



HOLOPHANE[®]
LEADER IN LIGHTING SOLUTIONS

experience
lighting's
best



Holophane's new state-of-the-art research, product development, and training facility

ABOUT HOLOPHANE

HOLOPHANE IS THE LEADER IN LIGHTING SOLUTIONS WITH OVER A CENTURY'S EXPERIENCE IN PROVIDING A WIDE RANGE OF LIGHTING SYSTEMS WITH THE LOWEST TOTAL COST OF OWNERSHIP, REMARKABLE VISUAL COMFORT, AND SUPERIOR VISIBILITY.

HOLOPHANE PRODUCTS REPRESENT THE ULTIMATE BALANCE OF PERFORMANCE AND AESTHETICS.



Lowest Total Cost of Ownership

Holophane’s advanced optical controls deliver more usable light per luminaire, allowing the use of fewer luminaires while maintaining required light levels. Precision designed optics ensure long lasting high performance. Meticulous detail in mechanical engineering and manufacturing provides luminaires with durability and dependability. Thoroughly tested energy efficient ballasts ensure longevity and less power consumption.

Great Visual Comfort

The hallmark of a Holophane luminaire is the borosilicate glass reflector/refractor. The glass prisms provide a combination of uplight and downlight to illuminate an environment evenly, creating great visual comfort without dark spots. Exacting use of prisms in Holophane optics create a visually appealing ‘sparkle’ without overpowering glare.

Superior Visibility

Holophane luminaires aid in creating a safe, comfortable and well lit environment that enables the freedom for a spectrum of indoor and outdoor activities. Superior color rendering means colors, objects, and faces are identified more quickly and accurately. Holophane luminaires provide more usable light with exceptional uniformity and balanced vertical and horizontal illumination.

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Western Kentucky University, Bowling Green, KY

INTRODUCTION

A SECURE ENVIRONMENT

Colleges and universities are communities comprised of common areas, walkways, parking areas, and buildings utilized for various purposes. Around the clock use of campus facilities by faculty and students makes safety and security essential. A proper lighting system that provides optimized visibility and visual comfort after dark can increase security and create a sense of safety. A well thought out lighting design of lecture halls can keep students engaged and promote interaction with faculty. The appearance of a university or college campus can make lasting impressions; visitors' opinions about the educational institution may form based on its grounds and the functionality of its structures.



Mississippi State University Security was a primary concern at Mississippi State University where many classes are held in the evenings. Washington PostLite® fixtures installed near residence halls and other buildings offer prismatic light control with Type III and V distribution to direct illumination onto the sidewalks and other areas where it is needed.



Georgetown University is synonymous with basketball. Installing Primalume® luminaires in the gymnasium increased light levels by 50 percent while at the same time delivering a 31-kilowatt reduction. Payback for the system was about two years.

“The fixtures cost less to operate and maintain,” said Pete Taylor, electrical maintenance supervisor for Georgetown University. “The gymnasium is so much brighter that it almost appears new. And we do not have the shadows we had in the past.”

LIGHTING FOR SPECIFIC NEEDS

Successful lighting is when the users’ needs are met. For example, the lighting in a gymnasium should provide sufficient illumination for players on the floor as well as spectators in the stands. A lecture hall should have both good vertical and horizontal illumination and color rendering in order to view displays, faces, and take notes. When designing the lighting for campus walkways or indoor and outdoor parking areas, for example, considerations for glare, uniformity, color rendering, light trespass should be taken into account. Colleges and universities require demanding lighting systems that are reliable and energy efficient. Lighting systems should also be easy to maintain and require minimal maintenance over time.

IES STANDARDS

The Illuminating Engineering Society of North America (IESNA) has developed standards for lighting of various environments within a college or university campus. All Holophane lighting systems meet or exceed IESNA recommendations, providing the lighting uniformity necessary to promote high levels of visibility.



Auburn University; Auburn, AL

LIGHTING BASICS

- Lighting Considerations
 - Lighting Uniformity
 - Vertical and Horizontal Illumination
 - Color Rendition
 - Aesthetics

- The Economics of Lighting
 - Operating Costs
 - Durability and Maintenance Ease

LIGHTING CONSIDERATIONS



Auburn University uses GranVille® luminaires to help create a feeling of daylight to promote safety and a feeling of security in historic Samford Park, which is considered the university's "front porch." The GranVille units use 100-watt high pressure sodium lamps to cast a warm, yellowish glow reminiscent of candlelight.

Enclosed and Gasketed Prispac® V luminaires supply high levels of horizontal illumination on the pool surface in the Auburn University natatorium. The luminaires, which provide a very wide spread of light, have decorative cylindrical-shaped covers and remote ballasts.



University of Notre Dame's auxiliary gymnasium has low profile CrystalGlo® luminaires that light all areas within the gymnasium. Primalume® luminaires provide high levels of vertical illumination so workers can read the labels in the University of Notre Dame print shop.

Optimized Visibility and Visual Comfort

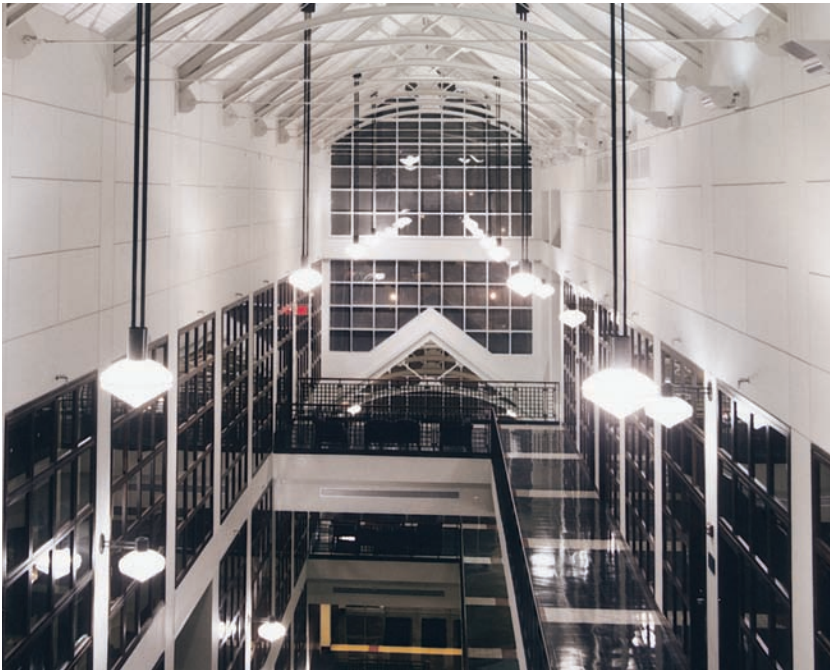
Lighting uniformity is essential in promoting good visibility in both indoor and outdoor areas. An evenly illuminated space can produce a feeling of a safe and secure environment. A degree of comfort is achieved as a result of being able to identify and discern details of objects and faces without the hindrances of shadows or glare.

