced with ropes in whose secondary level the flat, shingle-shaped overlapping glasses are located. SAINT-GOBAIN GLASSOLUTIONS Austria, Eckelt Glas, produced and supplied 3,000 m² of laminated safety glass **STADIP® DIAMANT®** for this project. The extra-clear float glass combines perfect colour neutrality with maximum transparency. Thus the glass blends perfectly into the filigree construction and underlines the almost weightless appearance of the dome.

Products
COOL-LITE®
SKN 176 II



COMMERCIAL OFFICES

ANA TOWER

BUCHAREST'S LATEST SKYSCRAPER IN THE ROMANIAN CAPITAL WITH HIGHLY TRANSPARENT SOLAR CONTROL GLASS FROM SAINT-GOBAIN

Location	Poligrafiei Blvd, Bucharest, Romania
Architect	Westfourth Architecture, Bucharest, Romania
Glass processor	SAINT-GOBAIN GLASSOLUTIONS Pietta Glass Working, Romania
General contractor	Ana Tower Offices
Photos	©Vlad Patru

The ANA Tower in northern Bucharest is one of the ten tallest buildings in the Romanian capital. The impressive reinforced concrete structure rises 110 meters high on an almost triangular ground plan. 24 of the 26 floors are reserved for office use in the premium segment.

Light-colored marble and staircase sculptures clad in fine woods transform the two-storey entrance hall into a prestigious lobby that welcomes visitors and employees in style. On the first two floors, there are elegantly furnished conference and meeting rooms as well as luxurious restaurants. The parking spaces are located in the basement levels.

Thanks to its highly innovative equipment, the ANA Tower has been able to achieve the highest standards of efficiency and room quality. The building was awarded the **LEED Platinum** sustainability certificate as a Green Building.

The façade of the ANA Tower is strictly gridded. The dark natural stone façade dissolves into a clear grid structure with high glass windows. The glazings, embedded in barely visible frames, rise over two storeys and are almost flush with the façade. 8,000 m² highly efficient solar control glasses from SAINT-GOBAIN were used for the sophisticated energy-saving glazing as it combines efficient solar control with maximum light transmission and excellent thermal insulation. The coating generation of **COOL-LITE® SKN 176 II** provides the employees in the offices of the ANA Tower optimum use of daylight.

ART AND CULTURE

LE DIAMANT

GLASSY CENTREPIECE OF EXTRA-CLEAR GLASS DIAMANT CONNECTS THE OLD AND THE NEW

Location	Place D'Youville, Québec (City), Canada
Architects	Coarchitecture - Atelier In situ – Jacques Plante architecte, Montreal, Canada
Glass processor	Multiver, Québec (City), Canada; SAINT-GOBAIN GLASSOLUTIONS Pruszkow, Poland
Photos	©Stéphane Groleau

The cultural and events centre «Le Diamant» was awarded by the Prix d'Excellence en Architecture, category cultural building. It is located on the Place d'Youville, an interface between the modern part of the city and Vieux-Québec, its historic centre. The core of the building consists of three volumes: a prestigious old building erected on the square in 1879, a new building at the rear for the theatre hall and a glass structure, the identity-giving «heart».

To the north and east, the centre adjoins the surrounding buildings. From the front and across the corner it shows itself in historical brickwork. The cube of the theatre hall, set in fair-faced concrete, carries a façade of precast concrete elements towards the street.

The architects inserted the glass volume of around 2,000 m^2 between the new and the existing building. SAINT-GOBAIN low-E coated glass **PLANITHERM**® **ONE II** allows a neutral and clear film with low emissivity, highly efficient on face 3, which leaves plenty of room on the front for SAINT-GOBAIN extra-clear glass **DIAMANT**® and a complex screen printing on side 2. The clarity of **DIAMANT**® allows this screen printing to keep its original color (pure white) and thus respects the intended design of the architecture team.

ART AND CULTURE

LE DIAMANT

Like a prism, the facetted glass body, which towers above the old building, stretches between two diagonals. The latter can be derived from the urban planning situation. Thus, the glass joint acts as a link between the two sides of the city, and the light-filled atrium as a semi-public meeting place and access to cultural events.

Carefully uncovered wooden half-timbered structures bear witness to the historical structure in many places on the open ground plans. A staircase made of wood and concrete leads the visitor - following the zenith light - into the foyer of the event cube'. The prism also leads to a terrace on the roof of the old building. The reward is a view towards the citadel and the city centre.

Products

COOL-LITE® ST BRIGHT SILVER on PLANICLEAR®, COOL-LITE® XTREME 60/28, STADIP®, STADIP® SILENCE®, DIAMANT®

COMMERCIAL OFFICES

HILLSIDE OFFICES BUDAPEST

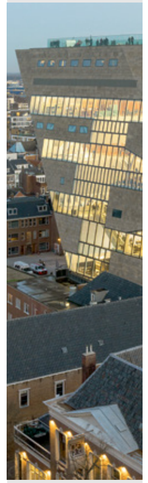
EXCELLENT FACADE EFFECT WITH HIGHLY REFLECTIVE SOLAR CONTROL GLASS FROM SAINT-GOBAIN

Location	Alkotás utca 55-61. District XII, Budapest, Hungary
Architects	Dr. Mihály Zoltán Oláh (Konstruma Mérnökiroda) & Péter Kis (PLANT Atelier), Kristóf Keszthelyi (LEAN TEAM Engineering Office), all Budapest, Hungary
Glass processor	Jüllich Glas Holding, Székesfehérvár, Hungary
Façade maker	NORDIKAL, Budapest, Hungary
Developer	Green Urban Elegant, Budapest, Hungary
General contractor	Market Építő, Budapest, Hungary
Photos	©Judit Sz. Nagy

Elegant, urban, green - these are the words that sum up the HillSide Offices. A vivid working and living area was created in the centre of Budapest, conveniently located west of the Danube. The architects Dr. Mihály Zoltán Oláh (Konstruma-General Designer) and Péter Kis (PLANT Atelier-Design Architect), coordinated by Kristóf Keszthelyi (LEAN TEAM Engineering Office), designed a building that is visible from afar and has a strong impact.

The nested complex is characterised by a horizontal façade structure and reflective surfaces. Restaurants and shops accessible from the street enrich the entire quarter. A total of 22,000 m² of rentable office space extend over seven storeys. Access is granted via a spacious lobby, which is located in the centre of the building as a glass-roofed atrium. On 500 m², high-quality designed zones invite you to linger. From here, four glass lifts take visitors and employees to the top.

The aesthetic façade is designed with glass from SAINT-GOBAIN. On the outside, the reflective solar control glasses **COOL-LITE® ST BRIGHT SILVER on PLANICLEAR®** impress with their extremely high transparency and silvery reflection. As fixed glazing, installed flush with the black parapet panels, they ensure a unified appearance. In the interior behind, **COOL-LITE® XTREME 60/28** guarantees a particularly bright and friendly atmosphere. Every second window can be opened, with enables the user to ventilate his office space himself. The overall concept of the building also convinced at the certification: the HillSide Offices was awarded **LEED Gold**.



ART AND CULTURE

FORUM GRONINGEN

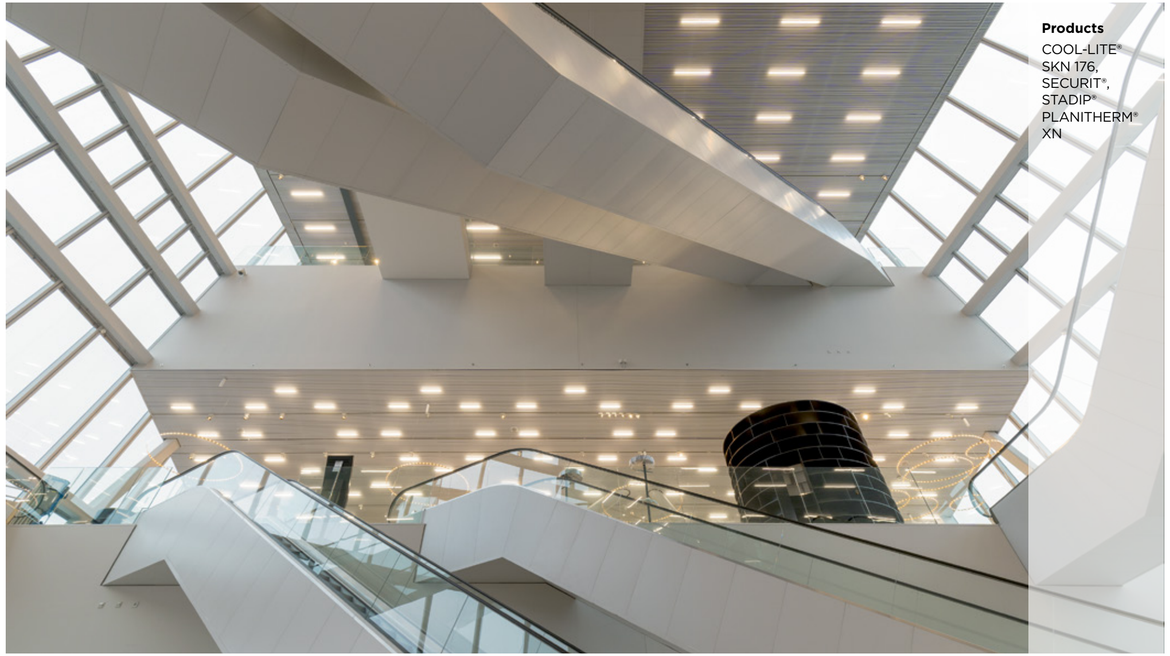
AN INNOVATIVE MIX OF URBAN CULTURE: LARGE GLASS FRONTS OFFER FANTASTIC VIEWS

Location	Nieuwe Markt 1, 9712 KN Groningen, The Netherlands
Architects	NL Architects, Amsterdam, The Netherlands
Glass processor	GLASSOLUTIONS Gevelbouw, Arnhem, The Netherlands
Façade maker	De Groot en Visser, Gorinchem, The Netherlands
General contractor	BAM Bouw en Techniek, Regio Noord, The Netherlands
Photos	©Marcel van der Burg, SGIMB GLASSOLUTIONS

The new center of the university city of Groningen is a «cultural department store». The building was designed by NL Architects and was opened in autumn 2019. The monumental construction offers a completely new mixture of cultural activities of libraries, cinemas and museums.

