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LIGHT SCENARIO BY MEANS OF OLED-TECHNOLOGIES IN FORMATION OF THE OBJECT-SPATIAL ENVIRONMENT OF SHOPPING AND OFFICE CENTRE AVE PLAZA IN KHARKIV

Mohova K.S., Tregub N.E. Light scenario by means of OLED-technologies in formation of the object-spatial environment of shopping and office centre AVE PLAZA in Kharkiv. Variants of light scenarios in formation of object-spatial environment of shopping and office centre AVE PLAZA by means of OLED-technologies are pointed out in the article. Compositional solutions of atrium space, show windows and territories near the square of the shopping center are suggested. LED lighting gives the possibility to use widely creative ideas in interior and exterior spaces. The proposed compositional solution of light scenarios can be used not only in the shopping and office centre AVE PLAZA, but also in other shopping centers to increase their attractiveness, comfort and advertising in the urban environment. The usage of basic research results will increase the comfort of urban environment and create expressive architectural and design solutions for wholesale and retail trade. Further research in this area should focus on issues of ergonomics and environmental data of lighting sources.

Key words: light scenario, OLED-technologie, shopping and office centre AVE PLAZA, object-spatial environment.

Мохова К.С., Трезуб Н.Е. Световые сценарии средствами OLED-технологий в формировании предметно-пространственной среды торгово-офисного центра AVE PLAZA (м. Харьков). В статье рассматриваются варианты световых сценариев в формировании предметно-пространственной среды торгово-офисного центра AVE PLAZA средствами OLED-технологий. Предложены композиционные решения атриумного пространства, витрины и территории сквера возле здания торгового центра. Светодиодное освещение позволяет максимально широко использовать креативные идеи в оформлении интерьера и экстерьера. Предложенные композиционные решения световых сценариев могут быть использованы не только в данном объекте ТОЦ AVE PLAZA, но и в других торгово-развлекательных центрах, что повысит их привлекательность, комфортность и рекламность в среде мегаполисов.

Использование основных результатов исследования будет способствовать повышению комфортности городской среды и созданию выразительных архитектурно-дизайнерских решений предприятий оптово-розничной торговли. Дальнейшие исследования в этом направлении должны сосредоточиться на вопросах эргономики и экологии данных источников света.

Ключевые слова: световые сценарии, OLED-технологии, торгово-офисный центр AVE PLAZA, предметно-пространственная среда.

Мохова К.С., Трезуб Н.Е. Светлові сценарії засобами OLED-технологій у формуванні предметно-просторового середовища торговельно-офісного центру AVE PLAZA (м. Харків). У статті розглядаються варіанти світлових сценаріїв у формуванні предметно-просторового середовища торговельно-офісного центру AVE PLAZA засобами OLED-технологій. Запропоновано композиційні рішення простору атриуму, вітрини і території скверу біля будівлі торговельного центру. Світлодіодне освітлення дозволяє максимально широко використовувати креативні ідеї в оформленні інтер'єру та екстер'єру. Запропоновані композиційні рішення світлових сценаріїв можуть бути використані не тільки в даному об'єкті ТОЦ AVE PLAZA, а й в інших торговельно-розважальних центрах, що підвищить їх привабливість, комфортність і рекламність в середовищі мегаполісів. Використання основних результатів дослідження буде сприяти підвищенню комфортності міського середовища і створенню виразних архітектурно-дизайнерських рішень підприємств оптово-роздрібної торгівлі. Подальші дослідження в цьому напрямку повинні зосередитися на питаннях ергономіки та екології даних джерел світла.

Ключові слова: світлові сценарії, OLED-технології, торговельно-офісний центр AVE PLAZA, предметно-просторове середовище.

Background. Light interior design is a multilevel system formed by different illumination devices that simultaneously solves functional, aesthetic and emotional tasks in accordance with the purpose of a room. Light is the most important element of interior space. Artificial lighting in the room performs utilitarian and aesthetic functions. Utilitarian function is defined by hygienic standards to ensure normal visual capacity of a man. Aesthetic function is defined by architectural and artistic requirements. Artificial lighting highlights and reveals the inner space, tectonic system, the scale of the interior and provides unity of stylistic solution by means of lamp forms. Because the light is very plastic «material», it can be used to create any image of the object.

