

solutions

www.ductal-lafarge.com

The Lafarge Ductal® newsletter - N° 6 - December 2007

Cogitech

"We are just beginning to exploit Ductal®'s potential"

As a specialist in engineering, prototyping and composite technical research, Cogitech is active in many business sectors such as: indoor and urban furniture, jewellery and cars. This dynamic company has enabled Lafarge to develop several innovative methods of employing Ductal®, like the amazing spiral staircase designed by Escaliers Décors.

"Our approach is to transfer skills," explains its director, Sylvain Quidant. "Going further than the traditional research departments, our workshop can produce casts and short runs, but the objective is to design production solutions for manufacturers.



The elegant marriage of PEFC certified wood and Ductal®, signed by the designer Paul Gaspard, for the GASPARD label.

Obviously our team's experience and the diversity of their expertise benefits to all our clients.

The know-how we have acquired in producing decorative furniture with complex methods of assembly and shapes can also be transferred to numerous industrial and architectural applications."

COGITTECH is now continuing to develop the use of Ductal® and is exploiting the technical and artistic qualities that allow it to be used in conjunction with other materials.

editorial

For a structural design

A footpath like a flying carpet, a staircase in space, a suspended roof - the latest architects' designs continually reveal more of Ductal®'s structural potential. Its capacities continue to be enhanced in the new approaches to progress and design. Supported by some of the great names in architecture, Ductal® can be amazingly shaped, designed and modulated in all these structures. A wide range of applications in which ductility,

mechanical resistance and durability are tested. Achievements that illustrate the new symbiosis that Ductal® allows between imagination and technical skill in order to combine proportioning and finesse or one-off pieces and mass production - as Rudy Ricciotti predicts, it has opened up "a new era."

Jean-François Batoz – Director of Development



Rudy Ricciotti for Maison Navarra: A new era

"The material as it has been used on this project displays every aspect of its performance in something that looks like a real choreography..." The experience of this structural cantilever roof is perfectly summed up in the explanation given by Rudy Ricciotti, the project's architect. No framework despite being 40m by 7.7m and only 3cm thick, the technological feat reveals "the pure expression of the material". For Romain Ricciotti, the civil engineer who did the calculations for this unconventional aeroplane wing, "Ductal® makes it possible to dispense with the framework leaving the designers completely free to



consider new shapes. Here the major innovation lies in the extreme reduction of the play in the material, which with thermal variations has a total bend of only 4 mm.

With the transport and handling constraints related to such large sections (3 tonnes each) Ductal® provides a mechanical optimum that is close to that of steel structures with far more conceptual flexibility."

"This roof, proportioned in relation to its own weight, wind lift, thermal expansion, service load and delivered as it is without needing any waterproofing, is a world first," enthuses Rudy Ricciotti. "And without doubt the most attractive part is making

use of very high technology that combines the aeronautic industry experience for the moulds design, very specialised casting calculations for monitoring the metal fibres reinforcement in the distribution volume and in the final analysis when making use of it, a technique that continues to employ the traditional skills of the trade. Ultra-high performance concretes have definitely opened up a new era."

Ascent
Fall 2007

Innovation award for a wastewater treatment plant

In Canada, the City of Edmonton's Gold Bar Wastewater Treatment Plant (with 192 Ductal® clarifier troughs) has won a prestigious PCI (Precast/Prestressed Concrete Institute) "Harry H. Edwards Industry Advancement Award". The award recognizes the material's superior performance in relation to its durability and light-weight design, as well as its ability to provide a cost effective solution.

Today's architecture
July / August 2007

Even more refined...

Ductal® combines utility, safety and aesthetics with a new range of urban furniture (shaped like commas), created by Francesco Passaniti. These unique furnishings provide attractive barriers that prevent vehicles from entering off-limit areas and protect pedestrians against unfortunate accidents."

Le Moniteur – Juillet 2007
Bétons – Sept./Oct. 2007
Les Echos – Juillet 2007
Le Point – Juillet 2007

The first building entirely covered in Ductal® hits the front pages

Covered with a double skin of Ductal®, the new RATP (Paris urban bus and rail network) bus station in Thiais (France) demonstrates amazing, innovative modernism. Well received by the press, this unique building appears to be a wave coming out of a Ductal® slab.



Tomi Ungerer Centre National de l'Illustration Flying carpet for people with reduced mobility

A great tribute to the artist and illustrator Tomi Ungerer, the Centre National de l'Illustration has opened its doors in the heart of the city of Strasbourg in Eastern France. In an exceptional architectural environment, Emmanuel Combarel and Dominique Marrec designed a remarkable sinuous footpath using Ductal®.

