

# 2 Heating and Lighting

The general philosophy with both heating and lighting is to 'supply what is required to the point of need', less but consistent light in circulation areas, but more light at the machinery and in quality control areas.

Examine the areas that are being heated or lit and decide if too much or too little light is being supplied. Offices need to be periodically checked to ensure that unused rooms are not being heated to the same temperature as those that are in use. Additionally, interlocks should be fitted to large access doors to ensure heating is switched off when the doors are left open. Poor fitting windows and doors are also a large source of heat loss and routine maintenance of these items will save more money than it costs. Lighting is one of the most important factors in our working environment and optimal levels will provide many advantages:

- Critical work is carried out under the best light conditions
- High productivity is obtained
- Improved safety on the job, especially when moving around
- Increased security and improved well-being

## 2.1 Light Source Selection and Fixtures

Fluorescent lighting is normally used in production and administration areas. These should be fitted with dimmable high frequency (HF) coils in all production rooms, including those with a high ceiling, allowing penetration of daylight.

### 2.1.1 *Energy Efficient Electronic Ballasts*

All fluorescent tubes are provided with electronic ballasts to reduce the current through the lamp, but they can also be fitted with high frequency ballasts (HF-coils).

As well as providing energy savings of approximately 25%, the HF-coils also provide quality advantages:

- An increased lifetime of 50% to 70%
- The tubes light up instantly – no flashing
- No flickering or stroboscopic effect
- Variable lighting regulation, e.g., after daylight radiation
- Cut-out of defect tubes

### **2.1.2 Energy Efficient Lighting Fixtures**

Old lighting fixtures are often inefficient. It normally pays to replace these fixtures with HF ballasts, reduce the number of tubes and still obtain better lighting efficiency. As a general rule, fixtures with fewer tubes are more efficient. This can be further improved by fitting fixed or loose reflectors in the tubes.

When designing the lighting system it is important not to over dimension as this can result in a very high maintenance factor. Over dimensioning is normally more expensive than cleaning and maintenance of the system. Therefore, it is important to find easy to clean lighting fixtures and to set up a fixed maintenance procedure.

## **2.2 Light Regulation**

### **2.2.1 Light Regulation According to Daylight Penetration**

Daylight penetration should be considered when designing room and workplace lighting in industrial premises. Building regulations regarding size of the windows normally ensures ample light during normal daylight hours. Equipment for control and regulation of artificial light is being used more often to adjust the lighting to reflect the daylight penetration and the requirements of the various activities. By regulating the artificial light according to the variations in the daylight, large energy savings can be obtained.