With the expressive shape and the imposing volume of the Groninger Forum, the city center receives a new impetus. In spite of the exceptional cubature the sharp-edged monolith, with its height of 45 meters, fits surprisingly well in its surroundings. For this it was awarded the renowned Dutch architecture prize of the «Brancheverenigning Nederlandse Architectenbureaus» (BNA) as «Best Building of the Year 2020».

The Forum is characterized by a central space, a unique atrium. The heart of the building is a spatial «interface» that connects all facilities and promotes the confrontation of opinions and the exchange of knowledge and ideas. Like a vertical urban district, it stacks public squares and private spaces over an area of 17,000 m².



Products
COOL-LITE® SKN 176, SECURIT®, STADIP® PLANITHERM® XN

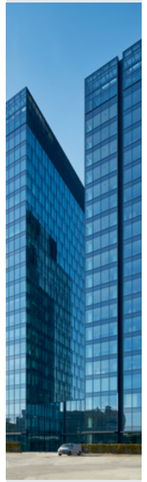
ART AND CULTURE

FORUM GRONINGEN

The pyramid-like geometry gives a pleasant lightness. The spectacular façade of the Groninger Forum attracts the most attention: a dynamic interplay of geometric façade surfaces that are connected to one another at different angles. The large glass surfaces on both sides of the building ensure the open character. They do not only offer a fantastic view of the city, but also make the activities in the building visible from the outside.

The glass for the large atrium façade and for the loopholes was supplied by SAINT-GOBAIN. There is a total of around 2,500 m² of forward and backward inclined glazing, parallelograms and panes with «polygons». The functional glass **COOL-LITE® SKN 176** together with **PLANITHERM® XN** ensures neutrality and high energy efficiency. The special glass **SECURIT®** provides significantly increased resistance to mechanical and thermal stresses than conventional annealed glass.

Products
COOL-LITE® SKN 176 II



COMMERCIAL OFFICES

VARSO 1 & 2

TOP PERFORMANCE WITH COOL-LITE® SKN SOLAR CONTROL GLASS FROM SAINT-GOBAIN

Location	Chmielna st., Warsaw, Poland
Architects	HRA Architekci, Warsaw, Poland
Glass processor	Press Glass, Konopiska, Poland; SAINT-GOBAIN GLASSOLUTIONS, Poland
Façade maker	ALUPROJEKT, WIDOK, Poland
General contractor	HB Reavis Construction, Slovakia
Photos	©SAINT-GOBAIN

The Varso complex with its three towers is probably Warsaw's most prestigious construction project at the moment. The already erected Varso 1 (91 meters) and Varso 2 (81 meters) by HRA Architekci, form a structural and functional unit together with the Varso Tower by Sir Norman Foster. The latter is scheduled for completion in 2021 and will be 310 meters high.

The architects of Varso 1 and Varso 2 rely entirely on the material glass and used triple-glazed, highly selective SAINT-GOBAIN **COOL-LITE® SKN 176 II** solar control glass. Approximately 43,000 m² were used and give the quarter a striking face. The buildings captivate with their streamlined, slender form and transparency.

The foyers provide astonishing views upwards. Avoiding the use of full walls and granting free access for pedestrians throughout the ground floor level, the architects took care of its maximum openness. This area is open to the public and provides access to the shops and cafés. The first NYX hotel will move in here and a Cambridge Innovation Center is being established. The Varso Place mixed-use development is among the first projects of this scale in Europe to become precertified with **WELL**.

COMMERCIAL OFFICES

VARSO 1 & 2

This certificate focuses on the impact of buildings on human well-being. There is a set of sensible built-in solutions making the buildings perfectly suited for safe office work. For example, a sensor system collects data on air temperature, CO_2 content and humidity, thus enabling control of current working conditions. Depending on the configuration, this system can also help to track the flow of traffic in the office, room occupancy and the distance between people, ensuring contact-free movement within the building.

COMMERCIAL OFFICES

THE LIGHT ONE

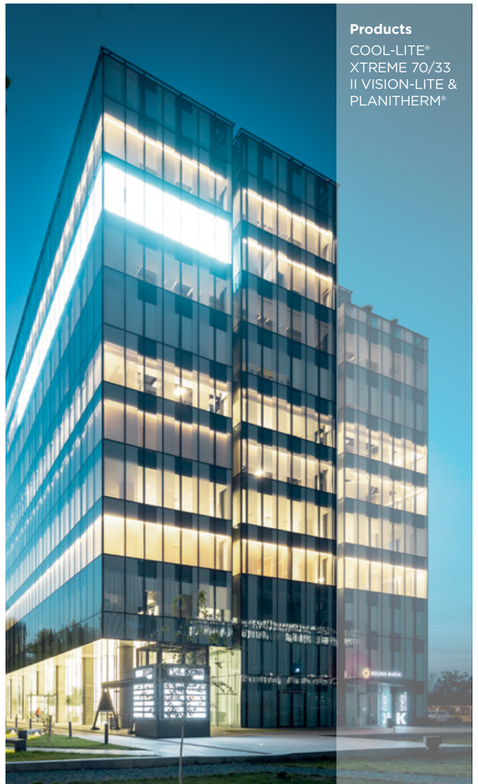
MAXIMUM TRANSPARENCY AND EXCELLENT TECHNICAL STANDARDS – NEW WORKPLACE WITH HIGH-PERFORMANCE GLASSES FROM SAINT-GOBAIN

Location	Bv. Iuliu Maniu 6R, Bucharest, Romania
Architect	M3D Cinetic, Bucharest, Romania
Glass processor	Spectrum Industries, Bucharest, Romania
Photos	©Vlad Patru

BREEAM®

The office building «The Light One» marks the first section of the urban development area «The Light» in Bucharest. The ageless modern design of the high-rise building is particularly impressive with its striking glass façade, which also helps to reduce energy consumption. The sustainable concept of the building complex convinces and was awarded **BREEAM Excellent** in 2020.

«The Light One» is prominently located on Boulevard Iuliu Maniu and with its glass façade and a transparent LED screen running across the corner on the ninth floor, forms a landmark visible from afar. The architecture takes up the rhythm of the new quarter, which connects the Polytechnic University on one hand and the city centre on the other. A two-storey lobby is followed by eleven storeys with around 22,000 m² of rentable space. The facilities in the centre of the building includes access, toilets and installation rooms. For the tenant, this means maximum flexibility in the use of his rooms, which extend between the central core and the room-high glazed window front.



Products

COOL-LITE® XTREME 70/33 II VISION-LITE & PLANITHERM®

COMMERCIAL OFFICES

THE LIGHT ONE

Light plays an essential role in the concept of «The Light One» - both actively and passively. 34,000 m² of **COOL-LITE® XTREME 70/33 II** solar control glass were used. A large part of the panes were provided with a translucent surface using screen printing. This underlines the verticality of the building and brings diffuse light to the inside. In addition, the glazing helps to reduce energy consumption in summer and in winter, which has a positive effect on the environmental performance and thus also on the sustainability certification **BREEAM Excellent**.

HEALTH & CARE

DIPARTIMENTO EMERGENZA URGENZA

SAINT-GOBAIN GLASS PROVIDES DAYLIGHT FOR THE HEALING

Location	Foggia, Italy
Architects	RTP – RPA, Perugia, Italy; Studio Altieri, Thiene (VI), Italy; SVEI, Rome, Italy; Engineering Studio, Cavaliere e Associati, Foggia, Italy; BTC, Bolzano, Italy
Glass processor	Vetrotreria Calasso Luigi, Copertino (LE), Italy; La Tecnica Nel Vetro, Scafati (SA), Italy
Photos	©SAINT-GOBAIN

Foggia is a city of 150,000 inhabitants on the spur of the "Italian boot» in Puglia region. The polyclinic attached to the university there has now been given a new center for emergency medicine and cardiovascular surgery, the Dipartimento Emergenza Urgenza (DEU). The construction work on the 65 million euro building was completed in October. The center is expected to go into operation in April 2021 after installation of all medical technology systems.

The new building, which is embedded in the clinic campus, was constructed as a seven-story cube with two inner courtyards and a solar roof freely arranged above the structure. The planners paid particular attention to the use of color – inside and outside the building. In the building, a color-based guidance system helps with orientation. Outside, on the north side of the building's envelope, the predominant tones are blue, grey and white. They can be seen on color alternating façade panels. Their interaction with the element glass creates an extremely lively appearance. To the main entrance in the south, the building is completely glazed. A steel structure was placed in front of the glass skin. On the one hand, it supports the solar roof, while on the other hand the lamellas embedded in it serve as shading and design element.

