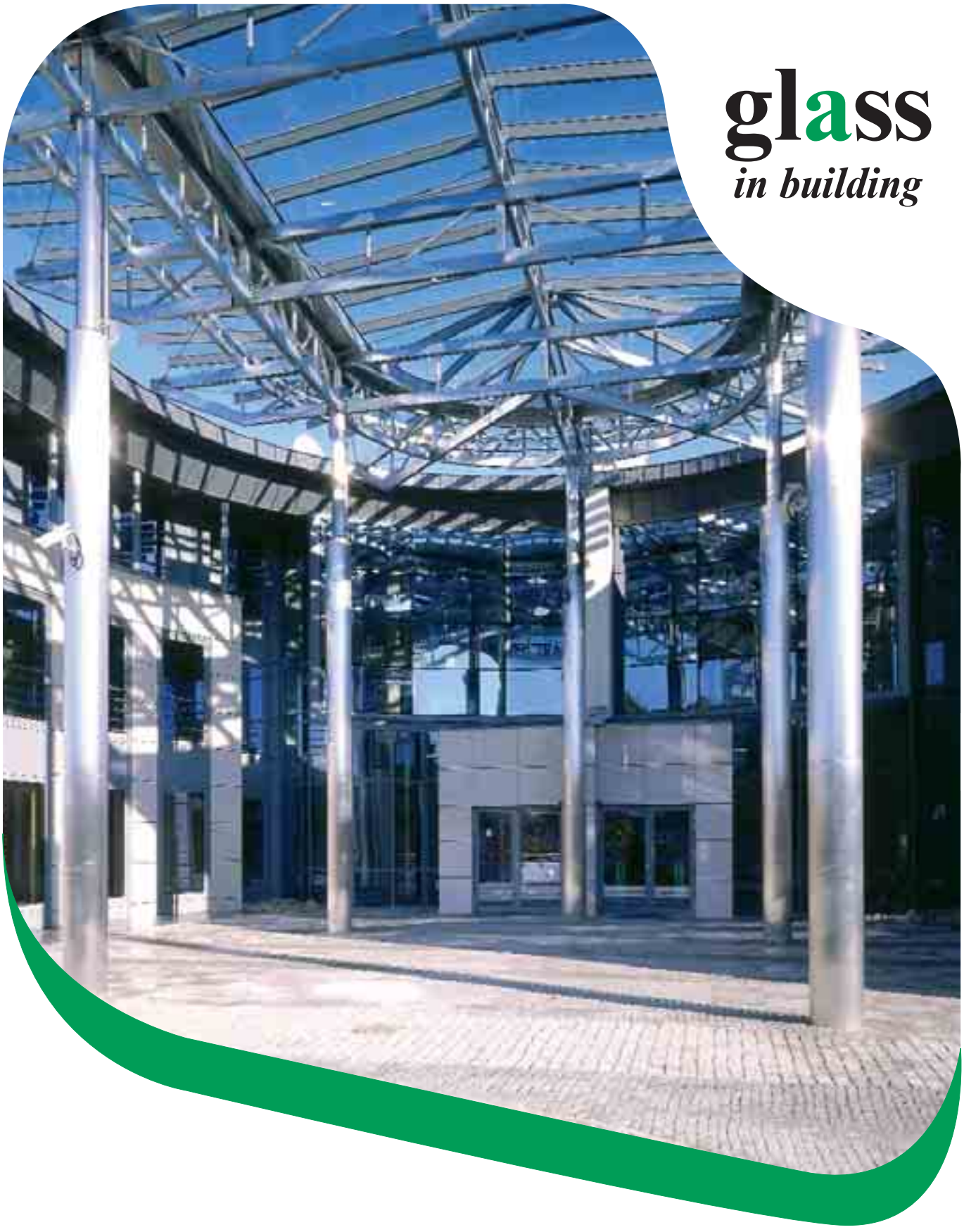


glass *in building*

Edition No.11

Pilkington Glass Products in Application

The International Magazine For Glass and Design

PILKINGTON

A member of NSG Group

contents








01
chapter

office buildings

The Vectra Cable Television Business Office, Gdynia, Poland

Project Summary

Building name:
TV Vectra
Location:
Gdynia-Orłowo, Poland
Client:
Telewizja Kablowa Vectra SA
Architects:
Studio Kwadrat
arch. Jacek Droszcz
General contractor:
Allcon SA Gdynia
IGU producer:
Pilkington IGP
Glass products:
Pilkington **Suncool**™ Brilliant Blue 50/27
Pilkington **Optilam**™ 9.5

Investment of the Year 2005

The new Vectra Cable Television offices were awarded the "Best Gdynia Investment Award" in 2005. The project involved a two-building office complex in Gdynia Orłów, located on the Orłowska Górka, to house the new business office of TV Vectra as well as the Hotel Kuracyjny with rehabilitation centre and health spa.

The buildings and the immediate surroundings were designed by the architects Jacek Droszcz and Adam Kościecha from the Kwadrat Architectonic Studio, whilst the interior is the work of the Kolor Plus workshop. The complex covers 9,612 m² in a prestigious area of Gdynia at the intersection of Popiela street and Zwycięstwa avenue.

Architect Jacek Droszcz explained "We decided to design two structures – an office building with a decidedly dominating form and the Hotel Kuracyjny. The construction of guesthouses in Orłów is a tradition, while the rehabilitation function of the hotel is tied to the firm's practice of hiring people with disabilities. Provision of these services to external clients means that the location has become more active, while the city and its residents have gained a new common space. They have also found here a pleasant walking path, which connects their neighbourhood with the centre of the district and the transport routes.
A previously dead and empty area of the city has now come alive."

A low-level office building occupies an area of 5,305 m^2. It has four storeys (including the basement level) with a total cubic are of 17,032 m^3.
The ground floor houses, among other facilities, a call centre and billing centre, a cafeteria for employees, office space and conference rooms. The first floor is occupied by offices, meeting rooms and halls designed for seminars, equipped with a modern audiovisual system. The top floor features offices for the Board, meeting rooms and a conference room. From the conference room, a stunning view of the sea and a panorama of the Orłowski Cliff unfolds.

The second building, with a total area of 2,500 m^2, includes the Hotel Kuracyjny, a rehabilitation centre and health spa.
The rehabilitation centre is well equipped to serve, among other disciplines Orthopaedics, Cardiology, Neurology and post-treatment therapy. This allows employees of the Vectra Group and residents of Gdynia, Gdańsk and Sopot to enjoy a wide range of treatments under the supervision of professional physiotherapists and doctors.

The glazing on all floors incorporates Pilkington **Suncool**™ Brilliant Blue 50/27, one of a group of high performance products. Pilkington **Suncool**™ Brilliant Blue 50/27 is a solar control glass with low emissivity properties. It is characterised by high light transmittance of around 50 per cent, as well as low solar energy transmittance of 27 per cent. Excellent solar control performance, as well as a U value of 1.1, guarantees optimum comfort levels in both summer and winter, as well as contributing to significant savings in energy use.

Additional requirements for the façade were sound insulation as well as anti-intruder protection for rooms located on lower floors. After an in-depth analysis, the decision was made to use Pilkington **Optilam**™ 9.5 laminated glass, which when combined with Pilkington **Suncool**™ Brilliant Blue solar control glass with a thickness of 6 mm, provides noise attenuation of 40 dB as well as anti-intruder security at P4A class level. A blue tone to the glazing harmonises perfectly with the colour scheme of the aluminium framework and other elements of the façade.

The architecture of the complex and the choice of building materials allow the structure to integrate with the greenery of the picturesque slope of Orłowska Górka.

SIA Glass AB Headquarter Building, Slöinge, Sweden

SIA Glass is a family company, producing ice-cream ('glass' in Swedish) located at Slöinge in the central county of Halland, between Falkenberg and Halmstad. A member of BERTE Gruppen AB, the company belongs to the oldest family-owned company in Sweden.

SIA Glass is regarded a top quality brand, with a 25 per cent market share in the supply of ice-cream to restaurants, institutional caterers, ice-cream bars and kiosks in Sweden. Its share of the convenience goods trade is 8 per cent and considerably higher in the high quality cream ice segment.

Project Summary

Building name:
SIA Glass AB
Location:
Slöinge, Sweden
Architects and designers:
Nada Ometlic, architect SAR/MSA,
Byggkonsult Lars Persson,
Falkenberg
General contractor:
PEAB, Halmstad
Aluminium profile system:
Cellglazing, Hansen Group
Glass construction and installation:
Preconal Fasad AB
IGU producer:
Schollglas GmbH
Glass products:
6 mm Pilkington **Suncool**™
Brilliant 50/25
8 mm Pilkington Spandrel Glass E100

New office and warehouse
Due to growth in the market and the company's future aspirations to secure the production of ice-cream on an international playing field, SIA Glass decided to invest in expanding their facilities at the Slöinge plant.

The total floor area of the new buildings is approximately 2,000 m^2, encompassing a new office and laboratory. At the same time the warehouse area was expanded.

Glass façade
The architect was looking for a design of the façade where the building merged with the beautiful countryside surroundings. An all-glass façade became the natural choice.

The office windows are IGUs with outer 6 mm Pilkington **Suncool**™ Brilliant 50/25, solar control glass. 8 mm Pilkington Spandrel E100 was used to give a continuous curtain wall effect to the façade.

Open interior with a lot of daylight
The interior office partitions are glazed with toughened Pilkington **Optifloat**™ Clear, single safety glass in full height, fixed in wooden frames. Thanks to an open atria plan with lots of glass, a bright and pleasant working environment has been achieved.

