Space Made Light
An innovative symbiosis of light and architecture

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ABSTRACT
How the interaction between space and light can satisfy your expectations in a bar, connect your mind to the landscape in an airport or can heighten your fun in a skate park?
Four projects, which differ in type and scale, reflect a specific approach in research and experimentation working with light. Spidi Showroom in Sarego (Vicenza, I) is a working environment enriched by a daylight solution and an integration with a series of different-toned fluorescent lamps. A polymorphous system for the Illy bars focus on definition of the change of quantity, color and distribution of light. A project of a temporary installation for “Light in Aligsås” (Sweden) is a interpretation of a urban space, where young people meet, as a connection between town and natural landscape. The indoor façade of the Falcone Borsellino Airport in Palermo follows this natural sensibility using backlit handcrafted tiles forming a colored wall-design reminding Sicilian regional features.
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1. INTRODUCTION
The architects starts from a basic consideration on light and perception: animals can detect things of environment from senses: their taste, smell, sound are much more developed than in human and they can have senses that are very different from our own: ecolocation, infrared vision, electric sense, and magnetic sense.
People instead use their visual system to assimilate about 80% of sensorial information from the environment. Light is the medium by which we are able to see, to orient ourselves and to communicate and has a profound effect on our mood and on our health, promoting a feeling of well-being: this idea is the base to develop a architectural methodology connected with the project of innovative lighting solutions.
The studio’s approach is focused on using light to enhance the experience of the people living in a space, and colour is a significant component of people experience.
The conceptual goal is to establish a memorable relationship between the situations experienced within the space
and the ensuing emotions.
Natural characteristics of daylight, changing intensity, distribution (direct sunlight and overcast sky) and tonality of natural light are involved with the regulation of human biorhythms and therefore affects emotions. The architects’ work has a strong connection to research and experimentation on projects using the different tonality of white light. With the term “colour of light” it is possible to refer to white light other than just coloured light. Warm white, neutral white and cool daylight white are derived from the white colour of light, going from a bright warm white of a sunrise to a cool white of a Nordic cloudy sky. Simplicity is the keynote for the lighting solutions proposed: coloured light appears on the projects as a note working mainly with white light.

2. EXPLORING A DESIGN PROCESS

2.1 Spidi showroom, a natural lighting system

This project, designed in regards to the Spidi showroom spaces and dining facility, was created to express the value of quality, design and research in the field of material science which is closely tied to the company’s image. Spidi develops new solutions for protection and safety on motorbike: the concept of the new space needed to offer a range of support service for testing, showing and commercializing firms’ new products. The building itself has been conceived as a “display case” that contains sample products: the visual and tactile association with the world of motorbikes was pursued through the use of different metals and different monochromatic surface textures: stainless steel, black iron and lead. Once inside the showroom, you lose visual contact with the exterior: a framework built in lightweight steel and glass that

Fig.1
Night views of the showroom

Fig.2
Artificial lighting provides constant quantity and quality (colour temperature) integration of natural light

Fig.3
The simulation laboratory during construction and during tests and photometric measurements
provides perfectly uniform lighting. Light enters through the glass ceiling and floods the space inside in a way that renders the passing of time imperceptible. This effect is a result of layering various filtering elements: the first layer is selective glass that allows penetration of only 40% of visible radiation; the second layer is frosted glass that diffuses direct solar radiation, and the third layer is a system of SPI canvas screens (Fig.1). The indoor lighting effects are emphasized by a structural system that has been specifically designed to be light and “fluid” for the penetration of light. Interchangeable, different colour temperature lamps (2700 and 6000 °K) were mounted as artificial lighting to complement the natural lighting tone during the different hours of the day (Fig.2). The combination of the two lamps is controlled using a programmed system that uses sensors and specific software to measure the quantity and the quality of the light that is integrated. The showroom is a vital and changing environment that can be continually reinterpreted and renovated: on the other hand the perfectly uniform lighting, achieved by integrating natural and artificial light, creates a perfect photographic daylight effect.