Three types of lamps are mainly used in the rooms. There are filament, halogen and fluorescent lamps. Those types of lighting that is closer to natural are more favorable and harmless for human vision. The future of lighting devices belongs to (light-emitting diodes) LEDs, so this study is very actual and important.

The relationship of this research work with scientific programs and practical tasks. The topic of this research is related to the complex topic of long-term plan of scientific and research work of the department «Furniture Design» KSADA 2010-2015. «The formation of design of environment paradigm: origins, modern status and development trends».

The purpose of the article is to characterize the author's compositional solutions of interior and exterior space in the shopping and office centre AVE PLAZA using OLED technologies.

The main material of the research. The study considers OLED lighting, because nowadays the revolution in LED lighting takes place. Thin and flat shape of organic LEDs makes it easy to integrate them into furniture, walls, ceilings or floors that cannot be done with other light sources. Unlike filament lamps, where light appears as a result of electric current passing through a wire or fluorescent lamps in which current is conducted through the gas, organic LED lighting works by passing electric current through one or more layers of ultrathin organic semiconductors. Such parameters as shape, size, color, lighting, lamp design can be varied and people can choose them to their taste. Organic LEDs make it possible to create ultra-thin (thickness of a sheet of paper), completely flat light sources. OLED is waterproof and airtight, it can change the brightness of the light it doesn't emit heat. Organic LEDs emit diffused non-dazzle light with high color rendering index. Unlike all other lamps, except fluorescent, OLED shine evenly, that is, they have low overall brightness. OLED are thin and flat, they can be on underlining of any shape. In addition, they are instantly turned on and consume little power that distinguishes them from other sources.

Lighting scenario of atrium in the shopping and office centre AVE PLAZA.

Lighting of spaces must necessarily be of two types, that is, the main and accentual. Very powerful lights that have certain characteristics and give diffused light are usually used for the main lighting. Sometimes, the beam of light is directed at the ceiling or any neutral surface, in case of reflection the scattered light appeared again, it does not tire the eyes and evenly illuminates the room.

Accentual lighting is extremely diverse. Light panels, illumination of shop windows or any other interior elements give unique charm to the mall.

Placement of small OLED-modules that are distributed in space are chosen for compositional solutions in general lighting of the atrium. These sources reflect light from the ceiling and give most of it back, dispersing evenly throughout the space. The reflected light makes the interior space weightless and transparent, and gives the impression of the most comfortable and uniform lighting. A large number of small lights form a decorative spiral mass, covering the entire scope of multilevel interior space (Fig. 1). This design solution is interesting for visitors of the shopping

and office centre on each floor. OLED-modules that are used in solving of basic lighting, give eye-pleasing light, characterized by soft shadow properties and uniform distribution of brightness of light reflected from the surfaces of walls, ceilings and floors. OLED-modules are opaque and do not transmit the blinding light, breaking the direct rays. The scattered light that is received from them has the largest ratio of utility and it is best suited for general lighting. It is possible to place these light sources freely, they may be located across the top area of the room. They can be mounted on light rod structures or mounted in suspended or casement ceilings. To create different lighting scenarios that can vary, for example, depending on the season, you can place a large number of OLED-modules in the form of butterflies, flowers and snowflakes across the atrium area and adjust their brightness and position in space. (Fig. 2)

For example, these modules can be placed on conductive structures that provide the greatest mobility. The design of such conductive wires is various: they can be mounted to a ceiling and to the walls. Light elements that are located on these wires, change the angle of the beam and its location easily. For example, if you want to concentrate the maximum amount of light at any single point, it is possible to move elements in the right place; to create general illumination light sources are placed in different locations of the room, and you can change an image of general lighting many times changing the position of lights. Also, the idea of using of OLED-modules with adjustable angle was used to correct the height of the room. The light is directed strictly to the walls, ceiling, however, it remains in the shade and becomes visually smaller.

Another variant of introduction of OLED lighting in the atrium in the shopping and office centre is the principle of emphasis of functional interior elements such as escalators, elevator shafts, barriers, floors), which reveals the tectonic and structural features of the architecture. This lighting can be built in and as a continuous band. This built in lighting emphasize functional areas and make atrium visually larger. The combination of different methods of lighting shows that lighting should be used as a means of visual correction of the size and proportions of the room.

Light scenario of the showcases in the shopping and office centre AVE PLAZA.

