made of thermal shock-resistant glass Light output is practically unaffected by surrounding temperatures, except for a few types made with only a single envelope Like fluorescent lamps, mercury lamps also require devices that limit the current

Mercury lamps for general lighting are available with either "clear" or phosphor-coated bulbs, of various sizes and shapes, from 75 to 1000 watts There is also a 3000 watt clear mercury lamp Typical efficiencies range from 40 to 60 lumens per watt, not including 10 to 20 percent power loss in the ballast. "Clear" mercury lamps produce light that is rich in yellow and green tones and almost entirely lacking in red Phosphor-coated (mercury-fluorescent) lamps afford several different steps of color improvement and are, therefore, more popular than clear lamps for industrial lighting

A number of special mercury lamps are available, including semi-reflector, reflectorized, and self-ballasted

The performance of mercury lamps depends to large extent on the characteristics of the ballasts In particular, ballast design will govern the ability of the lamp to start at low temperatures and will control the time required for the lamp to reach full output It will determine to a large extent the tolerance of a lamp to voltage dips Serious voltage dips or any power interruption will cause the lamp to become extinguished If for any reason the lamp is extinguished, it requires several minutes to cool before it will restart

Initial output ratings commonly apply after 100 hours operation to allow for some early drop in light output Thereafter the decline is very gradual The life and maintained output of a mercury lamp are relatively little affected by the number of operating hours per start Overwattage and underwattage generally have an adverse effect on both life and lumen maintenance

Because of their high brightness, mercury lamps (including reflectorized and semi-reflector types) require suitable luminaires to provide adequate shielding of the light source Luminaires also protect the lamps from physical damage

When fluorescent and mercury lamps are operated on alternating current circuits, the carry-over of light on each half cycle depends on the phosphorescent qualities of the coating Since the light, in effect, goes on and off 120 times a second, it creates a stroboscopic effect on moving objects such as flywheels and punch press parts, which may even appear to be at a standstill if the speed is in synchronism with current frequency

Stroboscopic effect can be overcome by operating adjacent fixtures on different phases of a multi-phase system

Use of Color

Interiors and equipment

Perception and visibility are improved by use of suitable colors on walls, ceiling, floor, and equipment Light-reflecting qualities of surfaces contribute to fuller utilization of available light, and properly chosen color helps eliminate sharp contrasts in brightness in the worker's field of vision, thus contributing to good seeing

White ceilings give maximum brightness If floors and equipment are rather dark, reflecting 25 to 40 percent of the light, then upper walls should have a reflectance of 50 to 60 percent

By judicious use of colors, an interior can be made attractive and thus have a good psychological effect on employees Light shades are appropriate for most parts of a plant Green and blue tints give a cool effect, and are psychologically valuable where temperatures are relatively high A soft blue-green color is commonly used on walls Ivory and cream are warm colors Rose shades are suitable for female rest rooms, while blue is preferred by men Light gray is effective for machinery—parts at the point of operation being painted orange to highlight any dangerous parts

Color-coding

Color is used extensively for safety purposes While never intended as a substitute for good safety measures and use of mechanical safeguards, standard colors are used to identify specific hazards Standards have been developed and are given in American National Standard Z53 1, *Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment* Be sure to check latest regulations for in-plant use,