Simplot Head Office, Chifley Business Park, Melbourne, Australia

Project Summary

Building name:
Simplot
Location:
Chifley Business Park,
Mentone, Melbourne
Australia
Client:
Simplot Australia
Architect:
Frank Faelli of Qanstruct
Design and construction:
Qanstruct Australia P/L
Structural engineer:
Gamble and Cosentino
Glazing fabricator:
Australian Aluminium
Glass products:
Pilkington **Eclipse Advantage**™
Arctic Blue
Pilkington **Solar-E**™
Pilkington **Seraphic**™
(foyer feature glass mural)

Looking the goods
Simplot ranks amongst Australia's top-ten distributors of frozen and canned foods. The company's new head office and research and development facility, located in Melbourne's Chifley Business Park, exudes a high level of amenity and presence.

Its façade is understated yet compelling, with a sequence of visual breaks in elevation that intrigues and tantalises as to what lies beyond. The 6,000 m² office building and 750 m² R&D facility prove that architecture can become its own living, breathing brand by virtue of intrinsic qualities.

Packaging and contents are highly relevant to the world of architecture. Simplot's new home lives right up to its external promise. In other words, there's style and substance. It's a project of simple transparency.

The main atrium, with its glass mural of Earth and Ocean, sets the scene. Approximately 350 staff occupy the two-level building. The building presents an inventive, fragmented screened façade featuring Pilkington **Eclipse Advantage**™ reflective Low-E glass. The project is a landmark building for the office park.

Evolution of light, shade and identity
According to design architect Frank Faelli of Qanstruct, the major design challenge was to provide a quality working environment for the staff, with a real sense of personal space in a high performance, modestly budgeted, building. The brief specified a high level of amenities, so that facilities such as the lunchroom, a 500 m² area, could be used by staff and also large numbers of visitors. Flexibility of floor plan was paramount. The design was based on being on the inside and looking outwards.

For the reception area, stackable glass doors are used to provide a flexible connection between atrium and dining hall as it is required for large functions. Given the nature of the client's business, this was especially relevant, justifying the creation of a memorable space and was consequently central to the brief.

The major challenge was to create much more than just a huge "call centre" style of building. Considerable effort went into breaking up the form visually, so rather than settling on one idea were created three distinct zones that defined distinct work zones.

At over 6,500 m^2, the floor area was so large that it splashed more daylight throughout the room and building than could have otherwise been imagined. The light carried through into the staff dining area, bringing illumination into the centre of the building.

There is also an absolute minimum number of solid walls, reflecting an increasing interest by businesses to achieve an open working environment to stimulate improved employee communication.
The use of glazing, in preference to solid walls, dramatically contributes to a connectedness that is positive for morale.

Pilkington **Eclipse Advantage**™ Arctic Blue, solar control with low E glass was selected for the project. Pilkington **Solar-E**™ laminated glass was also used for most of the exterior. It was economical and offered excellent performance characteristics. A mesh screen and louvres on the north and west elevations are used to reduce heat from the direct north-west sun without compromising views.

The building is four-star energy rated. This is a good example of how a building can be aesthetically pleasing whilst also contributing to energy efficiency by using natural daylight.

Continental Square Faria Lima, São Paulo, Brazil

Project Summary

Building name:
Continental Square Faria Lima
Location:
São Paulo, Brazil
Architects:
Aflalo & Gasperini Arquitetos
Contractor:
Inpar
Glass products:
Pilkington **Suncool**™ Blue*
10 mm Pilkington **Optilam**™

Design creates visual identity
Planned with the purpose of being a differentiated enterprise in the Vila Olímpia Village in São Paulo, Continental Square Faria Lima consists of three main buildings: the Continental Office Tower and two linked blocks; Caesar Business flats and Caesar Park Hotel.

The design of each building was driven by its intended functionality. Pilkington **Suncool**™ Blue high performance glass was used for its excellent solar control properties and ability to define the identity of the building.

Access to the buildings is via a central courtyard. The side street provides access to shops and a gymnasium. The building has been built on high concrete pillars, which create an open space on the ground floor.

Making use of 14,000 m² of Pilkington **Suncool**™ Blue glass in the whole block, the office tower required a plant with 2,000 m² of cinder blocks, resulting in a square shaped 15-storey building.

Visual Identity
In the façades, reflective glass forms vertical and horizontal stripes. The use of red, cream and white finishing for the panels created the identity of the buildings.

Noise reduction glass was a strong requirement for the hotel and the flats. As a result, the façades are glazed with 12 mm reflective laminated glass, glued with structural silicone to aluminium profiles.

For the commercial tower façade, as well as the ground floor and the marquise which connects the buildings, the glass was installed using a mixed mechanical fastening system. "They were framed with bezels," explains Itefal Director, José Sabioni. "Then, the glass used in the tower façade was sealed using neutral silicone. On the basement and ground floor areas, the fastening and sealing was done using silicone bezels."

Hanging marquise
The main access to the complex, through Olimpíadas Street, is symbolised by a hanging marquise constructed of glass in the central square. Glass was used to maximise the use of natural daylight.

220 m² of 10 mm Pilkington **Optilam**™ fastened with silicone bezels to aluminium squares was used.

* Pilkington **Suncool**™ Blue is a product of a Pilkington joint venture with Saint Gobain in Brazil.

Union Tower, Buenos Aires, Argentina

The Union Tower apartments project is part of the real estate market growth that Argentina has been experiencing over the past few years. The main feature in this urban phenomenon is a demand for top quality high-rise buildings used for housing, and The Union Tower is one of the most outstanding examples of this.

Project description

A good scenic view was the main driver used in selecting a glass with aesthetics that would enhance the view out of the building.

To provide extensive views of the River Plate from the front of the building, the windows are glazed with large glass panes in the sitting rooms and bedrooms. This was achieved with high performance double-glazed units made of 6 mm Pilkington **Arctic Blue**™ on the outer pane with a 12 mm air space and an inner pane of Pilkington **Optilam**™ 6.4. These significantly reduce solar radiation as compared to clear glass, whilst maintaining high light transmission.

Project Summary

Building name:
Union Tower
Location:
Belgrano, Buenos Aires, Argentina
Architects:
Roberto Parysow,
Jessica Parysow,
Emilio Schargrodsky
Glass products:
6 mm Pilkington **Arctic Blue**™
10 mm Pilkington **Optifloat**™ Clear
6 mm Pilkington **Optifloat**™ Clear
Pilkington **Optilam**™ 6.4
Pilkington **Optilam**™ 10.8

To avoid obstructing the views from the inside of the apartments, balustrades are constructed of Pilkington **Optilam**™ 10.8 Clear.

The windows on the rear façade of the building are smaller in size, as this is the area where the services, kitchens and domestic areas, are located. Here, panes of 6 mm Pilkington **Optifloat**™ Clear monolithic glass are used.
The ground floor houses the building's amenities and is designed with a surrounding wall of glass separating the access to the building from the public thoroughfare, providing both safety and transparency at the same time. Toughened 10 mm Pilkington **Optifloat**™ Clear was used to achieve this.

The top floor of the building is equipped with further communal areas, such as rest lounges, a gym and spa, all of which have unrivalled views of the city and the river, enhanced by curtain walls of double-glazing units with an outer pane of Pilkington **Arctic Blue**™.

With its unmistakeable blue-hued façade, the Union Tower apartment building is without doubt a landmark in the urban landscape of the northern area of the city of Buenos Aires, by far surpassing the requirements of a demanding real estate market.

Organización Internacional del Trabajo (OIT), Chile

Project Summary

Building name:
Organización Internacional del Trabajo, OIT (ILO)
Location:
Santiago, Chile
Architects:
Iglesis – Prat and Cristián Boza Asoc.
Contractor:
GHG
Façade builder:
Anodite
Glass products:
Pilkington **Optilam**™ Phon 10.8

San Cristóbal Hill, Mapocho River and the Andes Mountains are part of the natural environment surrounding the new building of the International Labour Organization (ILO). The building is one of a number of United Nations buildings in the area, such as the Economic Commission for Latin America and the Caribbean (ECLAC), among others.

According to the architect, "the design of the building is intended to create an open working environment, where everybody can see each other and where spaces interact." The result is a building with high visible light transmittance, from which occupants can enjoy the view of the Andes mountains.

Since acoustic pollution is a growing problem in major cities, and is one of the most important causes of stress, Pilkington **Optilam**™ Phon was selected as the best choice to preserve the calm of the natural environment that surrounds the building.

The use of Pilkington **Optilam**™ Phon 10.8, with a special acoustic polyvinyl butyral (PVB) interlayer designed to reduce noise, has proved to be highly effective. In addition, the glass also offers all the benefits of a laminated glass: security, safety, and UV filtration.

Evian Mineral Water Head Office, Lake Leman, France

Project Summary

Building name:
Evian Mineral Water Head Office
Location:
Lake Leman, France
Contracting authority:
PROLOG
Architect:
Magnin Architecture Office, Macon
Inspection office:
Alps Control
Façade:
Rinaldi Structural
Glass products:
Insulating Glass Units:
6 mm Pilkington **Activ**™ /
0.76 mm PVB/
6 mm Pilkington **Arctic Blue**™ –
10 mm air space –
8 mm Pilkington **Optitherm**™ SN

6 mm Pilkington **Activ**™ /
0.76 mm PVB/
6 mm Pilkington **Arctic Blue**™ –
10 mm air space –
6 mm Pilkington **Optifloat**™ Clear
Spandrel glass:
6 mm Pilkington **Arctic Blue**™
(toughened)

The "Light" Square

In the course of 2007, the Evian Mineral Water Company will complete the move of its global Head Office and its 180 employees into a new glass-clad building, situated at the side of Lake Leman.

