

BEST PRACTICES FOR 'QUALITY' LIGHTING RENOVATION PROJECTS



The World's Most Energy Efficient
Lighting Technology
Engineered for a Clean Tomorrow

LIGHTING ECONOMICS

A lighting system can be divided into three major components: initial, operating and maintenance cost. When the three elements are combined it is called "total cost of ownership." Initial or unit cost of a lighting system is only part of an overall evaluation; instead, a careful analysis of lighting requirements and total cost of ownership should be taken into account. When using an energy efficient and optically superior luminaire, higher initial costs are quickly offset by using fewer luminaires. Less luminaires translate to savings in energy consumption and maintenance over the life of the product.

Holophane's "SALE" software allows the financial analysis and comparison of total cost of ownership for two or more different lighting systems.

- The program evaluates initial, maintenance and annual operating costs of multiple lighting systems.
- "SALE" compares each system's payback time and net present value.
- Comparisons can be made based on any combination of installation, energy, and maintenance costs. Options are available to include expenses associated with installation such as conduit, wiring, outlet boxes and labor.



Holophane provides luminaires with the best combination of performance and lowest total cost of ownership. We offer unbiased solutions incorporating the best source technology for lowest total cost of ownership.

- Advanced research and development in superior optics and thermal control deliver products that generate more usable light with fewer luminaires. Precision optics allow for wider spacing between luminaires.
- Superior ballast designs and construction promotes energy efficient luminaires with longevity and dependability.
- Innovative luminaire designs and high quality manufacturing assures exceptional and reliable performance with minimal maintenance for many years.
- Glass optics resist electrostatic charges that attract dirt and dust. Wiping the glass during re-lamping will restore efficiency to 100%. The performance of glass is unaffected by long term exposure to UV rays.
- Holophane's Sales Representatives are lighting experts with extensive and continual training. Our sales professionals can educate and assist in finding the best solutions to fulfill any lighting requirement.



LIGHTING RENOVATION METHODS

1. Retrofitting: Examine current luminaire efficiency and replace components that improve performance.

- Lamps and ballasts are usually replaced.
- Reflectors, lenses or louvers are replaced or cleaned depending on the condition, budget, and time constraints.
- Control systems are installed when possible.

2. Replacement: Replace old luminaries using outdated technology on a one-for-one basis with new highly efficient luminaires. New luminaires also add to the aesthetic of the overall environment with new designs.

- HID probe start lamps and ballasts are replaced with HID pulse start, for better lamp lumen depreciation and increased lumens per watt.
- Fluorescent T12 are replaced with T8/T5HO for lower energy consumption and increased lumens per watt.
- Magnetic Ballasts may be replaced with Electronic for increased ballast efficiency.
- Holophane luminaires can often light an area to the same footcandle level with less wattage through superior optical performance. Lower wattage leads to greater energy savings.

3. Relight: In depth analysis of current environment and implement a new lighting system through use of efficient luminaires with lower costs of ownership. A thorough approach to factors affecting the quality of light as well as initial, operating and maintenance costs.

- Analysis of regulatory compliance, circuit sizing, control system, interior design, traffic control, visibility, psychological responses, appearance, flexibility requirements, user expectations, and day light contributions.
- Old luminaires, wiring and conduits are removed.
- New lighting system is installed along with control system to maximize energy savings.
- Holophane's expert sales professionals can assist in every step of a relight project and provide the best solutions for long term success.



Lighting renovation projects can be a significant financial investment and require careful evaluation of potential partners. Here are some tips and questions to ask prior to making a final decision:

- Visit past installations and take notes. Check references and financial stability. Review potential partner's business history and track record.
- Test recommendations against proposals. Is the partner biased toward one type of technology or do they offer both HID and fluorescent solutions?
- Are the sales representatives knowledgeable about all facets of lighting, including appropriate environmental and lighting considerations and requirements?
- Does the potential partner provide a full range of products and services?
- Is the potential partner only offering the lowest initial price (short term solution) or interested in providing a quality lighting solution with the lowest total cost of ownership (long term solution)?

Holophane has the expertise, resources, and flexibility to meet any lighting need.

ENVIRONMENTAL CONSIDERATIONS

The analysis of environmental factors such as user needs and preferences, safety regulations, maintenance requirements and energy consumption is taken into account in the design of a lighting plan.

A common error is simply matching current light levels when engaged in the relighting of a facility. Best practices indicate that light level requirements should focus on mean lumens at a predetermined time in the future. All facilities use lighting technology that depreciates over time; therefore, initial lumen output is higher and decreases over time resulting in mean lumen output.