In an outdoor setting, a uniformly illuminated area helps to create the feeling of daylight after dark. Drivers can discern road signs, objects and pedestrians and safely maneuver vehicles as a result of visibility all around. Pedestrians feel secure when recognition of shapes, objects, landmarks and other people are possible at a distance.

Excessive glare can create visual discomfort and counter the benefits of a good lighting system. Holophane's precisely controlled optics ensures low glare, allowing easy and comfortable rendering of the surrounding environment.

Illumination

Vertical illumination is the light that falls upon vertical surfaces such as signs on a campus, a ball traveling through the air in a gymnasium and the narrow space between two campus buildings. Horizontal illumination is the light that shines on horizontal surfaces such as the tabletops in a library, the walkways in an outdoor space, and the surface of a pool in a natatorium. A quality lighting system will provide sufficient levels of both vertical and horizontal illumination. As a rule of thumb, the vertical illumination level should be half that of the horizontal level. For example, if a gymnasium is designed for 100 horizontal footcandles (fc), the minimum vertical fc should be 50.



University of Dayton wanted to create an inviting atmosphere for faculty and students at its Joseph E. Keller School of Law while retaining an air of sophistication. The Enhanced PrismGlo® luminaires that were installed complement the facility's blend of modern and traditional architecture, with its combination of brick, steel, glass and cherry.



UCLA campus bookstore installed 02454 luminaires to create a comfortable environment with a classic appearance.

Color Rendition

Having the ability to determine the exact color of an object may be more important in some campus areas than in others. Students and faculty must be able to distinguish the colors of the paintings at an art show and enjoy the hues of the costumes in a play. Players, referees and others must be able to discern the colors of the opposing teams during a basketball tournament. Drivers need to be able to identify their vehicle in a heavy populated parking area or structure.

Color rendering is the ability of the light source (the lamp) to represent the true colors in an object. The closer the color rendering index (CRI) is to 100, the more natural colors will appear. A metal halide lamp, casts a whitish light, and can have a CRI as high as 90 and above. A high pressure sodium lamp provides a yellowish color and has a CRI of 20. Fluorescent lamps can include a wide range of CRI, but can be as high as 90 CRI. Metal halide HID or fluorescent lamp sources will be more appropriate for color sensitive areas as compared to high pressure sodium sources.

Aesthetics

A successful lighting project meets the required illumination levels, while enhancing the appearance of the space. Lighting can be aesthetically pleasing and simultaneously provide a sense of comfort. Luminaire enhancements such as decorative caps, finials, medallions, ribs and ornamental bands give a custom look and feel. Options such as banner arms, flag pole holders, custom logos and signage allow designers to adapt the lighting system to any area on campus.

Holophane offers classic, traditional, historic and modern style lighting systems that can enhance the appearance of any campus setting. Holophane indoor and outdoor luminaires are available in standard product offerings or custom solutions. Customized finishes are optional to complement any architectural style.

THE ECONOMICS OF LIGHTING



Northwestern University installed Prispack® V luminaires in the basketball courts, which are durable enough to withstand hits from flying objects yet are economical to operate.

The borosilicate glass reflectors on the Prispack V luminaires installed in the field house at Northwestern University do not attract dirt and dust and will not become discolored.



	Holophane	Competitor
COSTS		
Total installed cost of lighting system	\$31,384	\$26,972
Installed cost of building fixtures (new cost)	\$21,304	\$25,972
Installed cost of pole mounted outdoor fixtures	\$0	\$0
Cost of fixture removal	\$0	\$0
Cost of fixture/lamp-wire/fit	\$0	\$0
Annual energy cost (incl. outdoor)	\$11,470	\$16,992
Annual energy cost of outdoor fixtures	\$0	\$0
Annual energy cost of removed/replaced fixtures	\$0	\$0
Total annual maintenance cost	\$919	\$956
Annual maintenance cost of outdoor fixtures	\$0	\$0
Annual maintenance cost of removed/replaced fit.	\$0	\$0
Footcandle level / maintenance factor		
FINANCIAL		
Life of system (years)	10	10
Discount rate (%)	15%	15%
Annual system operating cost	\$12,389	\$17,943
Annual operating savings	\$5,560	
Payback time (years)	1.0	
ROI (%)	102.7%	
NPV	\$27,096	
Holophane Part Number	Competitor Part Number	
Fixture A	Fixture A	
Fixture B	Fixture B	
Fixture C	Fixture C	

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.

Operating Costs

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. Fewer luminaires translate to savings in energy consumption and maintenance over the life of the product.

It is difficult to place a dollar value on lighting deficiencies such as direct and reflected glare, shadows or uneven light distribution. A lighting system's design, materials and construction will dictate its usefulness, efficiency and durability. Total cost of ownership will be determined by the system's performance and its short- and long-term operating costs. Holophane lighting systems provide the best combination of lighting performance, aesthetics, and lowest operating costs.

Durability and Maintenance Ease

A quality lighting system constructed of high performance materials will last longer and require less maintenance. Design features such as interchangeable parts, a quick disconnect and hinged door assembly will simplify maintenance and reduce the time required to make repairs and change out lamps.

Holophane's glass optical systems will not discolor or attract dust and dirt - reducing cleaning requirements. Low copper aluminum alloy housing construction provide corrosion resistant luminaires that meet UL requirements for marine type environments — making the luminaires particularly beneficial for colleges and universities near the coast or those in geographical areas where snow and salt on the roads present a maintenance challenge.

All Holophane products are finished with polyester powder paints. A seven stage pretreatment process assures proper paint adhesion and meets or exceeds all applicable American Society for Tests and Measurements requirements (ASTM).



CHALLENGES AND SOLUTIONS

- Architectural Outdoor Lighting
- Outdoor Site and Area Lighting
- Indoor Sports Lighting
- Physical Plants and Facilities Lighting
- Architectural Indoor Lighting

ARCHITECTURAL OUTDOOR LIGHTING

North Carolina State University Students and faculty voted to install the GranVille® fixtures at North Carolina State University. Many students indicated the fixtures make them feel much safer when they walk on campus after dark. The luminaires also complement the architecture of existing buildings.



Mississippi State University Aesthetics were a concern on the Mississippi State University campus, where some of the buildings were constructed during the late 1800s. Washington PostLite® luminaires create the look of a bygone era while providing the lighting uniformity needed for a safe environment.

CHALLENGES

Safety is always the main concern when lighting a college campus. Officials want to replicate daylight as closely as possible so students, faculty and others will feel secure as they move about campus after dark. Light levels must be sufficient for vehicles as well as pedestrians.