This new functional site will accommodate a number of services that are today dispersed in various buildings no longer deemed fit for purpose.

A building which promotes the image of its occupant

The architect's challenge was to create a building that reflected Evian's image as market leader in mineral water distribution. The location on the shore of Lake Leman was key. The architect's idea was to reflect the water and its wave movement onto the building's façade, which contains a large number of glass panels.

For the façade, the contracting authority and architect chose Pilkington **Activ**™. The self-cleaning properties of Pilkington **Activ**™ enable the façade to remain clean and transparent, thus ensuring that the water imagery on the glass is preserved. In addition, the reduced cleaning expenses and the environmental water saving impacts of Pilkington **Activ**™ were attractive features.

The building is made up of five levels on a ground floor which covers 4,000 m^2. The top floor contains the company's cafeteria, which extends onto a vast external terrace overlooking Lake Leman. Departments including Evian's World Procurement and Group Accounting departments are now accommodated on the site.

Heilbronner Industrial Estate, Heilbronn, Germany

New glamour for an industrial monument – an extended silo tower glazed in Pilkington **Activ**™

The old industrial area of Heilbronn, near the shoreline of the river Neckar, has recently been rejuvenated. After two years of construction work, the "Am Kaiser's Turm" (AKT) building is now completely renovated. Its architecture is impressive, making it a key feature of the new Neckarpark. This industrial monument was extended with new buildings, whose service and retail companies are bringing new life to the area. An "eye catcher" is the glass cube on top of the 30 metre high silo tower. The glass used for the cube is Pilkington **Activ**™ self-cleaning glass, combined with solar control glazing.

The AKT was already a major landmark throughout the city. The top of the 30 metre high main building features an illuminated red "Kaiser's" commercial sign, which has long been a feature of the Heilbronner industrial area. Built in the period 1936–1939, the tower was originally surrounded only by a three-storey industrial building with a delivery area. The constructor was Josef Kaiser, son of the founders of the eponymous supermarket chain. Up until 2001 the old industrial building was used by the Tengelmann Group, Kaiser's parent company, for administration and storage.

Inspiration from "Neckar pebbles"

After an in-depth study on the redevelopment of the area, the decision was taken to commission the Heilbronn office of Müller Architects. They proposed a plan that envisaged a tripling of the base area of the existing building to around 14,500 m². The proposal included the addition of a new structure to the existing steel-concrete-clinker building, with two different sized, two-storey high ellipses. The architects took inspiration from the pebbles in the river Neckar, the organic forms of which are intended to give a counterpoint to the existing Bauhaus-architecture building. The ellipses are combined by a glass construction on the top floor and a membrane construction on the first floor on top of the patio.

The ellipses are of monolithic design, with flat slab, steel-concrete-stilts and combined carrier. Before construction work could start, extensive excavations, down to the level of the Neckar pebbles was required. The architects decided to use sheets of raw aluminium for the outer skin, which bends around both ovals and which, when the sun shines, are reminiscent of shiny pebbles in the water.

Project Summary

Building name:
Am Kaiser's Turm
Location:
Heilbronn, Germany
Architects:
müller.architekten
Contractor:
E. + E.K. Haub Familienbesitz und Verwaltungs GmbH & Co. KG, Wiesbaden, Germany
Represented by Tengelmann WHG/Bauwesen, Mülheim an der Ruhr, Germany
Façade builder:
MBO GmbH & Co. KG, Obersulm-Sülzbach
IGU producer:
Glaszentrum G.F. Schweikert, Heilbronn, Germany
Glass products:
Pilkington **Suncool**™ HP Neutral 70/40
Pilkington **Suncool**™ HP Neutral 53/40
Pilkington **Activ**™
Pilkington **Optilam**™ 12.8

Crowning Glass cube

The architects have used an eight metre high, two-storey glass cube for the silo tower, with a steel-glass-façade, providing for a panorama restaurant and an impressive view on Heilbronn. The cube is surrounded by a glazed construction with filigree bars. The objective was to achieve a perfectly flat glass cube with frameless transverse air conditioning. Night time illumination is provided by special RGB-controlled lighting around the inside of the façade. The system makes it possible to display a range of colour scenarios and to dim the lighting at the same time. The entire interior lighting system is based on light emitting diodes, which generate very little heat and consequently do not impose an additional load on the air conditioning system.

State of the art functional glazing

The glass used provides both aesthetic appeal and functionality and the resulting neutral glazing preserves the essential qualities of the original listed industrial building. From the functional point of view 1.5 by 3.5 metre windows combine a couple of features.

Pilkington **Optilam**™ 12.8 was used on the interior in order to meet all the requirements for occupant safety. The required maximum 40 per cent total solar heat transmission is achieved through the use of the two solar control products, Pilkington **Suncool**™ HP Neutral 70/40 and Pilkington **Suncool**™ HP Neutral 53/40. Another feature is the self-cleaning properties of Pilkington **Activ**™. The product features a special coated surface, which works in two stages: using a "photocatalytic" process, the surface reacts with ultra-violet rays from natural daylight to break down and disintegrate organic dirt. The second part of the process happens when rain or water hits the glass. Because Pilkington **Activ**™ is "hydrophilic," instead of forming droplets the water spreads evenly over the surface, and as it runs off takes the dirt with it. Compared with conventional glass, the water also dries off very quickly and does not leave unsightly "drying spots." The owners of the building save money, because the glass does not have to be cleaned so often, and the occupants are able to enjoy their view of Heilbronn and its surrounding vineyards.

Sparkasse Graz Bank, Graz, Austria

Austrian architects Szyszkowitz and Kowalski were tasked with designing a new innovative façade for the Sparkasse Graz Bank. The decision was taken to create and install an additional façade resembling the appearance of fish scales.

The intention was to create an airy space within the façade of the building, which was constructed and installed by Bomin Solar Herstellung und Vertrieb solartechnischer Anlagen GmbH, of Lörrach Germany.

Using Pilkington **Activ**™ self-cleaning glass, it was possible to create a brilliant optical view of the new façade and to minimize cleaning costs.

A total area of 2,300 m² was glazed with Pilkington **Activ**™. The glass was heat strengthened and laminated together with a pyrolytic and printed back pane by Bischoff Glastechnik in Bretten, Germany.

Project summary:

Building name:
Sparkasse
Location:
Graz, Austria
Architect:
Szyszkowitz and Kowalski
Glass products:
Pilkington **Activ**™

Overgrip Complex Building, Zoppè di San Vendemiano, Italy

Project summary:

Building name:
Overgrip
SOMEC S.p.A. Head Office
Location:
Zoppè di San Vendemiano (TV), Italy
Architects:
Ing. Giuliano Magnoler
with Artec Studio
Façade builder:
Somec Spa (Sossai Group)
IGU producer:
Soglass Srl (Sossai Group)
Glass products:
Pilkington **Planar**™
12 mm Pilkington **Optiwhite**™
10 mm Pilkington **Optiwhite**™
Laminated low E glass 66.2

Communication through architecture which is innovative in its appearance and its use of advanced technologies were the reasons for developing the new Sossai Group complex. The objective was to achieve a more functional and synergistic whole and to boost the Group's manufacturing potential by bringing together a number of the company's structures into one large headquarters.

The complex covers an area of 35,000 m^2, half of which is taken up by three buildings containing manufacturing and executive units.

In the entire complex, new solutions and innovations have been introduced to act as experimental samples for future applications on an industrial scale.

The new Overgrip Complex building contains a sophisticated system of vertical closures. A double skin façade system with an 800 mm air space results in an air ventilation system created between the two skins. Internal air is circulated and directed through the wide air space, regenerating previously used energy, to heat or air condition the interior. The external skin of the double skin façade utilises the Pilkington **Planar**™ system, comprising of 12 mm Pilkington **Optiwhite**™ toughened glass. The internal skin is an insulated glass unit,

comprising of toughened 10 mm Pilkington **Optiwhite**™, with a 20 mm air space and laminated low E glass 66.2.

The Pilkington **Planar**™ bolt-fixed system produces a continuous curtain wall of glazing, and was used to maximum effect with the two stylish curved façades that screen the hall and the executive sales offices. The double skin façade system was constructed using Pilkington **Optiwhite**™ glass, which has low iron content, therefore ensuring excellent light and energy transmission.

