Light Architecture

N.18

New software to optimise and sculpt natural light

Opening up interior areas to natural light, spreading it without distorting it, while providing precision control of its intensity by refining the spectrum...

Now this technical and aesthetic domestication of light is today more than ever a reality, thanks to new optimisation software for natural light developed by Everlite Concept together with Professor Marc Fontoynont, head of the Home Sciences Laboratory at the National School for Public Works, France. The software contains a database and the calculations for the light element of your architectural projects, and includes the technical characteristics of all the Everlite/Danpal construction systems. By combining them as a function of each project, it can determine and forecast the natural light performance of your creations. In this way Danpal further strengthens its technical assistance to those in the profession and their freedom of creation.

This technical assistance is also coupled with a voluntary policy of Research and Development of new products for new applications. Examples of this are Danpalon SOFTLITE (facades and roofing) and Danpatherm, specially created for visual and thermal comfort in sports centres.

Because technological innovation and technical assistance assist your creativity, Danpal and its regional sales managers are at your side to illuminate your choices naturally!

alain chambon

Blanchard Gymnasium, Pau
Architects, Tillous and Maréchal

Making light without the dazzle

By selecting a roof of Danpatherm, with the addition of SOFTLITE, architects Marc Tillous and Philippe Maréchal provided this multi-purpose gymnasium with a new lease of life and its users with a renewed pleasure in sport. A dazzling result in the control of dazzle AND THE ENERGY SAVINGS OBTAINED.

I had real pleasure! With these words contractor André Larrieu, 45 years in the business, finished his conversation. "It's the first time I used Danpatherm (Danpalon 16 + Danpalon 16) and I enjoyed the diversity of this building job, which required the utmost care, especially at the curved part at the bottom of the pitch". When the architects became involved in the project to repair the roof of the Blanchard gym, the first comments were the worrying leaks, related to overload on the wooden frame. Developments in the Snow and Wind Regulations made replacement of the roof necessary, and even indispensable. "When the old, asbestos-cement roof was put down, the glue-laminated frame rose some 40 cm at the centre!" comments architect Philippe Maréchal. In their original concept, the architects proposed a glazed shell covering the entire building. At the same time they called on the services of several technical specialists, including Ingelux for liquids and Addenda for thermodynamics. On account of costs, but also to limit solar penetration and to avoid the risks of a greenhouse effect, it was decided to retain the initial structure, in particular the central skylight. This is in fact used to create ventilation, by incorporating longitudinal blades, connected to a rain sensor, without having to touch the Danpatherm panels. As a man of experience, André Larrieu assumed that every large area of roof needed an escape for hot air.

A double skin

Redoing the roof affected an area of 650 square metres and Danpatherm proved an ideal material. It is in fact made up of a double layer of Danpalon separated by a 40mm thick cushion of air, into which an additional, transparent isolating material is inserted (Danpatherm +). In addition, the interior (lower) face underwent special treatment, Softlite, which allows light while limiting dazzle at the same time. It is the first, entirely translucent thermal insulating material. "At the beginning I was worried about too much light", explains Lionel Rousseau, Chairman of the Sports & Open Air Committee of the client, the SA Total Works Committee. "The result was perfect: the light is never blinding, ideal for playing tennis for example. We have only been able to test the greenhouse effect with outside temperatures of 20°, but no drawbacks have been noted". Philippe Maréchal adds that the lighting is pleasant, and the light is soft and blue-tinted in the evenings. And André Larrieu sums up, "The architect himself was reassured seeing the results. This is a product that is really worth getting interested in". So much so that another part of the building will also get this system.

Client: SA Total Works Committee (Pau, 64)

Architects: Marc Tillous - Philippe Maréchal (Pau, 64)

Fitting contractor: Larrieu Frères (Montfort, 64)

Material: Danpatherm +: double layer 16 Ice, inside face DP 16 Ice Softlite below – insulation – normal DP 16 Ice.