Products

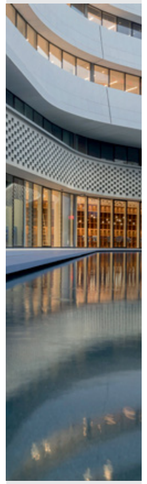
COOL-LITE® SKN 165 II,
STADIP® SILENCE®

HEALTH & CARE

DIPARTIMENTO EMERGENZA URGENZA

A total of 1,800 panes of the highly selective SAINT-GOBAIN solar control glass **CLIMAPLUS® SECURIT® COMFORT** are used on the building envelope. Thanks to its high transmission values, it allows plenty of daylight into the patients' rooms and ensures a pleasant room climate with high energy efficiency at the same time. By using these glasses, the planners take into account the positive effect of daylight on the recovery process. In addition, the high-quality insulation-glass **STADIP® SILENCE®** ensures appropriate acoustic comfort and keeps intrusive noise out.

Products
COOL-LITE® SKN,
CONTRAFLAM®



COMMERCIAL OFFICES

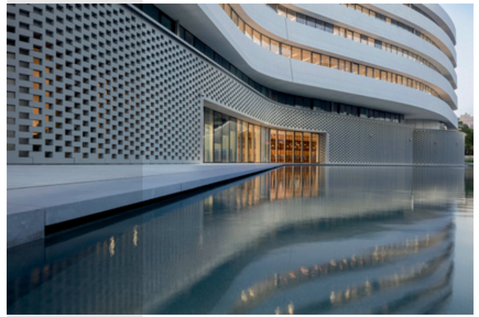
AGEMAR HEADQUARTERS

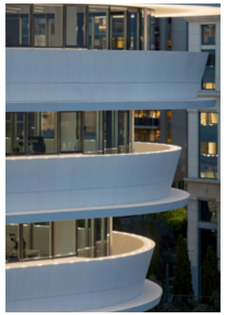
FLOWING SHAPES: PIONEERING ARCHITECTURE WITH FLAT AND CURVED GLASS FROM SAINT-GOBAIN

Location	Athens, Greece
Architects	Rena Sakellaridou, SPARCH architects, Athens, Greece
Glass processor	Vassiliou Glass Technologies, Greece
Photos	©Nikos Daniilidis

The new headquarters of Greece's largest Maritime Transportation Group AGEMAR rises majestically above south-western Athens. It looks like an urban pier and impresses with its sculptural architecture. In addition to the administrative and office facilities, it also contains spaces for the public, such as a museum, library, café and restaurant, as well as a gym and even an amphitheater.

The approximately 30,000 m² large building in the district of Kallithea/Attica is intended to express the connection to the sea. Its long, horizontally flowing lines adapt to the urban scale and set up a dialogue with the intense light of the Athenian sky. During the day, the natural light highlights the volume of the building, while at night the individual elements wriggle out of the darkness. The lighting concept was honored for this at the «darc awards» in the field of architecture and was also nominated for the EU MiesAward 2019.

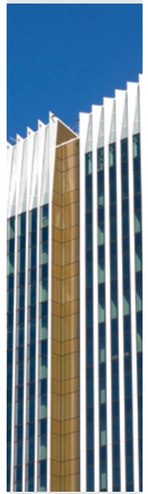




COMMERCIAL OFFICES

AGEMAR HEADQUARTERS

The project is also convincing in terms of sustainability: the successful materiality of white marble, light grey exposed concrete elements, curtain wall panels made of anodised aluminium, supplemented by flat or curved high-performance glass from SAINT-GOBAIN and a vertical garden create a harmonious landmark. It has been certified for its entire composition with the **LEED Platinum** Award for sustainable building. In particular, the insulating glass units (IGU) used the fire-resistant glass **CONTRAFLAM** and the solar control glass **COOL-LITE® SKN** harmonise trendsetting architecture and sophisticated building physics.



COMMERCIAL OFFICES

AGORA TOWER

FIRST BUILDINGS IN THE NEW SUSTAINABLE CITY QUARTER DESIGNED WITH GLASS FACADES BY SAINT-GOBAIN

Location	Váci út, near Árpád bridge, Budapest, Hungary
Architects	Florian Frotscher, Make Architects London, United Kingdom; Prof. Dr. József Finta and Gábor Kiss, FINTA Stúdió Budapest, Hungary
Glass processor	Jüllich Glas Holding, Székesfehérvár, Hungary; SAINT-GOBAIN GLASSOLUTIONS Austria, Eckelt Glas, Steyr, Austria
Developer	HB Reavis Hungary, Budapest, Hungary
Façade maker	ALUFE Fémszerkezeti, Székesfehérvár, Hungary
Photos	©Judit Sz. Nagy

The new Agora quarter is a unique mixed-use commercial and offices development center on Budapest's vibrant Váci út boulevard. Featuring a green area equalling the size of 15 tennis courts, the scheme of project developer on providing an active hub for the local community and bringing modern architectural value to the capital. The first buildings were completed in 2020 with the Agora Tower and Agora Hub.

The development of the entire district is guided by the principles of sustainability and well-being for the community. First high-ranking certifications speak for themselves, for example the pre-certification **BREEAM** Communities and **WELL Gold**.

In order to create an atmosphere of well-being and productivity Concept Designer Florian Frotscher, Make Architects London, and Prof. Dr. József Finta and Gábor Kiss leader designer of Budapest's FINTA Stúdió, designed generously sized squares and buildings.

Products

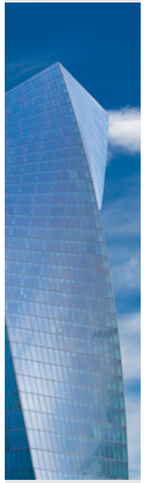
COOL-LITE® XTREME 60/28 (II), COOL-LITE® SKN 176, STADIP®, STADIP® SILENCE®, PLANITHERM® ONE ONTRASTVIEW®

COMMERCIAL OFFICES

AGORA TOWER

Looking at the first completed office buildings their neutral aesthetic are striking in the urban landscape. Jüllich Glas Holding from Székesfehérvár, Hungary, adapted insulating glazing depending on the installation situation and façade orientation. An architectural and visual highlight is provided by goldish **CONTRASTVIEW**®, developed by SAINT-GOBAIN GLASSOLUTIONS Austria, Eckelt Glas. Characteristic for this product is a partial printing on the outside with enamel color and a congruent grey tone, which is burnt onto this enamel color. This process guarantees a 100% congruence of the two color layers to each other. The special feature of using **CONTRASTVIEW**® as façade glass is its appearance: in case of Agora, it shimmers golden from the outside and there is a clear view from inside to outside.

Products
COOL-LITE® XTREME SILVER II



COMMERCIAL OFFICES

PROPERTY TOWER BAKU

SPECIAL TWIST WITH SILVER REFLECTIVE SOLAR CONTROL GLASS FROM SAINT-GOBAIN

Location	Heydar Aliyev Avenue, Baku, Azerbaijan
Architects	Hoffmann - Janz Architects, Vienna, Austria
Glass processor	SAINT-GOBAIN GLASSOLUTIONS Pietta Glass Working, Romania, SAINT-GOBAIN GLASSOLUTIONS, Glas Döring, Berlin, Germany
Façade maker	Metal Yapi, Istanbul, Turkey
Photos	©SAINT-GOBAIN

The Property Tower Baku in the Azerbaijani capital comes currently soon to completion. The spectacular eye-catcher of the 126 meters high skyscraper is the helical 90° rotation of the tower over its 33 floors. The smooth façade of reflective solar protection glass from SAINT-GOBAIN underlines the special dynamics of the architecture. With two striking incisions that look like ventral bandages, the general planners of Hoffmann Janz Architects, Vienna, gave their design an additional special malleable effect.

The heart of the building is a round ferroconcrete core, to which the reinforced concrete ceilings supported by vertical steel columns are connected. Only the steel columns at the corners are inclined and create the characteristic rotation. The building envelope follows this shape with 3.60 meters high and 1.50 meters wide glass elements from the façade specialist Metal Yapi.

The desired reflective silver appearance in the façade structure, provided by **COOL-LITE® XTREME SILVER II** with a solar factor of 0.25 and outstanding selectivity of 2.0 and excellent solar protection. The special effect of the façade allows the Property Tower in Baku to communicate with its surroundings. Depending on the lighting situation, there is a lively interplay between reflection and transparency. And it is behind this meaningful backdrop that the entire state assets of Azerbaijan are to be managed in future.

COMMERCIAL OFFICES

GLATT TOWER

HIGH-RISE BUILDING WITH A SMART STRUCTURAL GLAZED FAÇADE

Location	Zurich, Switzerland
Architects	Ramseier & Associates Zurich, Switzerland
Glass processor	SageGlass®
Façade maker	Krapf AG, Engelburg, Switzerland
Photos	©GLATT

Located between the Zurich city and the airport, the Glatt Tower gleams brightly over the Glatt, Switzerland's highest-revenue shopping mall. Its 12 floors feature fully equipped, modern, cooled rooms, a lobby, and conference and event rooms. The 40-year-old tower, landmark of the Zurich agglomeration, was in need of renovation. The new building shell is made of **SageGlass®**, the smart glass from SAINT-GOBAIN. It unites architecture and sustainability in a revolutionary way.