1. Analysis of space: Detail analysis of the environment.

- A. Functional elements affecting lighting design and light delivered to tasks: Ceiling height, room surface finishes, work plane height, windows, skylights or other fenestrations, equipment size and shape, space geometry, flexibility requirements, removal of hazardous wastes, and existing wiring conditions.
- B. Environmental conditions have a significant effect on the selection of the proper luminaire. Factors taken into consideration: Dust and dirt, presence of chemicals, airborne grease, moisture levels, ambient temperatures, vibration, incidental abuse, and insects.

2. Flexibility and Control Requirements

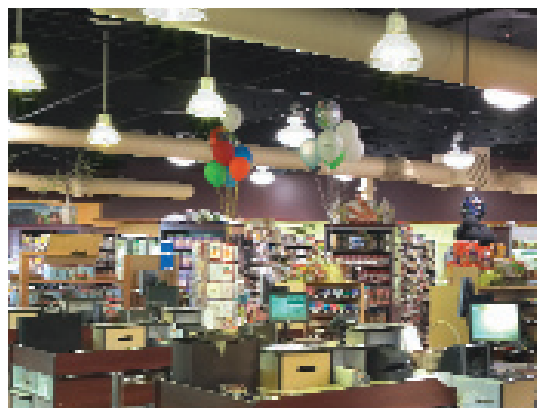
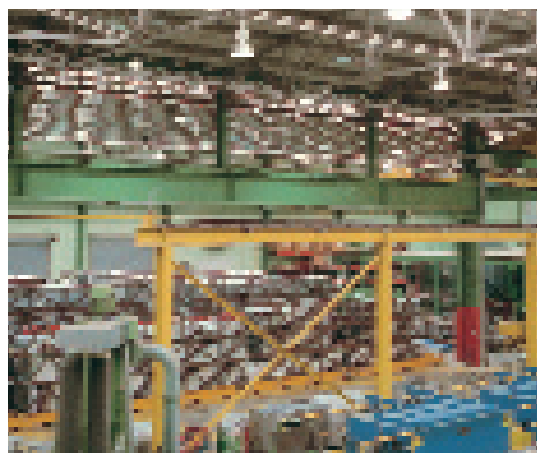
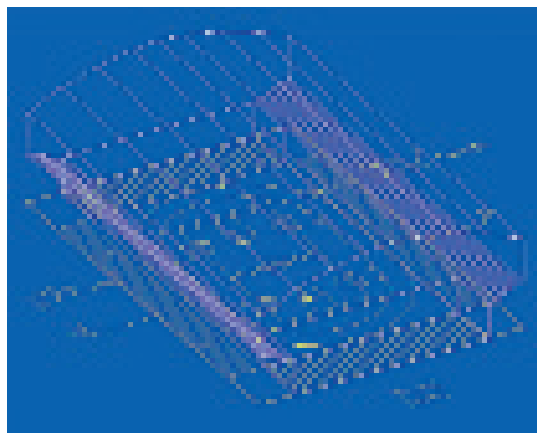
- A. Flexibility: In industrial and retail applications re-arrangement of the work space may require general renovations. Holoflex® wiring offers a fast and easy transition.
- B. Controls: Holophane offers scalable and flexible control systems from simple occupancy sensors to customized functionality in distribution controls for virtually any application.

3. Safety Requirements: Sufficient light levels promote a safer work environment and minimize on-the-job injuries, especially in industrial settings.

4. Maintenance Requirements: Holophane offers fluorescent and HID lighting systems that require minimal care. Our glass reflectors can be restored to near 100% efficiency by wiping the glass during re-lamping.

5. Energy Requirements: Holophane's superior luminaire efficiency and performance often result in significant energy reduction through the use of fewer luminaires and/or lower wattages while maintaining the designed illumination level.

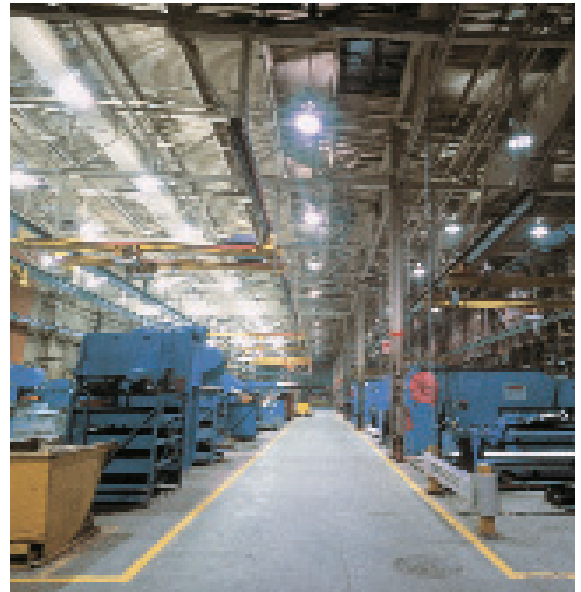
6. Regulatory Compliance: Along with energy requirements, other general regulations necessitate consideration. Local Holophane sales representatives can help determine which regulations are appropriate for specific applications.