Following completion of the bus station at Thiais, the ECDM agency again used Ductal®, this time for a visitors' footpath with the feel of a flying carpet that marks its cultural singularity. Interview with Emmanuel Combarel.



What was your first aim for this cultural project?

Emmanuel Combarel : The collection is on display in the villa Greiner, a late 19th century residence situated in the German quarter of Strasbourg. The main challenge was to design suitable access for people with restricted mobility without emphasizing any discriminatory aspect. We thought about creating a gently sloping pathway in the small garden, designed to lead to the exhibition rooms. We wanted to make the pathway an

introduction with a sinuous and amusing approach that enabled all visitors, whoever they may be, to have easy and user friendly access to the building as if on a flying carpet. Which explains all the difficulties the project presented us with! It was therefore essential to go for a material that was no more than 2cm thick overall and which could be easily modulated given the ramp's geometric complexity. Ductal® stood out. Mechanical resistance, finesse, specific elements... everything fulfilled our goals.

What were the constraints in relation to its use and in the end what did Ductal® bring to the museum's project?

Emmanuel Combarel : At the start the biggest problem was to draw-up 3D sections in the shape of a helix to create the alternating curves. But there were other constraints, such as the 4% limit for a wheelchair ramp and 2% for the slants. The 250 m² gardens were therefore used to the

maximum to make a ramp that is 49m long made up of 32 modules with very gentle curves.

THE CULTURAL SINGULARITY

Ductal® has therefore made it possible to design an extremely thin footpath (25mm) which is finally what gives us the strange impression of seeing people in a state of levitation as it disappears into the vegetation. Furthermore, from a "plastic" viewpoint, it pleased us to combine a material like Ductal® with the cultural aspects of a 19th century style building. The concrete pathway offers a different interpretation, an open and unusual progression. The occasional modifications we have made have enabled us to give this museum an essential dynamic... just like the international dimension of this creative space that will become a cultural flagship for the city.

Birmingham

A huge stairway in space

As a leader in the British market, Lafarge Cement UK has set up its new head office in the city of Birmingham, in the centre of the United Kingdom. The choice of location reflects a desire not only to be at the centre of the national Lafarge network of cement works and supply centres but also to be close to the major transport routes, notably rail and air with Birmingham International Airport.

The new premises have been designed with the idea of presenting Lafarge products and demonstrating both the durability and the low energy consumption that these materials favour.

The building has a concrete framework based on innovative solutions through the use of advanced concrete such as Agilia® which allows to realise large concrete ceilings in situ.

The great potential of these products has been exploited in order to optimise concrete's inherent thermal inertia properties, store energy and reduce the heating and air conditioning requirements. The consequence is a significant reduction in both operating costs and carbon emissions.



However, without doubt one of the most remarkable parts of this new head office is the huge stairway that rises up out of the central hall. The refinement of the Ductal® steps and landings gives it an elegance that appears to be directly related to the apparent state of weightlessness and lightness that Ductal® permits. Making the most of the high resistance provided by this ultra-high performance fibre reinforced concrete, the architects Webb Gray and Vincent and Goring have designed the stairway with a refinement that would never have been possible with conventional concrete.

This is clearly a showcase project that symbolizes the association between the architects' creativity, the performance of the materials developed by Lafarge and the know-how and competence of the pre casters, such as Bonna Sabla/J. Poussard, which supplied the Ductal elements.



A century of technology

Situated in the heart of the Canadian Rockies for a hundred years, the Lafarge cement plant in Exshaw, Alberta has built a solid reputation based on technological know-how. It is a position that has enabled it to become one of the most efficient and cost effective plants in the world; supplying the Canadian and US West with much needed cement, thereby ensuring continued growth and prosperity in the years ahead.

Recently, a special event was held at the plant to dedicate a new centennial monument to the thousands of employees, their families and the community - who played such an important part in its history. Evoking a modern, urban landscape, this unique work by artists, Michele and Andrew Mitchell of Edmonton, Alberta, places the plant in the future by using a combination of durable Lafarge materials such as Ductal® and precast concrete (produced by Lafarge's Alberta Precast team).

Aptly named "Enduring", this legacy project was inaugurated by Alan Kreisberg, Western Cement Region President, in celebration of 100 years of commitment to excellence.

Technical file

How are Ductal®'s aesthetic properties preserved?

The outstanding performances of Ductal® may often lead users to forget that it is a cement based material which, by essence, is sensitive to water, despite its extremely low porosity. The phenomenon is limited to the very near surface (at the micronic scale) but requires treatment to provide surface specific properties that avoid staining and efflorescence.