Besides functionality, lighting systems must be aesthetically pleasing. The campus setting is often the first area prospective students and others see when they visit a college or university, so making a positive first impression is essential. The lighting system can help create a certain ambience while complementing the architecture of campus buildings.

While light levels must be sufficient to meet user needs, designers want to avoid the “forest of poles” effect, which occurs when too many poles are installed too closely together. Luminaires must have the optics to shine the light where it is needed along pathways and roadways without creating dark spots, glare or pools of light. The lighting system must also prevent trespass light from shining into dormitory windows and other areas where it is unwanted.

Recommendations for Architectural Lighting

Paths and Walkways	1-5 horizontal footcandles
Buildings and Facades	5-15 horizontal footcandles
General Area Lighting	.5-2 horizontal footcandles

Recent studies show illuminance levels around 3 footcandles is required for a site to be perceived as safe at night as it is during the day. Assessments of safety declined sharply where illuminance fell below 1 footcandle.



GRANVILLE LUMINAIRES CREATE WARM, SAFE ENVIRONMENT AT UA

When the University of Alabama launched a campus-wide lighting project, officials wanted a lighting system that would create a sense of security yet would have enough historic appeal to complement the university's Georgian style architecture. The university, founded in 1831, has many older structures.

Luminaires also had to provide the photometrics needed to facilitate wider spacing between poles and provide enough flexibility to work around existing obstacles.

"We wanted a lighting system that was attractive yet unobtrusive," said Randy Barton, principal, Barton Engineers. "Although we considered acrylic luminaires, we decided to use glass fixtures because they are durable and require less maintenance."

The university installed acorn-shaped GranVille® Premier luminaires with 250-watt metal halide lamps along campus roadways, with tear drop shaped Esplanade® units and 175-watt metal halide lamps used to light walkways.

The lighting system was so successful that the city of Tuscaloosa standardized on the Esplanade fixtures.

"We've received many positive comments about the lighting," Barton said. "People like the fixtures' turn-of-the-century look and their ability to make the campus look warm and inviting after dark."



"PEOPLE LIKE THE FIXTURES' TURN-OF-THE-CENTURY LOOK AND THEIR ABILITY TO MAKE THE CAMPUS LOOK WARM AND INVITING AFTER DARK," RANDY BARTON, PRINCIPAL, BARTON ENGINEERS.

HOLOPHANE ADVANTAGES

Holophane understands how important it is to create a safe campus environment. Our luminaire optics distribute light down the walkway or roadway, overlapping the light patterns to eliminate dark spots and pools of light. An element of uplight shines onto shrubbery, trees and building facades, promoting lighting uniformity. High levels of vertical illumination light doorways and spaces between buildings and help pedestrians identify others on the street.

Holophane photometrics promote wider spacings between poles, eliminating the "forest of poles" look that can mar the landscape. Fewer light fixtures also translate into lower installation, maintenance and operating costs.

Our full line of decorative luminaires are attractive enough to enhance the appearance of any space and complement any architectural style. We offer a wide variety of luminaires designed to meet the aesthetic and architectural needs of any decorative street lighting project.

Holophane's architectural luminaires include acorn shapes, octagonal designs reminiscent of the 1920s and simplistic lines common to Colonial America. Embellishments such as decorative caps, finials, medallions and ornamental bands give colleges the opportunity to create a custom look. We also offer custom poles with options such as banner arms, flag pole holders, custom logos and signage.



The College of William and Mary wanted to assure student safety on its 80-acre campus, which is populated with ancient trees and red brick buildings reminiscent of the eighteenth century. The campus, which borders Colonial Williamsburg, replaced the existing units with RSL-350 luminaires, which have a colonial appearance so they fit well into the historic campus.

ESPLANADE LUMINAIRES SHOWCASE ISU ARTS CORRIDOR



Every year, thousands travel the Seventh Street Arts Corridor, the centerpiece and main thoroughfare for Indiana State University. After the University standardized on Somerset® luminaires for campus parking lots, the engineering department selected Esplanade® fixtures for a beautification project that included constructing a boulevard along the Arts Corridor.

One of the challenges was to install the same number of poles on each 20-foot island that extends down the center of the boulevard while providing high levels of visibility along the 20-foot wide street that runs along each side of the island. In the past, the University used shoe-box type luminaires to illuminate roadways.

“We liked the looks of the Holophane luminaires and their photometrics, which allowed us to place the poles where we wanted them,” said Pat Teeters, senior electrical engineer, Indiana State University. “We had worked with Holophane earlier and had a high level of confidence in the company’s capabilities and willingness to meet our needs.”



“WE LIKED THE LOOKS OF THE HOLOPHANE LUMINAIRES AND THEIR PHOTOMETRICS, WHICH ALLOWED US TO PLACE THE POLES WHERE WE WANTED THEM,” SAID PAT TEETERS, SENIOR ELECTRICAL ENGINEER, INDIANA STATE UNIVERSITY.

ISU installed Esplanade fixtures mounted on 30-foot decorative poles on each island and Washington PostLite® luminaires on 14-foot poles along the walkways. Both luminaire styles use 150-watt high pressure sodium lamps, with the Esplanade poles customized to incorporate an ISU camden decorative arm.

“Holophane luminaires have a historical appeal that enhances the boulevard aesthetics,” Teeters said. “The fixtures are also very functional and provide uniform lighting and high levels of visibility.”