In any store regardless of its specificity, designers pay special attention to lighting design of the shop window. It should be highlighted in particular way in order to attract buyers. Lighting is one of the most important factors in increasing sales. For example, two shops offer the same range of goods. Which one will be the most successful? That one which is brightly lit: the more intense ambient lighting, the greater influx of customers.

The combination of general and accentual lighting is used in the show windows. Lamps or searchlights are best suited for general lighting; they are usually

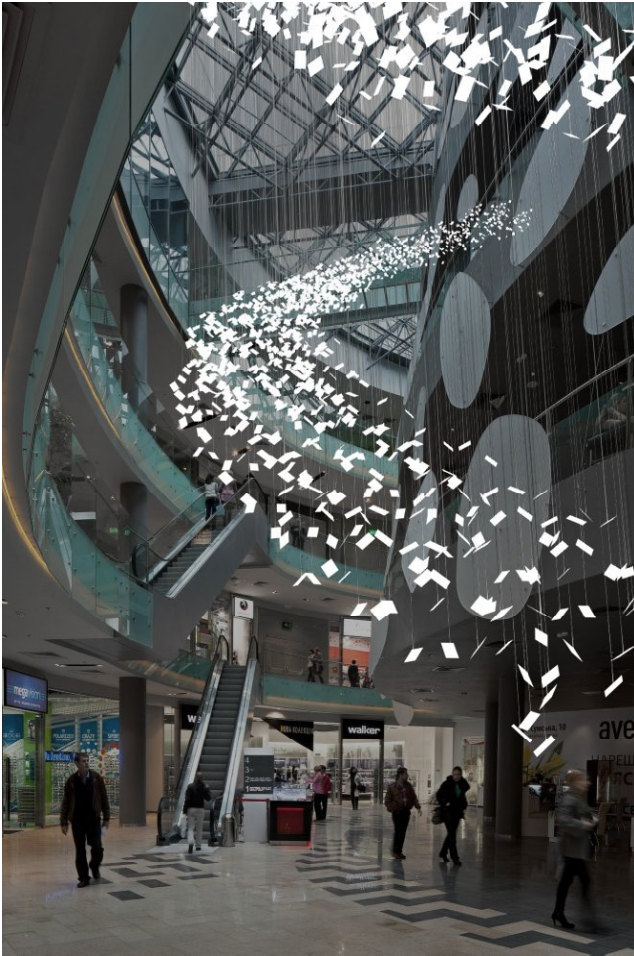


Fig. 1

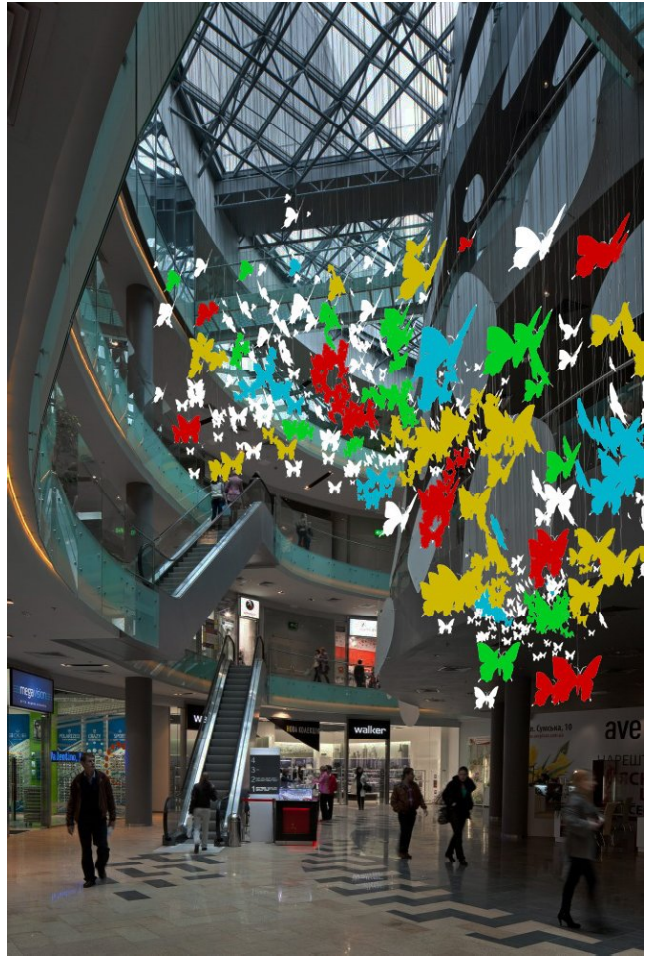


Fig. 2



Fig. 3



Fig. 4



Fig. 5

located at the top of windows. OLED-modules can also be used in lighting design of show windows and interior design of the store; they give the possibility to change colours. This light can also be effectively used for decorative lighting and creation of a special mood. OLED-modules were selected as decorative lighting of show windows because of their durability. The flow of light emanating from these lamps doesn't fade, and the lamp is not heated, in comparison with filament lamp.

One of the variants for the introduction of OLED-technologies in lighting of shop windows is

composition of OLED-modules that will serve not only for lighting and highlighting of decorative elements of the show windows, but they will act as a decorative element together with lamps (Fig. 3). In this case, such properties of light as brightness, light rhythm and color are used. The topic of the scenario «Seasons» allows us to emphasize the pictures queness of the shop windows. Also the flexibility of lighting solution plays an important role. It provides possible transformation of interior space, allows quickly rearrange emphasis in modified atmosphere. Today, it has become much

easier to create such systems. We can notice obvious advantages of moving light systems that allow you to change the emphasis. All this provides more opportunities for the combined usage of light. A lot of light points instead of one powerful lamp are used in the show window. It allows making more detailed stress (Fig. 4). Successful light concept of the store facilitates introduction with the proposed product.

Lighting design in formation of scenarios of the park at the shopping and office centre AVE PLAZA

Landscape lighting is one of the most popular trends in modern design because it allows you to see the landscape and the surrounding architecture in the most favorable light.

Initially, landscape lighting only provided the necessary level of illumination areas at night and served more for navigation and safety. For this purpose, a variety of street lamps were used, they gave the necessary light.

Most traditional garden and park lights still remain functional. OLED lighting with minimal design is suitable for landscape architecture, as they do not create a strong blinding effect.