BL2 Architects - Majau Hall, Bruges (33)

Natural light, signature, safety:
Danpalon puts its name to a winning combination!

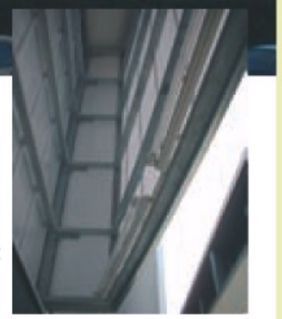
By creating a space that looks like waves and in the evening adding the effect of colours, the architects turned the Majau Sports Centre into a building you stop to look at: as though it was a monument.

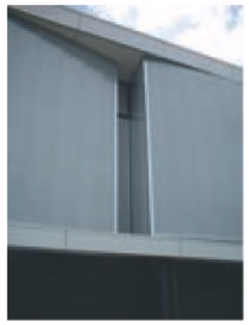
Architects:
BL2 Architects, Bordeaux (33).
Client: Bruges Municipality (33)
Fitting contractor: SMAC Bordeaux.

The sports centre in Bruges, already thirty year-old, was damaged by a storm in 2003, with its roof torn off, and needed to be taken in hand. To be made safe, requalified, and fully renovated... a building project awarded to the BL2 architectural office. Having reworked almost the entire building, the architects interested themselves in the north wall, originally made of yellowish, corrugated plastic. This was where the light was meant to come, without the direct effect of the sun. "We already have experience of Danpalon for a covered tennis court", explains Christophe Bonhomme. "We wanted to give a sense of space to the north wall of the Majau sports hall". Over the 3 metre concrete foundations the team erected a flat, internal wall of 180 sq. m. made of Danpalon 16 Ice, intended to be resistant to ball games. For the second skin, on the outside, it selected Danpalon 10 (210 sq. m.), set back from the roof and in the form of four waves, each one illuminated in the evening by green, yellow, blue and red lighting effects.

Positive in every shape

In order to avoid bending them, the Danpalon panels were set in vertical units on a galvanised steel structure, which itself was bent to create the curvature. Pascal Lecaudey, Director of Works at SMAC considers the installation was straightforward, "though nothing really is that simple!" complimenting at the same time "the real technical support we got from Everlite".
On the south side, the architects also used Danpalon, as a sort of free -running band 1 metre. high, set above the seats to create a diffuse light source, without harming users of the hall with excessive dazzle.
Christophe Bonhomme adds that at no time did the client discuss the cost of Danpalon. Other solutions were suggested, but the decision always came back to Danpalon.
And Pascal Lecaudrey sums up that Danpalon is "a serious material, with a very accurate specification for use and even for storage".
Today the Majau sports centre is part of the urban landscape, it even stands out, a monument that catches the eye, and that can be admired both in the day and at night.





INNOVATION

SIMULATING LIGHT
with Everlite software for optimising lighting effects

Together with Everlite, Prof. Marc Fontoynont, head of the Home Sciences Laboratory at the National School for Public Works, France, has contributed to the development of simulation software for lighting intensity, already acknowledged worldwide.

Starting with the axiom that a polycarbonate plate acts like a lamp providing light in a building, it is just a single (scientific) step to make a direct link between natural light and the light that Danpalon can spread. "The idea of the software," explains Marc Fontoynont, "was to work on architects' requirement to simulate light propagation.
An Everlite product defines an optical combination between the material itself and the outside light, which lets each square metre of this product be considered like a lamp in its own right".
Ingelux, a laboratory company, was given the development of the software. It worked on the combined distribution of natural brightness and the sun, and through that it applied specific optical principles to polycarbonate. "We calculated the distribution of light intensity in space, which differs according to the type of Danpalon. The objective was to link causes (an Everlite panel and the light environment) with effects (the distribution of light inside). We wanted to see what would be the light effects if we changed one Danpalon for another, and for that purpose we carried out did comparative simulations with a reference gymnasium at Beynost*".
The software, using know-how from France's National Centre for Scientific Research, was developed specifically for Everlite. After having been tested, it received international validation under the aegis of the Austria-based International Lighting Commission and its technical Committee TC 3.33.