Edinboro University



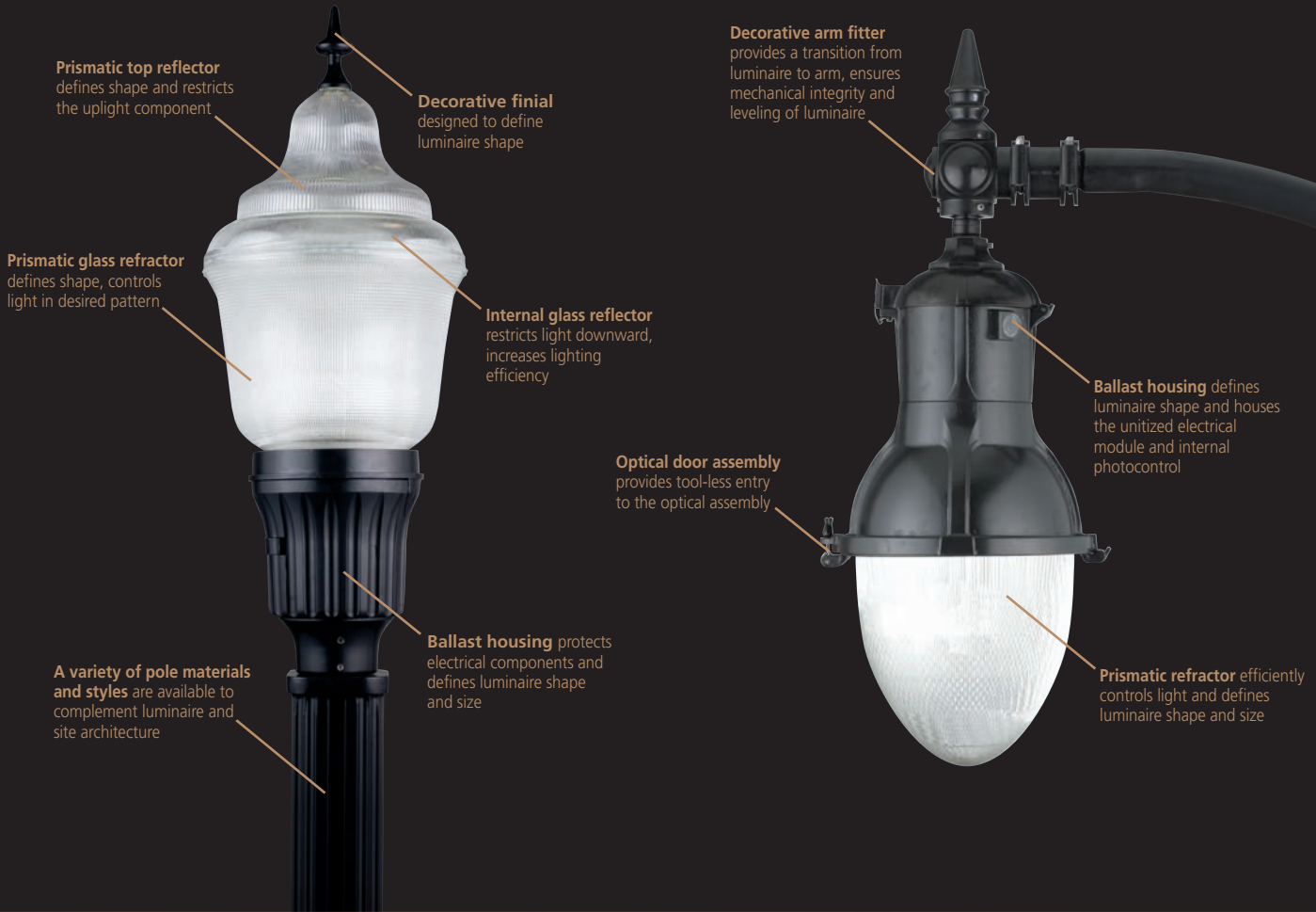
Northern Michigan University



Southern Connecticut State College



McLennan County Community College



GranVille® Series
(Available now with LED)



Washington PostLite®



Acrylic
Washington PostLite®



Harp Series



RSL-350



Arlington®
(Full cutoff optics)



Jefferson



Tear Drop Series



Utility Series
(Minuteman™)



Utility Series
(Dorchester®)



Utility Series
(Prismasphere®)

OUTDOOR SITE AND AREA LIGHTING

OSU Newark Campus installed Crestwood® luminaires to illuminate the student and staff parking lot, and entrance road along city bike path. The medium mount fixtures allow wider spacing between poles while promoting lighting uniformity.



McLennan County Community College

A rapidly growing student enrollment incited McLennan Community College to replace its outdated lighting system. The college installed architecturally styled PoleStar® luminaires with arched arm mounting and metalized prismatic glass symmetrical distribution. The luminaires perform better than the previous fixtures and they are durable and require less maintenance.

CHALLENGES

College and university officials want students and others to feel safe any time they move about campus. Commercial outdoor lighting systems may be used to light various campus settings, including parking lots, roadways and sidewalks, pedestrian tunnels, parks and building facades.

Light sources must provide high levels of illumination without glare to enhance security. The luminaires must be reliable since an outage could result in a dark and even threatening environment.

While shrubbery and other elements sometimes hide luminaires, other fixtures may be highly visible and should blend well with their surroundings. Light should be confined to areas where it is needed. This is especially important for campuses that border residential and commercial neighborhoods and light trespass is unwelcome.

Campus lighting systems must be economical to operate and maintain. Life cycle costs—the cost to own, operate and maintain the system during its life span—are often more important than purchase costs. Installation costs are also a consideration.

Recommendations for Site and Area Lighting

	Horizontal Footcandles	Uniformity Ratio <i>(Max. to Min.)</i>
Roadways	.5 – 1 ftc.	10:1
Parking Lots	1 – 3 ftc.	15:1
Parking Garages	5 – 10 ftc.	4:1
Pedestrian Tunnels	4 – 5 ftc.	4:1

Recent studies show illuminance levels around 3 footcandles is required for a site to be perceived as safe at night as it is during the day. Assessments of safety declined sharply where illuminance fell below 1 footcandle.

CAL POLY STATE UNIVERSITY MEETS REQUIREMENTS, SAVES ENERGY



Officials at Cal Poly State University, San Luis Obispo, were concerned about safety and energy when the university constructed two parking structures as part of its Poly Canyon Village student housing project. Holophane provided design assistance, combining IESNA lighting requirements with recommendations to save energy.

“We had serious concerns about meeting the minimum light levels needed to create a safe environment,” said Dennis K. Elliott P.E., Manager of Engineering and Utilities, Cal Poly State University. “We wanted luminaires that required less energy and were easy to install and maintain.”

Holophane EMS fluorescent luminaires were selected to photometrically comply with the design criteria for horizontal and vertical illumination. The EMS luminaires are designed to evenly distribute light on the horizontal plane and deliver high levels of vertical illumination for visual comfort and vehicle and pedestrian safety.



“THE HOLOPHANE FLUORESCENT LUMINAIRES HELPED US MEET IESNA RECOMMENDED LIGHT LEVELS AND REDUCED ENERGY NEARLY 40 PERCENT COMPARED TO A COMPETITIVE HID LUMINAIRE,” ELLIOTT SAID.

Working with Cal Poly State’s design team and electrical contractor, Holophane customized a ceiling mount bracket that complied with National Electric Code requirements and simplified installation.

“The system is energy efficient and out performs specifications set forth in California’s strict Title 24 Energy Code.”

To further conserve energy, photocells control the EMS luminaires on the parking structures’ perimeters and switch fixtures off when daylight levels are sufficient.

HOLOPHANE ADVANTAGES

Holophane lighting systems promote visual comfort and security in any outdoor setting. Borosilicate glass reflectors/refractors provide high levels of vertical illumination so vehicle drivers, pedestrians and bicyclists can read signs and identify objects, including automobiles and other people.

Some luminaires provide an element of uplight to illuminate dark ceilings and improve depth perception in parking decks and pedestrian tunnels. Other systems, including floodlighting and area lighting fixtures, are offered with various distributions and wattages to meet each application’s specific lighting requirements.

Luminaire photometrics promote wider spacing between fixtures, which reduces the number of units needed and decreases installation, maintenance and operating costs. Design features such as interchangeable ballast trays and removable luminaire doors ease maintenance and reduce the time required making repairs.

