

1.2 IMPORTANCE OF LIGHTING

Humans depend on Light for all activities. Light is a natural phenomenon, very vital for existence, which is taken for granted. In fact, Life involves day night cycles beginning with sunrise and ending with sunset. Pre-historic man had activities limited only to day time. Artificial light enables extended activity period employing in a planned optimized manner, minimizing the resources. Vision is the most important sense accounting for 80% information acquisition for humans. Information may be acquired through sun/moon light (direct/ reflected) or by using artificial light (closest to natural light). Before we go any further, it is worth looking at Teichmuller's definition for lighting. "We say the lighting is good, when our eyes can clearly and pleasantly perceive the things around us". Therefore, artificial light should be functional and pleasant both physiologically and psychologically. This is often achieved employing multiple sources. It must be borne in mind that the sources should be economic and energy efficient. As all of us are aware, all sources today employ electrical energy. Electrical energy is supplied as AC (alternating current) or DC (direct current). Usually electric power supply is AC in nature, either single phase or three phases. It must be borne that close circuit is a must for current flow. As it is well known losses exist in all electrical circuits or lines.

PROPERTIES OF GOOD LIGHTING SCHEME

1. Incandescence

Thermo luminescence is by definition radiation at high temperature. The sources employing this process are Incandescent Lamp, Gas Lamp, (flames and in oil Lamps and wax candles). They lead to a continuous spectrum of radiation.

2. Luminescence:

Luminescence Electro luminescence by definition Chemical or Electrical Action on gases or vapour radiation. Here color of radiation depends on the material employed. Usually this process leads to Line or Band Spectrum.

3. Fluorescence:

Fluorescence is a process in which the radiation is absorbed at one wavelength and is radiated at another wavelength. This re-radiation makes the light radiated visible.

Example: UV impinging on Uranium-Fluorescent oils.

4. Phosphorescence:

Phosphorescence is a process when energy is absorbed at some time and radiated later as glow. Examples of this process are luminous paints that contain calcium sulfide that lead to Phosphorescence. They produce light Radiation after exposure to light. In practice, good efficient lighting is obtained by combining Luminescence and Fluorescence. Fluorescent lamp is Luminescent source of low luminous value activating Fluorescent surfaces which lead to visible radiation. Here intensity depends on gas or vapor involved and phosphor material. However, the temperatures of the material play a role in radiation.