However, a functional component in landscape lighting fades into the background and its aesthetic perception becomes more important. So, today, landscape lighting is more demanded. It helps to emphasize the positive aspects and create more advantageous types of surrounding area in daylight hours. LED light sources provide maximum opportunities for this purpose.

LEDs are successfully used in outdoor lighting because they have a high level of protection against moisture and corrosion, resistant to vibration, impact resistant and can withstand the impact of different temperatures. In addition, they do not require special care, they are easy to operate and consume little power. In terms of design, the advantages of semiconductor light sources are good color and wide range of color temperature. Thanks to its technical characteristics they can be used in lamps of different shapes and can be built in into any surface.

For example, OLED-modules can be used to illuminate the area of the square. They will serve as a framework where decorative design lamp will be mounted (Fig. 4). OLED-modules will evenly distribute the light. This design solution highlights the contrast of modernity with the past; it gives a special charm and image to the square. These lamps are completely invisible during the daytime; they can be used absolutely in any design concept.

Design variants of lamps that often copy objects of nature and have bionic shapes are also suitable for this purpose. These lamps fit better in landscaping areas, make it more comfortable.

One solution was to create park square frames with OLED-modules that encircle the entire Park Avenue (Fig. 5). Thanks to built-in LED lights with horizontal light this solution allows to emphasize the texture of pavement (asphalt, paving blocks, etc.). With its light

and shade change even ordinary concrete in the light of these lamps looks impressive. By means of LED lamps using frames with interesting shaping you can create original light compositions that will form some illusions or visual effects. The growing popularity of OLED-technologies in landscape lighting is also due to the ability to create light dynamic effects programmed using a PC. "Smart" light allow you to set different scenarios, change colours, control brightness, which will depend on the level of natural light, and form a variety of lighting variants for weekends or weekdays.

Conclusions. LED lighting gives the possibility to use widely creative ideas in interior and exterior spaces. Conventional and organic LED lights let you create light constructions and design solutions, which were not available in the past due to technical reasons. The proposed compositional solution of light scenarios can be used not only in the shopping and office centre AVE PLAZA, but also in other shopping centers to increase their attractiveness, comfort and advertising in the urban environment. Further research in this area should focus on issues of ergonomics and environmental data of lighting sources.

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