All Holophane outdoor luminaires are constructed of rugged, corrosion-resistant materials that will stand up to the elements and environmental chemicals—including road salt—to assure long-term, reliable performance.



Student Parking; Pechina®

Northern Michigan University Olympic Training Center Northern Michigan University standardized on Somerset® luminaires for all roadway, parking lot and walkway lighting. University personnel appreciate the fixture's classic styling and multiple optical distributions, which provided design flexibility.



University of Auburn PoleStar® luminaires offer the lighting uniformity required to effectively illuminate the University of Alabama's stadium parking lot. Fixture photometrics allowed the university to attain desired light levels with fewer luminaires spaced farther apart.



Pechina®



GlasWerks® II Series



MetroVue®



Mongoose® Series



PoleStar® II



MirroStar®



Somerset®



Crestwood®



Prismbeam® II



Parkpak®



Wallpack® IV

INDOOR SPORTS LIGHTING

Kenyon College Holophane Enclosed Primalume® fixtures with electronic ballasts provide excellent light distribution and optimum control. Windows in the facility provide ample daylight, allowing the college to use the electronic ballasts' dimming capability to reduce energy consumption by as much as 50 percent.



Northern Michigan University Olympic Training Center Glare control was critical at Northern Michigan University's Olympic Education Center, where Holophane T Series lensed troffer fluorescent luminaires were selected because of their high efficiency optics and low glare lens. Although the job was designed with 190 4-lamp fluorescent fixtures, the university was able to install 88 three-lamp fixtures and attain the same light levels and uniformity.

CHALLENGES

Uniformity is essential when lighting a field house or gymnasium. Designers want high levels of illumination without shadows or glare.

Shadows during a volleyball game, for example, can hide the ball as it passes through the air. In a natatorium, shadows and glare can hamper the judges' ability to determine the winners in a race.

According to the IESNA handbook, vertical illumination takes precedence in aerial sports such as basketball while horizontal illumination is a priority in ground level sports, including boxing. Ceilings must be properly illuminated to reduce ceiling contrast and eliminate the cavern effect. Fixtures must also be able to withstand the impact of flying objects.

Because field houses and gymnasiums are often used for concerts, theatrical productions and graduation, these facilities must be able to vary the light levels to accommodate a range of activities.



Lake Erie College Equine Center; Primalume®

Refer to the "Sports and Recreation Area Lighting" section of the IES handbook for a complete account of illumination guidelines.



“WE SELECTED THE CRYSTALGLO LUMINAIRES BECAUSE EVEN WITH THE IRREGULAR SPACING, THE FIXTURES PROVIDE THE LIGHTING UNIFORMITY THAT WE NEED,” SAID KEMPF.

NOTRE DAME RETROFITS AUXILIARY GYM WITH LOW PROFILE LUMINAIRES

The University of Notre Dame has long been recognized for its winning athletic programs. The university's auxiliary gymnasium is the site of the varsity teams' closed practices as well as a variety of non-varsity events. Because of the facility's popularity, it is utilized 70 to 100 hours each week.

In the past, the gymnasium was illuminated with mercury vapor luminaires that had been installed during the early 1970s. At one time, the facility was used for wrestling, so most of the light fixtures had been mounted in the center of the gym where the mats were located. The result was a very bright area in the middle of the space with dark cavernous areas along the sides of the playing courts.

“Over the years, the athletic department had received a number of complaints about the inadequacy of the illumination,” said Paul Kempf, director of utilities, University of Notre Dame.

Based on past successes with Holophane luminaires in other campus facilities, the university retrofitted the aged lighting system with low profile CrystalGlo® luminaires and 400-watt metal halide lamps. The university kept the existing 30-foot lay-in ceiling, which concealed a number of obstacles such as piping and ductwork. Luminaire spacing varied since the fixtures had to be placed around these obstacles.

Illumination levels are 50 to 60 footcandles. The metal halide luminaires are more energy efficient than the mercury vapor system, which reduces operating costs. According to Kempf, the units are group relamped every two to three years.

HOLOPHANE ADVANTAGES

Holophane luminaires for gymnasiums, natatoriums and field houses have a borosilicate glass reflector that provides an element of uplight to illuminate the highest ceilings. A combination of direct and indirect light assures the entire space is comfortable and evenly illuminated—even a facility with an arched roof or vaulted ceiling.

The fixtures' glass reflectors resist dust build up so they continue to perform at maximum efficiency over time. Simply wiping the luminaires with a cloth will bring them back to their original level of performance. The fixtures' photometrics facilitate wider spacing, which reduces the number of luminaires, installation, maintenance and operating costs.

Holophane luminaires may be used with control systems to reduce the fixtures' output when a space is used for events that require less illumination.



Lansing Community College, Enduratron®

LIGHTING CREATES BRIGHT, FUNCTIONAL FACILITY FOR FRANKLIN & MARSHALL



Officials at Franklin & Marshall College wanted to create a bright environment without reflections or glare when they selected the lighting for the new natatorium, which is part of the college's Athletic & Recreation Complex. The facility houses an Olympic size 80-meter pool with a large skylight that runs the pool length.

"We wanted to assure we did not have the dreary atmosphere that is common to many indoor pools," said Steve Valeriano, electrical engineer and principal, Consolidated Engineers. "Because Franklin & Marshall is one of the top schools in swimming, officials hoped to hold national meets here, which necessitated higher illumination levels."



"ALL OF THE ELEMENTS BLEND TOGETHER NICELY," SAID VALERIANO. "THE FACILITY IS ABSOLUTELY BEAUTIFUL."

Prismalume® luminaires with 1,000-watt metal halide lamps were cable-mounted at 34 feet above the pool. Every lighting fixture is individually controlled, with a separate circuit running from each fixture into a relay box. The system is pre-programmed computer controlled with manual override.

Illumination levels are 100 footcandles for competition and 50 footcandles for recreational use.

At night, the skylight is illuminated with indirect shoebox type fixtures mounted upside down on a catwalk. The college installed Prismalume luminaires with 250-watt super metal halide lamps above the bleachers.



Michigan State University — Prismbeam® II



Northern Michigan University — Prismalume®



East Stroudsburg University; Prismalume®



Denison University Field House — Prismalume®

Electronic HID ballast provides dimming option, ease of maintenance and reduced energy costs

ISD SuperGlass® optics provides the most energy efficient luminaire, available in a variety of light distributions.

Concentric cooling fins allows a flow through ventilation providing thermal management

Steel rods and rings support and protect the glass reflector.

Isolated ballast housing maximizes heat dissipation, extends ballast life and reduces maintenance costs.

Optional upright distributes illumination across the ceiling to reduce contrast.

Miro®Silver reflector increases efficiency and control of lumen output from the lamps

Decorative closed endcap protects edges that allow addition of lenses or baffle.

