

Artificial Illumination in Temporary Exhibitions Set-up

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Illumination is an essential aspect in setting up museum exhibits which must not be underestimated, as often the positive outcome of an exposition may be ascribed to efficient lighting.

However, especially in the case of temporary exhibitions, very limited time is usually dedicated to in-depth analysis of the matters connected to setting up lighting for display.

In most cases, illumination is not properly dealt with. This often implies using previously existing lighting systems which are not fit for the purposes of a specific exhibition.

Adequate lighting must meet with several requirements, relating to

- (1) the place of exposition, which implies selecting adequate lighting fittings and defining how they are to be placed;
- (2) how the observer is related to the space of exposition, to the object being exposed and to the lighting system, the purpose being to optimise visual comfort;
- (3) how the work of art being exposed may be best appreciated and preserved.

This implies defining the technical requirements for proper lighting, acquiring full knowledge of the sources of light and illuminating fittings available on the market, and experimenting on direct and reflected glare, haze effect, contrast and shadows.

For all such purposes, a laboratory was set up in the Modern Art Gallery of Turin where experimenting was conducted on several different illumination systems with respect to objects placed on a wall, in windows or isolated. The purpose of this project was to analyse the above situations by employing different illuminating fittings provided by major producers of lighting systems operating in the field of expositions and lighting for display.

Experiments have firstly dealt with the study of wall-washer fittings installed on a track with a direct, frontal light, the purpose being to try three different fittings, two with mobile geometrical optic and one with fixed one.

The following *tests* were carried out:

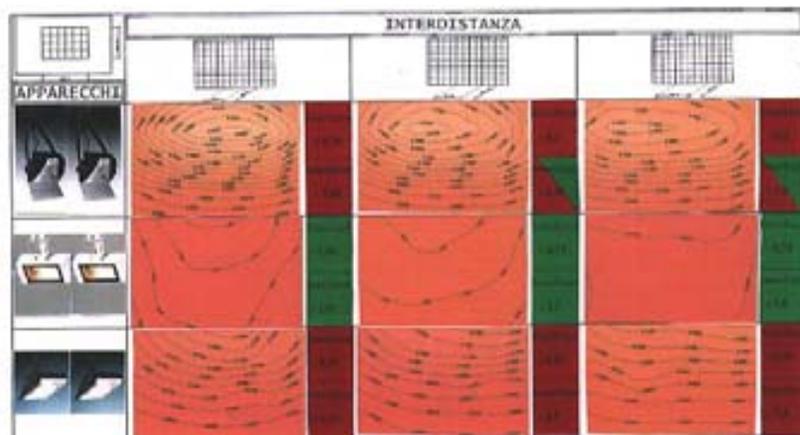
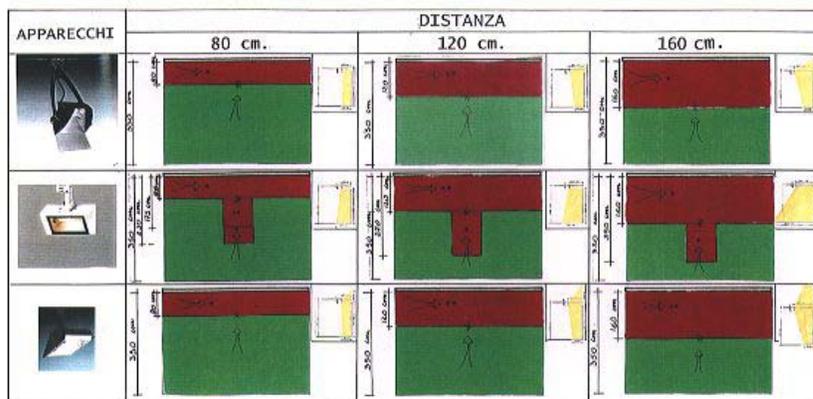
∅ Distribution of illumination was analysed by measuring the level of light diffused on a wall for display. Each fitting was placed at different distances from the wall, with two fittings placed at different distances one from the other every time. The results were expressed in graphics through diagrams with curves for an equal amount of light on different points of the wall. Data comparison determined which combination resulted in the best light uniformity.

∅ Perception analysis was conducted with three lighting fittings placed at different distances from the wall and from each other. The following elements were examined: *direct glare* by the sources of light when the visitor's position is laterally and

longitudinally aligned with the source of light; the *shadow patterns* resulting when frames with different thickness are placed on works of different sizes.

∅ The luminance on the exposed work, examined with respect to visibility and measured on a quantitative scale by means of a photometer placed at different distances from the wall. The purpose of this test was to analyse *reflected glare* in the presence of glass, which is usually associated with the presence or the absence of a "haze" effect on the object or surface exposed to light, and to analyse *the sharpness of contrast* with different backgrounds and different details.

Below are two examples of the thirty synoptic tables comparing the different lighting fittings under each parameter that was modified during experimentation. The first table regards an *analysis of direct glare*, while the second table represents *uniformity testing* conducted for each device placed at different distances from other fittings and from the wall or a given area of exposure.



Experiments were completed and the relevant data were collected in a *Wall-Washer Fitting Toolkit*. The purpose of this ready-reference manual is to provide lighting engineers and experts with guidelines in choosing the best solutions for specific lighting requirements.

The Introduction to the manual contains a presentation of the main features of wall-washer fittings and a list of problems and matters connected with the use of such fittings, namely:

- ∅ vertical tilt and cone of light
- ∅ uniformity
- ∅ direct glare
- ∅ shadows
- ∅ reflected glare
- ∅ contrast sharpness and "haze" effect

Particularly, three kinds of geometrical optic were identified: a fixed one, a moving one with screen, and a moving one without screen. The distance between the fitting and the wall was set as a variable parameter, while the area of exposure and the distance of the track from the floor were set out as fixed parameters.

The *Toolkit* judges on the suitability of each geometrical optic at every distance from the wall.

The purpose was thus to describe the potential of wall-washer fittings and their deficiencies, depending on their different placing position.

Below is an example of the two guideline pages of the manual used for each geometrical optic at each distance from the wall.



UNIFORMITA' della fascia espositiva
Entire/Emed (>0.5) = 0.17
Emed/Φ = 0.15 [lx/lm]

ABBAGLIAMENTO DIRETTO
 Si verifica solo lungo il percorso fucolare, in una zona larga 80 cm.
 E' comunque poco fastidiosa.

OMBRE PORTATE
 12% di ombra rispetto all'area del quadro.
 Questa situazione è stata verificata per un caso limite di cornice
 Apertura delle cornici in cui $\beta = 63.5^\circ$
 Larghezza della cornice

ABBAGLIAMENTO RIFLESSO
 Non si verifica abbagliamento riflesso poiché la sorgente non rientra nel "volume d'offesa", per qualsiasi posizioni assunte dall'osservatore.

RESA del CONTRASTO e presenza del "VELO"
 Non sussiste il problema poiché la sorgente risulta sempre al di fuori del "volume d'offesa".

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