The Sage Group plc Headquarters, Newcastle upon Tyne, England

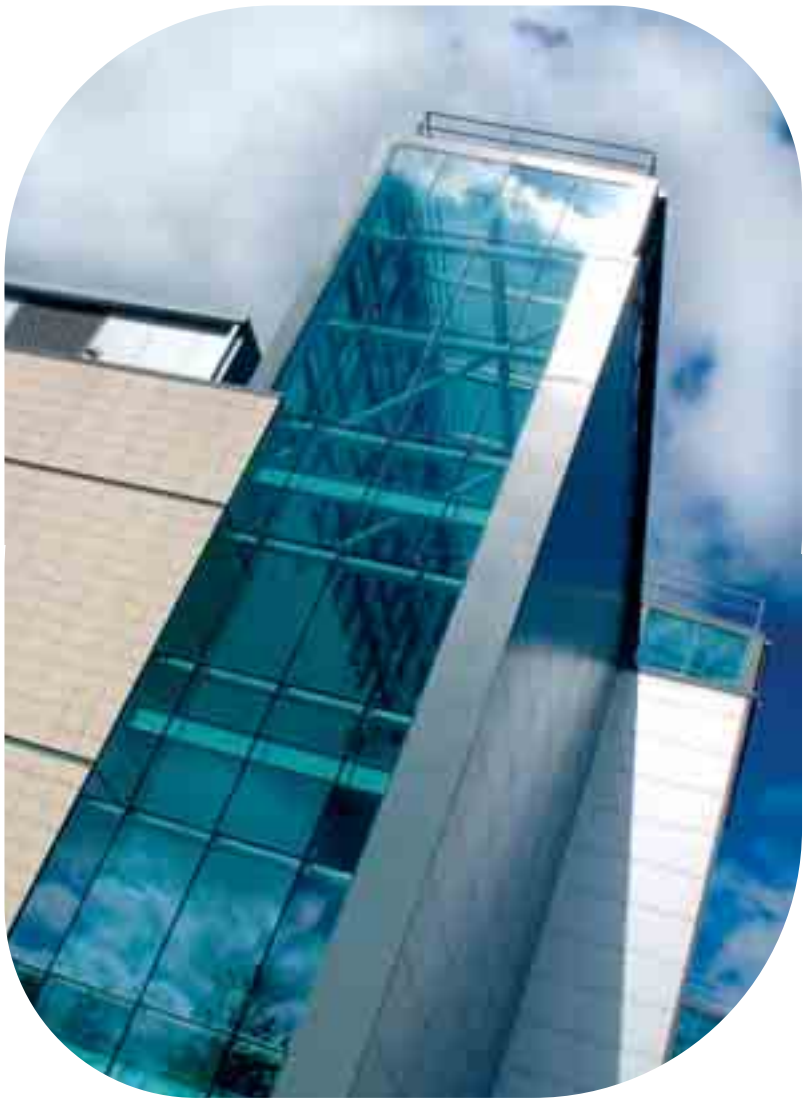
Wisdom of Sage in using Pilkington

Over 2,250 m^2 of double glazed laminated Pilkington **Planar**™ from Pilkington Building Products UK, was used to create a stunning effect on one of the UK's most energy efficient buildings: the international headquarters for The Sage Group plc at Newcastle Great Park.

The buildings were designed and constructed by architects Ian Darby Partnership and accredited installer Portal Ltd, who used Pilkington **Planar**™, the world market-leading bolted glass system, to create six separate vertical glazed screens, forming one huge T-shaped glazed atrium.

Project Summary

Building name:
The Sage Group plc Headquarters
Location:
Newcastle, England
Client:
The Sage Group plc
Architects:
Ian Darby Partnership
Façade builder:
Portal Ltd
Glass products:
Pilkington **Planar**™



The scheme – which required the use of the largest mobile tower crane in the UK during construction – is based on a collection of office pavilions linked to a central atrium space. The pavilions are intended to have separate identities yet still fit into the Sage family of buildings. Designed to act as an environmental buffer between each of the adjacent office pavilions, the atrium provides a vast communal space. The impressive structure forms the hub of the complex, opening onto two external courtyards in addition to accommodating staff facilities and a cafeteria.

David Shorey, Sales & Marketing Director, Portal Ltd, says: "We specified Pilkington **Planar**™ because it could be easily installed and met the stringent performance criteria required. The design utilised numerous specially incorporated vents in the floor and within the glazed area, which draw in fresh air and push stale air upwards, helping to create a temperate working environment through what is known as the 'stack effect'."

Pilkington **Planar**™ structural glass system can provide a complete glass envelope for building structures without the need for conventional frames. The specified glass works with the buildings environmental control management systems to create the optimum working environment, in the winter reducing heat loss to the outside, whilst in summer reducing solar heat gain through the glazing and using the high-level vents as an additional cooling mechanism.

02
chapter

academic institutions

Moscow International University glass atrium, Moscow, Russia

Project summary:

Building name:
Moscow International University (reconstruction)
Location:
Moscow, Russia
Architects and designers:
Alexander Loktev, "ARS" (ZAO "MosPromStroy")
General contractor:
ZAO "MosPromStroy"
Glass roof design and construction:
OOO "Sibir"
Electrically heated IGUs:
OAO "MosAvtoSteklo"
Glass products:
6 mm Pilkington **K Glass**™
10 mm and 3 mm Pilkington **Optifloat**™ Clear

Founded in 1992, Moscow International University is the first Russian non-state educational institution. It has six faculties, four higher education and two post-graduate schools, catering for approximately 1700 students.

Reconstruction – Glass Roof for the Atrium
Two years ago, a decision was made to reconstruct the old building and build a new one adjacent to it. This increased the university complex area to 14,800 m². To connect the two buildings and benefit from the open space, an atrium with a glass roof was built.

Electrically-heated roof glazing was selected for two main reasons. First, the roof is at an angle of 1.5 to 5 degrees horizontally. Secondly, the snow load was calculated as 720 kg/m².
Therefore, the heated roof was designed to melt the snow, enabling natural daylight to still flood into the atrium during winter.
Specially designed insulating glass units (IGUs) incorporating Pilkington **K Glass**™, low emissivity glass with hard conductive coating, were produced to meet the design and functional challenge.

Approximately 400 IGUs totalling 700 m² of different sizes and forms (trapeziums and triangles) were produced. Each IGU was unique, to accommodate the curved form of the roof. The IGUs with electric heating incorporated consisted of an outer pane of laminated 6 mm Pilkington **K Glass**™ (toughened) with 10 mm Pilkington **Optifloat**™ Clear (toughened) and inner pane laminated from two panes of 3 mm Pilkington **Optifloat**™ Clear.

Bright sunny courtyard for the students
When Moscow Mayor Yury Luzhkov, who is an honorary professor of the University, first visited the newly built atrium he was impressed with the functionality and space available for students to use all created by using glass.

With the new atrium, the University now has a modern look and a bright sunny area for students to either study or rest.

03
chapter

cultural centres

Ohtake Cultural Centre, São Paulo, Brazil

Project summary:

Building name:
Centro Cultural Tomie Ohtake
Location:
São Paulo, Brazil
Architect:
Ruy Ohtake
Contractor:
Método Engenharia
Glass products:
Pilkington **Suncool**™

New cultural centre in São Paulo integrates art, culture, business and leisure

Those who travel by Faria Lima Avenue in Pinheiros, São Paulo in the direction of the fashionable Alto de Pinheiros, will notice a six-storey office block with an unusual inverted trapeze form, one of the most modern buildings in the city.

Another construction in this area, with wavy forms in the façade, leading to Faria Lima Avenue and to the small access joining it to Pedroso de Morais Avenue, is the Tomie Ohtake Institute, the newest cultural centre in the city.

The development belongs to Laboratórios Aché, which when designing the office block, included a cultural centre and a convention centre. They gave the project to the architect Ruy Ohtake. The long service in project developments of the Ohtake Family was recognised by the naming of the building Ohtake and the cultural centre Instituto Tomie Ohtake. The project was awarded one of the six Biannual Architecture prizes awarded in Buenos Aires in November 2004.

Natural Light

The project used 12,000 m^2 of glass, mostly Laminated Pilkington **Suncool**™ high performance glass. On entering the cultural centre, a glass door automatically opens, revealing a reception foyer 70 metres long, 12 metres wide and 10 metres high, encased in glass. This allows natural light to enter the building.

It is evident that the Great Hall is designed as an "urban space" concept, with a diversity of functions. A café and restaurant are located to the rear of the hall. There are three exhibition rooms, one video room, a design store called Banedixt and a book and magazine stand called Banca Jardins by Ciro. The area also provides access to the office blocks and to the future 22-storey building. The building's elevators, offices and rest rooms include special amenities for the physically disabled.

Turku Art Museum, restoration and extension, Turku, Finland

Project summary:

Building name:
Turku Art Museum
Location:
Turku, Finland
Client:
City of Turku
Architectural design:
LPR-arkkitehdit Oy
Ola Laiho, Tiitta Itkonen, architects SAFA
Structural design:
Narmaplan Oy
Contractor:
Main contractor – extension
Jalora Planarian Oy
Restoration:
NCC Rakennus Oy,
Iittalan Kivijaloste Oy
Glass products:
Pilkington **Planar**™ system
10 mm Pilkington **Optifloat**™ Clear and
6 mm Pilkington **K Glass**™

In 1885, the Turku Art Association received a donation from an unknown benefactor for the building of an art museum. Later it was discovered that the donation came from two businessmen brothers, Ernst and Magnus Dahlström. A two-stage architectural competition for the building was held in 1899, and the winning entry was submitted by Gustaf Nyström. The brickwork frame building with granite facings was completed in 1904.

In the 1960s, damage caused by damp appeared on the exterior walls of the upper level exhibition rooms. Despite repairs, this proved to be a recurring problem that persisted until the late 1990s. Furthermore, the roof lights leaked and were difficult to clean and maintain.

The storage and exhibition spaces did not meet the requirements of modern museum activities from the point of view of heating, humidity and lighting conditions. In addition, it was very difficult to transport art works in and out of the museum and access for physically disabled people was extremely poor.

Ten years later, the renovation began to progress when an access driveway for the museum's service vehicles into the underground parking lot under the site was being built. Beside the route a loading bay was excavated as well as handling facilities with storage space for art works.

The architect planned a transparent, slender structure above ground that would enhance the architecture of the stone building. Insulating glass units (IGUs) comprising Pilkington **Optifloat**™ Clear and Pilkington **K Glass**™ for its excellent thermal and energy efficient characteristics were selected.