Ventilated reflector chamber creates airflow through the optical chamber, yields significantly better dirt depreciation.

Vertically stacked lamps reduces harsh surface glare, lowers its overall weight and eases installation.

Patented exclusive P.O.L.A.R. technology supplies more light, optimizes lumen output, increases energy.

Miro-Silver® is a Registered Trademark of Alanod



Enduratron®



Primalume® Series



Prismpack® V Series



Twin Series



PrismGlo® Series



Illuminaire® Series



Illumibay®



CrystalGlo®



IntelliVue®



HB/HC

PHYSICAL PLANTS AND FACILITIES LIGHTING

Notre Dame installed PrismGlo® luminaires to create a uniformly illuminated environment to facilitate maintenance within the university's power plant.

Heavy duty Petrolux® luminaires provided design flexibility when illuminating the exterior of the power plant at the university.



Erie County Tech School Prismalume® fixtures help simulate the work environment at Erie County Technical School. The luminaires create a bright atmosphere without glare so students can perform detailed tasks safely and efficiently.

CHALLENGES

College physical plants, water treatment facilities and maintenance areas are similar to industrial facilities. They often have wide, open spaces with both high and low ceilings crisscrossed by support beams and trusses. They may also have pipes and lines near the ceiling that block the light and keep it from reaching critical pieces of equipment.

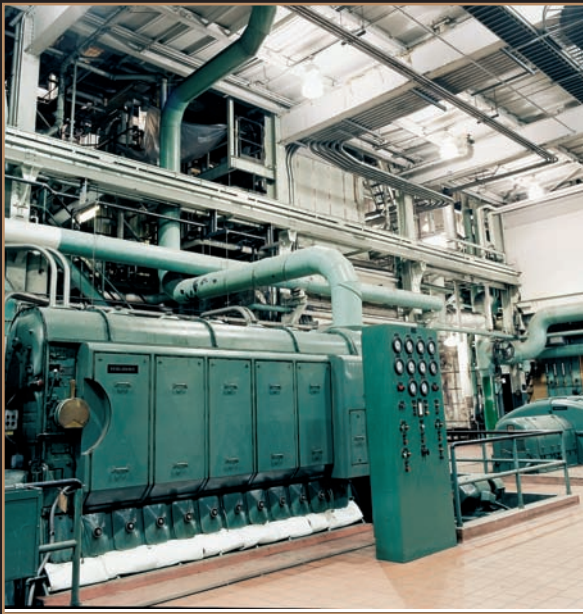
Physical plants, water treatment and maintenance facilities often require relatively high levels of illumination with sufficient vertical footcandles. Employees must be able to read gauges and take instrument readings to assure equipment is functioning properly. They also need quality illumination so they can see the parts to make necessary repairs.

Sometimes water treatment plants and maintenance facilities have wash down areas that are cleaned by spraying the area with hoses. Luminaires used in these locations must be corrosion-resistant and able to stand up to the environment.

Physical plants, water treatment plants and maintenance facilities may be comprised of a number of buildings housing various functions—all with different lighting needs.

Recommendations for Facility Lighting

	Footcandle Ratios	Uniformity (Max. to Min.)
Catwalks and Platforms	2-5	—
Boiler Rooms (control areas)	5-10	3:1
Basement Areas	2-5	—
Loading Areas	10-20	—



PRISMATIC GLASS LUMINAIRES BRIGHTEN POWER PLANT

An overhead crane in the 84,000-square-foot power plant at the University of Notre Dame made it difficult to get the illumination levels needed to monitor and repair equipment. The problem was compounded by the fact that equipment in the facility had been painted green and provided little reflectance.

The 300-watt incandescent fixtures used to light the plant in the past supplied little illumination on the 30-foot ceiling, and it appeared cavernous. Pipes and tubing that crisscrossed the aged wooden ceiling further blocked the light.

The university replaced the incandescent fixtures with prismatic glass Primalume® luminaires and 400-watt metal halide lamps. The Primalume units supply 15 percent uplight to illuminate the light green ceiling and create a uniformly lit environment. Illumination levels measure up to 100 footcandles.

“Many of the pipes in the ceiling have labels,” said Paul Kempf, director of utilities, University of Notre Dame. “When we have a problem, maintenance personnel must be able to read the labels so they can track the pipes and locate the problem.”

The incandescent fixtures previously used had acrylic reflectors that yellowed over time and lost some of their effectiveness. According to Kempf, the glass reflectors will not yellow.

“Wiping the fixtures down returns the fixtures to their original efficiency. They look and perform like new,” Kempf said.

The Primalume luminaires were installed in the same locations as the incandescent fixtures, which allowed the university to use the existing wiring. Fewer Primalume fixtures were used compared to the number of incandescent units that were previously installed.

“WE WERE ABLE TO GET MORE LIGHT USING FEWER FIXTURES,” SAID KEMPF. “THE ATMOSPHERE IS MUCH BRIGHTER AND APPEARS VERY CLEAN.”

HOLOPHANE ADVANTAGES

Holophane offers a wide variety of lighting systems to meet almost any lighting need at a campus physical plant, water treatment or maintenance facility. Luminaires have borosilicate glass reflectors/refractors that allow them to stand up to the harshest environments. Enclosed and gasketed luminaires prevent the collection of dirt and dust particles while standing up to high-pressure hose cleaning and chemicals.

Holophane luminaires also have die cast aluminum housings and corrosion-resistant coatings for long term service and minimal maintenance.

Holophane luminaires provide long and narrow, square or asymmetric light distributions to fulfill different applications and lighting requirements. The combination of available optics allow for even illumination throughout a facility despite obstruction of pipes and other physical barriers. Uplight (or indirect illumination) from the fixtures illuminates dark ceilings, making the environment safer, brighter and more comfortable.

Horizontal and vertical illumination levels are sufficient so employees can accurately read meters and gauges and make necessary equipment repairs.



Water Treatment Facility; PrismGlo®



“RETAIL” FIXTURES ILLUMINATE WATER TREATMENT PLANT

A water treatment facility in Miramar, Florida, uses commercial-type lighting fixtures to illuminate the 10,920-square-foot membrane area within the plant’s main processing building. PrismGlo® luminaires from Holophane are mounted at 15 feet and spaced 27 feet on center.

“The same reasons the PrismGlo luminaires are effective in a retail store make them well suited to this type of application,” said Bruce Contino, supervising electrical designer for Montgomery Watson. “They provide excellent vertical footcandle levels and good color rendition, which are important in a water treatment facility.”

Luminaires are hung on three-inch stems suspended from the concrete double T ceiling. According to Contino, the PrismGlo fixtures were mounted on shorter stems because of limited space between the ceiling and the bridge crane. Light levels are 30 footcandles.

