

# FAQ's

## **1. Explain a lighting fixture?**

A light fixture, light fitting, or luminaire is an electrical device used to create artificial light by use of an electric lamp. All light fixtures have a fixture body and a light socket to hold the lamp and allow for its replacement. Fixtures may also have a switch to control the light, either attached to the lamp body or attached to the power cable. Fixtures require an electrical connection to a power source, typically AC mains power, but also battery power for camping or emergency lights. Light fixtures may also have other features, such as reflectors for directing the light, an aperture (with or without a lens), an outer shell or housing for lamp alignment and protection, an electrical ballast or power supply, and a shade to diffuse the light or direct it towards a workspace (e.g., a desk lamp).

## **2. List the factors involved in choosing the appropriate type and quantity of lamps and light fixtures.**

The appropriate type and quantity of lamps and light fixtures may be selected based on the following:

- fixture efficiency
- lamp lumen output
- the reflectance of surrounding surfaces
- the effects of light losses from lamp lumen depreciation and dirt accumulation
- room size and shape
- availability of natural light (daylight)

### **3. What are the quality measures to be considered for lighting design?**

The quality measures considered for lighting design are:

- Visual comfort probability (VCP) indicates the percent of people who are comfortable with the glare from a fixture.
- Spacing criteria (SC) refers to the maximum recommended distance between fixtures to ensure uniformity.
- Color rendering index (CRI) indicates the color appearance of an object under a source as compared to a reference source.

### **4. What are the quality issues for lighting design?**

The quality issues are:

Glare is a sensation caused by luminance in the visual field that are too bright. Contrast is the relationship between the luminance of an object and its background, too much contrast causes glare and makes the visual task much more difficult.

- Uniformity of illuminance addresses how evenly light spreads over a task area. Non-uniform illuminance causes inadequate light levels in some areas, visual discomfort when tasks require frequent shifting of view from under lit to over lit areas, bright spots and patches of light on floors and walls that cause distraction and generate a low quality appearance
- Color rendition is the ability to see colors properly. The color rendering index (CRI) scale is used to compare the effect of a light source on the color appearance of its surroundings. A scale of 0 to 100 defines the CRI. A higher CRI means better color rendering, or less color shift. CRIs in the range of 75-100 are considered excellent, while 65-75 are good. The range of 55-65 is fair, and 0-55 is poor. Under higher CRI sources, surface colors appear brighter, improving the aesthetics of the space. Sometimes, higher CRI sources create the illusion of higher illuminance levels.

**5. Which are the components of a lighting fixture used to direct light? Describe them in detail.**

Reflectors, Lenses and Louvers are the components used to direct the light produced by the lamps. Reflectors are designed to redirect the light emitted from a lamp in order to achieve a desired distribution of light intensity outside of the luminaire. In most incandescent spot and flood lights, highly specular (mirror-like) reflectors are usually built into the lamps. One energy-efficient upgrade option is to install a custom-designed reflector to enhance the light control and efficiency of the fixture, which may allow partial de lamping. Retrofit reflectors are useful for upgrading the efficiency of older, deteriorated luminaire surfaces. A variety of reflector materials are available: highly reflective white paint, silver film laminate, and two grades of anodized aluminum sheet (standard or enhanced reflectivity).

Lenses made from clear ultraviolet-stabilized acrylic plastic deliver the most light output and uniformity of all shielding media. However, they provide less glare control than louvered fixtures. Clear lens types include prismatic, batwing, linear batwing, and polarized lenses. Lenses are usually much less expensive than louvers.

Louvers provide superior glare control and high visual comfort compared with lens-diffuser systems. The most common application of louvers is to eliminate the fixture glare reflected

on computer screens. So-called "deep-cell" parabolic louvers provide a good balance between visual comfort and luminaire efficiency. Although small-cell parabolic louvers provide the highest level of visual comfort, they reduce luminaire efficiency to about 35-45 percent. For retrofit applications, both deep-cell and small-cell louvers are available for use with existing fixtures.