ILLUMINATION CONSIDERATIONS

When choosing a new lighting system for long term success, it is critical to consider the following:

- **Illuminance levels:** Illuminance is the amount of light reaching a surface as measured in units of “footcandles” (lumens per square foot). Recommended lighting levels can be derived from the IESNA Lighting handbook.
- **Light Loss Factors (LLF):** LLF are used to adjust lighting calculations from a controlled laboratory environment to actual field conditions and/or from an initial installation condition to a maintained predetermined time frame condition.
 - **Luminaire Dirt Depreciation (LDD):** LDD is the accumulation of dirt on a luminaire resulting in a loss of light. Holophane’s glass optics resist electrostatic charges that attract dirt and dust. Wiping the glass during re-lamping will restore efficiency to 100%.
 - **Lamp Lumen Depreciation (LLD):** LLD is calculated by dividing mean lumens by initial lumens (values are readily available from lamp manufacturers). Different lamp sources have varying LLD values.
 - **Thermal Factor:** Higher luminaire mounting height generally results in hotter ambient operating temperature; this is especially true in unconditioned spaces. Holophane luminaires incorporate thermal management of the lamp and ballast to ensure 100% lumen output and dependable long term operation.
 - **Ballast Factor (BF):** A ballast factor of 1.0 represents a lamp that is operating at full wattage. BF less than 1.0 indicates a lamp will not receive the intended wattage, which results in lower light output. All Holophane manufactured HID ballasts have a BF of 1.0.
- **Uniformity:** Lighting uniformity is essential for all facilities to promote good visibility; however, certain tasks or areas may require different light levels.
- **Contrast:** Visibility is at maximum when contrast of an object with its background is very high. Higher illuminance through supplemental lighting may help compensate for poor contrast.
- **Glare:** Direct glare and reflected glare can have negative effects. Holophane trained lighting professions can assist in lighting design that promote greater visual comfort.
- **Color Rendering:** The closer the color rendering index (CRI) is to 100, the more natural the colors will appear. Holophane can provide expert advice on the right type of lamps and CRI for applications ranging from retail to industrial.



PRODUCTS

INDOOR



Enduratron™

- 320W to 400W
- Electronic HID ballast
- Patented ISD SuperGlass®
- UL/CUL listed, 40°C, damp location



Prismalume®

- 150W to 1000W
- Patented ISD SuperGlass®
- Excellent vertical illumination
- UL/CUL listed 65°C, damp location



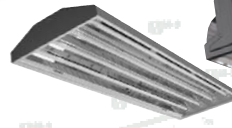
RE Luminaire

- 250W to 400W
- Encapsulated ballast
- Patented ISD SuperGlass®
- UL/CUL listed, 55°C, damp location



Enduralume®

- 250W to 400W
- Thermal shock resistant optics
- Acrylic or prismatic glass lens
- UL/CUL listed 55°C, damp location



HB/HC Series

- (4) 32W to (6) 54W
- Excellent energy saving alternative
- High color rendering
- Integral motion sensors
- UL/CUL listed damp location



IntelliVue®/IntelliBay®

- (2) 28W to (6) 54W
- Patented P.O.L.A.R. technology
- Vertically stacked lamps for glare reduction
- UL/CUL listed 55°C, damp location

OUTDOOR



MirroStar®

- 250W to 1000W
- IESNA full-cutoff optics
- Miro® 4 optical assembly



AEL 125

- 175W to 400W
- Sealed optical chamber
- Drop, sag or flat glass lenses



HMAO™

- 50W to 1000W
- Hermetically sealed specular panels
- Unitized ballast assembly



LMS™ Lowering Device

- 200W to 1000W
- Variety of luminaire options
- Available in two to six luminaire quantity options



Mongoose®

- 100W to 400W
- Round contemporary design
- Tool-less entry and quick disconnect ballast door