A stairwell and lift are built from the basement of the museum through the rock and up to the steel-glass tower, creating a corridor connection to the two exhibition floors and basement.

The extension design aims at continuing Gustaf Nyström's original symmetry. The lift shaft runs underground along the axis of the building. It is located beside the driveway running underground. A staircase that serves as an emergency exit has also been built symmetrical to the lift.

Today, visitors have the opportunity to compare and contrast the original building and construction style with the new glazed part of the building – demonstrating how a marriage of old and modern architecture can be achieved today.

04
chapter

social amenities

Extension of the Louis Aragon multi-media library, Martigues, France

Project summary:

Building name:
Louis Aragon multi-media library
Location:
Martigues, France
Contracting authority:
Ville de Martigues
Architect:
Emile Pamart – Mitre les Remparts – 13
Design office:
BET fire safety / SSI HELIATEC
Glass processor:
Comptoir Nimois du Verre – Garons – 30
Glass surface:
500 m² in partitions
Glass products:
15 mm Pilkington **Pyrostop**™ 30-10

The Louis Aragon library was built 25 years ago and has since seen an increase in its usage which has required its refurbishment and the building of an extension of 1,400 m².

The Louis Aragon multi-media library is situated on an island, between two canals. This miniature "Provincial Venice" is subject to regulations defining lateral alignments and height limits, which resulted in the linear development of the extension to the building.

It was not only necessary to rethink the whole of the internal organisation of the building, it was also necessary to adapt it to the evolution of information technology and means of communication by computer. Finally, it was necessary to bring the building up to modern standards and, in particular, with local fire regulations.

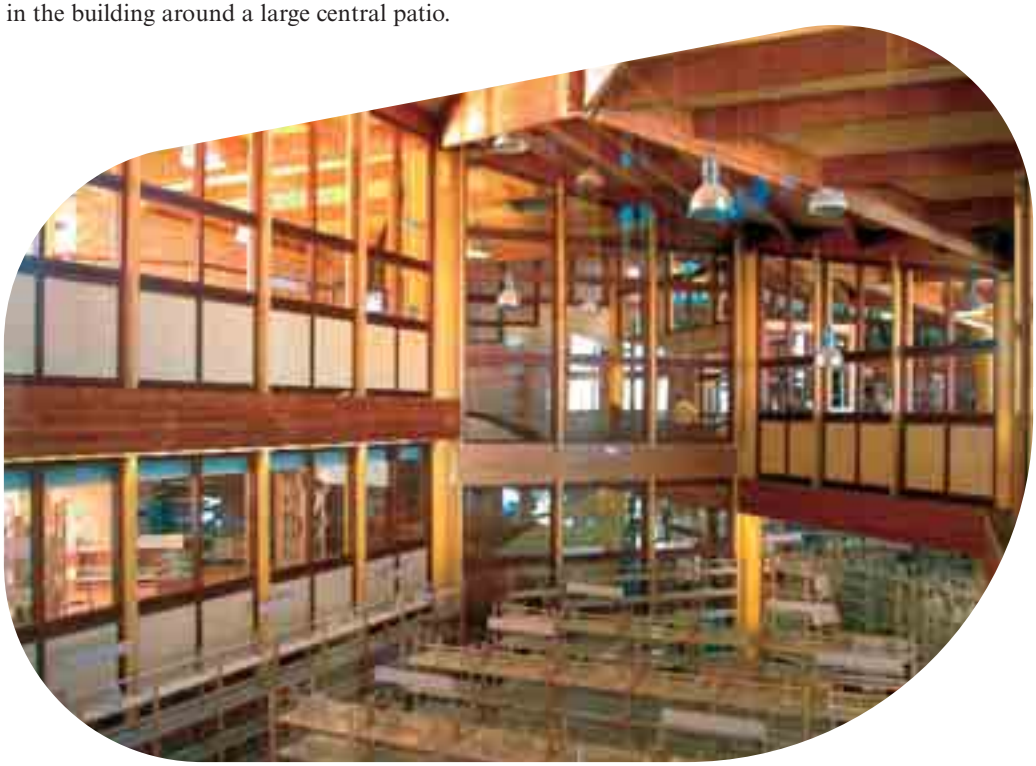
For the architect, Emile Pamart, the objective was to maximise open work spaces to increase communication between the different functions in the building around a large central patio.

The modular play of the structures, levels and empty spaces provided the architect with various options. Only through creating a visual and "open" environment could this be achieved.

The choice of glass

Pilkington **Pyrostop**™ glass was selected because it met the requirements of the architect and two major imperatives: transparency and safety. The fire resistance performance of Pilkington **Pyrostop**™ was all the more appreciated because the floors as well as the door and window frames of the building were made of wood.

15 mm Pilkington **Pyrostop**™ 30-10 (30 minutes integrity and insulation*) single glazing on a wood fixed frame ledge, which met the glazing requirements for the fire protection glass was specified. Pilkington **Pyrostop**™ also offers good thermal insulation to avoid the risk of fire spreading to other compartments of the building by radiation.



* Integrity – the ability of a specimen of a separating element to contain a fire to specified criteria for collapse, freedom from holes, cracks and fissures, and sustained flaming on the unexposed face.

Insulation – the ability of glazed screens or doors to limit the temperature rise on the non-fire side to an average of no more than 140°C and in any one position by no more than 180°C.

05
chapter

residential applications

Canal Housing Development, Ephraim Island, Gold Coast, Australia

Project summary:

Building name:
Canal Housing Development
Location;
Gold Coast, Australia
Architect:
Mirvac HPA
Developers:
Mirvac and The Lewis Land Group of Companies
Builder:
Mirvac Constructions
Structural engineer:
Robert Bird and Partners
Glazing fabricator:
Lidco, Hennessy Glass and Aluminium, Hughes and Hessy, Bradnam
Glass products:
Pilkington **EverGreen**™
Pilkington Texture Glass **Satinlite**™ (En suite)
Pilkington **Optifloat**™ Opal (Bathrooms)

Play of light

A resurgent Australian Gold Coast appears to be bursting with the upwardly mobile. Among the best residential developments is the $545 million Ephraim Island. The 12 hectare island has been converted by Mirvac Developers architectural arm, HPA, into a sequence of classy, light-filled apartments and pavilions by the water's edge.

Lewis Land and Mirvac Group entered a joint venture in 2001 to develop Ephraim Island's full potential as a prime waterfront residential site.

The project recognised the island's promise, and design and development has worked effectively with the site's natural attributes. Almost a third of the island is preserved as a mangrove, protected from construction or development.

Mirvac's in-house architectural practice, HPA, has produced a fascinating range of architectural styles and treatments. Research for the project involved the lead design architects camping on-site to better understand the site elements, orientation and prevailing breezes.

The temptations to stay home at Ephraim for the weekend are compelling. The island consists of 21 villas, 14 beach houses and 348 apartments – home to some 600 residents. A 115-berth marina provides yacht and power boat enthusiasts with mooring facilities.

There are other lures, including a fully equipped community gymnasium, spas, saunas, steam rooms, 25 metre heated lap pool, resort style swimming pool, children's wading pool, barbecue area and sunbathing terraces. Why leave indeed?

Landscaping and common areas throughout the island are a dominant feature and occupy more than 75 per cent of the total island area. The island's dune eco-system has been replicated as closely as possible, while the mangrove eco-system that covers a third of the island is protected from development.

Villas and Units are generously proportioned, with a strategy of using natural daylight throughout the interiors. Villas feature courtyards built around the idea of flexible walls where Pilkington **EverGreen**™ tinted glass significantly helps cut solar loads. The glass also provides an appealing aesthetic that contrasts plain white walls, natural materials and finishes.

A continuous glass façade was achieved through windows and sliding doors that could be opened regardless of wind direction and weather. They are characterised by full-height glazing with electronically controlled glass louvres on the west-facing side of the building.

Rising to the challenge of finding a point of differentiation, the designs incorporate some very clever material selections. The ensuite walls for example, made completely from 6 mm Pilkington Texture Glass (toughened for safety) not only allow natural light, to the bathrooms but as the walls are thin some valuable wall space over tradition solid walls is saved.

Ephraim Island's main appeal is a standard of architecture previously unavailable on this scale in this part of the world, together with pleasant, elegant, light interiors.