2.2 A polymorphus lighting system for Illy bar
The aim of this lighting project is to influence the costumers’ sensorial qualities in a positive manner throughout the day by changing the bar appearance during different consumer brackets. The space inside the bar changes depending on the social characteristics required on different occasions and the different types of food and drink that are offered. Five distinct time slots have been identified during the day: breakfast, lunch, break, aperitifs and cocktails. During each of these occasions, customers are looking for different experiences, depending on the working patterns and range of products offered by the bar. This awareness reveals an opportunity to diversify the space according to the various moments of the day, developing a lighting project, which introduces variables in the form of lighting profiles. The idea stems from the knowledge that the quality and quantity of lighting has a decisive effect on human bio-rhythms: indeed, our bodies react to changes in the intensity and colour of natural light. In this sense, changing the space means developing a tailored lighting system that can affect the customer’s perception inside the same space over the course of the day, and that also takes into consideration the seasonal conditions outside the bar (Fig.4).

The project was developed using a combination of lighting technology research, direct experiments using scaled-down models and full-size prototypes (Fig.3), and use of the light as a fully-fledged component of the design. The enormous capacity of the polymorphous system to adapt relies on the fact that it can balance the three key variables of light to suit requirements: (a) luminous intensity (i.e., the quantity of light), (b) the colour or tone of the light used, (c) the distribution of light, which depends on the mixture of different light sources with diffused, skimming or direct beams. The quality of the light offered by the Polymorphous Lighting Technique System recreates the variability of natural light, making the space comfortable for those working in the bar everyday and for the customers who use the bar occasionally.

2.3 Urban skate park in Alingsås
The project is part of “Light in Alingsås 2009” (Sweden), the biggest world lighting workshop, organized by PLDA
Fig. 4
The Polimorphus System was tested on a prototype to check the efficiency of integrating the control software and to adjust luminance and illumination lighting levels.

Fig. 5-6
Different lighting scenes of Alingsas Skatepark
Fig. 7
Sicilian shapes and colours defined the arrangement and tonality of the tactile wall.

Fig. 8
The Tactile wall is composed of interactive tiles that spin on their axes and show the colours of the glazed borders.

A light show was created with a series of different light scenes with a base of natural sounds. The project concept was to transform this dull architectural space, the skate park, into a creative young connector between urban life and natural environment. The young people using the skate park were considered in the lighting design: they helped to define the feelings and emotions they had while skating in the arena. Continuous, circular movements promoted concentration and relaxation.

Light, with the use of colour light, enhanced the overall space: the show started with a moon dancing on the concrete floor, and after a darkness effect, scenes went on with the simulation of...
morning daylight, moving on the green forest effect finally ending with a volcano eruption. The use of coloured light was essential to reproduce the emotions given by natural forces (Fig.5-6): from calm to shocking effects, from daylight levels to darkness during the show skaters were going on the light, in the light and following the light.

2.4 Palermo Airport Retail, innovative use of light with hand-worked and painted terracotta
This project offers to the passengers waiting for flights at Palermo airport a pre-flight shopping experience of a very unique kind. The key element is the façade system applied to the retail area: a composition of shapes, colours, lights and materials that can generate physical and emotional experiences and at the same time evoke local regional features. The walls were built using different-sized terracotta panel with edges glazed with different chromatic nuances evoking associations to the local landscape such as salt marshes, dry fields and citrus plantations (Fig.6).
Each of the panels has one or two holes drilled into them, allowing them to be mounted on metal rods. The majority of the panels mounted on just one rod can be rotated (Fig.7). The idea was not only to encourage physically touching the rough texture of the terracotta tiles but also to create continuously changing walls. The panels are also backlit: as a result, a rich and vibrant environment is created by the interaction of passengers in changing the colours around them and by the light enhancing the material's surface, produced by skilled artisans.

3. CONCLUSIONS
The use of different tonality of white light plays a key part in the design of the presented projects: part of the challenge is to integrate artificial and natural light sources, and to use artificial light reproducing in some way the effects of natural light.
The extraordinary interplay of natural light with materials in terms of contrast, texture, colour, time and movement gives the core principles that guide the lighting design process.

REFERENCES