

Energy Efficiency - System Design Strategies: High Performance Lighting Strategies – Ambient, Display and Exterior

Strategy: Use high efficiency lamps/light fixtures tailored to specific task, dimming controls, and occupancy/daylight controls.

Relevant Store Scale/Type: S,M,L / New, Adapted, Existing

Initial Cost:

1. Premium for high efficiency fixtures.
2. Sensors.

Return on Investment:

1. High performance lighting systems have potential saving in the range of 8%-15%.

Operator Benefits:

1. Energy savings yielded from lower cooling demands and lower electrical lighting demands.
2. Warm light and varying light levels creates a more attractive environment.
3. Lighting improvements for retrofits can be done incrementally with immediate payback.

Technical Considerations: Ambient

1. Use combination of down and uplight fixtures to eliminate hot spots in the ceiling area, give shadow-free illumination of the products below, and enable good visual acuity at lower lighting levels. This contributes to making shopping less frenetic and lowers lighting and cooling costs.
2. Install occupancy sensors in storage rooms, back-of-house offices and other vacant and low traffic areas.
3. Install and adjust automatic dimming controls to take advantage of daylighting and enable lowering light levels for restocking and cleaning while the store is closed.
4. Install fluorescent fixtures using T-8 lamps or ideally T-5 lamps
5. Consider lower ambient lighting levels with display lighting placed close to product to provide more contrast, allowing the items to better stand out.
6. For ambient lighting select lamps with good color rendering. Lower color temperatures (3,000 K or below) give a warmer feel.

Technical Considerations: Display

1. Install fluorescent fixtures using T-8 lamps or ideally T-5 lamps for display lighting.
2. Alternatively, use 39w metal halide display lighting hung lower in place of 70w.
3. For display lighting, consideration must be given to impact on life of food. Use lamps with full color rendition.
4. Use LED fixtures for signage and refrigerator cases. LEDs are 40 times more efficient than incandescent lamps.

Technical Considerations: Exterior

1. Use metal halide or LED lighting in parking lots with a 3fc average.
2. Use LED for pedestrian and building lighting.
3. Consider solar power to parking lot lights which offsets costs of conduit runs.
4. Zone parking lot lighting to minimum level after hours as needed for employee parking or minimal customer use if open 24/7.
5. Shield all exterior lights to shine down so only lighting needed areas.

Product/Manufacturer Suggestions, Resources & Examples for Lighting:

Case Study: A&P Food Market, Old Lyme, CT:

<http://www.lrc.rpi.edu/programs/DELTA/pdf/Vol-1-1-A&P.pdf>

Lighting Design Guidelines in Retail Stores:

<http://www.designlights.org/guides.html>

Lighting Supermarket Freezers with LEDs:

http://www.lrc.rpi.edu/programs/solidstate/cr_freezers.asp

Lighting for Food Display

<http://www.promolux.com/>