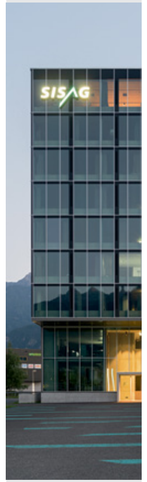
The square floor plan and the external shape of the office tower were retained during the renovation. However, the tower was completely "skeletonized" in order to create a modern room layout and to implement the new façade which consists of more than 1,000 prefabricated façade elements that were fitted from floor to ceiling with triple-insulated electrochromic **SageGlass®**.

The installation of an exterior solar protection was not an option due to the wind loads on the top of the façade. The innovative smart glass eliminates the need for blinds and shades as it automatically adapts to the weather conditions throughout the day. Each façade side silently and automatically changes its light transmission levels and solar factor in response to the measured solar energy with the overall aim of protecting the tower from overheating, effectively reducing air-conditioning costs. **SageGlass®** also keeps the building envelope transparent even when the sun is shining, meaning that the tower's occupants can see out at all times and benefit from the amazing views of the surroundings and a maximized daylight. This creates ideal working conditions for them to be more comfortable and thus concentrate better and be more productive.

Thanks to its dynamic glass façade, the Glatt Tower was able to keep its original shape while also meeting the latest modernity and ecological standards.

Products
SageGlass®

Products
SageGlass®
CLASSIC



COMMERCIAL OFFICES

SISAG CAMPUS

ENERGY EFFICIENCY AT THE HEART OF DESIGN

Location	Schattdorf, Switzerland
Architects	Drost + Dittli Architekten, Turbenthal, Switzerland
Glass processor	SageGlass®
Photos	©Damaris Betancourt

SISAG is one of the two most important Swiss providers of electric control and information systems for cable cars, as well as control and automation systems for other transportation and industrial applications. The SIS campus is a new addition to the company's headquarters in Schattdorf, Switzerland. The new building is 31 meters high and includes production areas, offices, a restaurant, as well as hotel rooms for training course participants. Energy efficiency was of primary importance when designing the new campus. A suitable solution was sought to ensure that this could be maintained, despite the glass façade.

Except for the north side of the building, the entire façade was fitted with dynamic glass by SAINT-GOBAIN SageGlass. This innovative glass can be programmed to tint automatically according to the level of sunlight. External solar protection systems are therefore not required, enabling people in the building to have uninterrupted views of the outdoors. The 4,265 m² of **SageGlass® CLIMATOP CLASSIC** also ensure pleasant room temperatures and prevent glare. The glass is controlled silently, which also contributes to the well-being of employees, guests and visitors.

COMMERCIAL OFFICES

SISAG CAMPUS

The smart glass façade on the new SISAG building significantly reduces air-conditioning costs. Heat can be retained in winter and daylight generates very little heat inside in summer. No air-conditioning or ventilation systems were installed anywhere in the building in Schattdorf. "We only need to cool things down a little in summer and require hardly any heating in winter. In theory, you can almost manage without turning the heater on at all," explains Erich Megert, Delegate of the Board of Directors and Head of Marketing at SISAG. Having uninterrupted views of nature increases job satisfaction, reduces stress and fatigue at work and also promotes good health and well-being.

COMMERCIAL OFFICES

TOMBOLA HOUSE

PERFECT MATCH BETWEEN COMFORT AND HI-TECH

Location	Low Street, Sunderland, United Kingdom
Architect	Ryder Architecture, London, United Kingdom
Glass processor	SageGlass®
Photos	©James Newton

Low Street in the British city of Sunderland was once a place where goods were warehoused and ships were built. Today, it features the new headquarters of Tombola, Europe's biggest online gaming company. As a leading tech company it was important for Tombola to design a high spec and technologically advanced building, which could attract young professionals, and to provide the best possible working environment for its employees.

The building, designed and built by Ryder Architecture and awarded with a prize by the Architects' Journal, embraces the historic industrial architecture of the local area. The main feature of the new headquarters is its trio of roof pitches that merge seamlessly with the longer sides of the red brick outer shell. To contrast this, a fully glazed façade on the eastern side opens up the view of to the river Wear and port beyond.

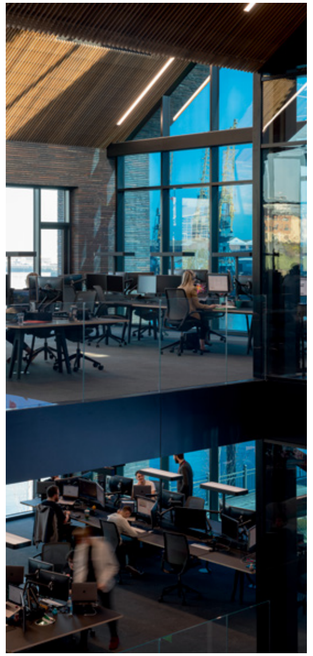
As the design evolved the architects realized that adding internal and external shading systems would spoil the striking appearance of the building. But with Tombola's staff working on computers, controlling glare was essential.

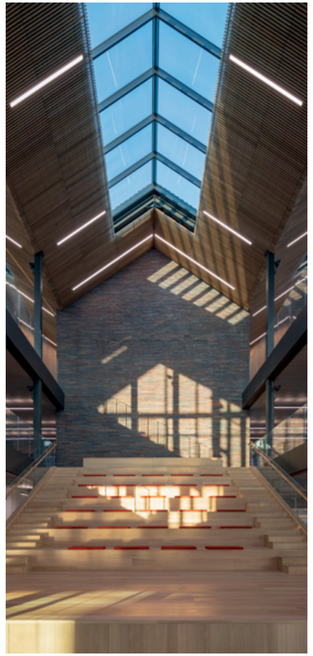
COMMERCIAL OFFICES

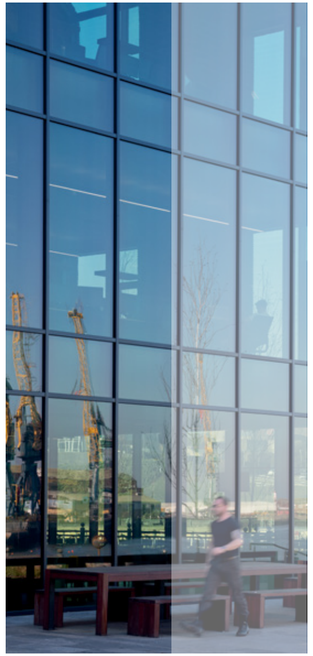
TOMBOLA HOUSE

SageGlass®, the smart glass of SAINT-GOBAIN, was the perfect fit. The 870 m² of **SageGlass**® **CLIMAPLUS**® **GREY** automatically tint in response to the sun, and can thus protect the staff from unwanted glare on their computers. It also improves their comfort by regulating the solar heat entering the room and maintaining the stunning views to the river, having a positive effect on their productivity.

Finally, **SageGlass**® has fully met Tombola's ambitions for the building aesthetically and functionally; the 300-plus employees can enjoy a comfortable and state-of-the-art working environment. And by controlling heat, **SageGlass**® will help reduce the energy consumption, without any mechanical shading altering the design.







Products
SageGlass®
CLASSIC

COMMERCIAL OFFICES

SCOTT SPORTS HEADQUARTERS

SENSITIVE TO SUNLIGHT

Location	Givisiez, Switzerland
Architects	Itten + Brechbühl, Basel, Switzerland
General planner	Sottas, Bulle, Switzerland
Glass processor	SageGlass®
Photos	©Philipp Zinniker

Since 2019, Scott Sports' unbroken innovative spirit has been evident at the company's headquarters in Givisiez, Switzerland. The new building, which will gather up to 600 people on its seven floors, impresses with its sunlight-sensitive façade. While the ground floor manages light and heat thanks to smart glass, from the first floor façade claddings made from micro-perforated aluminum sheets are oriented towards the sun's rays and thus bring dynamism to the outer skin: sometimes the façade looks like a shielding, protective shell, then again sharp-edged, moving and permeable.

The smart glass **SageGlass**® from SAINT-GOBAIN, installed in the high-tech façade on the ground floor, lets in natural light and provides a view of the interior up to a height of three meters, where new bikes are tested. Also, the ceiling has been constructed with deep glulam beams and tintable glass from **SageGlass**®. This allows for varying plays of light in the elongated, spacious room. According to the architects, the electrochromic glass mediates between inside and outside.

COMMERCIAL OFFICES

SCOTT SPORTS HEADQUARTERS

SageGlass® automatically tints or clears depending on the amount of sunlight. This means that additional shading elements can be dispensed with without having to compromise on interior comfort. While the entry of glare and heat or cold from the glazing are reduced, the view to the outside remains unobstructed and the incidence of daylight remains as high as possible. Thus, creating a unique and comfortable environment for visitors and employees alike.

The new headquarters also shines bright on the sustainability level. The building is Europe's first to operate a simultaneous heating, ventilation and acoustics management system. This helps ensure a sustainable energy supply and careful use of resources.