To benefit from the Everlite's light optimisation software in your designs, or for any other technical information, please contact the Technical service Department of DanPal (UK): Tel.: 01858 468323; Email: technical@danpal.co.uk orvisit www.danpal.co.uk

OMA, Rem Koolhaas and Kunle Adeyemi – University Museum of Seoul

Rem Koolhaas creates a Symphony of light with Danpalon

Rem Koolhaas loves shapes that are both monolithic and destructured, where it is as though space is suspended. For these light games, he is happy to make use of Danpalon, and does so yet again for this university museum floating on air.

Architects: OMA, Office for Metropolitan Architecture (Netherlands), Rem Koolhaas, with Kunle Adeyemi.

Architect in Korea: Samoo Architects & Engineers

Architecture Technical consultant: Jihyon Kim Architect.

Client: Seoul National University Museum.

Structural and mechanical engineering: Ove Arup & Partners

General contractor: Samsung Construction Co., Ltd.

In 1996 architect Rem Koolhaas looked into the first drawings for the future Seoul University museum. By summer 2005 his creation was complete. His idea: to create a direct relationship between the university campus and its urban environment. The building is not short on daring, and it could not be better described than with the expression, "sprung from the earth", since the museum truly seems to burst out of the ground: a rectangular box pointing towards the campus, partly suspended over a pedestrian plaza. The protected area thereby created becomes a crossroads and a meeting point for students and visitors from outside, as suggested in the project's master plan.

A rare intensity of light

Inside, an original movement system lets a visitor easily reach the four delineated areas: exhibition halls, library, offices, and training area with its own auditorium.

To serve the approximately 4,500 sq. metres of this monolith equally, spiral ramps coil round the interior, linking areas as much by their layout as by the play of materials. And light is a key element. The facades, opened up with large bay windows, let in large amounts of light transmitted inside using Danpalon 16mm Clear, which quite literally invades the space. Walls and ceilings in the movement areas in particular, around central staircases and where panels hide the neon lights that illuminate them. Remarkable for its monolithic appearance, this museum with three external levels provides the visitor with a rare sensation of clarity, with the Danpalon acting like a true light source. Architect Han Young Keun, working on the site, adds (in French!), "… and all that without the slightest technical construction problem".

OMA, Rem Koolhaas, Ellen van Loon - Casa da Musica, Porto (Portugal)

The polyhedral Casa da Musica in Porto, even if it has generated a lot of talk, is no less a major architectural work where Danpalon was used on a large scale.

Architects: OMA, Rem Koolhaas and Ellen van Loon

Associate architects: ANC Architects, Jorge Carvalho

Client: City of Porto

Four years late in completion and a budget that tripled! All the same: erected above the Rotunda da Boavista – a broad, tree-lined square that gives it air -, the Casa da Musica is a clear break with the city's architectural past. If its isolated mass that dominates an entire area cuts right across its environment, this true Opera is today part and parcel of the Porto cityscape. Even more, through the daring of its shapes and also by the cultural uplift that it cannot avoid stimulating, it is creating a new identity for the city.

Its own workshop

With a wealth of experience with Danpalon, Rem Koolhaas made the material the star of the interior fittings of the Casa da Musica. False ceilings and wall coverings, in the hall, on the stairs, the restrooms, there is Danpalon throughout all the horizontal and vertical movement areas that surround the "box", the main auditorium. It is the first time OMA has used such quantities of Danpalon for a public building. To enhance it even more, the designer responsible for lighting has added fluorescent tubes behind the panels. A gripping effect with a particular light, and like the building, with asymmetric shapes… so much so that Danpalon even has its own preparation workshop on site. Cutting, sizing, sawing are all made to measure, but without any bending: the system of installing panels was preferred to respect the building's appearance, with all its angles.

