

TRADE ARTICLE

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Retail Lighting Revolution – Part THREE: CHOOSING YOUR DISPLAY CASE SOLUTION

As we begin, here is a reminder about the volatility of LED lighting systems. These days it seems as if LED lighting systems change very rapidly, almost daily, and suddenly LEDs are the best choice for an application that was historically better served by some other source. For example, two years ago most practical LED lighting systems were far too expensive for most customers. Only a few early adopters ventured to try LED lighting, and most were disappointed at the color, life, and lack of payback. Today, the efficiency of LEDs has improved by 30-50%, the color quality is good to excellent, and the product quality is much higher – and yet, the LED products cost less. This will continue to occur for the foreseeable future.

In fact, efficient and low-cost LEDs have become off-the-shelf components. The only worry is that the products won't operate well over time – after all, most LED products promise 50,000 hours or more life, yet the critical components of the product were only invented less than 2,000 hours ago. It can happen to anyone – for instance, a lighting company in Florida recently recalled 554,000 LED bulbs. A problem of this scale could easily wipe out a company – and your investment in its lighting products. As a general overall caveat, observe time honored business practices and purchase LED products and services from companies that offer strong warranties. Your installation should be warranted until it pays for itself in energy savings.

General Considerations for Case Lighting

There are many types of display cases, ranging from grocery cases selling meat or produce, to cases containing cosmetics, fine art, jewelry or electronics. Although there are many reasons to select display case lighting that is specifically designed for the application, in general all display case lighting should:

- Be small and powerful so it does not obscure products
- Have a remote power supply and small, flexible wiring connections to prevent clumsy casework
- Keep the display case as cool as possible
- Have excellent color quality for the merchandise being lighted
- Tolerate hot or cold environments with minimal concern
- Be visually appealing or simply disappear so the customer focuses on the merchandise
- Be supplied in luminaires that are suitable for the case being illuminated (for example, sanitary, wet, or in close contact with combustible materials)
- Be relatively inexpensive to buy, own, maintain, and operate
- Have a minimum amount of UV or infrared radiation

Until the LEDs of today became available, nothing came close to meeting all of these requirements. Through the years, lighting and store designers struggled with a history of heavy, awkward, hot, expensive and/or ineffective lighting systems. At long last, modern LEDs can nicely light the inside of cases of all kinds and will be surprisingly inexpensive.

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How to Select Case Lighting

First, determine the surface area that you wish to light. For example, in a jewelry case 18" front-to-back and 5 feet wide, the illuminated area is $(1.5 \times 5) = 7.5$ square feet. To light a refrigerated case or dairy shelf area 5 feet wide and 15" from shelf to shelf, the area is $(5 \times 1.25) = 6.25$ square feet.

Second, determine what light level is required. The following light levels will generally prove adequate:

Jewelry	150-200 footcandles (1500-2000 lux)
Collectibles, Art	100-150 footcandles (1000-1500 lux)
Clothing, General Merchandise	75-100 footcandles (750-1000 lux)
Dairy, Produce, Food Cases	50-100 footcandles (500-1000 lux)
Parts, Hardware	25-75 footcandles (250-750 lux)

Note that the actual light level selection will be affected by a number of factors and these values may need adjustment. Be sure to test an area before proceeding with a major installation.

Third, determine the approximate amount of light by multiplying the area in square feet by the desired light level times 2. For example, for a jewelry case of 7.5 square feet and a desired light level of 200 footcandles, multiply $7.5 \times 200 \times 2 = 3,000$ lumens. For a strip 5 feet long, you will need a product putting out 600 lumens per foot, or two strips at 300 lumens per foot each.

Next determine the color temperature that is desired. Color temperature is the apparent warmth or coolness of the light source. The following are generally recommended:

Grocery stores, all applications	3500K-4000K
Jewelry, Crafts	4000K-5000K
Apparel	3000K-3500K
Parts, Bins	3500K-4000K
Other	Match general lighting

There are instances where the color temperature can be carefully chosen to address the specific display. For instance, gold looks better at 2700K-3000K, but diamonds look best at 4000K-5000K. A smart jeweler or museum curator will adjust the lighting to match the predominant display material. For the rest of us, following these principles will generally work.

Finally, determine the color-rendering index (CRI) of the lighting. This is the subtlest but perhaps the most important step. CRI is a scale of 0 to 100 where 0 is unpleasant and 100 is perfect. As a general rule, 80 CRI is the minimum acceptable amount. For most applications in retail lighting, lighting with CRI >86 is an overall good indication of color quality, however a CRI >90 is still preferred. Some companies are promoting special color blends that excite shoppers. These can have merit and should be carefully considered.

Summary

Linear display lighting systems have long been a necessary but expensive, heat-producing, energy hogging way to illuminate merchandise. LED lighting is almost always a far better solution. Today, LED lighting for all linear applications such as display shelves, display cabinets, cubicles, cubbies and valence shelves is the only sensible lighting system to use. Moreover, LED lighting is more energy efficient and in many cases, utility incentives will encourage most retailers to implement LED systems. However, wise retailers should remain skeptical and expect well-backed guarantees and warranties before taking the plunge. While LED lighting has become very good, the lighting industry still consists of many vendors who sell goods of variable quality. Be sure your installation will be working and warranted until it pays for itself in energy savings