COMMERCIAL OFFICES

PENNSYLVANIA HOUSING FINANCE AGENCY HEADQUARTERS

THE CHALLENGE TAKEN FOR A PASSIVE HOUSE BUILDING

Location	Harrisburg, Pennsylvania, USA
Architects	Murray Associates Architects, Harrisburg (PA) USA
Glass processor	SageGlass®
Photos	©Don Pearse Photographers

Zertifiziertes Passivhaus
Passivhaus Institut

The Pennsylvania Housing Finance Agency (PHFA) provides home ownership and rental financing support for individuals and families with special housing needs. In this capacity, they also support sustainable design and construction practices. When the opportunity came to renovate their headquarters in Harrisburg, PA, they knew they needed to "walk the walk" on sustainability, demonstrating both their own commitment and the ability to achieve high-performance targets in a cost effective manner. PHFA originally aimed for a LEED certification, but then challenged the architect, Murray Associates, towards the end of the design phase to pursue a **Passive House** certification. The main issue of their existing design was the highly glazed façade, which created solar heat gain issues and could make a Passive House certification difficult. The architect found the solution in **SageGlass**®, the smart glass of SAINT-GOBAIN. He said: "If we didn't use dynamic glass, we would have had to offset the energy loss elsewhere, such as adding solar panels or other energy saving elements to the design, and this building was right at the limit". The electrochromic glass works invisibly in the background to manage energy, harvesting solar heat in winter and limiting it in summer to reduce the use of HVAC. It also helps create a comfortable space with maximum natural light and permanent vision to the outdoors. In addition, the cost impact of adding **SageGlass**® in the design wasn't significant in comparison to a standard glazing with mechanical shades, especially once considering user benefits and ease of operation for the PHFA team and staff members.

COMMERCIAL OFFICES

PENNSYLVANIA HOUSING FINANCE AGENCY HEADQUARTERS

While achieving the **Passive House** certification along with occupant comfort and wellness goals was the most important, it was also about sending a broader message to the design community about what's possible.

Products
CONTRAFLAM 30, STADIP®, PLANIDUR®, PLANITHERM® ONE, SECURIT®-H

COMMERCIAL OFFICES

ZUGSPITZE MOUNTAIN STATION

SAFETY HIGHLIGHT

Location	Zugspitze, Germany
Architects	Sebastian Kroesen of Hasenauer Architects, Saalfelden am Steinernen Meer, Germany
Glass processor	Vetrotech SAINT-GOBAIN
Façade maker	Stahlbau Pichler, Bolzano, Italy
Photos	©Christoph Seelbach, VETROTECH SAINT-GOBAIN

The altitude, prevailing weather conditions at the Bavarian Zugspitze summit at just under 3,000 meters above sea level, geological factors and logistics posed enormous challenges for the project. This also applied to the transport of Vetrotech SAINT-GOBAIN's fire-resistant glass panes, which, like all other materials, had to be transported from an interim storage facility at 1,200 meters to the construction site using a separate material cableway, and installed at the mountain station by the Stahlbau Pichler company from Bolzano. Inside the station, the 176-square-meter **CONTRAFLAM** glass panes supplied by Vetrotech SAINT-GOBAIN for various different superstructures provide above all for safety at points of transition between individual areas of use as doors, windows or fire-protection walls.

An oasis of peace and safety

Sebastian Kroesen of Hasenauer Architects, who supervised the project from planning to completion, is especially pleased to have succeeded in creating an oasis of peace at the mountain station despite the rush of visitors. The design and furnishings of the restaurant and catering areas, for example, create a visually and factually quiet environment thanks to the selection of appropriate sound-absorbing materials. Safety is ensured both inside the restaurant and at the exits and transition points (at stairwells, for instance) by **CONTRAFLAM 30** fire-resistant glass, **STADIP**® 66.2 laminated safety glass made of **PLANIDUR**®, **PLANITHERM**® **ONE** and **SECURIT®-H** tested single-pane safety glass. A strong aesthetic accent is set by the parallelogram-shaped glass panes, which allow a view of the cable car technology from the restaurant. To ensure that the glass panes would survive the roughly 3,000-meter ascent to the summit undamaged, they were fitted with pressure-equalization valves, which were then removed prior to installation.

COMMERCIAL OFFICES

ZUGSPITZE MOUNTAIN STATION

The use of this high-performance glass made it possible to provide for fire-safety in the mountain station while ensuring that the full effects of the optimum transparency and closeness to nature envisaged by the planners can be experienced on all levels. The mountain station is thus a further example of how Vetrotech SAINT-GOBAIN, in cooperation with its partners, develops solutions that meet the highest project-specific requirements.

COMMERCIAL OFFICES

SALESFORCE TRANSIT CENTER

STUNNING FLOOR/SKYLIGHT FEATURE THE FIRST OF ITS KIND IN THE US

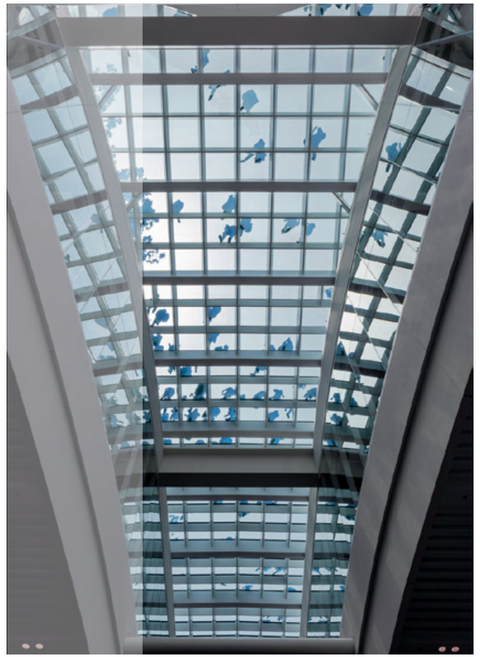
Location	San Francisco, United States
Architects	Pelli Clark Pelli Architects, New Haven (CT), United States
Glass processor	Vetrotech SAINT-GOBAIN
Photos	©James Z. Wu, Vetrotech SAINT-GOBAIN

Award-winning Pelli Clark Pelli Architects designed the Salesforce Transit Center with "soaring light-filled spaces" to give "San Francisco a grand entrance that befits its status as one of the world's great cities." Inside the airy and spacious Grand Hall, sunshine is filtered more than 30 meter below the center's above-street-level park by the **CONTRAFLAM 120** and **LITE-FLOOR** walkable fire-rated glass floor and skylight. More than 4,000 sheets of glass make up almost 300 panels, providing daylight for the Grand Hall. A second installation brings natural light down below street level.

"When ground broke on this project, this technology didn't exist," says Kevin Norcross, General Manager, Vetrotech SAINT-GOBAIN North America. "It has very specific specifications that have never been incorporated into a single project, ever. The fire rating, combined with the loading requirements and seismic resistance make it an engineering feat. It's a testament to the innovation of our team."

Pelli Clarke Pelli specified the most demanding requirements for a fire-rated glass floor and skylight to date for this project, and the solution is the only exterior multi-panel system to meet some of the world's most stringent specifications and pass all tests, including two-hour fire rating and seismic-resistance, live loading for foot traffic and waterproofing.

Products
CONTRAFLAM 120, LITE-FLOOR



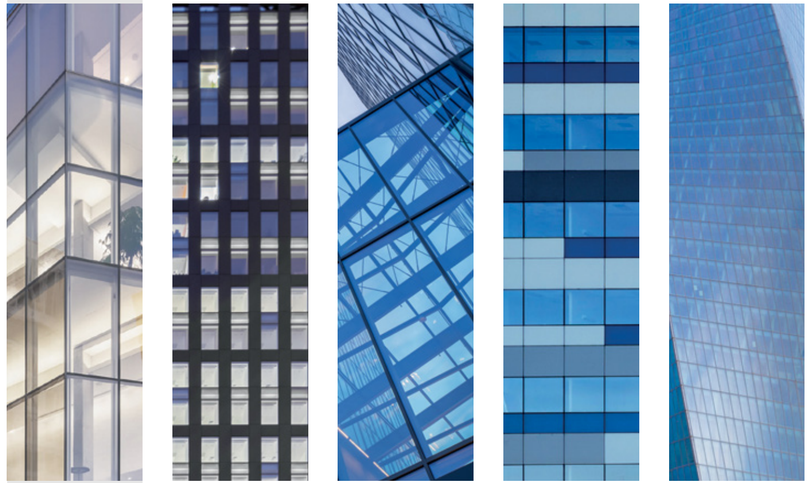
COMMERCIAL OFFICES

SALESFORCE TRANSIT CENTER

Teams from Vetrotech SAINT-GOBAIN and Greenlite Glass Systems Inc. worked in close collaboration with Roger Wilde, RDH, Larson Engineering and Pelli Clarke Pelli to on a design-assist for the project. Experts came together and used the combined decades of experience to produce and rigorously test an innovative, multifunctional solution involving horizontal fire-rated glass, structural glass, and spacers with airgaps to avoid replacing glass due to dirt and condensation issues that would develop with foot traffic and the outdoor environment.

"Architectural design is, in some ways, about imagining the unimaginable and bringing it to life," said Darin Cook, senior associate principal with Pelli Clarke Pelli. "It became clear to us early on that the floor/skylight wasn't going to be an off-the-shelf solution that just anyone could bid, price and build. We're very happy with what Vetrotech SAINT-GOBAIN and Greenlight came up with—it helps push the limits of opportunity in our industry."

Each panel of the floor was designed to fit a specific area, and fit in concert with the unique function of the building—including special seismic protections that allow certain areas to move independently of others in case of earthquakes.