“THE SAME REASONS WHY THE PRISMGLO UNITS ARE EFFECTIVE IN A RETAIL APPLICATION ARE WHAT MAKES THEM WELL SUITED TO INDUSTRIAL SETTINGS,” CONTINO SAID. “THEY PROVIDE EXCELLENT VERTICAL FOOTCANDLE LEVELS AND GOOD COLOR RENDITION, WHICH IS PARTICULARLY IMPORTANT IN A WATER TREATMENT PLANT.”

“The interior is bright and uniformly lit,” said Contino. “The PrismGlo optics cast light in every direction. Because the luminaires are enclosed, they’re applicable for almost any industrial-type facility with a suitable ceiling height.”

In addition to the PrismGlo units, the facility uses four-foot 7200 fluorescent PrismaLite®, luminaires in the chemical areas. The PrismaLite units are enclosed and gasketed and are impervious to corrosive gasses.



Control Room; IntelliVue®



Mail Room; Enduralume®

Universal mount provides you with the ability to do pendant, wall or stanchion mount

Ceiling, wall, and stanchion mountings are available to meet all your design requirements

Low profile housing provides low mounting heights

External capacitor module reduces operating costs by extending the capacitor life up to 5 times.

Heavy duty die cast aluminum housing, are offered standard in corrosion resistant polyester powder paint

Tool-less relamping with threaded optic for easy relamping

A choice of four optics offers symmetrical, asymmetrical or long and narrow distribution

ISD SuperGlass® reflector and a forward throw optic provides superior optical performance

A choice of four optics offers a variety of light distributions



Petrolux® III Series
(Wet location)



Bantam® 2000 Prismatite



Enduralume®



Low Profile Series



CentaGlo®



Prismalume® Series



Prismpack® V Series



IntelliBay®
IntelliVue®



Controlume®



HES

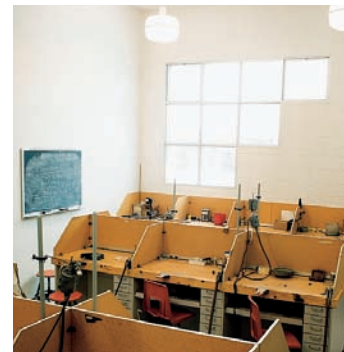
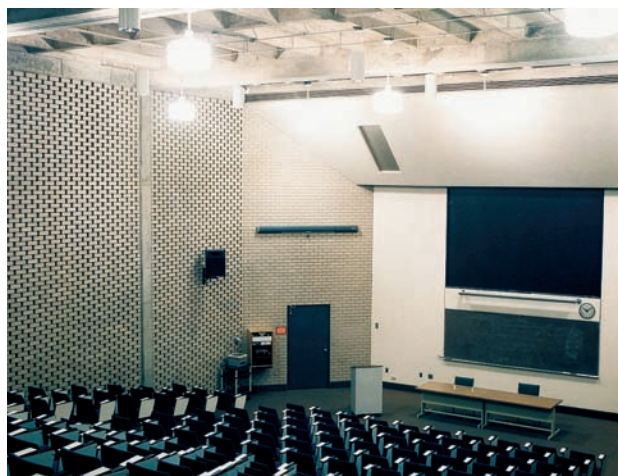


7200 Prismatite®

ARCHITECTURAL INDOOR LIGHTING

Lake Michigan College

PrismGlo® luminaires in Lake Michigan College's lecture hall and library provide 40 percent uplight. Forty-one PrismGlo fixtures replaced 160 incandescent and fluorescent units, reducing energy consumption while boosting visibility.



Flat Head Community College

PrismGlo® Athena luminaires installed in the art room and adjoining jewelry lab at Flathead Community College provide direct and indirect illumination, meeting student needs for lighting uniformity and excellent color rendition without shadows and glare. The fixtures use 175-watt metal halide lamps, with illumination levels at 80 footcandles.

CHALLENGES

Many areas within campus buildings will benefit from architectural high intensity discharge (HID) and compact fluorescent lighting. In high traffic areas such as lobbies, stairwells, hallways, libraries and atriums, aesthetics may very well be as important as functionality. The designer will likely want lighting fixtures that complement the building's architecture and blend with the materials used in floors, walls and ceilings.

Many of these spaces present a lighting challenge because of varying ceiling heights. One area may have a vaulted ceiling with trusses while an adjoining space will have a relatively low, finished ceiling. Lighting fixtures may need to be installed along the walls in stairwells, entrances and doorways.

In all of these areas, the lighting system must be versatile enough to effectively illuminate the space. Fixtures with an element of uplight will illuminate the ceiling and eliminate the dark and cavernous feeling. Indirect illumination or "bounce" light will also minimize shadows and promote lighting uniformity.

Efficiency and life cycle costs should also be considered since most colleges and universities must deal with budgetary constraints.

Recommendations for Architectural Lighting

	Horizontal Footcandles
Lobbies and Atriums	10
Libraries	30
Meeting Rooms <i>(Depending on primary visual task)</i>	30-100
Corridors	10-30
Building Entrances	5-30
Ramps and Stairs	10-30



CLEMSON UNIVERSITY SLASHES ENERGY AND MAINTENANCE COSTS

The Robert Muldrow Cooper Library boosted light levels and cut energy consumption by more than half. The existing fluorescent lighting system of the high traffic lobby was retrofitted with HID luminaires from Holophane. The 3,000-square-foot lobby used 200 four-foot fluorescent T12 luminaires (300 lamps) to light the space.

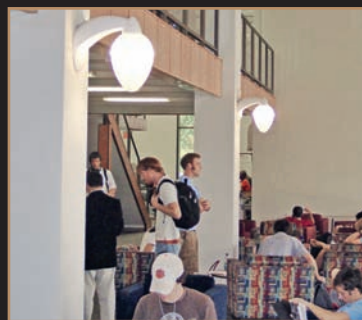
"The fluorescent luminaires became a maintenance nightmare, and an eyesore," said Allen Lohman, Project Manager. "The high ceiling and awkward location of luminaires above the staircase and balconies made it impossible to access with a motorized scaffold - at the time of replacement more than 70 percent of the units were burned out."

Aesthetic was a concern because Cooper Library was a showpiece for the university. The lighting system also required adequate illumination on light displays and exhibits.

The retrofit consisted of 11 Holophane pendant-mounted Illuminaire® Egg luminaires with 400-watt metal halide lamps. The uniquely shaped borosilicate glass optics provided 25 percent uplight to illuminate the suspended acoustical ceiling.

As a result of the retrofit, energy consumption has decreased from 12,000 watts for the fluorescent luminaires to 3,900 watts for the Holophane luminaires.

"The Holophane luminaires are much more efficient and easier to maintain than the previous system," said Lohman. "People like the new lighting system because it enhances the appearance of the space."



