INNOVATIVE SOLUTIONS IN THE LIGHTING OF AUDITORIUMS

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Proper lighting of auditoriums is crucial for the comfort of visitors, ensuring safety during evacuation and a favorable perception of performances, movie screenings or other events. With the development of lighting technologies such as LED and automation systems, it has become possible to increase lighting efficiency, reduce energy consumption, and improve the event environment.

The purpose of this study is to investigate ways to improve the energy efficiency of lighting systems in existing auditoriums and the project "Reading Club with an auditorium for 300 seats" (by Radetska O.V.), designed on Primorskaya Street in Odesa.

One of the most interesting examples of auditorium lighting in Ukraine is the Mayachok Event Hall in Kyiv. A sophisticated lighting system was implemented here, using more than 900 meters of LED strips and 84 LED luminaires. The walls have perforated niches with decorative lighting, which creates a special atmosphere. Lighting control in the hall is divided into zones and is carried out using the DMX protocol, which allows you to customize dynamic lighting for different events. The control can work both with the lighting director's console and with mobile devices.

We can also mention the Kyiv Academic Drama Theater in Podil, which combines static and dynamic lighting devices. This allows for the creation of unique world shows that are combined with acoustic solutions to enhance the experience of the performances.

Philips' LED luminaires for halls are characterized by their high energy efficiency and adaptability. Their LED systems integrate well with existing infrastructure and new installations, providing the precise dimming and color temperature control required for multifunctional spaces. Zumtobel LED Lighting's LED luminaires are designed to distribute light evenly, minimizing shadows and improving the overall visual experience in classrooms. There is a trend towards the use of high-tech and smar auditorium lightin systems. They not only make the hall more functional and productive, but also technically upgrade it. Undoubtedly, such lighting installations can be quite reliable in adverse conditions. There are options for environmentally friendly LED lighting with an emphasis on energy saving and intelligent control systems. Their lighting settings are versatile, support a variety of functions,

from concerts to lectures, and offer intelligent technical features such as remote control and automatic lighting control.

The lighting of the auditorium is based on a triangle pattern. Its wide side is located on the stage, and the apex is in the middle of the hall. The side areas are the darkest, and the very first rows may feel uncomfortable. In the Reading Club with a 300-seat auditorium project, comfortable viewing of performances without glare or excessive brightness is achieved through the use of windows that provide natural daylight and are positioned so as not to disturb the audience. Natural light helps to improve the energy efficiency of the hall's lighting. During performances or movie screenings, the light intensity can be reduced to create a favorable atmosphere, while during intermissions or preparations for events, bright general lighting is used. This rule is implemented with the help of luminaires built into the ceiling, which allows you to control the level of illumination at different stages of the hall's use. The project provides for the use of emergency lighting along the evacuation exits, which is a necessary requirement to ensure the safety of visitors. The integration of direct and indirect lighting fixtures ensures uniform light distribution and visual comfort. Such systems are especially effective in environments where presentations and performances require focused lighting on the stage while maintaining general illumination throughout the audience.

The concept of flexibility emphasizes that the hall lighting should allow for a variety of events, from concerts to lectures, with adaptive lighting systems. Adjustable spotlights for the stage, together with ambient LED lighting for the audience, ensure that the auditorium can effectively perform a variety of functions. LED lighting, which is energy efficient and environmentally friendly, has become the dominant choice in modern design due to its adaptability, durability, and ability to integrate with intelligent lighting systems, as seen in industry case studies These intelligent lighting installations provide dynamic control over light intensity and color, allowing spaces to transform according to the nature of the event. The combination of natural and artificial lighting strikes a balance between comfort and functionality, while emergency and exit lighting makes the space safe and convenient for mass events.

The placement of the luminaires in patterns that optimize both horizontal and vertical illumination ensures that every corner of the room is well lit without creating harsh shadows or over-lit areas, which is crucial for both the comfort and safety of the audience.

When selecting lamps for an auditorium, it is important to consider several criteria: light level, energy efficiency, dimmability, color temperature, and compatibility with the overall architectural design.