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

How to read our product names

basic performance	TL	g-value/solar factor	processing
COOL-LITE® XTREME 70/33 II			
XTREME = Extremely selective solar control coatings (triple silver) with reinforced thermal insulation	in double glass unit with 6 | 16 | 4	in double glass unit with 6 | 16 | 4	II = to be tempered

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

basic performance	color	substrate	TL	processing
COOL-LITE® SKN 183 II				
K = K-value (Ug-value)	B = blue	0 = DIAMANT	at 6 mm mono pane	II = to be tempered
S = high selective	G = golden	1 = PLANICLEAR		
T = temperable	N = neutral	2 = PARSOL BRONZE		
		3 = PARSOL GREY		
		4 = PARSOL GREEN		
		7 = PARSOL SAPHIRE BLUE		

Key performance factors

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.

Light transmission (LT)
Percentage of visible light directly transmitted through the glass.

Reflection inside (LRi)
Percentage of visible light directly reflected from the interior glass surface.

Reflection outside (LRe)
Percentage of visible light directly reflected from the exterior glass surface.

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.

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.

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.

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.

EUROPE

CLIMAPLUS® DOUBLE GLAZING UNITS

Values given according to the standards
[1]EN 410, [2]EN 673 and [3]EN ISO 140-3/717-1

coating / to be tempered / annealed	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 [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 for double glazing unit CLIMAPLUS® (6 | 16 | 4 mm, 90% Argon) on PLANICLEAR® or DIAMANT®															
COOL-LITE® XTREME 70/33 II DIAMANT® with EASYPRO	extra clear	71	0.33	0.38	2.15	11	13	1.0	25.0	35(-1;-5)		to be tempered		yes	
COOL-LITE® XTREME 70/33 DIAMANT®	extra clear	71	0.33	0.38	2.15	11	13	1.0	25.0	35(-1;-5)					
COOL-LITE® XTREME 70/33 II with EASYPRO	neutral	70	0.33	0.38	2.12	11	13	1.0	25.0	35(-1;-5)		to be tempered		yes	
COOL-LITE® XTREME 70/33	neutral	70	0.33	0.38	2.12	11	13	1.0	25.0	35(-1;-5)					
COOL-LITE® XTREME 60/28 II DIAMANT® with EASYPRO	extra clear	62	0.28	0.33	2.21	15	17	1.0	25.0	35(-1;-5)		to be tempered		yes	
COOL-LITE® XTREME 60/28 DIAMANT®	extra clear	61	0.28	0.33	2.18	14	17	1.0	25.0	35(-1;-5)					
COOL-LITE® XTREME 60/28 II with EASYPRO	neutral	61	0.28	0.32	2.18	14	17	1.0	25.0	35(-1;-5)		to be tempered		yes	
COOL-LITE® XTREME 60/28	neutral	60	0.28	0.32	2.14	14	17	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	
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	
COOL-LITE® XTREME 50/22 II DIAMANT® with EASYPRO	extra clear	48	0.21	0.24	2.29	16	18	1.0	25.0	35(-1;-5)		to be tempered		yes	
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	
COOL-LITE® SKN for double glazing unit CLIMAPLUS® (6 | 16 | 4 mm, 90% Argon) on PLANICLEAR® or DIAMANT®															
NEW COOL-LITE® SKN 083 II with EASYPRO	extra clear	76	0.41	0.47	1.85	12	13	1.0	25.0	35(-1;-5)		to be tempered			
NEW COOL-LITE® SKN 083	extra clear	76	0.41	0.47	1.85	12	13	1.0	25.0	35(-1;-5)					
NEW COOL-LITE® SKN 183 II with EASYPRO	neutral	75	0.40	0.46	1.88	12	13	1.0	25.0	35(-1;-5)		to be tempered			
NEW 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 with EASYPRO	extra clear	71	0.38	0.44	1.87	13	15	1.0	25.0	35(-1;-5)		to be tempered	yes[8]	yes	
COOL-LITE® SKN 076	extra clear	71	0.38	0.44	1.87	13	15	1.0	25.0	35(-1;-5)					
COOL-LITE® SKN 176 II with EASYPRO	neutral	70	0.37	0.43	1.89	13	15	1.0	25.0	35(-1;-5)		to be tempered	yes[8]	yes	
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 with EASYPRO	extra clear	62	0.35	0.40	1.77	17	19	1.0	25.0	35(-1;-5)		to be tempered	yes[8]	yes	
COOL-LITE® SKN 065	extra clear	62	0.35	0.40	1.77	17	18	1.0	25.0	35(-1;-5)			yes[8]		
COOL-LITE® SKN 165 II with EASYPRO	neutral	61	0.34	0.39	1.79	16	19	1.0	25.0	35(-1;-5)		to be tempered	yes[8]	yes	
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 with EASYPRO	extra clear	53	0.29	0.33	1.83	18	23	1.0	25.0	35(-1;-5)		to be tempered	yes[8]	yes	
COOL-LITE® SKN 054	extra clear	53	0.29	0.33	1.83	19	23	1.0	25.0	35(-1;-5)			yes[8]		
COOL-LITE® SKN 154 II with EASYPRO	neutral	52	0.28	0.32	1.85	18	23	1.0	25.0	35(-1;-5)		to be tempered	yes[8]	yes	
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 145	neutral	41	0.22	0.25	1.86	19	15	1.1	25.0	35(-1;-5)					
COOL-LITE® SKN 044 II with EASYPRO	extra clear	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 with EASYPRO	neutral	42	023	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.

CLIMAPLUS® DOUBLE GLAZING UNITS

Values given according to the standards
[1]EN 410, [2]EN 673 and [3]EN ISO 140-3/717-1

coating / to be tempered / annealed	with EASYPRO on demand	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 [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 (with PLANITHERM® XN on face #3) for double glazing unit CLIMAPLUS® (6 | 16 | 4 mm, 90% Argon) on PLANICLEAR®																
COOL-LITE® KBT 140		blue	37	0.27	0.31	1.37	23	14	1.1	25.0	35(-1;-5)		temperable			
COOL-LITE® KG 137 ANNEALED		golden	35	0.27	0.31	1.30	30	25	1.1	25.0	35(-1;-5)					
COOL-LITE® KG 137 TEMPERED		golden	34	0.28	0.32	1.21	33	28	1.1	25.0	35(-1;-5)		to be tempered			
COOL-LITE® KN 166 II	yes	neutral	60	0.39	0.45	1.54	20	22	1.0	25.0	35(-1;-5)		to be tempered			
COOL-LITE® KNT 164		neutral	58	0.42	0.49	1.38	13	7	1.1	25.0	35(-1;-5)		temperable	yes		
COOL-LITE® KNT 155		neutral	48	0.35	0.44	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 138 II		silver	37	0.25	0.29	1.48	38	17	1.1	25.0	35(-1;-5)		to be tempered			
COOL-LITE® KS 147		silver	43	0.30	0.34	1.26	42	34	1.1	25.0	35(-1;-5)		temperable			
COOL-LITE® ST (with PLANITHERM® XN on face #3) for double glazing unit CLIMAPLUS® (6 | 16 | 4 mm, 90% Argon) on PLANICLEAR®																
COOL-LITE® ST BRIGHT SILVER DIAMANT®		silver	63	0.52	0.60	1.21	32	31	1.1	25.0	35(-1;-5)	yes	temperable	yes	yes	yes
COOL-LITE® ST BRIGHT SILVER PLANICLEAR®		silver	61	0.51	0.58	1.20	32	31	1.1	25.0	35(-1;-5)	yes	temperable	yes	yes	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	yes
COOL-LITE® ST 150		neutral	46	0.38	0.44	1.21	19	19	1.1	25.0	35(-1;-5)	yes	temperable	yes	yes	yes
COOL-LITE® ST 136		grey	34	0.28	0.32	1.21	23	20	1.1	25.0	35(-1;-5)	yes	temperable	yes		yes
COOL-LITE® STB 136		blue	33	0.28	0.32	1.18	19	17	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 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 for double glazing unit CLIMAPLUS® (4 | 16 | 4 mm, 90% Argon) on PLANICLEAR® or DIAMANT®																
PLANITHERM® XN II DIAMANT®	yes	extra clear	83	0.67	0.77	1.24	12	12	1.1	20.0	31(-1;-4)		to be tempered		yes	
PLANITHERM® XN DIAMANT®		extra clear	83	0.67	0.77	1.24	12	12	1.1	20.0	31(-1;-4)					
PLANITHERM® XN II	yes	neutral	82	0.65	0.75	1.26	12	12	1.1	20.0	31(-1;-4)		to be tempered		yes	
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 clear	73	0.54	0.62	1.35	22	22	1.0	20.0	31(-1;-4)		to be tempered		yes	
PLANITHERM® ONE DIAMANT®		extra clear	73	0.53	0.61	1.38	23	23	1.0	20.0	31(-1;-4)					
PLANITHERM® ONE II	yes	neutral	72	0.53	0.61	1.36	22	23	1.0	20.0	31(-1;-4)		to be tempered		yes	
PLANITHERM® ONE		neutral	72	0.52	0.60	1.38	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.