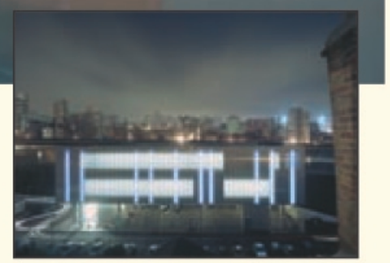
Diamond shaped

Its detractors have bestowed on the Casa da Musica the epithet "badly peeled potato". But some admirers see in it a sober variation on the Guggenheim Foundation in Bilbao, where the external destructuralisation is taken up inside, particularly in the foyer stairways. From outside it is a rough diamond where light penetrates through openings and appears to be reflected to infinity, an effect created by the Danpalon panels hung below fluorescents. A light that leads the spectator towards the music, towards the enormous auditorium that – oh so rare - opens up fully over the city.

AREP Architects – Feeder Line Building (SNCF), Paris

Architectural integration in an urban setting: SNCF chooses Danpalon

To replace a work building devastated by fire in 1999, SNCF gave its Architecture Department (DAAB) a reconstruction project in which Danpalon became the ideal material for integration into a cityscape.



Architects: Daniel Claris and Raphael Ricote.
Project manager: Gloria Lugo. Research manager: Jean-Claude Migniot.
Prime contractor: DAAB, the Architectural & Design Department of the SNCF
Client: SNCF
Fitting contractor: Brézillon.
Feeder Lien building: L. 80 m, w. 12 m, h. 14 m.

Two criteria governed the work on the new Feeder Line building on the railway tracks Paris-Nord. Firstly an aesthetic geared to an industrial environment within an urban setting: from whence came the idea of a double skin made of a metallic material stretched over a frame. And then a bright atmosphere inside the building: which was the origin of the translucent façade made of Danpalon 16. However, the choice of Danpalon for the front meant a resistance constraint, provided by ironwork: which was where the parapet and balustrade came from. According to architect Raphael Ricote, "the Feeder Line Building had to incorporate a metallic architecture that would create a dialogue with the Hittorff Hall in the Gare du Nord and act as a continuation to a glass building located at the angle of the Boulevard de la Chapelle. The combined use of Danpalon Ice and Clear ensured the required homogeneity and sublimated the aesthetics.

***Architect: Lobjoy & Bouvier** – "La Salamandre" reprocessing factory in Sivert, Lass (49)888

Total Reprocessing

To fit into the social fabric without adulterating it and to blend into the landscape without taking it over was the double challenge for this waste-reprocessing factory, set up in the Anjou countryside in 2004. Using walls of Danpalon the target has been achieved.*

Architects: Ludovic Lobjoy, Lobjoy & Bouvier (92)

Client: CGEA / Onyx

Town: Sivert, East Anjou (49)

Fitting contractor: Arblade, from Tacoignières (78)

Collections from 210 communities (210,000 inhabitants), 100,000 tons per annum.

To construct this waste-reprocessing factory, 35 m high in the middle of the country, the Lobjoy & Bouvier architects office did not want a large box that would obscure the horizon. "We had to break up the large block style and thus fragment the buildings", by sticking to the scale of "a simple, quiet, broken-up countryside"; forests, lines of trees, hedges, isolated trees, meadows and fields, the warp and weft of the land. "The parcelled-up geometry breaks the landscape into a particularly structured mosaic of shapes and matter". To obtain a similar sense of light and simplicity, the architect, in collaboration with the landscape artist Ursula Kurz, dreamt up a concrete foundation stained earth colour and green clapboard-type boarding, above which in the middle were placed the Danpalon panels, which in turn were topped by metal boards with iridescent varnish that took on the irregular colours of the weather.

