

## Foot-Candle Readings



### **STARLITE® Full Spectrum Natural Fluorescent Light**

#### Full-Spectrum Lighting

Insight into new lighting technology, such as Starlite® full-spectrum light, is important for businesses concerned with gaining a competitive edge, as well as increasing the value of services provided to customers.

Today, businesses must familiarize themselves with the many new aspects of lighting technology. This includes understanding the characteristics of the type of lighting being installed. Traditionally this has been the responsibility of interior designers, architects and space planners. While it may not be necessary to gain as high a level of expertise in these areas, additional lighting knowledge can make the electrical contractor an important information resource to the customer and other members of the design team. This type of additional input will contribute to the success of the overall lighting system.

Starlite® full-spectrum light by Star Lighting Products® is an excellent example of how unique characteristics of lighting can affect the installation of a lighting system. Because of its far greater spectral power distribution as compared to standard Cool White fluorescent light (sometimes called distorted spectrum light), Starlite® requires a different approach to

measurement and fixture placement.

While full-spectrum light may be new to many people, it is not a new concept. Starlite® full-spectrum simulates the full spectral power distribution range (both visible and ultraviolet) of natural outdoor light. Our eyes have evolved in full-spectrum light, and it is the light in which we see best. Standard Cool White fluorescent light does not provide the type of light conducive for high color rendering. Lack of good color rendering is one reason people view objects next to windows to see colors and textures more clearly, although the light level in the room may seem adequate.

The advantage of Starlite® full-spectrum light in the indoor environment include:

- perceiving fine details clearer
- performing visually demanding tasks (such as color matching) more effectively
- reducing glare, thereby lessening eye fatigue and strain
- reducing maintenance and replacement costs due to its long life features

Because of the different qualities of light, it is not surprising that devices, such as luminance meters designed to measure foot-candles of incandescent light, are inaccurate when measuring Starlite® full-spectrum light. Luminance meters are still relied upon today because, not long after electric light sources were invented, a set of lighting standards was established to determine the adequacy of our indoor environment. In 1924, the International Commission of Illumination established the foot-candle as a measurement of luminance or light quantity. Since then, luminance meters or light meters, have been used to measure luminance in foot-candles only and are not completely accurate for measuring light across all spectra.

A foot-candle reading is a measurement of illumination equal to one lumen per square foot, or the amount of light that is spread over a square foot surface by one candle, when all parts of the surface are exactly one foot from the candle light source. Foot-candle levels only indicate the amount of illumination or light intensity, which is not necessarily an indication of visual performance, as is the case with Starlite® full-spectrum light. Although Starlite provides superior indoor lighting compared to standard Cool White fluorescent light, it will show a low foot-candle reading, which would seem to indicate inadequate lighting.

Despite its limited utility, the foot-candle has persisted in the electrical contracting industry as a dominant factor in the measurement of illumination. As seen with Starlite® full-spectrum light, other aspects of light must be considered.

Color temperature, spectral power distribution and color rendering are just as important, or perhaps even more important, in describing visual acuity or “see ability.” See ability includes the ability to define form, which is a primary function of the eye, but also includes color discrimination and color rendering.

Spectral power distribution (quantity of light or power emitted at each wavelength) is used to determine color temperature, color rendering index and lumen output of a particular lamp. The SPD of each major lamp type must be measured by an optical instrument called a spectroradiometer to determine quality and application purposes of lighting systems. The

spectroradiometer is a photometric laboratory device that breaks up the light into its individual wavelengths and measure the energies of the light spectrum. Because of the size and high cost of this piece of equipment, the spectroradiometer is not a practical field tool for electrical contractors. A better way to determine technical specifications for the proposed lighting is to contact the regional sales office or the sales engineering department of the manufacturer. They will be able to give you the information you need to determine the applicability of the light for specific jobs.

The color temperature of a light source is measured to determine light quality. Color temperature has no relationship to room temperature and pertains only to the appearance of the light source. Color temperature refers to the temperature in degrees Kelvin at which a blackbody, a theoretical perfect radiator, would have to be heated to match most nearly the perceived color of the light source. For example, most Cool White fluorescent lights cast a yellowish or green tint and measure between 4200K-4500K. Using this same indicator, Starlite® full-spectrum light measures approximately 5750K, the same as ideal natural outdoor light, with the perfect blend of phosphors to also match natural light.

The International Color Rendering Index (CRI) pertains to the way colors of objects appear under a lamp compared to a standard reference source and is dependent upon the spectral power distribution. Scientists judge the color-rendering capability of light, or see ability, by the CRI scale. The scale runs from 1 to 100. All colors appear “true” under natural daylight, which has a (CRI) of 100...perfect light. Starlite® has a CRI of 92, the closest match to perfect natural daylight provided by any fluorescent light.

While it remains essential for electrical contractors to know the nuts and bolts of wiring a fixture, it is also becoming important to understand the qualitative aspect of modern lighting technology. The success of a lighting installation ultimately depends on how well the lighting suits the needs of the customer. Additional insight about the characteristics of Starlite full-spectrum light will help electrical contractors provide valuable information to customers interested in installing this unique lighting technology.

**Product Watts:**

**Product Bases:**

**Product Notes:** 1-800-392-3552