CLIMAPLUS® DOUBLE GLAZING UNITS

Values given according to the standards
[1]EN 410, [2]EN 673 and [3]EN ISO 140-3/717-1

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 [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 for double glazing unit CLIMAPLUS® (4 | 16 | 4 mm, 90% Argon) on PLANICLEAR® or DIAMANT®															
ECLAZ® II DIAMANT®	extra clear	84	0.73	0.83	1.15	12	12	1.1	20.0	31(-1;-4)		to be tempered			
ECLAZ® DIAMANT®	extra clear	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 clear	80	0.61	0.71	1.31	16	18	1.0	20.0	31(-1;-4)		to be tempered			
ECLAZ® ONE DIAMANT®	extra clear	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)					
BIOCLEAN XTREME 60/28	neutral	56	0.26	0.30	2.15	17	18	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)					
VISION-LITE on DIAMANT® for anti reflectance															
VISION-LITE (laminated glass 44.1) DIAMANT®	extra clear	97	0.85	0.97	1.14	1	1	5.6	20.0	34(-1;-3)					
VISION-LITE II DIAMANT® (6 mm)	extra clear	98	0.87	0.99	1.13	1	1	5.7	15.0	32(-1;-2)		to be tempered			
SEMI VISION-LITE II (6 mm)	extra clear	94	0.88	1.01	1.07	5	5	5.7	15.0	32(-1;-2)		to be tempered			
SEMI VISION-LITE (6 mm)	extra clear	94	0.89	1.03	1.06	5	5	5.7	15.0	32(-1;-2)					

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.

CLIMATOP TRIPLE GLAZING UNITS

Values given according to the standards
[1]EN 410, [2]EN 673 and [3]EN ISO 140-3/717-1

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 [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 (with PLANITHERM® XN on face #5) for triple glazing unit CLIMATOP (6 | 12 | 4 | 12 | 4 mm, 90% Argon) on PLANICLEAR® or DIAMANT®															
COOL-LITE® XTREME 70/33 II DIAMANT® with EASYPRO	extra clear	65	0.31	0.36	2.10	13	16	0.7	35.0	36(-1;-5)		to be tempered		yes	
COOL-LITE® XTREME 70/33 DIAMANT®	extra clear	65	0.31	0.36	2.10	13	16	0.7	35.0	36(-1;-5)					
COOL-LITE® XTREME 70/33 II with EASYPRO	neutral	63	0.31	0.35	2.03	13	16	0.7	35.0	36(-1;-5)		to be tempered		yes	
COOL-LITE® XTREME 70/33	neutral	63	0.31	0.36	2.03	13	16	0.7	35.0	36(-1;-5)					
COOL-LITE® XTREME 60/28 II DIAMANT® with EASYPRO	extra clear	57	0.27	0.31	2.11	16	19	0.7	35.0	36(-1;-5)		to be tempered		yes	
COOL-LITE® XTREME 60/28 DIAMANT®	extra clear	56	0.27	0.31	2.07	16	19	0.7	35.0	36(-1;-5)					
COOL-LITE® XTREME 60/28 II with EASYPRO	neutral	55	0.26	0.30	2.12	16	19	0.7	35.0	36(-1;-5)		to be tempered		yes	
COOL-LITE® XTREME 60/28	neutral	55	0.26	0.30	2.12	15	19	0.7	35.0	36(-1;-5)					
COOL-LITE® XTREME SILVER II DIAMANT®	bright silver	46	0.24	0.27	1.92	31	20	0.7	35.0	36(-1;-5)		to be tempered		yes	
COOL-LITE® XTREME SILVER II	silver	45	0.23	0.27	1.96	30	20	0.7	35.0	36(-1;-5)		to be tempered		yes	
COOL-LITE® XTREME 50/22 II DIAMANT® with EASYPRO	extra clear	44	0.20	0.23	2.20	17	20	0.7	35.0	36(-1;-5)		to be tempered		yes	
COOL-LITE® XTREME 50/22 II with EASYPRO	neutral	43	0.19	0.22	2.26	17	20	0.7	35.0	36(-1;-5)		to be tempered		yes	
COOL-LITE® SKN (with PLANITHERM® XN on face #5) for triple glazing unit CLIMATOP (6 | 12 | 4 | 12 | 4 mm, 90% Argon) on PLANICLEAR® or DIAMANT®															
NEW COOL-LITE® SKN 083 II with EASYPRO	extra clear	69	0.38	0.44	1.82	15	16	0.7	35.0	36(-1;-5)		to be tempered			
NEW COOL-LITE® SKN 083	extra clear	69	0.38	0.44	1.82	15	16	0.7	35.0	36(-1;-5)					
NEW COOL-LITE® SKN 183 II with EASYPRO	neutral	68	0.37	0.43	1.84	14	16	0.7	35.0	36(-1;-5)		to be tempered			
NEW COOL-LITE® SKN 183	neutral	68	0.37	0.43	1.84	14	16	0.7	35.0	36(-1;-5)					
COOL-LITE® SKN 076 II with EASYPRO	extra clear	65	0.35	0.37	1.86	15	18	0.7	35.0	36(-1;-5)		to be tempered	yes[8]	yes	
COOL-LITE® SKN 076	extra clear	65	0.35	0.41	1.86	15	18	0.7	35.0	36(-1;-5)					
COOL-LITE® SKN 176 II with EASYPRO	neutral	64	0.34	0.40	1.88	15	17	0.7	35.0	36(-1;-5)		to be tempered	yes[8]	yes	
COOL-LITE® SKN 176	neutral	64	0.34	0.40	1.88	15	17	0.7	35.0	36(-1;-5)					
COOL-LITE® SKN 065 II with EASYPRO	extra clear	57	0.32	0.37	1.78	18	21	0.7	35.0	36(-1;-5)		to be tempered	yes[8]	yes	
COOL-LITE® SKN 065	extra clear	57	0.32	0.37	1.78	18	20	0.7	35.0	36(-1;-5)			yes[8]		
COOL-LITE® SKN 165 II with EASYPRO	neutral	55	0.31	0.36	1.77	18	20	0.7	35.0	36(-1;-5)		to be tempered	yes[8]	yes	
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 with EASYPRO	extra clear	49	0.27	0.31	1.81	19	24	0.7	35.0	36(-1;-5)		to be tempered	yes[8]	yes	
COOL-LITE® SKN 054	extra clear	49	0.27	0.31	1.81	20	24	0.7	35.0	36(-1;-5)			yes[8]		
COOL-LITE® SKN 154 II with EASYPRO	neutral	47	0.26	0.30	1.81	19	23	0.7	35.0	36(-1;-5)		to be tempered	yes[8]	yes	
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 145	neutral	37	0.20	0.23	1.85	20	17	0.7	35.0	36(-1;-5)					
COOL-LITE® SKN 044 II with EASYPRO	extra clear	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 with EASYPRO	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.

CLIMATOP TRIPLE GLAZING UNITS

Values given according to the standards
[1]EN 410, [2]EN 673 and [3]EN ISO 140-3/717-1

coating / to be tempered / annelead	with EASYPRO on demand	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 [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	processing possibilities: lamination tested towards PVB[4]	processing possibilities: bending[5]	processing possibilities: screenprinting & enamelling[6]
COOL-LITE® K (with PLANITHERM® XN on face #3 and #5) for triple glazing unit CLIMATOP (6 | 12 | 4 | 12 | 4 mm, 90% Argon) on PLANICLEAR®																
COOL-LITE® KBT 140		blue	33	0.24	0.27	1.38	24	16	0.7	35.0	36(-1;-5)		temperable			
COOL-LITE® KG 137 ANNEALED		golden	31	0.24	0.28	1.29	30	26	0.7	35.0	36(-1;-5)					
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® KN 166 II	yes	neutral	55	0.34	0.39	1.62	21	23	0.7	35.0	36(-1;-5)		to be tempered			
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	0.24	0.27	1.42	23	12	0.7	35.0	36(-1;-5)		temperable	yes		
COOL-LITE® KS 138 II		silver	33	0.22	0.26	1.50	39	19	0.7	35.0	36(-1;-5)		to be tempered			
COOL-LITE® KS 147		silver	39	0.27	0.31	1.44	43	33	0.7	35.0	36(-1;-5)					
COOL-LITE® ST (with PLANITHERM® XN on face #3 and #5) for triple glazing unit CLIMATOP (6 | 12 | 4 | 12 | 4 mm, 90% Argon on PLANICLEAR®																
COOL-LITE® ST BRIGHT SILVER DIAMANT®		silver	58	0.45	0.52	1.29	34	31	0.7	35.0	36(-1;-5)	yes	temperable	yes	yes	yes
COOL-LITE® ST BRIGHT SILVER PLANICLEAR®		silver	56	0.44	0.50	1.27	33	30	0.7	35.0	36(-1;-5)	yes	temperable	yes	yes	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	yes
COOL-LITE® ST 150		neutral	42	0.33	0.37	1.27	20	21	0.7	35.0	36(-1;-5)	yes	temperable	yes	yes	yes
COOL-LITE® ST 136		grey	31	0.24	0.27	1.29	23	21	0.7	35.0	36(-1;-5)	yes	temperable	yes		yes
COOL-LITE® STB 136		blue	30	0.24	0.27	1.25	19	19	0.7	35.0	36(-1;-5)	yes	temperable	yes		yes
COOL-LITE® ST 120		silver	17	0.15	0.17	1.13	32	27	0.7	35.0	36(-1;-5)	yes	temperable	yes		yes
COOL-LITE® STB 120		blue	18	0.15	0.18	1.20	21	29	0.7	35.0	36(-1;-5)	yes	temperable	yes		yes
Low-E coating for triple glazing unit CLIMATOP (4 | 12 | 4 | 12 | 4 mm, 90% Argon) on PLANICLEAR® or DIAMANT®																
PLANITHERM® XN II DIAMANT®	yes	extra clear	76	0.56	0.64	1.36	15	15	0.7	30.0	32(-1;-5)		to be tempered		yes	
PLANITHERM® XN DIAMANT®		extra clear	76	0.56	0.64	1.36	15	15	0.7	30.0	32(-1;-5)					
PLANITHERM® XN II	yes	neutral	74	0.54	0.62	1.37	14	14	0.7	30.0	32(-1;-5)		to be tempered		yes	
PLANITHERM® XN		neutral	74	0.54	0.62	1.37	14	14	0.7	30.0	32(-1;-5)					
PLANITHERM® ONE II DIAMANT®	yes	extra clear	60	0.40	0.46	1.50	33	33	0.7	30.0	32(-1;-5)		to be tempered		yes	
PLANITHERM® ONE DIAMANT®		extra clear	60	0.39	0.44	1.54	33	33	0.7	30.0	32(-1;-5)					
PLANITHERM® ONE II	yes	neutral	59	0.39	0.45	1.51	32	32	0.7	30.0	32(-1;-5)		to be tempered		yes	
PLANITHERM® ONE		neutral	59	0.38	0.43	1.55	32	32	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.