A lantern effect

The use of 16 mm Danpalon Crystal was dictated by two requirements, based on the appearance of each building. On the one hand they were to mask the concrete structures, and the Danpalon connectors were fixed T-shaped to them. On the other hand, they were to create both transparency and light, with the Danpalon cladding the metallic structure. Over the 1,000 sq. m. treated with Danpalon, no lighting was added, "so as not to risk giving the building the look of a monument", the architect explains. With the lighting of the workshops, Danpalon itself creates "a mysterious lantern effect", visible only from the factory's surroundings.
Patrice Morineau, sales director and in charge of costings at Arblade, which specialises in the cladding of buildings, followed the la Salamandre site closely. Used to working with Danpalon, he does not recall any problems with the Lasse factory, echoing "the quality of the technical specifications' requirements", for which Everlite "had a big lead".

A canopy is unveiled

Architects Briton and Claude, Challans (85)
La Guérinière Shopping Centre, Noirmoutier (85)

Architect:
Briton and Claude, Challans (85)
Client:
Intermarché, La Guérinière (85)
Fitting contractor:
Brilland, Les Herbiers (85)

At the new shopping centre at La Guérinière, the Intermarché and Bricomarché stores are connected by a monumental canopy made of Danpalon, like an extension towards the blue skies.

What's special about the Ile de Noirmoutier is that it's flat! And its landscape is strictly controlled: architect Serge Claude knew that in creating the La Guérinière shopping centre that he had to limit himself to a height of 7 metres. However, his concerns for integration went beyond that. He preferred treated wood boarding for the walls. And to enhance the appearance he added a 150 metre long canopy that went round the entire place, acting also as weather protection and a meeting area. In due course, within two years, several extensions will complete the shopping centre and the canopy will be a lively place under which to meet and to wander from shop to shop. "I like this material, its transparency which does not limit vision", explains Serge Claude about Danpalon 16, of which he made use of 1,000 square metres here. Not to disturb the view the canopy has a 7% incline curvature as required by the standard and all the better, because it softens the look of the building. "We wanted it in blue so as to weigh it all down and to create an extension of the sky". In which they succeeded.

Architects of Franconville Municipality (95)
Client: Franconville Municipality
Fitting contractor: Isobac, Persan (95)
Engineering analyses: Scoping, Châtenay-Malabry (92)

Architects of Franconville Municipality (95) – Franconville Sports Centre

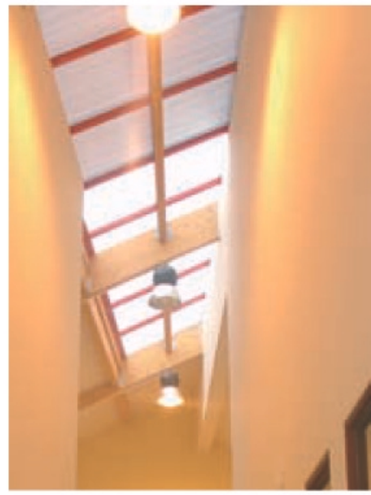
Controlite varies the light

To serve two parts of a new sports centre, a corridor that could have been closed in was opened up to the light thanks to its roof of remote-controlled Controlite.

Put up for the planned 3rd school by the Regional Authority, the town of Franconville's 9th gym is a building of 2,400 square metres, made up of a gym and a table tennis room. The corridor that serves all the facilities (sports halls on one side, changing rooms and showers on the other) was a major element in the building's design. To get the most out of this essential area, the architects chose to play the natural light card. A study carried out together with Scoping led to selecting a roof made of Controlite, with an area of about 50 square metres, with electrical remote control. "We preferred natural light, but we also wanted to control the heat in the summer", explains Didier Andreani, the municipality's Deputy Director of Technical Services, adding that the use of polycarbonate also represented a real saving.

Particular attention

The installation, carried out by Isobac, required several corrections, mainly because this was a first for the company. "You have to be very careful!" comments André Navareno, Isobac's works manager. "When we understood how the panels interlocked and how the tie bars went on the mounts, the system was easy enough. And the dimensions of each part were absolutely right. Once in place, Controlite is a really interesting material". Yet again Controlite has been able to cast light on the shadows.



