Offices with computer workstations present complex visual needs. Lighting is frequently the last area of consideration when a company is planning and laying out their workstations. Very few organizations plan for the human interface at the computer workstation with office lighting in mind.

Computer operators have different lighting requirements from workers who read hard copy documents. Individual differences affect lighting requirements. It is a well-known fact that older persons need more light than the younger generation and the United States population is aging. Being able to provide optimal illumination for multi-worker offices is the challenge.

Various Factors Influence Effective Lighting

Contrast, brightness, quantity of light, and color of light affect the quality of lighting. Contrast between a visual target and the background must be sufficient for the worker to clearly view the task. The color of light affects visual comfort and productivity. Several types of lighting are available for the office environment. Full spectrum fluorescent lighting is designed to mimic natural light, but the cost is very high. Due to the cost, most offices use the standard fluorescent bulb, which are very hard on the eyes. Soft white fluorescent bulbs are warmer in color, create less glare, and are often a better choice. However, the best choice for the office is not direct overhead lighting, but indirect lighting that is directed at the ceiling and cascades off the ceiling. Indirect lighting in combination with task lighting is most effective in presenting a clear, easy to read computer monitor and well lighted source documents.

What Creates Eye Strain?

In the office work environment of today, the effect of various risk factors can be intensified by the many hours we spend on the computer completing our work tasks. There are several factors in the computer environment that can contribute to eyestrain. These include:

- High level of ambient light
- Lack of task lighting
- Sunlight
- Small font size
- High hours of computer use
- Poor contrast (character/background, screen/background, screen/document)

Suggestions For Computer Workstation Lighting

Recommended light levels for today’s computerized office: ¹

- Ambient lighting for the computer monitor environment: 30 - 50 foot-candles (fc)
- Lighting for writing/reading/hard copy tasks: 75 foot-candles (fc)²

When you have an employee whose job involves intense use of the computer (4 or more hours a day) the lower lighting levels in the range of 30 - 50 fc are appropriate. However, when working off a source document the illumination on the source document should be relatively high, while lighting on the computer should be low. To properly illuminate the source document a task light should be provided.

Reflections and glare can interfere with visual comfort when working at a computer. Glare sources can include lights, windows, shiny surfaces, glasses, white clothing and white paper.

Glare and reflections can be reduced in the following ways:

- Reduce light from the windows. Consider full or partial coverage of windows with the use of cur-
• Do not place the monitor directly in front of the window or work with the window directly behind you.
• Position the monitor perpendicular to windows and other light sources.
• Use ceiling fixtures that provide controlled indirect lighting.
• Remove bulbs, install dimmer switches that allow for an adjustable light level, or on/off switches.
• Do not locate the monitor directly under, or in front, of overhead lights.
• Use a visor to cover the monitor reducing the glare from overhead lighting.
• Fluorescent lighting filters that fit over the bulb.
• Putting away unneeded papers and reflective materials.
• Only as a last resort, use of an anti-glare filter is suggested.

Summary

Lighting is critical in our office work environment today, and can have a significant impact on workers’ comfort and productivity. It is important to consider human interface at the workstation in relation to the lighting being provided. Pre-plan the lighting of your office and make it a priority and not an afterthought of your design.

In addition to the guidelines provided above, regular checkups with an eye care provider are an important part of keeping employees healthy and productive.

References

2. ANSI/IESNA RP 1 - 1993 – Office Lighting