Illumination

Toolbox Talk

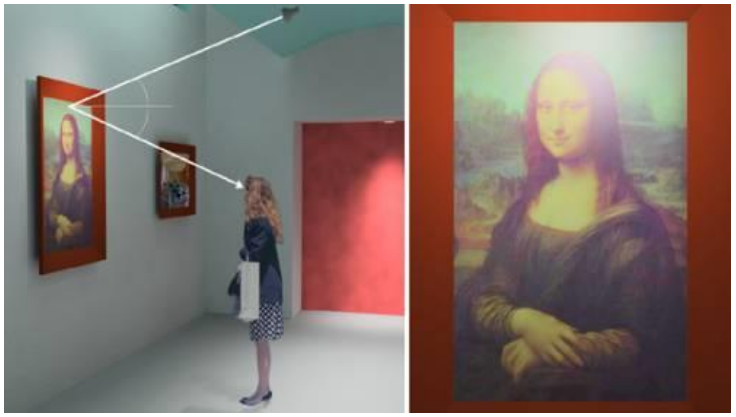
efnms
European Federation of National Maintenance Societies vzw

EHSEC

Negative impacts of lighting

Glare

- It is created when there are high-gloss areas in the worker's field of vision which cause a decrease in visual acuity.
- It is caused by sources with a luminance difference> 10 relative to the environment



Negative impacts of lighting

- Eye strain from visual attachment due to the intense and persistent effort they are subjected to and which is hindered by inappropriate lighting.
- Visual fatigue which means fatigue of the optical muscle

Symptoms

- Eye irritation, lacrimation
- Conjunctivitis
- Diplopia
- Headaches, drowsiness
- Reduced capacity for eye convergence
- Reduced visual acuity
- Reduced visual sensitivity to contrasts

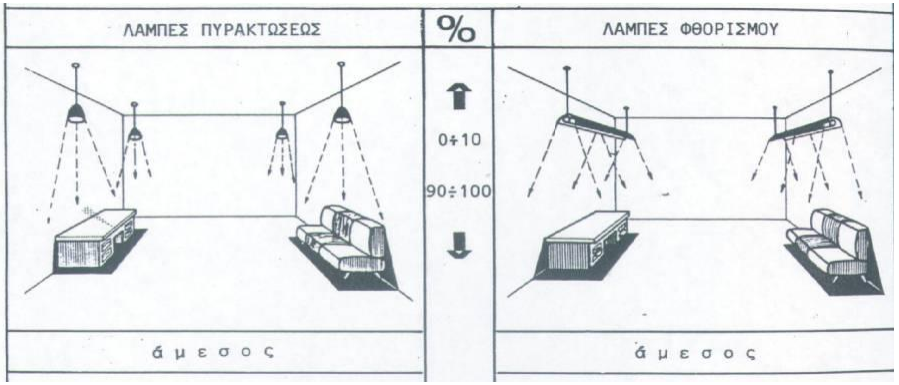
Natural lighting

The kind of light provided by natural lighting is best suited for human vision. Therefore, it should be ensured that workplaces are illuminated as much as possible with such lighting.

Artificial lighting

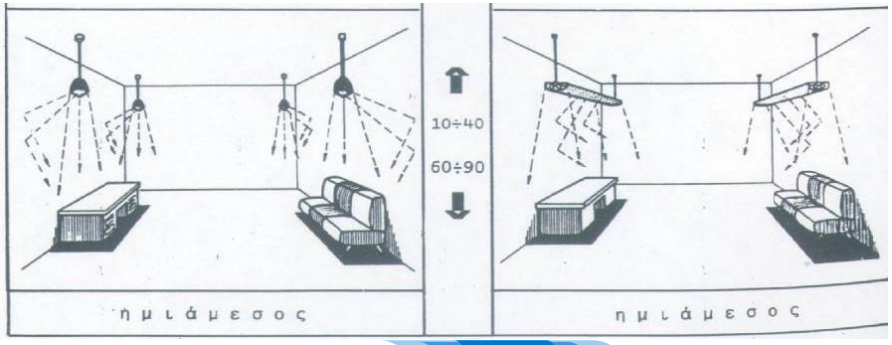
- Direct

  is the artificial lighting where almost all light (90-100%) is directed towards the work surface. Direct lighting has the advantage of the low cost of initial installation and ease of maintenance. However, it has serious drawbacks, such as that it quickly tires the eyes, causes glare, creates intense shadows, etc. In recent years, an effort has been made to replace it with other types of lighting.



Artificial lighting

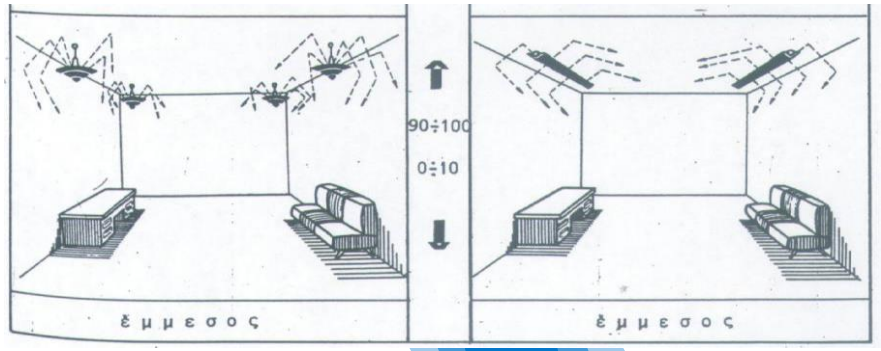
- Semi direct
  is lighting in which much of the light (50-90%) is directed toward the surface of the work, while the rest to the roof. This type of lighting has the advantage of being pleasant, creating only few shades and causes glare only to a small extent, while at the same time it has a low installation cost and has relatively easy maintenance. Its drawbacks are that it does not completely eliminate the shadows and glare, and that it has a relatively low performance, which is even smaller when the walls and ceiling are dark in color



Artificial lighting

- Indirect

is the one where most of the light (90-100%) is directed towards the roof. Indirect lighting fully meets the demands of good lighting, minimizing or eliminating shadows and glare while at the same time ensuring uniformity of lighting. It can not be generalized, however, because it requires large costs for initial installation and maintenance. This kind of lighting, can be used in conjunction with local lighting in the workstations to reduce installation and operating costs.



Measurement of harmful factors

- **Preliminary examination**
  - Collection of information (former measurements)
  - Indicative measurements
- **Measurements Strategy**
  - Choice of factors that will be measured
  - Finding appropriate methodology and measurement instruments
  - Conversation with the responsible persons for the accurate definition of the time and points of measurement
- **Conducting measurements by also recording the exact environmental conditions**
- **Results**
  - Recording and evaluating the results
  - Conclusions
- **Measurements Repetition**

Measurement of harmful factors

Results must be managed as follows:

- Recording the instrument output
- Evaluation
- Comparison of the results with the corresponding limit values
- Conclusions
- Proposals to reduce the exposure

Measurements repetition if necessary

Technical Documentation

- Choice of approved methods
- Instrument maintenance and calibration accompanied by the valid certificate
- Comparison of results with legial limits and proposals based on other directives.

Illumination Measurements

- Initially, we make an overview of the area (size, windows, lighting fixtures, office locations, etc.) and compile the elements that will compose the subjective assessment of the lighting conditions (lighting conditions & fixtures, reflections, shadows, glare).
- After that we make specific measurements at predetermined positions at the working area.

Luxmeter