"THE HOLOPHANE LUMINAIRES ARE MUCH MORE EFFICIENT THAN THE PREVIOUS SYSTEM" SAID LOHMAN.

HOLOPHANE ADVANTAGES

Holophane offers a full line of aesthetically pleasing HID and compact fluorescent luminaires designed to meet the lighting needs of a variety of interior spaces. Ageless prismatic glass reflectors/refractors add elegance and a certain sparkle while promoting high levels of visual comfort. Aluminum husks, colored bands, and custom mounting brackets lend designer appeal.

Holophane luminaires will complement any design theme or architectural style—from the retro warehouse or open loft look of the 1930s to more traditional styles. Besides our high bay fixtures, we offer several compact luminaires for lower and/or finished ceilings.

Holophane optics will not yellow over time and resist static charges which attract dust and dirt. Optics can be restored to 100% of their initial efficiency by simply wiping the glass during re-lamping. Because some Holophane luminaires are 95 percent efficient, fewer fixtures are required to effectively illuminate the space. Fewer luminaires not only eliminates ceiling clutter, but reduces installation, maintenance and operating costs.



Student Cafeteria — Illuminaire®



LIGHTING AT LAW SCHOOL IS FUNCTIONAL, APPEALING

When the new Joseph E. Keller School of Law was constructed at The University of Dayton, the lighting designer wanted to enhance the building's appearance and continue the theme of simple elegance. The lighting system selected had to be versatile enough to effectively illuminate the various areas within the school.

"The challenge was to show the building's scale," said John Harpest, team manager, Heapy Engineering, Dayton. "We wanted people to experience the magnitude of the atrium, the lobby and the open stairwell."

Teardrop-shaped Enhanced PrismGlo® luminaires were installed in all of the above areas. The fixtures use 175-watt and 250-watt metal halide lamps in the stairwell, and 250-watt metal halide lamps in the library. Illumination levels range from 15 to 20 footcandles in the atrium and lobby and more than 50 footcandles in the library stacks.



"...BECAUSE OF THE LIGHT CONTROL PROVIDED BY THE PRISMATIC GLASS FIXTURES, GLARE HAS NOT BEEN A PROBLEM. THE ATMOSPHERE IS BRIGHT BUT COMFORTABLE."

"We were concerned about brightness in the stairwell because the fixtures are mounted at lower heights," said Harpest. "Glare was a question since the facility has polished terrazzo floors. However, because of the light control provided by the prismatic glass, glare has not been a problem. The atmosphere is bright but comfortable."



Agricultural Center; Illuminaire®



School Cafeteria; 02454



Fitness Center; Illuminaire®

Integral, surface, remote, and recessed mounting options to meet a variety of applications

Quick install box allows for quick labor saving installation and fast maintenance

Die cast aluminum housing offers corrosion resistant polyester powder paint or metallic finishes

Stems are available in various lengths to support and suspend optics at different height

Distinct claw and cap designs offer an extra decorative element

Five architecturally shaped optics provides the right blend of uplight and downlight distribution to meet various illumination requirements



Die cast aluminum alloy ballast and optical support housing, pretreated and coated with electro-statically deposited thermoset polyester white paint available in a variety of mounting options for surface, pendant and remote options

Stem assembly in a variety of lengths to position optics at a desired mounting height

Luminaire is finished with a polyester powder paint applied after a seven stage pretreatment process to assure durability

Choice of five unique optics offers a variety of optics choices in asymmetric and symmetric light distributions



02454



PGRL



PrismGlo® Series



Illuminaire® Series



Enduratron®



Illumibay®



CrystalGlo®

PARTIAL PROJECT LISTING

United States

Arizona State University
 Auburn University
 Ball State Muncie
 Baylor College
 Brown University
 California State University
 Cal Poly State University
 Clarkson University
 Clemson
 Cleveland State University
 Colgate University
 College of William & Mary
 Columbia College
 Columbia University
 Columbus State University
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 Depaul University
 Drake University
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 Fort Lewis College
 Fresno Pacific University
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 Furman University
 Georgia Southern University
 Georgetown University
 Georgia Military College
 Gettysburg College
 Hastings College

Indiana State University
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 Purdue University
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 Saint Francis Xavier University
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 University of Tennessee
 University of Texas
 University of Toledo
 University of Tulsa
 University of Virginia
 University of Washington
 UNLV
 Wake Forest University
 Washington State University
 Wheaton College
 Western Kentucky University
 Western Maine University
 Wilkes University
 Williams College

Canada

Queen's University;
 Kingston, Ontario
 University of Calgary;
 Calgary, Alberta

SUMMARY

The lighting needs on a college or university campus are as diverse as the institution itself. While safety and security are always a priority, colleges and universities are concerned about aesthetics and making the right impression.

With a century of industry leadership, Holophane offers a wide range of lighting systems designed to meet a college or university's specific lighting needs. For interior applications, Holophane luminaires provide lighting uniformity and excellent color rendition without shadows and glare. On roadways and sidewalks, fixtures offer high levels of visibility that enable drivers and pedestrians to move around safely after dark.

Holophane luminaires with glass reflectors and refractors are also durable and highly appealing. For further details, contact your local Holophane factory sales representative or visit www.holophane.com.



Featured from left, top to bottom.

Delaware Tech Enhanced PrismGlo® provides a stylish and inviting setting, while maintaining effective visibility of color and texture in Delaware Tech's campus bookstore.

Princeton Utilizing 50% fewer fixtures than the original fluorescent system, the Primalume® system with metal halide lamps at Hobart Baker Rink, Princeton University's ice skating arena, generates twice as much light while cutting energy costs.

UC Irvine The Petrolux® II installation at the parking garage of UC Irvine provides excellent vertical lighting and high visibility giving the students and faculty a feeling of security.

William and Mary The RSL-350 fixtures replaced the plastic reflectors on a one for one basis. The light level doubled and energy usage was reduced by almost a third.



HOLOPHANE[®]
LEADER IN LIGHTING SOLUTIONS

An **AcuityBrands** Company

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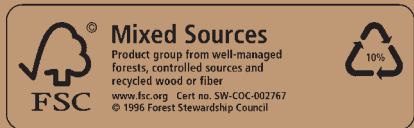
Contact your local Holophane factory sales representative for application assistance, and computer-aided design and cost studies. For information on other Holophane products and systems, call the Inside Sales Service Department at 866-759-1577. In Canada call 905-707-5830 or fax 905-707-5695.

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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 sales representative.

Visit our web site at www.holophane.com

Certain airborne contaminants can diminish the integrity of acrylic. Please refer to the Acrylic Environmental Compatibility Chart (HL-2445) for suitable uses.



Buying products with the FSC label supports the growth of responsible forest management worldwide. The eco savings in the production of this brochure:

- 4 trees preserved for the future*
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- 326 lbs net greenhouse gases prevented*
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