PoleStar® II

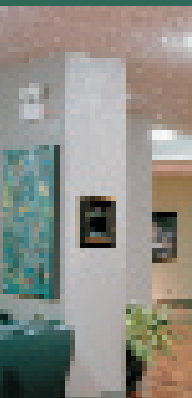
- 250W to 1000W
- European Styling
- Medium and large sizes
- Round, square, octagonal or post top shapes



Wallpack® IV

- 250W to 400W
- Die cast aluminum housing
- Prismatic glass refractor
- Stainless steel hardware

EMERGENCY



DeLeon® HD

- 6W to 60W
- Constructed of impact resistant, fiberglass reinforced polyester
- Direct view red or green LEDs
- Hazardous location rated



Magellan® EC

- Choice of housing materials
- UL 924 ratings
- NAV-Check self diagnostic capable



DeSoto® M60

- 25W to 1800W
- Corrosion and impact resistant
- NAV-Check self diagnostic capable
- UL 924 and NEMA ratings

SYNERGY CONTROLS



- Flexible Control Choices
- Low-Voltage Switching
- Distributed Control
- Customized Functionality
- Maximum Energy Savings
- Maximum Expandability

NATIONAL ACCOUNTS



Holophane's National Accounts Group provides a full range of services that supports a partnership program to meet specific design and construction requirements. Highly trained factory direct field representatives and international project support provide the opportunity to streamline purchasing and engineering decisions to reduce the overall cost of doing business. Regardless of project size or location, customers can rest assured their needs will be addressed. Holophane provides a single point of contact, professional design services, standardized pricing, multi-location unified product, and turnkey capabilities. Our services, expertise and flexibility provide our customers with peace of mind.

THE FOLLOWING ARE RESOURCES THAT ARE AVAILABLE TO YOU THROUGH YOUR NATIONAL ACCOUNT MANAGER:

- Local, regional, national, and international project support/management
- Comprehensive technical service
- Training on lighting concepts
- Product performance comparisons
- Product selection recommendations
- Product specifications
- Design assistance
- Lighting analysis tools
- Professional seminars at Holophane's Light & Vision facility
- Comprehensive facility lighting system audits
- Financial evaluation assistance of system options
- Custom presentations for your team
- Product samples for demonstrations and trial installations
- Coordination of turnkey services
- Financial assistance

RENOVATION AND RELIGHTING

Holophane is partnered with our sister company, SAERIS to offer a seamless transition to a new lighting system. SAERIS provides a single point of contact for all turnkey installation responsibilities, allowing business to operate as usual without interruptions. Unrivaled lighting expertise and rapid execution provide our customers with the lowest cost of ownership.



SERVICES INCLUDES:

- Lighting design and economic feasibility study
- Preliminary lighting survey of the facility
- Lighting proposal
- Lighting design with luminance calculations
- Alternatives and recommendations
- Complete luminaire schedule
- Economic feasibility study
- Simple payback and ROI
- Potential utility rebates
- EPAAct qualification
- Leasing options
- Detailed audit and installation analysis
- Thorough site audit
- Detailed scope of work
- Installation costs
- Material – luminaires and controls
- Labor
- Services
- Financing alternatives
- Installation plan
- Security access
- Product storage
- Recycling and disposal of waste
- Management of 'discoverables'
- Installation services
- Project management
- Labor – both union or non-union
- Materials ordering coordination
- Permits
- Coordinated invoicing
- Post installation services
- Project review
- Full close-out documentation
- Disposal services (including hazardous materials)
- Materials receiving coordination
- Warranty services





An **AcuityBrands** Company

Acuity Brands Lighting, Inc.

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Milton Keynes MK1 1JG, England

Holophane, S.A. de C.V., Apartado Postal No. 986,
Naucalpan de Juarez, 53000 Edo. de Mexico

Contact your local Holophane factory sales representative for application assistance, and computer-aided design and cost studies. For information on other Holophane products and systems, call the Inside Sales Service Department at 740-345-9631. In Canada call 905-707-5830 or fax 905-707-5695.

Limited Warranty and Limitation of Liability
Refer to the Holophane limited material warranty and limitation of liability on this product, which are published in the "Terms and Conditions" section of the current buyers guide, and is available from your local Holophane factory sales representative.

Visit our web site at www.holophane.com



Luminaires may utilize fluorescent or high intensity discharge sources that contain small amounts of mercury. New disposal labeling for these lamps includes the mercury identifier shown on the right to indicate that the lamp contains mercury and should be disposed of in accordance with local requirements.

Information sources regarding lamp recycling and disposal are included on the packaging of most mercury-containing lamps and also can be located at www.lamprecycle.org.