

Light

Introduction:-

Good Lighting is essential for effective vision and puts lesser strain increasing working efficiency

REQUIREMENTS OF GOOD LIGHTNING:-

1. Sufficiency:- Should be sufficient enough to enable the eye to discern the details of the object as well as the surroundings. - Illumination of 15-20 foot candles is a basic minimum - may differ from 5-100 foot candles in industries
2. Distribution:- should be uniform, having same intensity, over the whole field of work.
3. Absence of Glare:- Glare is excessive contrast which may be direct from a light source or a Reflected glare, - it causes acute discomfort and reduces critical vision.
4. Absence of Sharp Shadows:- it causes confusion to the eye
5. Steadiness:- source should be constant to avoid eye strain
6. Colour of Light:- is not very important as long as the intensity is adequate. - It should be soothing to the eyes.
7. Surroundings:- For effective vision colour schemes in the room are important. - e.g.-Black object is difficult to identify in a dark background - so Reflection Factors Are as follows:- Ceiling and Roofs - 80% Walls - 50 - 60% Furniture - 30 - 40% Floor - < 15 - 20% - Contrast colours can be used to prevent accidents.

TYPES OF LIGHTNING

Natural Lighting:- • Derived partly from the sky and partly from reflection

• It also depends upon the time of the day, season, weather and atmospheric pollution. Suggestions For Improving Daylight Illumination:-

(1) ORIENTATION:- The brightness of the sky is not constant on the east and west and therefore the illumination is subject to variation in buildings facing east or west. - Buildings are therefore oriented, wherever possible, towards north or south for uniform illumination. - This is particularly important in respect of schools, factories and laboratories where uniform lighting is required in all the rooms.

2) REMOVAL OF OBSTRUCTIONS:- Removal of obstructive items either wholly or partially is likely to give the most effective single improvement in lighting.

3) WINDOWS:- Windows should be properly planned - A tall window gives greater penetration of light; a broad window gives greater diffusion of light. - The rule is that window area should not be less than 10% of the floor area. - The usefulness of the windows is reduced, by covering them unnecessarily with curtains and screens.

4) INTERIOR OF THE ROOMS:- The ceiling should be white, the upper portions of the walls light tinted; and lower portions somewhat darker so as to give comfortable contrast to the eyes

B . Artificial Lighting-: There are five systems of artificial lighting direct, semi-direct, indirect, semi - indirect, direct- indirect

a) **Direct-:** In direct lighting 90 to 100 per cent of the light is projected directly towards the working area. - Direct lighting is efficient, economical. But tend to cast sharp shadows. - It should not fall into the eyes.

b) **Semi Direct-:** Here 10 to 40 % of the light is projected upwards so that it is reflected back on the object by the ceiling.

c) **Indirect-:** light does not strike a surface directly. because 90 to 100 per cent of the light is projected towards the ceiling and walls.

c) **Semi Indirect-:** Here , 60 to 90% of the light is directed upwards, and the rest downwards.

d) **Direct Indirect-:** Here , light is distributed equally.

Methods of Artificial Lighting-:

1) **Filaments Lamp-:** The electric current heats up the tungsten filament and the light emitted depends upon the temperature.

- Accumulation of dust on the bulbs reduces illumination by 30 to 40 per cent.

2) **Fluorescent Lamp-:** Fluorescent lamps are economical in the use of electric current; they are cool and efficient; the light emitted simulates natural light.

- The lamps consist of a glass tube filled with mercury vapour and an electrode fitted at each end. The inside of the tube is coated with fluorescent chemicals, which absorb practically all the ultraviolet radiation and remit the radiation in the visible range.