Mountain summit restaurant, Stoos Switzerland

Project Summary

Building name:
Gipfelrestaurant Fronalpstock Stoos, Switzerland
Location:
Stoos SZ, Switzerland
Architects:
Architektur & Ingenieurbüro Christoph Breu, Rickenbach/Switzerland
Façade builder:
Fensterfabrik Von Euw Rothenthurm SZ, Switzerland
IGU producer:
Pilkington Glass Wikon AG, Wikon, Switzerland
Glass products:
Pilkington **Insulight**™ Therm Ug 1.0 W/m²K (EN)
outside:
8 mm Pilkington **Optifloat**™ Clear
inside:
Pilkington **Optilam**™ Therm 8.8

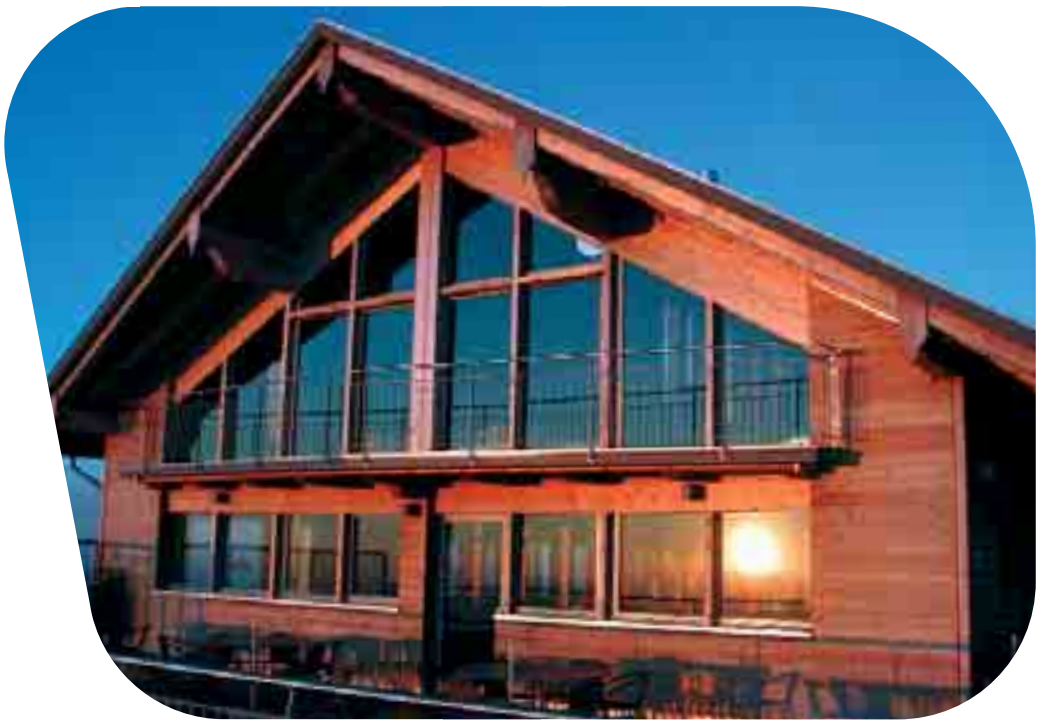
In 1997, a fire triggered by lightning destroyed the mountain top Fronalpstock Stoos summit health resort restaurant. A new and modern restaurant has recently been rebuilt at the same location. This has greatly benefited the resort and a new aerial cable car and chair lift were built in anticipation of increased numbers of visitors.

The Fronalpstock Stoos health resort stands an impressive 1900 metres above sea level and with its breathtaking panoramic view across 11 lakes and the surrounding mountain landscape, it was a challenge for the architect from both a planning and construction point of view.

Project idea
The new restaurant was designed to convey a relaxed cosy atmosphere, with sufficient space for 300 diners, both in the restaurant and on the terrace. The traditional mode of construction, with the basement in reinforced concrete and the floor above in timber, was combined with a significant volume of glazing. The architect's idea was to have rooms flooded with natural light on all sides.

From the glass terrace, a stunning picturesque view of the mountain landscape fascinates visitors. The east and west façades are entirely glazed from ceiling to floor, allowing light to bathe through the building as the sun rises in the morning and sets in the evening. On the north-facing side, a two-storey atrium was constructed entirely in glass, allowing stunning glare-free views from the ground and top floors of the Schwyz basin with its spectacular panorama.

Special features & Glass
A service cableway had to be constructed to transport building materials. The building was constructed in a record time of eight months and the summit restaurant was then opened to the public. Due to the exposed position on the



summit, heavy gusts of wind up to 150 km/h can be experienced. Despite the generous protruding balcony, snow and rain is hurled against the west façade under great pressure (see winter illustration). This strong atmospheric influence is unique and could not have been foreseen.

To counteract wind and snow loads during winter, the architect and developer chose wood and metal framed Pilkington **Insulight**™ Therm consisting of 8 mm Pilkington **Optifloat**™, a 12 mm air space filled with krypton gas and Pilkington **Optilam**™ Therm 8.8. The total IGU thickness was therefore 28 mm and the U-value in accordance with EN 1.0 W/m²K. The floor to ceiling glazing had to have wooden mullions fitted for reinforcement. The metal cladding gave sufficient protection from wind and snow thrown against the glass by wind, whilst the wood framing on the inside gives the feeling of a cosy mountain chalet.

Final observations:
The defined objective was more than achieved and visitors are very impressed. At peak times, 1,000 meals are served at lunchtime. It's worth making the Fronalpstock Stoos summit resort your destination when the weather is good!

Glass Tree House, MacMaster's Beach, Australia.

Project Summary

Building name:
Glass Tree House
Location:
MacMaster's Beach,
North Central Coast,
New South Wales
Architects:
Malcolm Carver co-founder
of Scott Carver
Glass products:
Pilkington **Activ**™

Situated at MacMaster's Beach on the north central coast of New South Wales, this glass tree house is designed to make the most of its stunning coastal forest location. In order to maintain both the external appearance of the building and views of the ocean, architect Malcolm Carver specified Pilkington **Activ**™ self-cleaning glass. This has not only minimised the cleaning requirements, but also kept the glazed façade in pristine condition, despite the harsh marine and woodland environment.

© Eric Sierens

Brief

"The brief called for a minimal maintenance beach house – on a budget for two families to share," writes Malcolm Carver. It was designed to maximise the sea view, blend into the environment and have minimal impact on the trees surrounding the site.

The isolated site is in an extensive and natural coastal bushland environment adjoining Bouddi National park, one hour north of Sydney. The house has been designed to enhance and reflect the significant trees surrounding it.
The steel frame conforms to forest building regulations in the event of a fire and has been galvanised to match the colour of the gum trees.

© Eric Sierens

For the external finishes, it was particularly important to minimise painting costs and window cleaning/accessibility costs. The solution was a galvanised finish for the structural steel frame and Pilkington **Activ**™ self-cleaning glass for the windows.

Design

The theme of the development is contemporary, with an open floor plan design and expansive windows to capture vistas and eliminate barriers between inside and outside.

Cost

Minimal maintenance objectives drove the design to respect both initial capital costs and the costs arising from long-term maintenance. In a short-break retreat, having to carry out regular window cleaning would have somewhat defeated its purpose.

© Eric Sierens

Conclusion

The fully glazed beach house is fitted with Pilkington **Activ**™ self cleaning glass throughout the lower and upper floor plans. Architect Malcolm Carver describes the performance of the glass as "phenomenal": "We have never had to clean it, even though we are right by the ocean with its salt laden winds and mist. There is also the debris and sap falling from the surrounding eucalyptus, along with bird droppings and other soiling, but the first rain shower along strips it all as clean as a whistle – it always looks as if the window cleaner has just left!"

© Eric Sierens

Home for the Elderly and Nursing Homes, Upper Frick Valley, Switzerland

The Association for the Care of the Aged in the Upper Frick Valley (VAOF) runs two nursing homes for the aged, in Frick and Laufenburg. The Frick establishment was recently expanded with the construction of apartments for the elderly.

Walker Architekten AG designed an exceptionally environmentally friendly and space-optimising building. Special attention was also given to integrating the new building with the existing residential area.

A total of 28 apartments was created. The living quarters are south-west facing, in accordance with the shape of the property. The north eastern side was planned as a spacious development area and an emergency exit area.

An important goal was to design the building so that natural light could permeate the apartments whilst at the same time offering a view of the landscaped park. This was achieved through a floor to ceiling glass façade.

In order to evaluate solar transmission into the building, an extensive climate simulation was carried out. The aim was to achieve reduced solar radiation during the day and cool temperatures at night. To fulfil these requirements, Pilkington **Insulight Activ**™ Sun 54/33 glass units (self-cleaning glass with a solar control coating) are fitted. In total 450 m² Pilkington **Insulight Activ**™ was used. The entire glass construction has a Ug value of 1.0 W/m²K (excluding frames, air space filled with krypton gas).

The façade was constructed from wood and metal by 4B Fenster AG. Each of the 81 prefabricated elements consists of a large, solid glazed part and a small ventilation wing. The glazing was installed after the assembly of the window frames on the building site. Around half of these windows are motorised and can be controlled electronically (WindowMaster advanced). In this way, various requirements, such as night time cooling, could be fulfilled. Over the first summer, the combination of sun protection glass and natural night time cooling worked very well. Prior to the refining adjustments of the controls, the temperature in the passageway never exceeded 23°C, even on hot summer days.

Through the intelligent application of advanced glazing technology and market-proven controls, a pleasant room temperature was achieved for the residents without expensive and energy intensive air conditioning.

Project Summary

Building name:
Home for the Elderly and Nursing Homes
Location:
Frick AG, Upper Frick Valley, Switzerland
Architect:
Walker Architekten AG, Christoph Rufle, Brugg, Switzerland
Window manufacturer:
4B Fenster AG, Hochdorf, Switzerland
IGU producer:
Pilkington Glas Wikon AG, Wikon, Switzerland
Glass products:
Pilkington **Insulight Activ**™ Sun 54/33

Watkins Residence, Adelaide, Australia

Project Summary

Building name:
Watkins Residence
Location:
Adelaide, Australia
Client:
Chris Watkins
and Lisa Bishop
Architect:
Chris Watkins
Builder:
Chris Watkins/Joe Watkins
Structural engineer:
Wallbridge and Gilbert
Glazing fabricator:
Construction Glazing
Glass products:
Pilkington **Activ Optilam**™ 10.4
Pilkington **Optilam**™ I
Translucent White 10.4

Pilkington **Activ**™ **self-cleaning glass performs to its full potential.**
Apart from its Arts Festival, Adelaide is lesser known for its patronage of progressive architecture. It's a difficult profession at the best of times. Good clients are almost everything and always in short supply, which is why Chris Watkins leapt at the chance to design his own house on the verdant slopes of Mount Osmond. To add to the complexity of the project, planning regulations threatened to stonewall the building application with an unassailable cliff face.