Architect: Cabinet Amsellem
Client: SILIC, Paris
Sub-Client: Socomie, Nanterre (92)
Fitting contractor: Technibaie, Plessis-Pâté (91)

Architect: Jacob Amsellem - Nacre Building, Nanterre (92)

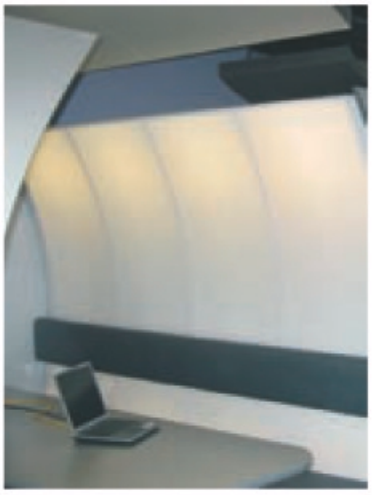
A glass roof with solar control

To restore a partly blind building, the architect chose to open up a central patio protected by a roof of Controlite – for which the implementation was a pleasant discovery for Technibaie.

To give the thirty year-old Nacre building a new soul, Jacob Amsellem created in the middle a patio around which all activities would take place. To cover this area that was also conceived as a meeting point for the occupants, the architect selected a roof made of 80 square metres of Controlite.
daylight into this otherwise "blind" building", he explains. He opted for Controlite: "I wanted a light material that was easy to install, without having to install glass, which moreover would have required adding sunshades". Cyrille Valente, manager of Technibaie had never experimented with installing Controlite. "It was a real eye opener", he says. "I approached it like a ready to install product, provided with exact edges, with no working problems, not more difficult than a standard sheet of aluminium", he adds. This simplicity was due to the precision of the prior analysis of the building, the precision of the Controlite units delivered, and the exactness of the installation instructions. Installed on a tubular metal frame, the Controlite roof also has a solar receptor, which creates savings in heating and airconditioning.

Adds Cyrille Valente, "What's more, the wiring system for the electrical installation of the receptors was simple and did not require an electrician". By selecting Controlite the architect sought both protection against bad weather and limiting the impact of heat in the summer. And with tongue in cheek, " the opinion of future occupants will be a real thermometer for us of the product's effectiveness!"

Light cafe!



The University of Durham, UK, has a living area where students can relax while remaining connected to the realities of their studies. Where Danpalon also lights up their spirits...

Architect: PH Partnership, Birtley, County Durham.

Client: University of Durham.

Contractor: Vest Construction with installers T Manners Ltd, County Durham.

Since the opening of its Techno Café, the Department of Computing Sciences is the latest wired meeting place in the University of Durham. Fausto Pereira, the Techno Cafe's architect, wanted "a place for socialising and interaction that would be perfectly suited to small groups". A place to study, think and communicate, and where technology supports work. That's how the idea of "pods" was born, a sort of alcove where you can hide yourself away to really work hard, while remaining open to the café. Each pod has a table with IT connections and an interactive LCD screen on the wall, all covered by an arch made of Danpalon. "We were looking for a translucent material capable of letting through a diffuse light suited for working with computers. Danpalon meets this requirement perfectly". To stay within budget, the architect adjusted the initial curvature of the alcoves: this let him keep to Danpalon's maximum, manual curvature without thermo forming the panels, thereby avoiding having to bring in specialists.

An instant success

To familiarise themselves with installing 200 square metres of opal Danpalon 08 Multicell, a test was carried out on a sample pod. "We were surprised," recounts Fausto Pereira, "with the ease of installation of the system". The work was completed so fast, that we are looking to recommend Danpalon on other projects!" As for the cafe, its success was immediate, with both students and university staff. So much so that they would like to see more projects like this around the campus. At the heart of the CETL, the excellence centre for IT training run by the Department of Computer Science, the Techno Café has created its minor revolution, totally against the draconian rules usually imposed in computer research labs. Here, connected to WiFi or plugged in to the net, you can have a drink and nibble at leisure. Otherwise the Techno Café would not be a café!