Protection is even more demanding in terms of perfection given that Ductal® has a very high density. The Ductal® development team has established 2 classes of product that enable it to be used for all kinds of applications, particularly the aesthetic ones that this ultra-high performance concrete inspires. The first class of product is more particularly destined for out-

door applications (façades, urban furniture etc), when exposed to the rain are subject to efflorescence. Coatings that are permeable to air and water have been perfected to protect the surface while letting the material breath.

The second class of product applies to all indoor objects, particularly those exposed to household and food related attacks (tables, coun-

tertops etc). It is a 100% stain resistant anti UV coating that has been especially developed for Ductal®. It makes the surface non sensitive to water while retaining the aesthetic properties of the material and notably the unique surface appearance and tactile sensitivity that contributes to the attractiveness of Ductal®.

Japan lands on Ductal®

Tokyo's Haneda Airport is the 4th largest airport in the world (in terms of passenger numbers) and, with a take-off every two minutes, it has reached full capacity on its three runways. The construction of a fourth runway will make it possible to open up new international connections for the capital. Guaranteeing a 20% increase in traffic, this new runway was seriously delayed by... the local fishermen as it is directly built over their fishing area. Emerging from the sea, an ultra modern pier on submerged piles will be entirely covered with Ductal slabs fixed on steel girders. Given not only the economic stakes but also those involved in building this technological feat, the engineers obviously set the requirements very high in terms of both the durability and resistance of the materials and the low maintenance costs.

Resistance to freezing, the degree of impermeability, the capacity to resist salt abrasion, as well as the lightness of the materials shaping the slabs were the criteria that led to the choice of an ultra-high performance concrete. To meet the challenge of a daily production of concrete that will allow the pier to see the light of day before the end of 2009, the companies Taiheiyō Cement and Taisei, licensed by Lafarge, undertook to supply the airport site with Ductal® for the next two years. 7,000 blocks of UFC pre-stressed concrete will be precasted in a specific plant nearby the jobsite i.e. 24,000 m³, making it the largest project in the world in relation to the surface area and the technical constraints. A project to watch !

Absolut Béton : Unique Ductal® tiles for unique kitchens

Created by the craftsmen who adore the changes taking place with concrete, Absolut Béton wanted to use all Ductal's technical capacities.

Top kitchen specialists, they design pieces either made to measure or



using existing moulds that all present their very own patina and personality. "Because that is the magic of the material that stands out from the often impersonal work surfaces," explains Stéphane Bruno, managing director, "to appear as a unique and living sculpture even when produced semi industrially."

One of the major advantages is that it can cope with anything from manufacturing to fitting. And even if necessary the layout plan for concrete tiles, which are the latest thing from the company. Some magnificent slabs that give a kitchen its particular hallmark as no other decorative element can. For further information : www.absolutbeton.fr

Lighting news

Nessie receives the 2007 design award



Designed by the Scottish designer Neil Poulton and developed by Atelier SEDAP, Nessie, the new range of outdoor lighting in Ductal®, has been directly inspired by the surreal shape of the Loch Ness monster that is dear to the designer's heart. Pure lines of a long neck emerging from nowhere and plunging back down into the lake, the perfect curve of a glimpsed back, each light combines the latest developments in two high tech fields: Ductal® for the structure and LEDs, high power Luxeon K2 for the light source. A real outdoor sculpture, Nessie makes ideal use of the material developed by Lafarge to stretch, bend, curve and espouse the designer's desires.

The quality of the finishes is the hallmark of Atelier SEDAP which for 25 years has

been specialising in high precision casting. The Nessie collection is the final outcome of all its know-how. The coherence between two high tech solutions, one extremely resistant to all outside attacks and

the other providing constant lighting and durability (50,000 hours) will attract private individuals, demanding hoteliers and professionals in distribution that are looking for a designer, economic and long lasting lighting solution. Indeed, the range has already convinced

the APCI (Agence pour la Promotion de la Création Industrielle) jury which presented it with its 2007 design award in mid October. The Nessie collection is available in two colors : charcoal or sand. For further information : www.sedap.com



Effervescent industrial furniture!

Metal chairs, steel desks, concrete tables... industrial furniture is very fashionable today. For example, Tolix's timeless 1930s "A chair" design is a roaring success once again. Today the famous name, the undisputed specialist in hot galvanised steel furniture, has reinvented outdoor

furniture to be more in tune with current trends. This time it is combined with Ductal® to overcome the technical constraints of sheet metal that is too thin to be suitable for the tops of outdoor tables. Employing this process expertise, Tolix has adapted to this new material and has created its own casting workshop. In the end, with its mechanical resistance but above all its ductility, Ductal® makes it possible to produce outdoor or indoor tables on which prints and optic fibres work in different ways to enliven the sheet metal. A very high-end market range where the visual impression and the feel of Ductal® are fully exploited.