The result appears simple and uncomplicated. From the street, it presents an anonymous, almost blank façade. Little effort appears to have been expended on decoration although on closer inspection the copper façade – which has already acquired an intriguing patina – might be viewed as fish or reptile scales. The project presents a modest building footprint, minimal site disturbance and a low roofline so as not to impact neighbours.

While Watkins' response appears a model of restraint, many of the Adelaide hills' houses seem to be designed with the film "The Sound of Music" in mind. An appearance by the singing, waving, Von Trapp family would not entirely surprise. Glockenspiel houses with gingerbread finishes hardly seem to fit Australian or, for that matter, Adelaide conditions. In contrast, the Watkins' house is yodel free.

Designed for his young family, the house has a flexible floor plan. But the winning pitch, not surprisingly, is the floor to ceiling glazing on the north elevation that takes in the tableaux of grassy slopes and beyond to the sea. Room dividers are vast sheets of Pilkington **Optilam**™ I Translucent White 10.4 with a translucent white interlayer that retract into wall cavities, eliminating stone walls and creating a feeling of more space. Undressed concrete walls provide a raw, muscular edge consistent with the expressed steel sections below.

"It's all very old fashioned," confesses Watkins. "Few people have the chance to build their own house. It's something that interests me as an architect. There is this making of the thing. It's really informative of design. If you have that physical connection with, and understanding of, materials you can design so much better. Architecture graduates have often never touched a piece of steel or felt what concrete can do in its liquid state. This was another reason why I was fascinated by the science of self-cleaning glass."

From a glazing viewpoint, Watkins sought substantial technical advice from Pilkington. For architects and clients alike Pilkington **Activ**™ has been a revelation as external window cleaning can be risky, labour intensive and expensive. "I was dubious as to whether it could remain clean, but Pilkington **Activ**™ has really lived up to the promise," says Watkins.

Maximising on natural light, the house incorporates glazing on the east and south elevations to introduce controlled light into the bathroom and kitchen at floor level.

Watkins views the house as a continuation of his love affair with the open plan, informal living space of Modernism. Natural light is a great informer and in this respect, an environmental consideration too. "On a simplistic level this is what the project is all about. On a technological level we were building on a tight budget, it was about using technology and materials that were available and affordable."

Completed by a father and son team in the old fashioned way, here is a house that continues a most distinguished tradition of ordered thoughtful assembly and elegance. On a potential slippery slope, this is a house of very high traction.

Cameratta Residential Complex, Warsaw, Poland

Project Summary

Building name:
Eko-Park Cameratta
Location:
Warsaw, Poland
Client:
Eko-Park SA
Architects:
Bulanda & Mucha Architects, arch. Andrzej Bulanda, arch. Włodzimierz Mucha
General contractors:
Mitex, Kajima
Profiled glass façade:
Polring-Glass
IGU producer:
Pilkington IGP
Glass products:
Pilkington **Profilit**™
Pilkington **Insulight**™ Protect

The Cameratta residential complex was constructed in the Warsaw district of Mokotów, near the greenery of Warsaw Central Park (Pole Mokotowskie). The development represents a further phase in the Warsaw housing project known as Eko-Park, the town planning aspects of which were formulated by the firm of APA Kuryłowicz, which was also the general designer of the whole Eko-Park complex. Further residential complexes were designed by other practices. The A2 phase, known as Cameratta, is the work of the Bulanda, Mucha Architekci architectural studio.

In designing this stage of the investment, the architects, decided on a simple architectural approach and modelled their design on residential architecture of the 1920s and 30s. The four-storey buildings are surrounded by trees and gardens. Sections of the elevation where the walls are faced in grey brick are a reference to pre-war modernist buildings. Modernism is also exhibited in details such as spiral patio staircases.

Despite rigorous regulations on the town planning project, this phase of the investment has its own individual characteristics. For instance, one wing of the building has been constructed at an angle to prevent the destruction of a tree, creating an interesting effect. On the building roofs, stand-alone two-storey family homes have been built in unique geometric shapes. Each home has a patio and garden located on an upper level and connected to the lower level by an external

staircase. Characteristic planks have been mounted on the upper section of the elevation as well as steel openwork balustrades.

The project also includes glass elements that differentiate the building and give them a modern appearance. Windows have been designed in various sizes and positions. The large windows on the upper levels are particularly eye-catching. In the Cameratta complex, the window woodwork includes Pilkington **Insulight**™ Protect insulating glass units, with class 2(B)2 laminated safety glass. On the ground floor, anti-intruder glazing has been used. In addition to safety and burglar-proof glass properties, the double glazed units demonstrate low emissivity, characterised by a low factor of U-value at the level of 1.1 W/m^{2}K.

Not only the windows and sections of the façade have been constructed with glass. Pilkington **Profilit**™ profiled glass was incorporated in the stairwell glazing. Internal walls are also glazed with double sheets of Pilkington **Profilit**™ K25/60/7 wired glass, as well as Pilkington **Profilit**™ K25/60/7 Plus 1.7 low emissivity glass. Aside from aesthetic appeal, this ensured effective daytime illumination throughout the room, as well as insulation, which contributes to energy conservation.

The architects at the Bulanda, Mucha studio have used profiled glass on the higher floor balustrades*. These opaque balustrades are made using double-shell Pilkington **Profilit**™ K25/60/7. One panel includes wired panels, ensuring greater privacy, which was one of the priorities for the residential complex, whilst providing exceptional aesthetics.

The Cameratta Residential Complex is a unique investment in the centre of Warsaw, differing greatly from standard residential blocks and apartments. The original design and surrounding greenery ensure residents exceptional comfort practically unfound in the city centre. A prime location and interesting design guarantee the investment great success.

* As with all products, the suitability of Pilkington **Profilit**™ for use in any particular application should be confirmed and due account taken of relevant national regulations, standards and codes.

06
chapter

entertainment / leisure centres

Sheraton Miramar Hotel, Viña del Mar, Chile

Project Summary

Building name:
Sheraton Miramar Hotel
Location:
Viña del Mar, Chile
Architect:
Alemparte, Barreda y asociados
Façade builder:
Tecma S.A.
Contractor:
Sigro
Glass products:
Pilkington **EverGreen**™
Pilkington **Optifloat**™ Clear

Located 100 km to the north of Santiago, the Sheraton Miramar Hotel is embedded in a rock face, offering spectacular views of the Pacific Ocean.

With an investment of $30 million, Sheraton Miramar has eight floors, 142 rooms, five convention centres, five boardrooms, one business centre, three swimming pools, one gymnasium, one restaurant, one bar, one cafeteria and 383 parking spaces.

The hotel is built in the shape of a horseshoe, to ensure all rooms can enjoy the sea view. The client requested a transparent façade, with high daylight transmittance and a green colour, which matches that of the sea and also has a good shading coefficient. As the hotel is near the shore surrounded by rocks, solar control was a "must."

For these reasons, Pilkington **EverGreen**™ High Performance Tinted float glass was the product of choice. It achieved the architect's requirements of increased daylight transmittance, low reflection and a uniform appearance. Pilkington **EverGreen**™ was installed in insulating glass units (IGUs) with Pilkington **Optifloat**™ Clear float glass.

Nautical Centre, Cluses, France

The nautical centre at Cluses, half way between Mont Blanc and Lake Leman, has become famous for the quality of its services. It is tucked away in the heart of the Faucigny in the centre of the Arve valley and near some internationally recognised tourist attractions.

For the construction of the Cluses nautical centre the contracting authority and project manager decided to design an aesthetically pleasing building that would blend into the environment in any season and have an acceptable maintenance cost. The site at Cluses in the heart of the valley, facing the mountains deserved a special building. Therefore, the proposal for a building that was largely glass, open to the outside and trans-parent was selected. The intention was for the mountain ranges to be visible through the glass panels and to be reflected in the windows. Located at a high altitude, the building interior needed to be comfortable and the temperature pleasant during both summer and winter. Lastly, the use of glass as the principle material was not to lead to an increase in the maintenance and management costs of the building.

The designers recommended double glazed units comprising Pilkington **Activ Suncool**™ Neutral 70/40 glass. Pilkington **Activ**™ offers self-cleaning properties whilst Pilkington **Suncool**™ provides excellent solar control and this was combined with Pilkington **Optilam**™ 8.8. The laminated glass

Project Summary

Building name:
Nautical Centre
Location:
Cluses, France
Contracting authority:
SIO – Cluses
Architect:
Agency Cottet-Puinez Architects – Morzine (74)
Design office:
Cochon – Evian
Glass processor:
Solyver – Lyon (69)
Facadier:
Alpal – Pringy (74)
Glass products:
Insulating glass units 1,250 m²
Composition:
Exterior face:
Pilkington **Activ Suncool**™ Neutral 70/40
Cavity:
12 mm air
Interior face:
Pilkington **Optilam**™ 8.8

panels in Pilkington **Optilam**™ ensured the safety of guests and staff against injuries in the event of glass breakage.

The glass met all the architect's requirements of:

- solar protection and thermal insulation: good management of solar radiation in both summer and winter,
- bright light: guaranteed maximum natural light,
- glass panels always clean on the outside.

Pilkington **Activ Suncool**™ glazing is ideal for fitting to the faces of buildings. Pilkington **Activ Suncool**™ can be combined in double glazing with other Pilkington glass panel products to improve noise insulation and safety.