CLIMATOP TRIPLE GLAZING UNITS

Values given according to the standards
[1]EN 410, [2]EN 673 and [3]EN ISO 140-3/717-1

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 [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	processing possibilities: lamination tested towards PVB[4]	processing possibilities: bending[5]	processing possibilities: screenprinting & enamelling[6]
Low-E coating for triple glazing unit CLIMATOP (4 | 12 | 4 | 12 | 4 mm, 90% Argon) on PLANICLEAR® or DIAMANT®															
ECLAZ® II DIAMANT®	extra clear	78	0.61	0.70	1.28	15	15	0.7	30.0	32(-1;-5)		to be tempered			
ECLAZ® DIAMANT®	extra clear	79	0.62	0.71	1.27	15	15	0.7	30.0	32(-1;-5)					
ECLAZ® II	neutral	76	0.59	0.68	1.29	14	14	0.7	30.0	32(-1;-5)		to be tempered			
ECLAZ®	neutral	77	0.60	0.69	1.28	14	14	0.7	30.0	32(-1;-5)					
ECLAZ® ONE II DIAMANT®	extra clear	70	0.48	0.55	1.46	24	24	0.7	30.0	32(-1;-5)		to be tempered			
ECLAZ® ONE DIAMANT®	extra clear	72	0.48	0.55	1.50	21	21	0.7	30.0	32(-1;-5)					
ECLAZ® ONE II	neutral	69	0.47	0.54	1.47	23	23	0.7	30.0	32(-1;-5)		to be tempered			
ECLAZ® ONE	neutral	70	0.47	0.54	1.49	21	21	0.7	30.0	32(-1;-5)					
BIOCLEAN (with PLANITHERM® XN on face [#3 and] #5) for triple glazing unit CLIMATOP (6 | 12 | 4 | 12 | 4 mm, 90% Argon) PLANICLEAR® for easy maintenance															
BIOCLEAN II	neutral	71	0.53	0.61	1.34	17	17	0.7	35.0	36(-1;-5)		to be tempered			
BIOCLEAN	neutral	69	0.52	0.60	1.33	17	16	0.7	35.0	36(-1;-5)					
BIOCLEAN XTREME 60/28	neutral	51	0.24	0.28	2.13	18	20	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	21	15	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 /12mm Air Space / 6mm with coating on surface #2.

Product[1]	Light Transmittance LT (%)	SHGC	Shading Coefficient SC	LSG Selectivity	External Light Reflectance LRe (%)	U-Value (NFRC) W/m²K: Internal Light Reflectance LRi (%)	U-Value (NFRC) W/m²K: 12mm air	U-Value (NFRC) W/m²K: 12mm air (R)	U-Value Btu/(h.ft².F): 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 II4	70	0.30	0.34	2.33	11	13	1.62	0.62	1.40	0.28	0.25			21053
COOL-LITE® XTREME 60/28 II4	61	0.26	0.30	2.34	14	17	1.63	0.61	1.41	0.29	0.25			21068
COOL-LITE® XTREME 50/22 II	47	0.20	0.23	2.35	16	18	1.61	0.62	1.39	0.28	0.24			21076
COOL-LITE® SKN 183 II4	74	0.36	0.42	2.05	13	13	1.63	0.61	1.41	0.29	0.25			20896
COOL-LITE® SKN 176 II4	68	0.34	0.39	2.00	13	15	1.60	0.67	1.39	0.28	0.25			21100
COOL-LITE® SKN 165 II4	60	0.31	0.35	1.94	16	17	1.63	0.61	1.41	0.28	0.25			21112
COOL-LITE® SKN 154 II3,4	50	0.26	0.30	1.93	18	265	1.61	0.62	1.39	0.28	0.25	yes		21136
COOL-LITE® SKN 144 II	40	0.22	0.26	1.78	20	12	1.64	0.61	1.42	0.29	0.25			21160
COOL-LITE® KNT 164	57	0.46	0.53	1.25	14	10	1.87	0.53	1.67	0.33	0.29	yes		21176
COOL-LITE® KNT 155	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	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	60	0.37	0.43	1.63	22	25	1.63	0.61	1.41	0.29	0.25			21224
COOL-LITE® ST 167	60	0.60	0.69	1.01	22	23	2.67	0.37	2.53	0.47	0.45	yes	yes	21232
COOL-LITE® ST 150	46	0.46	0.55	0.97	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	71	0.30	0.35	2.36	11	13	1.62	0.62	1.4	0.28	0.25			21056
COOL-LITE® XTREME 60/28 II DIAMANT®4	62	0.26	0.30	2.29	15	17	1.63	0.61	1.41	0.29	0.25			21072
COOL-LITE® XTREME 50/22 II DIAMANT®	48	0.20	0.23	2.40	16	18	1.61	0.62	1.39	0.28	0.24			21080
COOL-LITE® SKN 083 II4	76	0.37	0.43	2.05	12	13	1.61	0.62	1.39	0.28	0.24			20904
COOL-LITE® SKN 076 II4	71	0.35	0.40	2.05	13	15	1.61	0.62	1.39	0.28	0.25			21104
COOL-LITE® SKN 065 II4	62	0.32	0.37	1.92	17	19	1.63	0.61	1.41	0.29	0.25			21116
COOL-LITE® SKN 054 II4	53	0.27	0.31	1.95	18	23	1.61	0.62	1.39	0.28	0.25			21140
COOL-LITE® SKN 044 II	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	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	49	0.23	0.26	2.13	30	18	1.61	0.62	1.39	0.28	0.24			
COOL-LITE® ST 120	7	0.11	0.13	0.65	44	39	1.88	0.53	1.69	0.33	0.30			21280
COOL-LITE® ST BRIGHT SILVER DIAMANT	63	0.66	0,76	0,96	35	35	2,69	0,37	2,55	0,47	0,45		1800X321	21228
COOL-LITE® ST 150	46	0,46	0,55	0,97	20	22	2,67	0,37	2,53	0,47	0,45		600X321	21248
COOL-LITE® STB 136	32	0,37	0,42	0,86	19	20	2,60	0,40	2,46	0,46	0,43		600X321	21400
COOL-LITE® STB 120	20	0,26	0,30	0,77	21	32	2,53	0,40	2,38	0,45	0,42		600X321	21312
PLANITHERM® XN	81	0.61	0.7	12	13	1.66	0.60	1.44	0.29	0.25	XN		1800X321	21424
PLANITHERM® XN II	81	0.61	0.7	12	13	1.66	0.60	1.44	0.29	0.25	XN		1800X321	21424
PLANITHERM® ONE II														
ECLAZ®	82	0.67	0.77	12	11	1.67	0.60	1.46	0.29	0.26	ECLAZ®		600X321	
ECLAZ® ONE II	78	0.56	0.64	15	17	1.40	0.70	1.40	0.29	0.25	ECLAZ® ONE		600X321	
BIOCLEAN II	79	0.76	0.87	18	17	2.68	0.37	2.55	0.47	0.45	BIOCLEAN +		600X321	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 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.

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® HARMONYTM

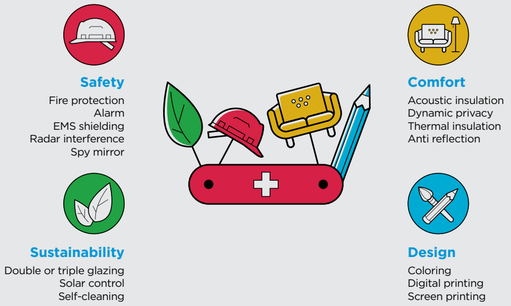
Advantages

- 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

VETROTECH

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 BUILDING 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 SageGlass®	Electric swicheable glass from translucent to transparent Electric swicheable heating glass Swicheable electrochromic glass
Fixing systems	POINT S (SPIDER-GLASS®) POINT D (SPIDER-GLASS®) 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

SAINT-GOBAIN

Business Unit Glass Facades
Tour Saint-Gobain
12, place de l'Iris
92400 Courbevoie • France