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DESIGNING LIGHTING ENVIRONMENTS FOR MUSEUM AND ART GALLERY INTERIORS

Pardayev Abbos
Teacher at Karshi State University

Zokirjonova Joziba
Student at Karshi State University

Abstract:

The article examines the features of interiors intended to house museum exhibits, studies the lighting characteristics of these interiors, as well as methods for the correct use of artificial and natural lighting for museums and art galleries.

Keywords

lighting, exposure, light perception, conservation

Introduction

Museum and exhibition lighting is considered one of the most challenging areas of lighting design and engineering. Mistakes in this area not only lead to reduced visitor flow due to poorly lit exhibits, but also to damage to valuable exhibits due to the destructive effects of light.

The aim of the study is to identify lighting methods that are beneficial for the perception and conservation of exhibits and to study methods for creating effective lighting design in exhibition halls.

Using natural light

One of the main tasks of lighting exhibition spaces is to provide favorable conditions for perceiving exhibits. [4]

For psychophysiological reasons, natural lighting is preferred when permitted by conservation requirements. [3] Daylight is considered the best for correct light perception. In exhibition spaces, light openings should, if possible, not be in the line of sight of visitors viewing exhibits. To limit glare from light openings, blinds and screens should be used.

As a rule, paintings are best seen when they are evenly illuminated with diffused light, which avoids harsh shadows, glare, and specular reflections.

An example of proper lighting is the Tretyakov Gallery. (Fig. 1) The ceilings of the Tretyakov Gallery are made of inorganic silicate glass. This light-diffusing (opalescent) glass is used to make diffusion-diffusing elements.

Diffused light falls evenly from the ceiling. This lighting eliminates harsh glare and shadows on exhibits, creating uniform illumination throughout the halls.

Fig. 1. Use of light-diffusing glass in the exhibition hall of the Tretyakov Gallery

Use of artificial lighting

In rooms intended for the display of paintings, graphics, fabrics, carpets, tapestries, etc., direct sunlight should be avoided due to its destructive effect on dyes, fabrics, and paper. In such cases, artificial lighting must be used.

The use of artificial lighting in museums allows exhibition curators to fully control the lighting environment in the halls. Modern LED technology allows for precise adjustments to each exhibit, such as setting the desired color temperature or power. Various optics can be used to highlight each exhibit individually or, conversely, create a soft, floodlit illumination across an entire wall.

When designing lighting for rooms containing light-sensitive objects, it is necessary to resolve conflicting issues: making the exhibits clearly visible to viewers and protecting them from excessively bright, destructive light.

Each type of exhibit has yours certain level acceptable illumination . [1]

Table 1 Permissible illumination standards for different types of exhibits

Illumination standard, lx	Type of exhibit
50	Objects made of fabric or newsprint, watercolor painting
30–50	Low lightfastness exhibits: tempera, drawings, manuscripts, stamps, graphics
150	Exhibits of medium lightfastness: wood and bone items, oil paintings
200–300	Large-sized exhibits with high lightfastness: bronze, marble sculptures
300–500	Highly lightfast exhibits with fine details: jewelry, porcelain, coins, weapons
500	Precious metals and stones

To ensure the necessary conservation of certain types of exhibits, the lighting must be dim. An example of such lighting is the Pushkin State Museum of Fine Arts (Fig. 2). Viewers have difficulty perceiving paintings in dim light, but the lighting designers devised a unique technique: they darkened the walls and avoided ambient lighting. When visitors enter the hall, their eyes immediately begin to adjust to the dim light, so after a while, the accent lighting appears brighter to eyes accustomed to darkness.

Fig. 2. Accent lighting of paintings in the Pushkin State Museum of Fine Arts

The perception of an artwork depends on the placement of lighting fixtures. Directed light on the exhibit helps highlight the object within the overall display, attracting the viewer's attention, and serving as a form of navigation for museum visitors. In any case, direct light from the lamps should be avoided from entering the viewer's field of view.

Paintings are best perceived when illuminated by a light source of the same color as the one used to create them. [6] An inappropriate color palette and saturation can result in a painting being perceived quite differently from the artist's intended meaning. For example, the gloom and horror inherent in a painting can easily be ruined by a bright light. Conversely, one can enhance the perception of a painting or other work of art by dimming the lighting or emphasizing certain areas.

To visually enhance the volume of three-dimensional figures, diffused and direct light are combined in a specific ratio. [7] (Fig. 3) This division is relative rather than absolute, as both streams of light alternate and support each other. Exhibition lighting designers believe that the illumination ratio between the museum piece and the background should be 2:1. This prevents the object from becoming overly dramatic, while also focusing attention on the exhibit.

Fig. 3. Combination of diffused and direct light in a 2:1 ratio

Conclusion

Lighting methods must be appropriate to the type of exhibit to ensure its best preservation. When designing the interior of a museum or art gallery, attention must be paid to lighting, which can accentuate specific moments in a painting, create the desired atmosphere, and evoke various emotions. Lighting guides the viewer to the riches of fine art.

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