National Rock Climbing Centre, Edinburgh, Scotland

Pilkington Touches the Void

Pilkington's world-leading structural glazing system, Pilkington **Planar**™, was used to dramatic effect at Scotland's latest landmark sports complex, the National Rock Climbing Centre near Edinburgh, built in a former quarry.

The £26 million project comprises a 3,600 m² climbing hall incorporating a 25 metre-high natural rock wall, a central glazed atrium and a 10,000 m² building that includes offices, training and leisure facilities and accommodation. Over 1,100 m² of Pilkington **Planar**™ was used on the structure's roof and three vertical screens to create a natural transparent connection between the climbing hall and the surrounding landscape of natural rock faces, which are incorporated into the design to form the north and west walls of the climbing hall. The architects, A Priori Design, were supported by specialist subcontractor Charles Henshsaw & Sons. A value-engineered approach resulted in large glass panels and an optimised steel support structure to answer the brief of creating a "natural status" sports facility. Pilkington **Planar**™ laminated glass was specified for the roof and its supporting fins, to provide enhanced safety for the public space below. The three 24 metre-high vertical walls were specified as Pilkington **Planar**™ toughened

Project Summary

Building name:
National Rock Climbing Centre
Location:
Edinburgh, Scotland
Client:
National Rock Climbing Centre
Architects:
A Priori Design
Subcontractor:
Charles Henshsaw & Sons
Glass products:
Pilkington **Planar**™

and heat soaked glass. All the structural glass was installed to a fine tolerance of ± 5 mm, which reflects the accuracy of manufacture of the Pilkington **Planar**™ components.

Jerry Almond, Charles Henshaw & Sons' Commercial Sales Manager, commented: "The value-engineered roof, with the large panels, introduced significant cost savings and gave the structure a lighter, more natural appearance. Laminated fins to the roof also helped to maximise daylight, which would not have been so easily achieved with steelwork."

Pilkington **Planar**™ met the challenges of minimising the amount of steel used in the glass support structure and maximising transparency. The result was a spectacular structure that easily accommodated safety concerns.

07
chapter

retail centres

USA, New York City Apple Store | 60

Apple Store, New York City, USA

Project Summary

Building name:
Apple Store
Location:
5th Avenue at 59th Street
in Midtown, New York City
Architect:
Bohlin Cywinski Jackson
Façade engineer:
Eckersley O'Callaghan,
London UK
Façade contractor:
Seele GmbH & Co. KG,
Gersthofen, Germany
Glass products:
Pilkington **Optiwhite**™
Volume:
10 horizontal glass beams
to support the roof panes
24 vertical fins to which the
façade panes are connected
numbers of façade panes
to be provided if required

Apple opened its latest store on Fifth Avenue, New York City in May 2006. The store is five stories high, featuring 4,000 ft² of retail space. The store is itself all underground except for the entrance – a 32 foot glass cube.

The architect's challenge was to create a recognised and appealing iconic landmark on one of Manhattan's most popular streets, in line with Apple's reputation as a modern and technological leader, whilst also enhancing New York City's process of rejuvenation to reshape the city.

The result was the creation of a magnificent glass cube entrance to the store, made of Pilkington **Optiwhite**™, low-iron glass. The cube consisted of numerous laminated Pilkington **Optiwhite**™ panels, each approximately 1,000 cm high and 48 cm wide.

The panels were assembled by a special technique developed and patented by specialist glass processors Bischoff Glastechnik (BGT). Ten horizontal glass beams were used to support the roof panes, with 24 vertical fins connecting the glass façade panels.

On entering the stunning glass cube entrance, a set of spiral glass stairs leads customers to the underground store levels, where various Apple items are on display.

With the incredible entrance, Apple has created what is expected to become a New York landmark located at a very prominent location in Manhattan.

08
chapter

special applications

The Netherlands, Utrecht "Sound Barrier" and "The Cockpit" | 62

"Sound Barrier" and "The Cockpit," Utrecht, The Netherlands

Project Summary

Building name:
The Sound Barrier
and the Cockpit
Location:
A2 motorway, Leidsche Rijn
(Utrecht)
Client:
Municipality Utrecht,
Project Bureau Leidsche Rijn
Architects:
ONL Kas Oosterhuis
Contractor:
Meijers Staalbouw,
Serooskerke
Glass supplier:
Pilkington Benelux B.V.
Engineering:
Pilkington Glastechniek
(now operating as an
independent company
Absoluut Glastechniek)
Glass products:
Pilkington **Insulight**™ Sun 70/40
Pilkington **Insulight**™ Sun 66/33
Pilkington **Insulight**™ Therm SNA

Not long ago, a new acoustic barrier, the Sound Barrier, appeared alongside the A2 motorway near Utrecht. The 1.5 km-long structure at Leidsche Rijn stands on a five metre high slope and is eight metres high on average. At the front, the Sound Barrier's steel frame is covered with 8,300 triangular plates of predominantly grey-coloured reinforced glass, each 6 mm thick and with different dimensions and shapes. In the centre of the barrier is a building known as the Cockpit. It hosts the headquarters of the Hessing motor company, suppliers of Lamborghini, Maserati, Bentley and Rolls Royce cars. The floor area of the Cockpit is 5500 square metres, comprising a walkway, with offices on two levels.

The whole scheme is designed in "blob" architecture (computer-generated spherical shapes) by ONL, a firm of architects, headed up by Professor (Eng) Kas Oosterhuis.

The Sound Barrier
The ends of the barrier are shaped like a snake's head and are lit up at night from the inside. The front of the barrier is illuminated by LEDs.

There's hardly a straight line in the design, which is generated from a 3D "point cloud" in the architect's computer system. The fact that everything on the screen is spherical makes it difficult to envisage the final design.

The glass is not mounted in a frame or on adaptors, but in rubber mouldings. The glass and the rubber mouldings were put together in the factory, which meant that faster assembly was possible. What was unique in this respect was that the rubber was adapted to the construction, an innovative technique even for the rubber industry and a world “first.”

The use of rubber helped to keep the project within the demanding budget. Any attempt to mount the glass using traditional frames and adapters would have sent the building costs far too high and glass as a cladding for the Sound Barrier would have been impossible.

The noise barrier comprises approximately 150 segments. The triangular glass plates have a base of about three metres. All 8,300 glass plates have different dimensions, a fact that placed special demands on logistic processes both in the fabrication of the glass as well as during erection on site.

The building process was a file to factory process – the glass and steel structure were fabricated simultaneously directly from the architect's and engineers' software on to the cutting tables.

The Cockpit

The Cockpit is 180 metres long, with a view over the A2 motorway. It consists of offices and the Hessing motor company showroom. With a pedestrian walkway area and offices on two levels, an open section has been created between the two levels, which is where the Hessing show room is located.

The Cockpit incorporates structural glazing that is mechanically attached and built into the continuous frame of the barrier. In this respect the building appears to be fully integrated into the acoustic barrier.

The glass in the Cockpit comprises various elements. The upper section consists of Pilkington **Insulight**™ Sun 66/33 and the central section is Pilkington **Insulight**™ Sun 70/40. Although the tolerance of the steel is approximately five times greater than that of the glass, a special technique made it possible to glaze the glass directly onto the steel structure. In addition to the great variation in tolerance, the design was also robust to manage the large variation in expansion properties between steel and glass. The glass and steel for the Cockpit were also produced in a file to factory process.

The "Sound Barrier" and "The Cockpit" were awarded the Dutch Glass Award in November 2006 and the Steel Prize 2006. In the near future, the same techniques will be used to erect two spherical buildings directly behind the Cockpit. These will be built of glass mounted on a steel structure without measurement being necessary, which means that all shapes and dimensions can be achieved at a lower cost.

Pilkington Products

Category	Product
 Solar Control	Pilkington **Optifloat**™ Bronze, Grey, Green
	Pilkington **Arctic Blue**™
	Pilkington **EverGreen**™
	Pilkington **Solar-E**™
	Pilkington **Eclipse Advantage**™
	Pilkington **Suncool**™ HP
	Pilkington **Suncool**™ Brilliant
	Pilkington **Activ**™ Blue
	Pilkington **Insulight**™ Sun
 Thermal Insulation	Pilkington **Optifloat**™ Clear
	Pilkington **K Glass**™
	Pilkington **Optitherm**™ SN
	Pilkington **Optitherm**™ S3
	Pilkington **Insulight**™ Therm
 Fire Protection	Pilkington **Pyrostop**™
	Pilkington **Pyrodur**™
	Pilkington **Pyroshield**™
 Noise Control	Pilkington **Optilam**™ Phon
	Pilkington **Insulight**™ Phon
 Safety	Pilkington T
	Pilkington **Optilam**™
	Pilkington **Insulight**™ Protect
 Security	Pilkington **Optilam**™
	Pilkington **Insulight**™ Protect
 Self-cleaning	Pilkington **Activ**™
	Pilkington **Activ**™ Blue
	Pilkington **Insulight Activ**™
 Decoration	Pilkington Decorative Glass
	Pilkington Texture Glass
	Pilkington Spandrel Glass
	Pilkington Oriel Collection
	Pilkington **Optimirror**™
	Pilkington **Optifloat**™ Satin
	Pilkington **Optifloat**™ Opal
	Pilkington **Insulight**™ Décor
 Glass Systems	Pilkington **Planar**™
	Pilkington **Planarclad**™
	Pilkington **Profilit**™
 Special Applications	Pilkington **Galleria**™
	Pilkington **OptiView**™
	Pilkington **Optiwhite**™
	Pilkington **Mirropane**™
	Pilkington **TEC Glass**™

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